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UNITED STATES SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

Form 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2021

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from _____ to _____

Commission file No. 1-8491

HECLA MINING COMPANY

(Exact name of registrant as specified in its Charter)

Delaware	**77-0664171**
State or Other Jurisdiction of Incorporation or Organization	I.R.S. Employer Identification No.
6500 N. Mineral Drive, Suite 200 Coeur d'Alene, Idaho	**83815-9408**
Address of Principal Executive Offices	Zip Code

208-769-4100
Registrant's Telephone Number, Including Area Code

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.25 per share	HL	New York Stock Exchange
Series B Cumulative Convertible Preferred Stock, par value $0.25 per share	HL-PB	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months, and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act:

Large accelerated filer ☒
Non-accelerated filer ☐
Accelerated filer ☐
Smaller reporting company ☐
Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒
☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the registrant's voting Common Stock held by non-affiliates was $3,959,657,057 as of June 30, 2021. There were 536,822,656 shares of the registrant's Common Stock outstanding as of June 30, 2021, and 538,352,111 shares outstanding as of February 17, 2022.

Documents incorporated by reference herein:

To the extent herein specifically referenced in Part III, the information contained in the Proxy Statement for the 2022 Annual Meeting of Shareholders of the registrant, which will be filed with the Commission pursuant to Regulation 14A within 120 days of the end of the registrant's 2021 fiscal year, is incorporated herein by reference. See Part III.

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Special Note on Forward-Looking Statements

Certain statements contained in this report (including information incorporated by reference) are "forward-looking statements" and are intended to be covered by the safe harbor provided for under Section 27A of the Securities Act of 1933, as amended ("Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended ("Exchange Act"). Our forward-looking statements include our current expectations and projections about future production, results, performance, prospects and opportunities, including reserves and resources. We have tried to identify these forward-looking statements by using words such as "may," "might," "will," "expect," "anticipate," "believe," "could," "intend," "plan," "estimate," "project" and similar expressions. These forward-looking statements are based on information currently available to us and are expressed in good faith and believed to have a reasonable basis. However, our forward-looking statements are subject to a number of risks, uncertainties and other factors that could cause our actual production, results, performance, prospects or opportunities, including reserves and resources, to differ materially from those expressed in, or implied by, these forward-looking statements.

These risks, uncertainties and other factors include, but are not limited to, those set forth under *Item 1A. Risk Factors* and *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations*. Given these risks and uncertainties, readers are cautioned not to place undue reliance on our forward-looking statements. Projections and other forward-looking statements included in this report have been prepared based on assumptions, which we believe to be reasonable, but not in accordance with United States generally accepted accounting principles ("GAAP") or any guidelines of the Securities and Exchange Commission ("SEC"). Actual results may vary, perhaps materially. You are strongly cautioned not to place undue reliance on such projections and other forward-looking statements. All subsequent written and oral forward-looking statements attributable to Hecla Mining Company or to persons acting on our behalf are expressly qualified in their entirety by these cautionary statements. Except as required by federal securities laws, we disclaim any intention or obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Risk Factors Summary

The following is a summary of the principal risks that could adversely affect our business, operations and financial results. These risks are described in more detail under *Item 1A. Risk Factors* of this report.

Financial Risks

- A substantial or extended decline in metals prices would have a material adverse effect on us.
- An extended decline in metals prices, an increase in operating or capital costs, mine accidents or closures, increasing regulatory obligations, or our inability to convert resources or exploration targets to reserves may cause us to record write-downs, which could negatively impact our results of operations.
- We have a substantial amount of debt that could impair our financial health and prevent us from fulfilling our obligations under our existing and future indebtedness.
- We have had losses that could reoccur in the future. Our ability to recognize the benefits of deferred tax assets related to net operating loss carryforwards and other items is dependent upon future cash flows and taxable income.
- Our accounting and other estimates may be imprecise.
- Commodity and currency risk management activities could prevent us from realizing possible revenues or lower costs or expose us to losses.

Operation, Climate, Development, Exploration and Acquisition Risks

- Natural disasters, public health crises (including COVID-19), political crises, and other catastrophic events or other events outside of our control may materially and adversely affect our business or financial results.
- The COVID-19 virus pandemic may heighten other risks.
- Climate change could negatively impact our operations and financial performance.
- Mining accidents or other adverse events at an operation could decrease our anticipated production or otherwise adversely affect our operations. Our operations may be adversely affected by risks and hazards associated with the mining industry that may not be fully covered by insurance.
- Efforts to expand the finite lives of our mines may not be successful or could result in significant demands on our liquidity, and our costs of development of new orebodies and other capital costs may be higher than estimated. Our ore reserve and resource estimates may be imprecise.
- Our ability to market our metals production depends on the availability of smelters and/or refining facilities, and our operations and financial results may be affected by the disruptions or unavailability of such facilities. Shortages of critical parts and equipment may adversely affect our development projects.
- We derive a significant amount of revenue from a relatively small number of customers.
- Certain of our mines and exploration properties are located on land that is or may become subject to competing title claims and/or claims of cultural significance.
- We may be subject to a number of unanticipated risks related to inadequate infrastructure.
- We face inherent risks in acquisitions of other mining companies or properties that may adversely impact our growth strategy. The properties we may acquire may not produce as expected, and we may be unable to accurately determine reserve potential or identify associated liabilities. We may be unable to successfully integrate the operations of the properties we acquire. We may not realize all of the anticipated benefits from our acquisitions.
- The issues we have faced at our Nevada Operations could require us to write-down the associated long-lived assets. We could face similar issues at our other operations.
- We face risks relating to transporting our products from our mines, as well as transporting employees and materials at Greens Creek.

Legal, Regulatory and Compliance Risks

- Our operations are subject to complex, evolving and increasingly stringent environmental laws and regulations. Compliance with environmental regulations, and litigation based on such laws and regulations, involves significant costs and can threaten existing operations or constrain expansion opportunities. Mine closure and reclamation regulations impose substantial costs on our operations and include requirements that we provide financial assurance supporting those obligations.
- We are required to obtain governmental permits and other approvals in order to conduct mining operations. We face substantial governmental regulation, including the Mine Safety and Health Act, various environmental laws and regulations and the 1872 Mining Law. Additionally, new federal and state laws, regulations and initiatives could impact our operations.
- We are currently involved in ongoing legal disputes. Legal challenges could prevent the Rock Creek or Montanore projects from ever being developed. The titles to some of our properties may be defective or challenged.
- Our environmental and asset retirement obligations may exceed the provisions we have made.

Risks Relating to Our Common Stock and Our Indebtedness

- We may be unable to generate sufficient cash to service all of our debt and meet our other ongoing liquidity needs and may be forced to take other actions to satisfy our obligations, which may be unsuccessful.

- The price of our stock has a history of volatility and could decline in the future. Our Series B preferred stock has a liquidation preference of $50 per share or $7.9 million. We may not be able to pay common or preferred stock dividends in the future. The issuance of additional shares of our preferred or common stock in the future could adversely affect holders of common stock.

- Our existing stockholders are effectively subordinated to the holders of our 7.25% Senior Notes due February 15, 2028 ("Senior Notes"). Our Senior Notes and the guarantees thereof are effectively subordinated to any of our and our guarantors' secured indebtedness to the extent of the value of the collateral securing that indebtedness. Our Senior Notes are structurally subordinated to all liabilities of our non-guarantor subsidiaries.

- The provisions in our certificate of incorporation, our by-laws and Delaware law could delay or deter tender offers or takeover attempts. The terms of our debt impose restrictions on our operations.

PART I

Item 1. Business

For information regarding the organization of our business segments and our significant customers, see *Note 4* of *Notes to Consolidated Financial Statements.*

Information set forth in Items 1A and 2 below are incorporated by reference into this Item 1.

Introduction

Hecla Mining Company and its subsidiaries have provided precious and base metals to the U.S. and worldwide since 1891 (in this report, "we" or "our" or "us" refers to Hecla Mining Company and our affiliates and subsidiaries, unless the context requires otherwise). We discover, acquire and develop mines and other mineral interests and produce and market (i) concentrates containing silver, gold (in the case of Greens Creek), lead and zinc, (ii) carbon material containing silver and gold, and (iii) unrefined doré containing silver and gold. In doing so, we intend to manage our business activities in a safe, environmentally responsible and cost-effective manner.

The silver, zinc and precious metals concentrates and carbon material we produce are sold to custom smelters, metal traders and third-party processors, and the unrefined doré we produce is sold to refiners or further refined before sale of the metals to traders. We are organized and managed in four segments that encompass our operating mines and significant assets being Greens Creek, Lucky Friday, Casa Berardi and the Nevada Operations.

Our current business strategy is to focus our financial and human capital in the following areas:

- Rapidly responding to the threats from the COVID-19 pandemic to protect our workforce, operations and communities while maintaining liquidity.

- Operating our properties safely, in an environmentally responsible, and cost-effective manner.

- Maintaining and investing in exploration and pre-development projects in the vicinities of eleven mining districts and projects we believe to be under-explored and under-invested: Greens Creek on Alaska's Admiralty Island located near Juneau; North Idaho's Silver Valley in the historic Coeur d'Alene Mining District; the silver-producing district near Durango, Mexico; in the vicinity of our Casa Berardi mine and the Heva-Hosco project in the Abitibi region of northwestern Quebec, Canada; our projects located in two districts in Nevada; our projects in northwestern Montana; the Creede district of southwestern Colorado; the Kinskuch project in British Columbia, Canada; and the Republic mining district in Washington state.

- Improving operations at each of our mines, which includes incurring costs for new technologies and equipment.
- Expanding our proven and probable reserves, minerals resources and production capacity at our properties.
- Conducting our business with financial stewardship to preserve our financial position in varying metals price and operational environments.
- Advancing permitting of one or both of our Montana projects.
- Continuing to seek opportunities to acquire and invest in mining and exploration properties and companies.

Metals Prices

Our operating results are substantially dependent upon the prices of silver, gold, lead and zinc, which can fluctuate widely. The volatility of such prices is illustrated in the following table, which sets forth our average realized prices and the high, low and average daily closing market prices for silver, gold, lead and zinc for each of the last three years. The sources for the market prices are the London Market Fixing prices from the London Bullion Market Association for silver and gold and the Cash Official prices from the London Metals Exchange for lead and zinc.

	2021	2020	2019
Silver (per oz.):			
Realized average	$ 25.24	$ 21.15	$ 16.65
Market average	$ 25.17	$ 20.51	$ 16.20
Market high	$ 28.48	$ 28.89	$ 19.31
Market low	$ 21.53	$ 12.01	$ 14.38
Gold (per oz.):			
Realized average	$ 1,796	$ 1,757	$ 1,413
Market average	$ 1,800	$ 1,770	$ 1,392
Market high	$ 1,940	$ 2,067	$ 1,546
Market low	$ 1,684	$ 1,474	$ 1,270
Lead (per lb.):			
Realized average	$ 1.03	$ 0.84	$ 0.91
Market average	$ 1.00	$ 0.83	$ 0.91
Market high	$ 1.14	$ 0.96	$ 1.03
Market low	$ 0.86	$ 0.72	$ 0.80
Zinc (per lb.):			
Realized average	$ 1.44	$ 1.03	$ 1.14
Market average	$ 1.36	$ 1.03	$ 1.16
Market high	$ 1.73	$ 1.29	$ 1.37
Market low	$ 1.15	$ 0.80	$ 1.00

Our results of operations are significantly impacted by fluctuations in the prices of silver, gold, lead and zinc, which are affected by numerous factors beyond our control. See *Item 1A. Risk Factors – A substantial or extended decline in metals prices would have a material adverse effect on us* for information on a number of the factors that can impact prices of the metals we produce. Our average realized prices for silver, gold, lead and zinc were higher in 2021 compared to 2020 and 2019. Market metal price trends are a significant factor in our operating and financial performance. We are unable to predict fluctuations in prices for metals and have limited control over the timing of our concentrate shipments which impacts our realized prices. However, we utilize financially-settled forward contracts for the metals we produce with the objective of managing the exposure to changes in prices of those metals contained in our concentrate shipments between the time of sale and final settlement. In addition, at times we utilize a similar program to manage the exposure to changes in prices of zinc and lead (but not silver and gold) contained in our forecasted future concentrate shipments. See *Note 10* of *Notes to Consolidated Financial Statements* for more information on our base and precious metal forward contract programs.

A comprehensive discussion of our financial results for the years ended December 31, 2021, 2020 and 2019, individual operation performance and other significant items can be found in *Item 7. Management's Discussion and Analysis of Consolidated Financial Condition and Results of Operations*, as well as the *Consolidated Financial Statements* and *Notes* thereto.

Products and Segments

Our segments are differentiated by geographic region. We produce zinc, silver and precious metals flotation concentrates at Greens Creek and silver and zinc flotation concentrates at Lucky Friday, each of which we sell to custom smelters and metal traders. The flotation concentrates produced at Greens Creek and Lucky Friday contain payable silver, zinc and lead, and at Greens Creek they also contain payable gold. At Greens Creek, we also produce gravity concentrate containing payable silver, gold and lead. Unrefined bullion (doré) is produced from the gravity concentrate by a third-party processor, and shipped to a refiner before sale of the metals to precious metal traders. We also produce unrefined gold and silver bullion bars (doré), loaded carbon and precipitates at Casa Berardi and the Nevada Operations, which are shipped to refiners before sale of the metals to precious metal traders. At times, we sell loaded carbon and precipitates directly to refiners. Payable metals are those included in our products which we are paid for by smelters, metal traders and refiners. Our segments as of December 31, 2021 included:

- Greens Creek located on Admiralty Island, near Juneau, Alaska. Greens Creek is 100% owned and has been in production since 1989, with a temporary care and maintenance period from April 1993 through July 1996.

- Lucky Friday located in northern Idaho. Lucky Friday is 100% owned and has been a producing mine for us since 1958. Unionized employees at Lucky Friday were on strike from mid-March 2017 until early January 2020, resulting in limited production during that time. Re-staffing of the mine and ramp-up activities were substantially completed, and the mine returned to full production in the fourth quarter of 2020.

- Casa Berardi located in the Abitibi region of northwestern Quebec, Canada. Casa Berardi is 100% owned and has been in production since late 2006.

- The Nevada Operations located in northern Nevada. Nevada Operations is 100% owned and consists of four land packages in northern Nevada totaling approximately 110 square miles and containing three previously-operating mines with a history of high-grade gold production: Fire Creek, Hollister and Midas. As discussed in *Item 7. Management's Discussion and Analysis of Consolidated Financial Condition and Results of Operations - Nevada Operations*, in the second quarter of 2019, we ceased development to access new production areas at our Nevada Operations until completion of studies and test work, including the results of the mining and processing of a bulk sample of refractory ore through a third party ore processing agreement in the first nine months of 2021, resulting in, among other changes, suspension of production in the second half of 2021.

San Sebastian in Mexico was also considered a segment prior to 2021. Production ceased in the fourth quarter of 2020, and exploration activities are currently ongoing. San Sebastian's activity for all periods presented in this Annual Report on Form 10-K is included in "other".

The contributions to our consolidated sales by our operations in 2021 were 48% from Greens Creek, 30% from Casa Berardi, 16% from Lucky Friday and 6% from Nevada Operations.

Governmental Regulation

The following is a summary of governmental regulation compliance areas which we believe are significant to our business and may have a material effect on our consolidated financial statements, earnings and/or competitive position.

Health and Safety

We are subject to the regulations of the Mine Safety and Health Administration ("MSHA") in the United States, the Commission of Labor Standards, Pay Equity and Occupational Health and Safety in Quebec, and the Mexico Ministry of Economy and Mining, and work with these agencies to address issues outlined in any investigations and inspections and continue to evaluate our safety practices. We strive to achieve excellent mine safety and health performance, and attempt to implement reasonable best practices with respect to mine safety and emergency preparedness. Achieving and maintaining compliance with regulations will be challenging and may increase our operating costs. See *Human Capital - Health and Safety* below and *Item 1A. Risk Factors – We face substantial governmental regulation, including the Mine Safety and Health Act, various environmental laws and regulations and the 1872 Mining Law*.

Environmental

Our operations are subject to various environmental laws and regulations at the federal and state/provincial level. Compliance with environmental regulations, and litigation based on environmental laws and regulations, involves significant costs and can threaten existing operations or constrain expansion opportunities. Mine closure and reclamation regulations impose substantial costs on our operations and include requirements that we provide financial assurance supporting those obligations. We have over $180 million of financial assurances, primarily in the form of surety bonds, for reclamation company-wide. We anticipate approximately $6 million in expenditures in 2022 for idle property management and environmental permit compliance. We also plan to invest approximately $2 million in 2022 in on-going reclamation works at the former Troy Mine in Montana; the projected remaining cost for reclamation at the site is included in our accrued reclamation and closure costs liability. See *Item 1A. Risk Factors – We face substantial governmental regulation, including the Mine Safety and Health Act, various environmental laws and regulations and the 1872 Mining Law*; *Our operations are subject to complex, evolving and increasingly stringent environmental laws and regulations* ; *Compliance with environmental regulations, and litigation based on such regulations, involves significant costs and can threaten existing operations or constrain expansion opportunities*; *Our environmental and asset retirement obligations may exceed the provisions we have made*; and *New federal and state laws, regulations and initiatives could impact our operations*.

Licenses, Permits and Claims/Concessions

We are required to obtain various licenses and permits to operate our mines and conduct exploration and reclamation activities. See *Item 1A. Risk Factors – We are required to obtain governmental permits and other approvals in order to conduct mining operations*. Targets at our San Sebastian exploration project in Mexico, our exploration targets and Hatter Graben project in Nevada, the Rock Creek and Montanore exploration projects in Montana, and our planned open pits at Casa Berardi can only be developed if we are successful in obtaining the necessary permits. In Montana, letters withdrawing from consideration the current Plan of Operations for each of the Rock Creek and Montanore projects were recently submitted to the United States Forest Service ("USFS"). These actions reflect the consolidated project ownership and new ideas that Hecla brings rather than the separate ownership and ineffective strategies of the projects' prior owners. The Company intends to submit a new Plan of Operations for the Montanore site that will be limited to evaluation activities only. If approved and subsequent data collection and analysis activities suggest development of a mine is feasible, then it is anticipated that a new Plan of Operations for construction and development at Montanore would be submitted for approval. While no activities beyond care and maintenance are currently proposed for Rock Creek, mineral and other property rights there should not be impacted. See *Item 1A. Risk Factors – We are required to obtain governmental permits and other approvals in order to conduct mining operations* and *Legal challenges could prevent the Rock Creek or Montanore projects from ever being developed*. In addition, our operations and exploration activities at Casa Berardi and San Sebastian are conducted pursuant to claims or concessions granted by the host government, and otherwise are subject to claims renewal and minimum work commitment requirements, which are subject to certain political risks associated with foreign operations. See *Item 1A. Risk Factors – Our foreign activities are subject to additional inherent risks*.

Taxes and Royalties

We are subject to various taxes and government royalties in the jurisdictions where we operate, including those specific to mining activities. These include: federal income taxes; state/provincial income taxes; county/city and bureau property taxes and sales and use tax in the U.S.; goods and services tax in Canada; value added tax in Mexico; mining-specific taxes in Alaska, Idaho, Nevada and Quebec; and mining royalties in Alaska, Nevada and Mexico. Accrual and payment of taxes and accounting for deferred taxes can involve significant estimates and assumptions and can have a material impact on our consolidated financial statements. Tax rates and the calculations of taxes can change significantly and are influenced by changes in political administrations and other factors. See *Item 1A. Risk Factors – Our accounting and other estimates may be imprecise*; *Our ability to recognize the benefits of deferred tax assets related to net operating loss carryforwards and other items is dependent on future cash flows and taxable income*; *Our foreign activities are subject to additional inherent* risks; and *We face substantial governmental regulation, including the Mine Safety and Health Act, various environmental laws and regulations and the 1872 Mining Law*. Also, see *Note 7* of *Notes to Consolidated Financial Statements* for more information on income taxes.

Physical Assets

Our business is capital intensive and requires ongoing capital investment for the replacement, modernization and expansion of equipment and facilities and to develop new ore reserves. At December 31, 2021, the book value of our properties, plants, equipment and mineral interests, net of accumulated depreciation, was approximately $2.3 billion. For more information see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.* We maintain insurance policies against property loss and business interruption. However, such insurance contains exclusions and limitations on coverage, and there can be no assurance that claims would be paid under such insurance policies in connection with a particular event. See *Item 1A. Risk Factors – Our operations may be adversely affected by risks and hazards associated with the mining industry that may not be fully covered by insurance*.

Human Capital Management

As of December 31, 2021, we employed approximately 1,650 people, of which approximately 950 were employed in the United States, 650 in Canada, and 50 in Mexico. The vast majority of our employees are full-time. Approximately 15% of our employees were covered by a collective bargaining agreement.

One of our greatest resources is our people, with the attraction, development and retention of talent critical to delivering our business strategy. Key areas of focus for us include:

Health and Safety

The safety and health of our employees is of paramount importance. We invest in effective ways to operate our mines more safely. Our goal is to achieve world-class safety and health performance by promoting a deeply rooted value-based culture of safety and utilizing technology and innovation to continually improve the safety at our operations. We know that instilling the behavior of safety awareness is fundamental to making our workplace as safe as possible. Therefore, we invest in our people with training and workforce development programs that focus on safety first. All employees receive training that complies with or exceeds the applicable safety and health regulations as set by the governing body in the jurisdiction in which each operation is located. As part of our commitment to safety, we track a variety of safety performance indicators, including injuries, near misses, observations, and equipment damages. Our goal is to reduce safety incidents. Our All Injury Frequency Rate ("AIFR") is calculated as the number of incidents in the period multiplied by 200,000 hours and divided by the number of hours worked in the period. Company-wide, our AIFR dropped by 77% from 2014 to 1.22 in 2020, which was the lowest in our company's history and 46% below the U.S. national average for MSHA's "metal and nonmetal" category. In 2021, our AIFR increased to 1.45; however, that rate was still 40% below the U.S. national average.

During fiscal year 2020, we launched a proactive response to the escalating COVID-19 outbreak and temporarily suspended operations at our Casa Berardi mine, starting at the end of March, and at our San Sebastian mine, in early April, due to government mandated closures. Those sites returned to full operations in mid-April and early-May, respectively. To mitigate the impact of COVID-19, we have taken precautionary measures, including implementing very detailed corporate and site-specific plans in February and early March 2020. Our plans included being flexible and quickly adapting to changing circumstances and government mandates. Even before mining was deemed an essential industry in the United States, we implemented procedures and policies to help keep our workers safe and ensure our supply chain, such as limiting site access, adopting social distancing, enhanced cleaning practices, implementing temperature testing, and quarantining protocols. We also commenced remote work protocols for those employees who wished to work remotely and could effectively do so. We took these actions to secure the safety of our employees, our vendors, and the communities in which our team members live and work, and to adhere to Centers for Disease Control recommendations. During 2021, we continued to operate under our COVID-19 mitigation plans, while adjusting our protocols to address developments throughout the year.

Compensation and Benefits

We are often among the largest private-sector employers in the communities in which we operate. We strive to provide a compensation and benefits package that succeeds in attracting, motivating, and retaining employees. For many decades, we have been at the forefront of offering competitive wages and among the highest valued benefits in the communities where we operate. These competitive wage and benefit packages have been key to the strong retention of our employees. In addition to competitive base wages, we offer retirement benefits, health insurance benefits, incentive plans, and paid time off. We believe our retirement benefits in particular, which include both defined benefit and defined contribution plans for U.S.-based employees, set us apart from many other employers.

Retention and Employee Development

A key element of our employee retention has been our culture. Maintaining a work environment in which our employees are provided the tools they need to grow and succeed and supporting the communities in which our mines and offices are located has been part of our culture for over a century. Our employees benefit from company-sponsored health and wellness programs that cover education, health interventions and disease management. In combination with the Hecla Foundation, we support employees both at the work site and in the communities in which we operate.

We are committed to hiring talented people, developing effective leaders and providing an inclusive workplace. The mining workforce of the future, like all industries, will see a continual change in the jobs and skill sets required as we adopt new technologies and make our workplace safer and more efficient. We are also committed to helping employees update their skills. For example, we are working with North Idaho College's Career Training Center to develop a training curriculum to update the worker skill sets necessary to meet the changing mining workforce dynamic. In addition, we have long supported the Pathways to Mining Careers program, a career training partnership with the University of Alaska Southeast in Juneau. We also offer a reimbursement program to assist with educational expenses for employees who are interested in furthering their education. Advanced education can improve job performance and increase advancement opportunities for the employee, while providing flexibility to our company by increasing the employee's knowledge base and skill set.

Annual employee surveys are conducted to gauge employee concerns and morale. The results of the surveys, and any responsive measures, are shared with our board of directors. Strategic talent reviews and succession planning reviews are conducted periodically across all business areas, and our training programs are adapted accordingly. The Chief Executive Officer ("CEO"), senior level company leadership and board of directors regularly review top talent across the organization. Creating more opportunities for minorities, including women and indigenous people, are among our priorities for employee development. We also strive to maintain an inclusive workplace, and provide periodic training to employees to help meet that goal. Our employees are required to abide by our Code of Conduct, which is provided to employees upon being hired and annually, and is available on our website, to promote the conduct of our business in a consistently legal and ethical manner. Among other provisions, the Code of Conduct reflects that it is our policy and practice not to discriminate against any employee because of race, color, religion, national origin, sex, sexual orientation, gender identity or expression, age, or physical or other disability. We expect our leaders to set the example by being positive role models and good mentors for our employees.

We employ our Senior Vice President - Chief Administrative Officer who is responsible for developing and executing our human capital strategy. The position is an executive-level position to reflect the priority we place on utilizing our human capital resources to meet our business strategy.

Available Information

Hecla Mining Company is a Delaware corporation. Our current holding company structure dates from the incorporation of Hecla Mining Company in 2006 and the renaming of our subsidiary (previously Hecla Mining Company) as Hecla Limited. Our principal executive offices are located at 6500 N. Mineral Drive, Suite 200, Coeur d'Alene, Idaho 83815-9408. Our telephone number is (208) 769-4100. Our web site address is www.hecla-mining.com. We file our annual, quarterly and current reports and any amendments to these reports with the SEC, copies of which are available on our website or from the SEC free of charge (www.sec.gov or 800-SEC-0330). Our restated certificate of incorporation, bylaws, charters of our audit, compensation, and governance and social responsibility committees, as well as our Code of Ethics for the Chief Executive Officer and Senior Financial Officers and our Code of Conduct, are also available on our website. In addition, any amendments to our Code of Ethics or waivers granted to our directors and executive officers will be posted on our website. Each of these documents may be periodically revised, so you are encouraged to visit our website for any updated terms. We will provide copies of these materials to stockholders upon request using the above-listed contact information, directed to the attention of Investor Relations, or via e-mail request sent to hmc-info@hecla-mining.com.

Item 1A. Risk Factors

The following risks and uncertainties, together with the other information set forth in this report, should be carefully considered by those who invest in our securities. Any of the following material risk factors could adversely affect our business, financial condition or operating results and could decrease the value of our common or preferred stock or other outstanding securities. These are not all of the risks we face, and other factors not presently known to us or that we currently believe are immaterial may also affect our business if they occur.

Financial Risks

A substantial or extended decline in metals prices would have a material adverse effect on us.

Our revenue is derived primarily from the sale of concentrates and doré containing silver, gold, lead and zinc and, as a result, our earnings are directly related to the prices of these metals. Silver, gold, lead and zinc prices fluctuate widely and are affected by numerous factors, including:

- speculative activities;
- relative exchange rates of the U.S. dollar;

- global and regional demand and production;
- political instability;
- inflation, recession or increased or reduced economic activity; and
- other political, regulatory and economic conditions.

These factors are largely beyond our control and are difficult to predict. If the market prices for these metals fall below our production, exploration or development costs for a sustained period of time, we will experience losses and may have to discontinue exploration, development or operations, or incur asset write-downs at one or more of our properties. See *Item 1. Business - Introduction* for information on the average, high, and low daily closing prices for silver, gold, lead and zinc for the last three years. On February 18, 2022, the closing prices for silver, gold, lead and zinc were $23.77 per ounce, $1,894 per ounce, $1.07 per pound and $1.66 per pound, respectively.

An extended decline in metals prices, an increase in operating or capital costs, mine accidents or closures, increasing regulatory obligations, or our inability to convert resources or exploration targets to reserves may cause us to record write-downs, which could negatively impact our results of operations.

When events or changes in circumstances indicate the carrying value of our long-lived assets may not be recoverable, we review the recoverability of the carrying value by estimating the future undiscounted cash flows expected to result from the use and eventual disposition of the asset. Impairment must be recognized when the carrying value of the asset exceeds these cash flows. Recognizing impairment write-downs could negatively impact our results of operations. Metals price estimates are a key component used in the evaluation of the carrying values of our assets, as the evaluation involves comparing carrying values to the average estimated undiscounted cash flows resulting from operating plans using various metals price scenarios. Our estimates of undiscounted cash flows for our long-lived assets also include an estimate of the market value of the resources and exploration targets beyond the current operating plans.

We determined no impairments were required for three triggering events identified during 2021. For more discussion, see the below risk factors, "*We may not realize all of the anticipated benefits from our acquisitions*" and "*The issues we have faced at our Nevada Operations could require us to write-down the associated long-lived assets. We could face similar issues at our other operations. Such write-downs may adversely affect our results of operations and financial condition.*" If the prices of silver, gold, zinc and lead decline for an extended period of time, if we fail to control production or capital costs, if regulatory issues increase costs or decrease production, or if we do not realize the mineable ore reserves, resources or exploration targets at our mining properties, we may be required to recognize asset write-downs in the future. In addition, the perceived market value of the resources and exploration targets of our properties is dependent upon prevailing metals prices as well as our ability to discover economic ore. A decline in metals prices for an extended period of time or our inability to convert resources or exploration targets to reserves could significantly reduce our estimates of the value of the resources or exploration targets at our properties and result in asset write-downs.

We have a substantial amount of debt that could impair our financial health and prevent us from fulfilling our obligations under our existing and future indebtedness.

As of December 31, 2021, we had total indebtedness of approximately $521.5 million, primarily in the form of our Senior Notes. Our level of debt and our debt service obligations may have adverse effects on our business, financial condition, cash flows or results of operations, including:

- making it more difficult for us to satisfy our obligations with respect to the Senior Notes;
- reducing the amount of funds available to finance our operations, capital expenditures and other activities;
- increasing our vulnerability to economic downturns and industry conditions;
- limiting our flexibility in responding to changing business and economic conditions;

- jeopardizing our ability to execute our business plans;
- placing us at a disadvantage when compared to our competitors that have less debt;
- increasing our cost of borrowing; and
- limiting our ability to borrow additional funds.

We and our subsidiaries may incur substantial additional indebtedness in the future. Although the indenture governing our Senior Notes contains restrictions on the incurrence of additional indebtedness, these restrictions are subject to a number of significant qualifications and exceptions and, under certain circumstances, the amount of additional indebtedness that could be incurred in compliance with these restrictions could be substantial. In July 2018, we entered into our $250 million senior credit facility. Like the indenture, the credit agreement governing the revolving credit facility also has restrictions on the incurrence of additional indebtedness but with a number of significant qualifications and exceptions. If new debt is added to our and our subsidiaries' existing debt levels, the risks associated with such debt that we currently face would increase. In addition, the indenture governing the Senior Notes does not prevent us from incurring additional indebtedness under the indenture.

We have had losses that could reoccur in the future.

We have experienced volatility in our net income (loss) reported in the last three years, as shown in our *Consolidated Statement of Operations and Comprehensive (Income) Loss*, including net income of $35.1 million in 2021 and losses of $9.5 million in 2020 and $94.9 million in 2019. A comparison of operating results over the past three years can be found in *Results of Operations* in *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.*

Many of the factors affecting our operating results are beyond our control, including, but not limited to, the volatility of metals prices; smelter terms; rock and soil conditions; seismic events; availability of hydroelectric power; diesel fuel prices; interest rates; foreign exchange rates; global or regional political or economic policies; inflation; availability and cost of labor; economic developments and crises; governmental regulations; continuity of orebodies; ore grades; recoveries; performance of equipment; price speculation by certain investors; and purchases and sales by central banks and other holders and producers of gold and silver in response to these factors. We cannot assure you that we will not experience net losses in the future.

Our accounting and other estimates may be imprecise.

Preparing consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts and related disclosure of assets, liabilities, revenue and expenses at the date of the consolidated financial statements and reporting periods. The more significant areas requiring the use of management assumptions and estimates relate to:

- mineral reserves, resources, and exploration targets that are the basis for future income and cash flow estimates and units-of-production depreciation, depletion and amortization calculations;
- future ore grades, throughput and recoveries;
- future metals prices;
- future capital and operating costs;
- environmental, reclamation and closure obligations;
- permitting and other regulatory considerations;
- asset impairments;

- valuation of business combinations;
- future foreign exchange rates, inflation rates and applicable tax rates;
- reserves for contingencies and litigation; and
- deferred tax asset valuation allowance.

Future estimates and actual results may differ materially from these estimates as a result of using different assumptions or conditions. For additional information, see *Critical Accounting Estimates* in *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations*, *Note 2* of *Notes to Consolidated Financial Statements,* and the risk factors set forth below: "*Our costs of extending existing reserves or development of new orebodies and other capital costs may be higher and provide less return than we estimated,*" "*Our ore reserve and resource estimates may be imprecise,*" "*We are currently involved in ongoing legal disputes that may materially adversely affect us,*" and "*Our environmental and asset retirement obligations may exceed the provisions we have made.*"

Commodity and currency risk management activities could prevent us from realizing possible revenues or lower costs or expose us to losses.

We periodically enter into risk management activities to manage the exposure to changes in prices of silver, gold, lead and zinc contained in our concentrate shipments between the time of sale and final settlement. We also utilize such programs to manage the exposure to changes in the prices of lead and zinc contained in our forecasted future shipments. Such activities are utilized in an attempt to partially insulate our operating results from changes in prices for those metals. However, such activities may prevent us from realizing revenues in the event that the market price of a metal exceeds the price stated in a contract, and may also result in significant mark-to-market fair value adjustments, which may have a material adverse impact on our reported financial results. In addition, we are exposed to credit risk with our counterparties, and we may experience losses if a counterparty fails to purchase under a contract when the contract price exceeds the spot price of a commodity.

In 2016, we also initiated financially-settled forward contract programs to manage exposure to fluctuations in the exchange rates between the U.S. dollar ("USD") and the Canadian dollar ("CAD") and the impact on our future operating costs denominated in CAD. In 2021, we initiated a similar program related to future development costs denominated in CAD. As with our metals derivatives, when utilized, such activities may prevent us from realizing possible lower costs on a USD-basis in the event that the USD strengthens relative to the CAD compared to the exchange rates stated in the forward contracts, and also expose us to counterparty credit risk.

See *Note 10* of *Notes to Consolidated Financial Statements* for more information on these forward contract programs.

Our ability to recognize the benefits of deferred tax assets related to net operating loss carryforwards and other items is dependent on future cash flows and taxable income.

We recognize the expected future tax benefit from deferred tax assets when the tax benefit is considered to be more likely than not of being realized. Otherwise, a valuation allowance is applied against deferred tax assets, reducing the value of such assets. Assessing the recoverability of deferred tax assets requires management to make significant estimates related to expectations of future taxable income. Estimates of future taxable income are based on forecasted income from operations and the application of existing tax laws in each jurisdiction. Metals price and production estimates are key components used in the determination of our ability to realize the expected future benefit of our deferred tax assets. To the extent that future taxable income differs significantly from estimates as a result of a decline in metals prices or other factors, our ability to realize the deferred tax assets could be impacted. Additionally, significant future issuances of common stock or common stock equivalents, or changes in the direct or indirect ownership of our common stock or common stock equivalents, could limit our ability to utilize our net operating loss carryforwards pursuant to Section 382 of the Internal Revenue Code. Future changes in tax law or changes in ownership structure could limit our ability to utilize our recorded tax assets. We determined as of December 31, 2021, that we expect to realize an additional $58.4 million of the Hecla U.S. tax group deferred tax assets and released the valuation allowance by a corresponding amount, reflecting our current expectations. We currently do not have valuation allowances for certain amounts related to the Nevada U.S. tax group and certain foreign deferred tax assets, and our deferred tax assets as of December 31, 2021 were $295.5 million, net of $39.2 million in valuation allowances. See *Note 7* of *Notes to Consolidated Financial Statements* for further discussion of our deferred tax assets.

Returns for investments in pension plans and pension plan funding requirements are uncertain.

We maintain defined benefit pension plans for most U.S. employees, which provide for defined benefit payments after retirement for those employees. Canadian and Mexican employees participate in public retirement systems for those countries and are not eligible to participate in the defined benefit pension plans that we maintain for U.S. employees. The ability of the pension plans maintained for U.S. employees to provide the specified benefits depends on our funding of the plans and returns on investments made by the plans. Returns, if any, on investments are subject to fluctuations based on investment choices and market conditions. In addition, we have a supplemental excess retirement plan which was funded as of December 31, 2021. A sustained period of low returns or losses on investments, or future benefit obligations that exceed our estimates, could require us to fund the pension plans to a greater extent than anticipated. See *Note 6* of *Notes to Consolidated Financial Statements* for more information on our pension plans.

Operation, Climate, Development, Exploration and Acquisition Risks

Natural disasters, public health crises (including COVID-19), political crises, and other catastrophic events or other events outside of our control may materially and adversely affect our business or financial results.

If any of our facilities or the facilities of our suppliers, third-party service providers, or customers is affected by natural disasters, such as earthquakes, floods, fires, power shortages or outages, public health crises (such as pandemics and epidemics), political crises (such as terrorism, war, political instability or other conflict), or other events outside of our control, our operations or financial results could suffer. Any of these events could materially and adversely impact us in a number of ways, including through decreased production, increased costs, decreased demand for our products due to reduced economic activity or other factors, or the failure by counterparties to perform under contracts or similar arrangements.

For example, the ongoing COVID-19 pandemic has impacted our operations and financial results over the last two years. Restrictions imposed by governments in Alaska, Quebec and Mexico have caused us to temporarily suspend operations and/or revise operating procedures. These restrictions caused us to incur costs of approximately $5.7 million in 2020 and $3.4 million in 2021. In addition, silver production at Greens Creek in the third quarter of 2021 was 30% lower than in the third quarter of 2020 due to reduced ore grades as a result of mine sequencing, which was impacted by manpower challenges due to COVID-19 and increased competition for labor. At the Lucky Friday and Nevada Operations, COVID-19 procedures have been implemented without a significant impact on production or operating or suspension costs or production. As we enter 2022, COVID-19 continues to disrupt our operations. Although COVID-19 impacts on our operations and financial results have not yet been material, it is possible they may become so in the near future, including if we are forced to continue with existing or adopt new restrictions on operations and if those restrictions continue longer than anticipated or become broader.

The additional protocols implemented at our mine sites and other restrictions in response to the pandemic have limited the access of our contractors, consultants and other third-party service providers to our operations. As a result, less exploration and definition drilling occurred at some of our operations and exploration properties in 2020 which in turn limited reserve and resource conversion in 2020; however, drilling increased and our reserve and resource conversion improved in 2021. It is possible restrictions and procedures related to the pandemic could continue to limit access of contractors and others to our operations and have a negative impact on our recognition of reserves and resources or other areas.

We continue to monitor the rapidly evolving situation and guidance from federal, state, local and foreign governments and public health authorities and may take additional actions based on their recommendations. The extent of the impact of COVID-19 and any subsequent variants on our business and financial results will also depend on future developments, including the duration and spread of the outbreak within the markets in which we operate and the related impact on prices, demand, creditworthiness and other market conditions and governmental reactions, all of which are highly uncertain.

The COVID-19 virus pandemic may heighten other risks.

To the extent that the COVID-19 virus pandemic adversely affects our business and financial results, it may also have the effect of heightening many of the other Risk Factors described herein, including, but not limited to, risks related to commodity prices and commodity markets, commodity price fluctuations, our indebtedness, information systems and cyber security and risks relating to our mining operations such as risks related to mineral reserve and mineral resource estimates, production forecasts, impacts of governmental regulations, international operations, availability of infrastructure and employees and challenging global financial conditions.

Climate change could negatively impact our operations and financial performance.

Climate change is expected to create more extreme weather patterns that can increase frequency of droughts and increase the amount of rainfall, circumstances that require careful water management. Potential key material physical risks to Hecla from climate change include, but are not limited to:

- Increased volumes of mine contact water requiring storage and treatment;
- Increased design requirements for stormwater diversion and associated water management systems; and
- Reduced freshwater availability due to potential drought conditions.

In addition, we have identified the opportunities and potential risks for Hecla as we shift toward a decarbonized energy future. Technologies that support decarbonization include renewable energy sources, electric vehicles, and energy storage, all of which require the metals we produce. However, as America transitions to these renewable energies, they may not have the same reliability as conventional energy sources. Thus, in a transition, we could see a possible curtailment of our energy supply, and these new energy sources may cost more in the future than our current supplies, which could negatively our impact financial performance.

Mining accidents or other adverse events at an operation could decrease our anticipated production or otherwise adversely affect our operations.

Production may be reduced below our historical or estimated levels for many reasons, including, but not limited to, mining accidents; unfavorable ground or shaft conditions; work stoppages or slow-downs; lower than expected ore grades; unexpected regulatory actions; if the metallurgical characteristics of ore are less economic than anticipated; or because our equipment or facilities fail to operate properly or as expected. Our mines are subject to risks relating to ground instability, including, but not limited to, pit wall failure, crown pillar collapse, seismic events, backfill and stope failure or the breach or failure of a tailings impoundment. Both the Lucky Friday and Casa Berardi mines have a history of ground instability underground and related incidents which in the past have resulted in loss of production at these facilities and some of the other effects described below. The occurrence of an event such as those described above could result in loss of life or temporary or permanent cessation of operations, any of which could have a material adverse effect on our financial condition and results of operations. Other closures or impacts on operations or production may occur at any of our mines at any time, whether related to accidents, changes in conditions, changes to regulatory policy, or as precautionary measures.

In addition, our operations are typically in remote locations, where conditions can be inhospitable, including with respect to weather, surface conditions, interactions with wildlife or otherwise in or near dangerous conditions. In the past we have had employees, contractors, or employees of contractors get injured, sometimes fatally, while working in such challenging locations. An accident or injury to a person at or near one of our operations could have a material adverse effect on our financial condition and results of operations.

At the Lucky Friday mine we are utilizing a new mining method called Underhand Closed Bench ("UCB"). See *Item 2. Properties - Lucky Friday* for a description of the UCB method. We started testing the UCB method in 2020 and it was used for approximately 86% of the tons mined at Lucky Friday in 2021. A patent application for the UCB method has been filed with the U.S. Patent and Trademark Office. However, the UCB method has not been used at other mines. Although we believe the testing has resulted in better management of the Lucky Friday mine's seismicity, we cannot predict unknown hazards that the UCB method might cause.

Our operations may be adversely affected by risks and hazards associated with the mining industry that may not be fully covered by insurance.

Our business is capital intensive, requiring ongoing investment for the replacement, modernization or expansion of equipment and facilities. Our mining and milling operations are subject to risks of process disruptions and equipment malfunctions. Equipment and supplies may from time to time be unavailable on a timely basis. Our business is subject to a number of other risks and hazards including:

- environmental hazards;
- unusual or unexpected geologic formations;
- rock bursts, ground falls, pit wall failures, or tailings impoundment breaches or failures;
- seismic activity;
- shaft failure;
- road and bridge failures;
- underground fires or floods;
- unanticipated hydrologic conditions, including flooding and periodic interruptions due to inclement or hazardous weather conditions;
- civil unrest or terrorism;
- changes in interpretation or enforcement of regulatory and permitting requirements;
- industrial accidents;
- disruption, damage or failure of power, technology or other systems related to operation of equipment and other aspects of our mine operations;
- labor disputes or strikes; and
- our operating mines have tailing ponds which could fail or leak as a result of seismic activity, unusual weather or for other reasons.

Such risks could result in:

- personal injury or fatalities;
- damage to or destruction of mineral properties or producing facilities;
- environmental damage and financial penalties;
- delays in exploration, development or mining;
- monetary losses;
- inability to meet our financial obligations;
- asset impairment charges;

- legal liability; and
- temporary or permanent closure of facilities.

We maintain insurance to protect against losses that may result from some of these risks, such as property loss and business interruption, in amounts we believe to be reasonably consistent with our historical experience, industry practice and circumstances surrounding each identified risk. Such insurance, however, contains exclusions and limitations on coverage, particularly with respect to environmental liability, political risk and seismic events. We cannot assure you that claims would be paid under such insurance policies in connection with a particular event. Insurance specific to environmental risks is generally either unavailable or, we believe, cost prohibitive, and we therefore do not maintain environmental insurance. Occurrence of events for which we are not insured may have an adverse effect on our business.

Our costs of extending existing reserves or development of new orebodies and other capital costs may be higher and provide less return than we estimated.

Capitalized development projects may cost more and provide less return than we estimate. If we are unable to realize a return on these investments, we may incur a related asset write-down that could adversely affect our financial results or condition.

Our ability to sustain or increase our current level of metals production partly depends on our ability to develop new orebodies and/or expand existing mining operations. Before we can begin a development project, we must first determine whether it is economically feasible to do so. This determination is based on estimates of several factors, including:

- ore reserves and resources;
- expected ore grades and recovery rates of metals from the ore;
- future metals prices;
- facility and equipment costs;
- availability of adequate staffing;
- availability of affordable sources of power and adequacy of water supply;
- exploration and drilling success;
- capital and operating costs of a development project;
- environmental and closure, permitting and other regulatory considerations and costs;
- adequate access to the site, including competing land uses (such as agriculture);
- applicable tax rates;
- foreign currency fluctuation and inflation rates; and
- availability and cost of financing.

Many of these estimates are based on geological and other interpretive data, which may be imprecise. As a result, actual operating and capital costs and returns from a development project may differ substantially from our estimates, and, as such, it may not be economically feasible to continue with a development project.

Our ore reserve and resource estimates may be imprecise.

Our ore reserve figures and costs are primarily estimates and are not guarantees that we will recover the indicated quantities of these metals. You are cautioned not to place undue reliance on estimates of reserves (or resource estimates or exploration targets). Reserves are estimates made by our professional technical personnel of the amount of metals that they believe could be economically and legally extracted or produced at the time of the reserve determination. No assurance can be given that the estimated amount of metal or the indicated level of recovery of these metals will be realized. Reserve and resource estimation is an interpretive process based upon available data and various assumptions. Our reserve and resource estimates may change. Reserves are valued based on estimates of costs and metals prices, which may not be consistent among our properties or across the industry. The estimated quantities and economic value of ore reserves may be adversely affected by:

- declines in the market price of the various metals we mine;
- increased production or capital costs;
- reduction in the grade or tonnage of the deposit;
- decrease in throughput;
- increase in the dilution of the ore;
- future foreign currency rates, inflation rates and applicable tax rates;
- reduced metal recovery; and
- changes in environmental, permitting or other regulatory requirements.

Short-term operating factors relating to our ore reserves, such as the need to sequentially develop orebodies and the processing of new or different ore grades, may adversely affect our cash flow.

If the prices of metals that we produce decline substantially below the levels used to calculate reserves for an extended period, we could experience:

- delays in new project development;
- net losses;
- reduced cash flow;
- reductions in reserves and resources;
- write-downs of asset values; and
- mine closure.

Additionally, resource estimates and exploration targets are subject to further exploration and development, and are, therefore, subject to considerable uncertainty. Despite our history of converting resources and exploration targets to reserves through additional drilling and study work, we cannot be certain that any part or parts of resources or exploration targets will ever be confirmed or converted into reserves as defined by the SEC.

Efforts to expand the finite lives of our mines may not be successful or could result in significant demands on our liquidity, which could hinder our growth.

One of the risks we face is that mines are depleting assets. Thus, in order to maintain or increase production we must continually replace depleted ore reserves by locating and developing additional ore. Our ability to expand or replace ore reserves primarily depends on the success of our exploration programs. Mineral exploration, particularly for silver and gold, is highly speculative and expensive. It involves many risks and is often non-productive. Even if we believe we have found a valuable mineral deposit, it may be several years before production from that deposit is possible. During that time, it may become no longer feasible to produce those minerals for economic, regulatory, political or other reasons. As a result of high costs and other uncertainties, we may not be able to expand or replace our existing ore reserves as they are depleted, which would adversely affect our business and financial position in the future. For example, the additional protocols implemented at our mine sites and other restrictions in response to the pandemic limited the access of our contractors, consultants, and other third-party service providers to our operations. As a result, less exploration and confirmation drilling occurred at some of our operations and exploration properties in 2020, which in turn limited reserve and resource conversion in 2020; however, drilling increased and our reserve and resource conversion improved in 2021.

Our ability to market our metals production depends on the availability of smelters and/or refining facilities and our operations and financial results may be affected by disruptions or closures or the unavailability of smelters and/or refining facilities for other reasons.

We sell our metals products to smelters and metal traders. Our doré bars are sent to refiners for further processing before being sold to metal traders. Access to refiners and smelters on terms which are economic is critical to our ability to sell our products to buyers and generate revenues. If smelters or refiners are unavailable or unwilling to accept our products, or we are otherwise unable to sell our products to customers on acceptable commercial and legal terms, our operations and financial results could be adversely affected. See *Note 4* of *Notes to Consolidated Financial Statements* for more information on the distribution of our sales and our significant customers.

We derive a significant amount of revenue from a relatively small number of customers and occasionally enter into concentrate spot market sales with metal traders.

For the fiscal year ended December 31, 2021, our four largest customers accounted for approximately 37%, 22%, 22% and 6%, respectively, of our total revenues. Given our operations produce unique qualities of concentrates, which a limited number of smelters can process effectively, we enter into long-term benchmark contracts for a majority of our total concentrates production. We expose lesser portions of our concentrates production to spot market sales to metal traders to benefit from favorable spot market sales terms from time to time. Our results of operations, financial condition and cash flows could be materially adversely affected if one or more of our long-term customers were to decide to interrupt or curtail their activities, terminate their contracts with us or fail to renew existing contracts. Additionally, if spot market conditions deteriorate rapidly, we could have difficulty selling a portion of our concentrates, and metal traders could refuse to perform under existing contracts, which could also result in materially adverse effects on our results of operations, financial conditions and cash flows. See *Note 4* of *Notes to Consolidated Financial Statements* for more information on the distribution of our sales and our significant customers.

Shortages of critical parts and equipment may adversely affect our operations and development projects.

We have been impacted, from time to time, by increased demand for critical resources such as input commodities, drilling equipment, trucks, shovels and tires. These shortages have, at times, impacted the efficiency of our operations, and resulted in cost increases and delays in construction of projects; thereby impacting operating costs, capital expenditures and production and construction schedules.

Our foreign activities are subject to additional inherent risks.

We currently have foreign operations in Mexico and Canada, and we expect to continue to conduct operations there and possibly other international locations in the future. Because we conduct operations internationally, we are subject to political, social, legal and economic risks such as:

- the effects of local political, labor and economic developments and unrest;
- significant or abrupt changes in the applicable regulatory or legal climate;

- significant changes to regulations or laws or the interpretation or enforcement of them, including with respect to tax and profit-sharing matters arising out of the use of outsourced labor and other services at our San Sebastian operation in Mexico, which was impacted by amendments to Mexico's Federal Labor Law in 2021, but immaterially as production at San Sebastian ceased in 2020;
- exchange controls and export restrictions;
- expropriation or nationalization of assets with inadequate compensation;
- unfavorable currency fluctuations, particularly in the exchange rate between the U.S. dollar and the Canadian dollar and Mexican Peso;
- repatriation restrictions;
- invalidation and unavailability of governmental orders, permits or agreements;
- property ownership disputes;
- renegotiation or nullification of existing concessions, licenses, permits and contracts;
- criminal activity, corruption, demands for improper payments, expropriation, and uncertain legal enforcement and physical security;
- failure to maintain compliance with corruption and transparency statutes, including the U.S. Foreign Corrupt Practices Act;
- disadvantages of competing against companies from countries that are not subject to U.S. laws and regulations;
- fuel or other commodity shortages;
- illegal mining;
- laws or policies of foreign countries and the United States affecting trade, investment and taxation;
- opposition to our presence, operations, properties or plans by governmental or non-governmental organizations or civic groups;
- civil disturbances, war and terrorist actions; and
- seizures of assets.

The occurrence of any one or combination of these events, many of which are beyond our control, could materially adversely affect our financial condition or results of operations.

Our operations and properties in Canada expose us to additional political risks.

Our properties in Canada may be of particular interest or sensitivity to one or more interest groups, including aboriginal groups (which are generally referred to as "First Nations"). We have mineral projects in Quebec and British Columbia that are or may be in areas with a First Nations presence. It is our practice to work closely with and consult with First Nations in areas in which our projects are located or which could be impacted by our activities. However, there is no assurance that relationships with such groups will be positive. Accordingly, it is possible that our production, exploration or development activities on these properties could be interrupted or otherwise adversely affected in the future by political uncertainty, native land claims entitlements, expropriations of property, changes in applicable law, governmental policies and policies of relevant interest groups, including those of First Nations. Any changes in law or relations or shifts in political conditions may be beyond our control, or we may enter into agreements with First Nations, all of which may adversely affect our business and operations and if significant, may result in the impairment or loss of mineral concessions or other mineral rights, or may make it impossible to continue our mineral production, exploration or development activities in the applicable area, any of which could have an adverse effect on our financial condition and results of operations.

Certain of our mines and exploration properties are located on land that is or may become subject to traditional territory, title claims and/or claims of cultural significance, and such claims and the attendant obligations of the federal government to those tribal communities and stakeholders may affect our current and future operations.

Indigenous interests and rights as well as related consultation issues may impact our ability to pursue exploration, development and mining at certain of our properties in Nevada, Montana, Alaska, British Columbia and Quebec. There is no assurance that claims or other assertion of rights by tribal communities and stakeholders or consultation issues will not arise on or with respect to our properties or activities. These could result in significant costs and delays or materially restrict our activities. Opposition by tribal communities and stakeholders to our presence, operations or development on land subject to their traditional territory or title claims or in areas of cultural significance could negatively impact us in terms of permitting delay, public perception, costly legal proceedings, potential blockades or other interference by third parties in our operations, or court-ordered relief impacting our operations. In addition, we may be required to, or may voluntarily, enter into certain agreements with such tribal communities in order to facilitate development of our properties, which could reduce the expected earnings or income from any future production.

We may be subject to a number of unanticipated risks related to inadequate infrastructure.

Mining, processing, development, exploration and other activities depend on adequate infrastructure. Reliable roads, bridges, ports, power sources, internet access and water supply are important to our operations, and their availability and condition affect capital and operating costs. Unusual, infrequent or extreme weather phenomena, sabotage, amount or complexity of required investment, or other interference in the maintenance or provision of such infrastructure, or government intervention, could adversely affect our mining operations.

We face inherent risks in acquisitions of other mining companies or properties that may adversely impact our growth strategy.

We are actively evaluating opportunities to expand our mineral reserves and resources by acquiring other mining companies or properties. Although we are pursuing opportunities that we feel are in the best interest of our stockholders, these pursuits are costly and often unproductive.

There is a limited supply of desirable mineral properties available in the United States and foreign countries where we would consider conducting exploration and/or production activities. For those that exist, we face strong competition from other mining companies, many of which have greater financial resources than we do. Therefore, we may be unable to acquire attractive companies or mining properties on terms that we consider acceptable.

Furthermore, there are inherent risks in any acquisition we may undertake which could adversely affect our current business and financial condition and our growth. For example, we may not realize the expected value of the companies or properties that are acquired due to declines in metals prices, lower than expected quality of orebodies, inability to achieve the expected or minimum level of operating performance, failure to obtain permits, labor problems, changes in regulatory environment, failure to achieve anticipated synergies, an inability to obtain financing, and other factors described in these risk factors. Acquisitions of other mining companies or properties may also expose us to new legal, geographic, political, operating, and geological risks.

See the risk factor below, "*We may not realize all of the anticipated benefits from our acquisitions*," for developments at Nevada Operations.

We may be unable to successfully integrate the operations of the properties we acquire.

Integration of the businesses or the properties we acquire with our existing business is a complex, time-consuming and costly process. Failure to successfully integrate the acquired properties and operations in a timely manner may have a material adverse effect on our business, financial condition, results of operations and cash flows. The difficulties of combining the acquired operations with our existing business include, among other things:

- operating a larger organization;
- operating in multiple legal jurisdictions;
- coordinating geographically and linguistically disparate organizations, systems and facilities;
- adapting to additional political, regulatory, legal and social requirements;
- integrating corporate, technological and administrative functions; and
- diverting management's attention from other business concerns.

The process of integrating operations could cause an interruption of, or a slowdown in, the activities of our business. Members of our senior management may be required to devote considerable amounts of time to this integration process, which will decrease the time they will have to manage other parts of our business. If our senior management is not able to effectively manage the integration process, or if any business activities are interrupted as a result of the integration process, our business could suffer.

The issues we have faced at our Nevada Operations could require us to write-down the associated long-lived assets. We could face similar issues at our other operations. Such write-downs may adversely affect our results of operations and financial condition.

We review our long-lived assets for recoverability pursuant to the Financial Accounting Standard Board's Accounting Standards Codification Section 360. Under that standard, we review the recoverability of our long-lived assets, such as our mining properties, upon a triggering event. Such review involves comparing an asset's carrying value to its fair value. When the carrying value of the asset exceeds its fair value (which is based on estimating the future undiscounted cash flows expected to result from the use and eventual disposition of the asset or a market value approach), an impairment must be recognized. We conduct a review of the financial performance of our mines in connection with the preparation of our financial statements for each reporting period and determine whether any triggering events are indicated.

We determined suspension of production in Nevada during 2021 represented a triggering event requiring an assessment of recoverability of the carrying value of our long-lived assets in Nevada. Although we concluded the carrying value assessment indicated no impairment of our Nevada Operations, at that time, such analysis was, and any future analysis will be, based on estimates, judgments and assumptions which may turn out to be incorrect or inaccurate.

The estimates, judgments and assumptions we use in any fair value/impairment assessment of our long-lived assets relate to factors impacting the future cash flows estimated at any of our operations, including, but not limited to: (i) metals to be extracted and recovered from proven and probable ore reserves and, to some extent, identified mineralization beyond proven and probable reserves, (ii) future operating and capital costs, and (iii) future metals prices. These estimates, judgments and assumptions are made in good faith and using management's best judgments; however, there can be no assurance that any of them will prove to be accurate. Evaluation of the possibility of a future impairment loss, as well as the calculation of the amount of any impairment loss, involve significant estimates, judgment and assumptions, and no assurance can be given as to whether or not we will recognize an impairment loss in the future, or if the amount of loss would be within any estimated range we may disclose. As a result, in future periods we could face another triggering event which could lead to an impairment charge, and any such impairment charge could be material.

We may not realize all of the anticipated benefits from our acquisitions.

We may not realize all (or any) of the anticipated benefits from any acquisition, such as increased earnings, cost savings and revenue enhancements, for various reasons, including difficulties integrating operations and personnel, higher than expected acquisition and operating costs or other difficulties, unknown liabilities which may be significant, inaccurate reserve estimates, unrealized exploration targets, ore grades or mill recoveries that are lower than required for portions of the orebodies to be economic, and fluctuations in market prices.

At our Nevada Operations, mine production at Fire Creek continued through the first half of 2021, and was then suspended as we continue studies of hydrology, mining and milling. Revenues exceeded total capital and production costs in 2020 and 2021. However, we anticipate incurring care-and-maintenance costs in the future unless and until we have enough exploration success and development to resume mining operations. See the risk factors above, "*An extended decline in metals prices, an increase in operating or capital costs, mine accidents or closures, increasing regulatory obligations, or our inability to convert resources or exploration targets to reserves may cause us to record write-downs, which could negatively impact our results of operations,*" and "*The issues we have faced at our Nevada Operations could require us to write-down the associated long-lived assets. We could face similar issues at our other operations. Such write-downs may adversely affect our results of operations and financial condition.*"

The properties we may acquire may not produce as expected, and we may be unable to determine reserve potential, identify liabilities associated with the acquired properties or obtain protection from sellers against such liabilities.

The properties we acquire in any acquisition may not produce as expected, may be in an unexpected condition and we may be subject to increased costs and liabilities, including environmental liabilities. Although we review properties prior to acquisition in a manner consistent with industry practices, such reviews are not capable of identifying all existing or potential adverse conditions. Generally, it is not feasible to review in depth every individual property involved in each acquisition. Even a detailed review of records and properties may not necessarily reveal existing or potential problems or permit a buyer to become sufficiently familiar with the properties to fully assess their condition, any deficiencies, and development potential. See the risk factors above, "*We may not realize all of the anticipated benefits from our acquisitions,*" and "*An extended decline in metals prices, an increase in operating or capital costs, mine accidents or closures, increasing regulatory obligations, or our inability to convert resources or exploration targets to reserves may cause us to record write-downs, which could negatively impact our results of operations*."

We face risks relating to transporting our products from our mines, as well as transporting employees and materials at Greens Creek.

Certain of the products we ship to our customers are subject to regulatory requirements regarding shipping, packaging, and handling of products that may be considered dangerous to human health or the environment. Although we believe we are currently in compliance with all material regulations applicable to shipping, packaging, and handling our products, the chemical properties of our products or existing regulations could change and cause us to fall out of compliance or force us to incur substantial additional expenditures to maintain compliance with applicable regulations. Further, we do not ship our own products but instead rely on third party carriers to ship our products to our customers. To the extent that any of our carriers are unable or unwilling to ship our products in accordance with applicable regulations, including because of difficulty in obtaining, or increased cost of, insurance, or are involved in accidents during transit, we could be forced to find alternative shipping arrangements, assuming such alternatives would be available, and we could face liability as a result of any accident. Any such changes to our current shipping arrangements or accidents involving the shipment of our products could have a material adverse impact on our operations and financial results.

In addition, Greens Creek operates on an island and is substantially dependent on various forms of marine transportation for the transportation of employees and materials to the mine and for the export of its products from the mine. Any disruption to these forms of marine transportation could adversely impact mine operations, and possible effects could include suspension of operations.

Legal, Regulatory and Compliance Risks

We face substantial governmental regulation, including the Mine Safety and Health Act, various environmental laws and regulations and the 1872 Mining Law.

Our business is subject to extensive U.S. and foreign federal, state, provincial and local laws and regulations governing environmental protection, natural resources, prospecting, development, production, post-closure reclamation, taxes, labor standards and occupational health and safety laws and regulations, including mine safety, toxic substances and other matters. The costs associated with compliance with such laws and regulations are substantial. Possible future laws and regulations, or more restrictive interpretations of current laws and regulations by governmental authorities, could cause additional expense, capital expenditures, restrictions on or suspensions of operations and delays in the development of new properties.

U.S. surface and underground mines like those at our Lucky Friday, Greens Creek and Nevada Operations are inspected at least quarterly by MSHA, which inspections often lead to notices of violation under the Mine Safety and Health Act. Any of our U.S. mines could be subject to a temporary or extended shutdown as a result of a violation alleged by MSHA.

In addition, we have been and are currently involved in lawsuits or regulatory actions in which allegations have been made that we caused environmental damage, are responsible for environmental damage caused by others, or violated environmental laws or permits, and we may be subject to similar lawsuits or actions in the future. Moreover, such environmental matters have involved both our current and historical operations as well as the historical operations of entities and properties we have acquired. See the risk factors below titled "*Our operations are subject to complex, evolving and increasingly stringent environmental laws and regulations,*" "*Compliance with environmental regulations, and litigation based on such regulations, involves significant costs and can threaten existing operations or constrain expansion opportunities*," and "*Our environmental and asset retirement obligations may exceed the provisions we have made*."

Some mining laws prevent mining companies that have been found to (i) have engaged in environmentally-harmful conduct or (ii) be responsible for environmentally-harmful conduct engaged in by affiliates or other third parties, including in other jurisdictions, from maintaining current or obtaining future permits until remediation or restitution has occurred. If we are found to be responsible for any such conduct, our ability to operate existing projects or develop new projects might be impaired until we satisfy costly conditions. For example, in June 2021, the State of Nevada passed a law that would limit an applicant's ability to obtain an exploration or a mining operation permit from the Nevada Division of Environmental Protection if the applicant, or each person who has a controlling interest in the applicant (if the applicant is a business entity), has either (1) defaulted on a reclamation obligation under Nevada law (including by forfeiting a surety or failing to pay the costs or penalties associated with reclamation) or (2) is otherwise not in good standing with a governmental agency in relation to reclamation of an exploration project or mining operation situated outside the State of Nevada. Although we believe this new statute does not currently apply to us or any of our affiliates, it is possible that it could cause us compliance issues in the future, including with respect to ongoing litigation in the State of Montana. See the risk factor below, "*Legal challenges could prevent the Rock Creek or Montanore projects from ever being developed.*"

We cannot assure you that we will at all times be in compliance with applicable laws, regulations and permitting requirements. Failure to comply with applicable laws, regulations and permitting requirements may result in lawsuits or regulatory actions, including orders issued by regulatory or judicial authorities causing operations to cease or be curtailed, which may require corrective measures including capital expenditures, installation of additional equipment or remedial actions. Any one or more of these liabilities could have a material adverse impact on our financial condition.

In addition to existing regulatory requirements, legislation and regulations may be adopted, regulatory procedures modified, or permit limits reduced at any time, any of which could result in additional exposure to liability, operating expense, capital expenditures or restrictions and delays in the mining, production or development of our properties. Mining accidents and fatalities or toxic waste releases, whether or not at our mines or related to metals mining, may increase the likelihood of additional regulation or changes in law or enhanced regulatory scrutiny. In addition, enforcement or regulatory tools and methods available to regulatory bodies such as MSHA or the U.S. Environmental Protection Agency ("EPA"), which have not been or have infrequently been used against us or the mining industry, in the future could be used against us or the industry in general.

From time to time, the U.S. Congress considers proposed amendments to the 1872 Mining Law, which governs mining claims and related activities on federal lands. The extent of any future changes is not known and the potential impact on us as a result of U.S. Congressional action is difficult to predict. Changes to the 1872 Mining Law, if adopted, could adversely affect our ability to economically develop mineral reserves on federal lands. For example, in 2021 the U.S. Congress debated imposing royalties on minerals extracted from federal lands. Although legislation was not passed as of the date of this report, it is possible that in the future royalties or taxes will be imposed on mining operations conducted on federal land, which could adversely impact our financial results.

Our operations are subject to complex, evolving and increasingly stringent environmental laws and regulations. Compliance with environmental regulations, and litigation based on such regulations, involves significant costs and can threaten existing operations or constrain expansion opportunities.

Our operations, both in the United States and internationally, are subject to extensive environmental laws and regulations governing wastewater discharges; remediation, restoration and reclamation of environmental contamination; the generation, storage, treatment, transportation and disposal of hazardous substances; solid waste disposal; air emissions; protection of endangered and protected species and designation of critical habitats; mine closures and reclamation; and other related matters. In addition, we must obtain regulatory permits and approvals to start, continue and expand operations. New or revised environmental regulatory requirements are frequently proposed, many of which result in substantially increased costs for our business. See the risk factor above, "*We are required to obtain governmental permits and other approvals in order to conduct mining operations*" and the risk factor below, "*Mine closure and reclamation regulations impose substantial costs on our operations, and include requirements that we provide financial assurance supporting those obligations. These costs could significantly increase*."

Our U.S. operations are subject to the Clean Water Act, which requires permits for certain discharges into waters of the United States. Such permitting has been a frequent subject of litigation and enforcement activity by environmental advocacy groups and the EPA, respectively, which has resulted in declines in such permits or extensive delays in receiving them, as well as the imposition of penalties for permit violations. In 2015, the regulatory definition of "waters of the United States" that are protected by the Clean Water Act was expanded by the EPA, thereby imposing significant additional restrictions on waterway discharges and land uses. However, in 2018, implementation of the relevant rule was suspended for two years, and in December 2019 a revised definition that narrows the 2015 version was implemented. In late 2021, the EPA and US Army Corps of Engineers proposed to revise the definition again, moving it back to its more inclusive, pre-2018 definition. If this rule change were to take effect or states take action to address a perceived fall-off in protection under the Clean Water Act, litigation involving water discharge permits could increase, which may result in delays in, or in some instances preclude, the commencement or continuation of development or production operations. Enforcement actions by the EPA or other federal or state agencies could also result. Adverse outcomes in lawsuits challenging permits or failure to comply with applicable regulations or permits could result in the suspension, denial, or revocation of required permits, or the imposition of penalties, any of which could have a material adverse impact on our cash flows, results of operations, or financial condition. See *Note 15* of *Notes to Consolidated Financial Statements*.

Some of the mining wastes from our U.S. mines currently are exempt to a limited extent from the extensive set of EPA regulations governing hazardous waste under the Resource Conservation and Recovery Act ("RCRA"). If the EPA were to repeal this exemption, and designate these mining wastes as hazardous under RCRA, we would be required to expend additional amounts on the handling of such wastes and to make significant expenditures to construct hazardous waste storage or disposal facilities. In addition, if any of these wastes or other substances we release or cause to be released into the environment cause or has caused contamination in or damage to the environment at a U.S. mining facility, that facility could be designated as a "Superfund" site under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"). Under CERCLA, any present owner or operator of a Superfund site or the owner or operator at the time of contamination may be held jointly and severally liable regardless of fault and may be forced to undertake extensive remedial cleanup action or to pay for the cleanup efforts. The owner or operator also may be liable to federal, state and tribal governmental entities for the cost of damages to natural resources, which could be substantial. Additional regulations or requirements also are imposed on our tailings and waste disposal areas in Alaska under the federal Clean Water Act. See *Note 15* of *Notes to Consolidated Financial Statements*.

Legislative and regulatory measures to address climate change and greenhouse gas emissions are in various phases of consideration. If adopted, such measures could increase our cost of environmental compliance and also delay or otherwise negatively affect efforts to obtain permits and other regulatory approvals with regard to existing and new facilities. Proposed measures could also result in increased cost of fuel and other consumables used at our operations, including the diesel generation of electricity at our Greens Creek operation, used when we are unable to access hydroelectric power. Climate change legislation may also affect our smelter customers that burn fossil fuels, resulting in fewer customers or increased costs to us, and may affect the market for the metals we produce with effects on prices that are not possible for us to predict.

Adoption of these or similar new environmental regulations or more stringent application of existing regulations may materially increase our costs, threaten certain operating activities and constrain our expansion opportunities.

Some of our facilities are located in or near environmentally sensitive areas such as salmon fisheries, endangered species habitats, wilderness areas, national monuments and national forests, and we may incur additional costs to mitigate potential environmental harm in such areas.

In addition to evolving and expanding environmental regulations providing governmental authorities with the means to make claims against us, private parties have in the past and may in the future bring claims against us based upon damage to property and injury to persons resulting from the environmental, health and safety impacts of prior and current operations (including for exposure to or contamination by lead). Laws in the U.S. such as CERCLA and similar state laws may expose us to joint and several liability or claims for contribution made by the government (state or federal) or private parties. Moreover, exposure to these liabilities arises not only from our existing but also from closed operations, operations sold to third parties, or operations in which we had a leasehold, joint venture, or other interest. Because liability under CERCLA is often alleged on a joint and several basis against any property owner or operator or arranger for the transport of hazardous waste, and because we have been in operation since 1891, our exposure to environmental claims may be greater because of the bankruptcy or dissolution of other mining companies which may have engaged in more significant activities at a mining site than we but which are no longer available for governmental agencies or other claimants to make claims against or obtain judgments from. Similarly, there is also the potential for claims against us based on agreements entered into by certain affiliates and predecessor companies relating to the transfer of businesses or properties, which contained indemnification provisions relating to environmental matters. In each of the types of cases described in this paragraph, the government (federal or state) or private parties could seek to hold Hecla Limited or Hecla Mining Company liable for the actions of their subsidiaries or predecessors.

The laws and regulations, changes in such laws and regulations, and lawsuits and enforcement actions described in this risk factor could lead to the imposition of substantial fines, remediation costs, penalties and other civil and criminal sanctions against us. Further, substantial costs and liabilities, including for restoring the environment after the closure of mines, are inherent in our operations. There is no assurance that any such law, regulation, enforcement or private claim, or reclamation activity, would not have a material adverse effect on our financial condition, results of operations or cash flows.

Mine closure and reclamation regulations impose substantial costs on our operations and include requirements that we provide financial assurance supporting those obligations. These costs could significantly increase and we might not be able to provide financial assurance.

We are required by U.S. federal and state laws and regulations and by laws and regulations in the foreign jurisdictions in which we operate to reclaim our mining properties. The specific requirements may change and vary among jurisdictions, but they are similar in that they aim to minimize long term effects of exploration and mining disturbance by requiring the control of possible deleterious effluents and re-establishment to some degree of pre-disturbance land forms and vegetation. In some cases, we are required to provide financial assurances as security for reclamation costs, which may exceed our estimates for such costs. Conversely, our reclamation costs may exceed the financial assurances in place and those assurances may ultimately be unavailable to us.

The EPA and other state, provincial or federal agencies may also require financial assurance for investigation and remediation actions that are required under settlements of enforcement actions under CERCLA or equivalent state regulations. Currently there are no financial assurance requirements for active mining operations under CERCLA, and a lawsuit filed by several environmental organizations which sought to require the EPA to adopt financial assurance rules for mining companies with active mining operations was dismissed by a federal court. In the future, financial assurance rules under CERCLA, if adopted, could be financially material and adverse to us. See the risk factors, "*Our operations are subject to complex, evolving and increasingly stringent environmental laws and regulations. Compliance with environmental regulations, and litigation based on such regulations, involves significant costs and can threaten existing operations or constrain expansion opportunities*" and "*We are required to obtain governmental permits and other approvals in order to conduct mining operations*."

We are required to obtain governmental permits and other approvals in order to conduct mining operations.

In the ordinary course of business, mining companies are required to seek governmental permits and other approvals for continuation or expansion of existing operations or for the commencement of new operations. Obtaining the necessary governmental permits is a complex, time-consuming and costly process. The duration and success of our efforts to obtain permits are contingent upon many variables not within our control. Obtaining environmental permits, including the approval of reclamation plans, may increase costs and cause delays or halt the continuation of mining operations depending on the nature of the activity to be permitted and the interpretation of applicable requirements established by the permitting authority. Interested parties, including governmental agencies and non-governmental organizations or civic groups, may seek to prevent issuance of permits and intervene in the process or pursue extensive appeal rights. Past or ongoing violations of laws or regulations involving obtaining or complying with permits could provide a basis to revoke existing permits, deny the issuance of additional permits, or commence a regulatory enforcement action, each of which could have a material adverse impact on our operations or financial condition. In addition, evolving reclamation or environmental concerns may threaten our ability to renew existing permits or obtain new permits in connection with future development, expansions and operations. We cannot assure you that all necessary approvals and permits will be obtained and, if obtained, that the costs involved will not exceed those that we previously estimated. It is possible that the costs and delays associated with the compliance with evolving standards and regulations could become such that we would not proceed with a particular development or operation.

Specific examples of where we face permitting risk include the following:

- Continued extension of the planned life of mine at Greens Creek will require future expansion of the tailings storage facility. This will involve federal permitting under the National Environmental Policy Act (NEPA) and either an environmental assessment or environmental impact statement. While efforts are underway in Congress to streamline the federal permitting process, e.g. including mining under the FAST-41 regulatory process, our experience suggests this permitting process could be lengthy. Thus, we have initiated the permitting process for tailings expansion even though tailings capacity at Greens Creek is estimated to remain sufficient for the next approximately 10 years.

- At Casa Berardi, obtaining permits and modifications to the mine license area will be required to successfully develop the planned open pit extensions at the site and for long term management of tailings and waste rock generated through mining operations.

- At San Sebastian, regulatory approvals and landowner consents are required to successfully develop new mineralization.

- At Hollister in Nevada, state approvals will be required for waste rock management from development of the Hatter Graben or other mine expansions. This permitting will require coordination with the Western Shoshone who have long-standing ties to this land area.

- At the Lucky Friday, an expansion of the current tailings storage facility will be required to achieve the planned life of mine. We have begun the permitting process in advance of need for the additional storage capacity.

See the risk factors above, "*Certain of our mines and exploration properties are located on land that is or may become subject to traditional territory, title claims and/or claims of cultural significance by certain Indigenous Nations, and such claims and the attendant obligations of the federal government to those tribal communities and stakeholders may affect our current and future operations.*" and "*Legal challenges could prevent the Rock Creek or Montanore projects from ever being developed*."

We are often required to post surety bonds or cash collateral to secure our reclamation obligations and we may be unable to obtain the required surety bonds or may not have the resources to provide cash collateral, and the bonds or collateral may not fully cover the cost of reclamation and any such shortfall could have a material adverse impact on our financial condition. Further, when we use the services of a surety company to provide the required bond for reclamation, the surety companies often require us to post collateral with them, including letters of credit. Currently we utilize letters of credit issued under our revolving credit facility as the source of such collateral, and as a result, there are less funds available for us to borrow under the facility for other purposes. In the event that we are unable to obtain necessary bonds or to post sufficient collateral, we may experience a material adverse effect on our operations or financial results. See the risk factors below, "*Our Senior Notes and the guarantees thereof are effectively subordinated to any of our and our guarantors' secured indebtedness to the extent of the value of the collateral securing that indebtedness,* "*Any downgrade in the credit ratings assigned to us or our debt securities could increase future borrowing costs, adversely affect the availability of new financing and may result in increased collateral requirements under our existing surety bond portfolio*," and "*Mine closure and reclamation regulations impose substantial costs on our operations, and include requirements that we provide financial assurance supporting those obligations. These costs could significantly increase*."

We are currently involved in ongoing legal disputes that may materially adversely affect us.

There are several ongoing legal disputes in which we are involved, including a putative class action lawsuit filed against us and certain current and former directors and officers involving our Nevada Operations, and additional actions may be filed. We may be subject to future claims, including additional claims relating to our Nevada Operations. Further, we have experienced in the past, and could experience in the future, claims regarding environmental damage or compliance, safety conditions or other matters at our mines. The outcomes of these pending and potential claims are uncertain. We may not resolve these claims favorably. Depending on the outcome, these actions could cause adverse financial effects or reputational harm to us. If any of these disputes result in a substantial monetary judgment against us, are settled on terms unfavorable to us, or otherwise impact our operations (such as by limiting our ability to obtain permits or approvals), our financial results or condition could be materially adversely affected. For a description of some of the lawsuits and other claims in which we are involved, see *Note 15* of *Notes to Consolidated Financial Statements*.

Our environmental and asset retirement obligations may exceed the provisions we have made.

We are subject to significant environmental obligations. At December 31, 2021, we had accrued $113.2 million as a provision for environmental and asset retirement obligations. We cannot assure you that we have accurately estimated these obligations, and in the future our accrual could materially change and we could voluntarily incur expenditures in excess of our accrual. Our environmental and asset retirement obligations and voluntary expenditures could have a material adverse impact on our cash flows, results of operations, or financial condition. For information on our potential environmental liabilities and asset retirement obligations, see *Note 5* and *Note 15* of *Notes to Consolidated Financial Statements*.

New federal and state laws, regulations and initiatives could impact our operations.

In recent years there have been several proposed or implemented ballot initiatives that sought to directly or indirectly curtail or eliminate mining in certain states, including Alaska, where our Greens Creek mine operates, and Montana, where we are seeking to develop the Montanore and Rock Creek projects. While both a salmon initiative in Alaska and a water treatment initiative in Montana were defeated by voters in November 2018, in the future similar or other initiatives that could impact our operations may be on the ballot in these states or other jurisdictions (including local or international) in which we currently or may in the future operate. To the extent any such initiative was passed and became law, there could be a material adverse impact on our financial condition, results of operations or cash flows.

Legal challenges could prevent the Rock Creek or Montanore projects from ever being developed.

The proposed development of our Rock Creek project has been challenged by several regional and national conservation groups at various times since the USFS issued its initial Record of Decision ("ROD") in 2003 approving Revett Mining Company's plan of operation (Revett is now our wholly-owned subsidiary, named Hecla Montana, Inc.). Some of these challenges have alleged violations of a variety of federal and state laws and regulations pertaining to water rights and permitting activities at Rock Creek, including the Endangered Species Act, NEPA, the 1872 Mining Law, the Federal Land Policy Management Act, the Wilderness Act, the National Forest Management Act, the Clean Water Act, the Clean Air Act, the Forest Service Organic Act of 1897, and the Administrative Procedure Act. As a result of litigation challenging the ROD, in May 2010, the USFS was directed by the Montana Federal District Court to produce a Supplemental Environmental Impact Statement ("SEIS") to address NEPA procedural deficiencies that were identified by the court. The new SEIS was prepared and in August 2018, a new final ROD was issued. In early 2019, a group of environmental groups and other organizations filed a lawsuit challenging the ROD, and in April 2021, the Montana Federal District Court issued an opinion and order vacating the new final ROD issued by USFS and a related biological opinion issued by the United States Fish and Wildlife Service (the "2021 Rock Creek Order").

A joint final Environmental Impact Statement with respect to our Montanore project was issued in December 2015 by the USFS and the Montana Department of Environmental Quality ("DEQ"), and each agency issued a ROD in February 2016 providing approval for development of the Montanore project. However, private conservation groups have taken and may in the future take actions to oppose or delay the Montanore project. On May 30, 2017, the Montana Federal District Court issued Opinions and Orders in three lawsuits challenging previously granted environmental approvals for the Montanore project. The Orders overturned the approvals for the project granted by the USFS and the United States Fish and Wildlife Service ("USFWS"), and in each case remanded the ROD and associated planning documents for further review by the agencies consistent with the Court's Opinions. In June 2017, the Court vacated the agencies' approvals for the project. As a result, additional work must be performed by the agencies to address the deficiencies in the ROD and associated planning documents identified by the Court, and new approvals must be granted, before the project may proceed beyond certain preliminary actions. The USFS has issued a draft SEIS for the evaluation phase for public comment. The status of a final SEIS and ROD is unclear as the USFS and the USFWS consider the impacts of the 2021 Rock Creek Order. In addition, Montanore's updated water discharge permit under Montana law was found to be invalid by the Montana Supreme Court in November 2020. As a result, the site is operating under the previously issued permit as authorized by law.

In March 2018, each of Hecla Mining Company and our CEO was notified by the DEQ of alleged violations of Montana's mine reclamation statutes and related regulations due to our CEO having been an officer of a mining company that declared bankruptcy in 1998, together with the fact that subsequently, proceeds from that company's sureties were insufficient to fully fund reclamation at that company's mine sites in Montana. The allegations of DEQ led to litigation between Hecla and certain of our subsidiaries and DEQ. However, on August 2, 2021, the DEQ voluntarily moved to dismiss the litigation, and on September 22, 2021, the Court dismissed the case. Certain environmental and other groups have sued the DEQ in an effort to attempt to force DEQ to re-initiate litigation against us, our subsidiaries or our CEO. Our relevant subsidiaries are seeking to intervene in the lawsuit to protect their interests.

The net effect of the legal challenges to our Montanore and Rock Creek projects is that permitting has been delayed and further delays are likely, along with increased costs, and ultimately we may be prevented from ever fully-permitting or exploring or developing the two projects.

The titles to some of our properties may be defective or challenged.

Unpatented mining claims constitute a significant portion of our undeveloped property holdings in the United States. For our operations in Canada and Mexico, we hold mining claims, mineral concession titles and mining leases that are obtained and held in accordance with the laws of the respective countries, which provide Hecla the right to exploit and explore the properties. The validity of the claims, concessions and leases could be uncertain and may be contested. Although we have conducted title reviews of our property holdings, title review does not necessarily preclude third parties (including governments) from challenging our title. In accordance with mining industry practice, we do not generally obtain title opinions until we decide to develop a property. Therefore, while we have attempted to acquire satisfactory title to our undeveloped properties, some titles may be defective.

Risks Relating to Our Common Stock and Our Indebtedness

We may be unable to generate sufficient cash to service all of our debt and meet our other ongoing liquidity needs and may be forced to take other actions to satisfy our obligations, which may be unsuccessful.

Our ability to make scheduled payments or to refinance our debt obligations and to fund our planned capital expenditures and other ongoing liquidity needs depends on our financial and operating performance, which is subject to prevailing economic and competitive conditions and to certain financial, business and other factors beyond our control. There can be no assurance that our business will generate sufficient cash flow from operations or that borrowings will be available to us to pay the principal, premium, if any, and interest on our debt or to fund our other liquidity needs. We may need to refinance all or a portion of our debt on or before maturity. We may be unable to refinance any of our debt on commercially reasonable terms or at all.

In addition, we conduct substantially all of our operations through our subsidiaries, certain of which are not guarantors of our debt. Accordingly, repayment of our debt is dependent on the generation of cash flow by our subsidiaries and their ability to make such cash available to us, by dividend, debt repayment or otherwise. Unless they are guarantors of our debt, our subsidiaries do not have any obligation to pay amounts due on our debt or to make funds available for that purpose. Our subsidiaries may not be able to, or may not be permitted to, make distributions to enable us to make payments in respect of our debt. Each subsidiary is a distinct legal entity and, under certain circumstances, legal and contractual restrictions may limit our ability to obtain cash from our subsidiaries. While the credit agreement governing our revolving credit facility and the indenture governing our Senior Notes limit the ability of our subsidiaries to incur consensual restrictions on their ability to pay dividends or make other intercompany payments to us, these limitations are subject to qualifications and exceptions. In the event that we do not receive distributions from our subsidiaries, we may be unable to make required principal and interest payments on our debt.

If our cash flows and capital resources are insufficient to fund our debt service obligations, we may be forced to reduce or delay investments and capital expenditures or to sell assets, seek additional capital or restructure or refinance our debt. Our ability to restructure or refinance our debt will depend on the condition of the capital markets and our financial condition at such time. Any refinancing of our debt could be at higher interest rates and may require us to comply with more onerous covenants, which could further restrict our business operations. The terms of existing or future debt instruments and the indenture governing our Senior Notes may restrict us from adopting some of these alternatives. Further, these alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations. In addition, any failure to make payments of interest and principal on our outstanding debt on a timely basis would likely result in a reduction of our credit rating, which could harm our ability to incur additional debt.

The price of our stock has a history of volatility and could decline in the future.

Shares of our common and outstanding preferred stock are listed on the New York Stock Exchange ("NYSE"). The market price for our stock has been volatile, often based on:

- changes in metals prices, particularly silver and gold;
- our results of operations and financial condition as reflected in our public news releases or periodic filings with the SEC;
- fluctuating proven and probable reserves;
- factors unrelated to our financial performance or future prospects, such as global economic developments, market perceptions of the attractiveness of particular industries, or the reliability of metals markets;
- market prices of our publicly traded debt;
- political and regulatory risk;
- the success of our exploration, pre-development, and capital programs;
- ability to meet production estimates;
- environmental, safety and legal risk;
- the extent and nature of analytical coverage concerning our business; and
- the trading volume and general market interest in our securities.

The market price of our stock at any given point in time may not accurately reflect our value, and may prevent stockholders from realizing a profit on, or recovering, their investment.

Our Series B preferred stock has a liquidation preference of $50 per share or $7.9 million.

If we were liquidated, holders of our preferred stock would be entitled to receive approximately $7.9 million (plus any accrued and unpaid dividends) from any liquidation proceeds before holders of our common stock would be entitled to receive any proceeds, but after holders of all notes issued under the indenture governing our Senior Notes received any proceeds.

We may not be able to pay common or preferred stock dividends in the future.

Since January 2010, we have paid all regular quarterly dividends on our Series B preferred stock. The annual dividend payable on the Series B preferred stock is currently $0.6 million. Prior to 2010, there were numerous occasions when we did not declare dividends on the Series B Preferred Stock, but instead deferred them. We cannot assure you that we will continue to pay preferred stock dividends in the future.

Our board of directors adopted a common stock dividend policy that has two components: (1) a dividend that links the amount of dividends on our common stock to our average quarterly realized silver price in the preceding quarter, and (2) a minimum annual dividend of $0.015 per share of common stock, in each case payable quarterly, when declared. See *Note 12* of *Notes to Consolidated Financial Statements* for more information on our common stock dividend policy.

From the fourth quarter of 2011 through and including the fourth quarter of 2021, our board of directors has declared a common stock dividend under the policy described above (although, until recently, in most cases only a minimum dividend was declared and none relating to the average realized price of silver due to the prices not meeting the policy threshold). The declaration and payment of common stock dividends, whether pursuant to the policy or in addition thereto, is at the sole discretion of our board of directors, and we cannot assure you that we will continue to declare and pay common stock dividends in the future. In addition, the indenture governing our Senior Notes limits our ability to pay dividends.

Our existing stockholders are effectively subordinated to the holders of our Senior Notes.

In the event of our liquidation or dissolution, stockholders' entitlement to share ratably in any distribution of our assets would be subordinated to the holders of our Senior Notes. Any rights that a stockholder may have in the event of bankruptcy, liquidation or a reorganization of us or any of our subsidiaries, and any consequent rights of stockholders to realize on the proceeds from the sale of any of our or our subsidiaries' assets, will be effectively subordinated to the claims of the holders of our Senior Notes.

The issuance of additional shares of our preferred or common stock in the future could adversely affect holders of common stock.

The market price of our common stock may be influenced by any preferred or common stock we may issue. Our board of directors is authorized to issue additional classes or series of preferred stock without any action on the part of our stockholders. This includes the power to set the terms of any such classes or series of preferred stock that may be issued, including voting rights, dividend rights and preferences over common stock with respect to dividends or upon the liquidation, dissolution or winding up of the business and other terms. If we issue preferred stock in the future that has preference over our common stock with respect to the payment of dividends or upon liquidation, dissolution or winding up, or if we issue preferred stock with voting rights that dilute the voting power of our common stock, the rights of holders of the common stock or the market price of the common stock could be adversely affected.

The provisions in our certificate of incorporation, our by-laws and Delaware law could delay or deter tender offers or takeover attempts.

Certain provisions in our restated certificate of incorporation, our by-laws and Delaware law could make it more difficult for a third party to acquire control of us, even if that transaction could be beneficial to stockholders. These impediments include:

- the classification of our board of directors into three classes serving staggered three-year terms, which makes it more difficult to quickly replace board members;
- the ability of our board of directors to issue shares of preferred stock with rights as it deems appropriate without stockholder approval;
- a provision that special meetings of our board of directors may be called only by our chief executive officer or a majority of our board of directors;
- a provision that special meetings of stockholders may only be called pursuant to a resolution approved by a majority of our board of directors;
- a prohibition against action by written consent of our stockholders;

- a provision that our board members may only be removed for cause and by an affirmative vote of at least 80% of the outstanding voting stock;

- a provision that our stockholders comply with advance-notice provisions to bring director nominations or other matters before meetings of our stockholders;

- a prohibition against certain business combinations with an acquirer of 15% or more of our common stock for three years after such acquisition unless the stock acquisition or the business combination is approved by our board prior to the acquisition of the 15% interest, or after such acquisition our board and the holders of two-thirds of the other common stock approve the business combination; and

- a prohibition against our entering into certain business combinations with interested stockholders without the affirmative vote of the holders of at least 80% of the voting power of the then outstanding shares of voting stock.

In addition, amendment of most of the provisions described above requires approval of at least 80% of the outstanding voting stock.

Our Senior Notes and the guarantees thereof are effectively subordinated to any of our and our guarantors' secured indebtedness to the extent of the value of the collateral securing that indebtedness.

Our Senior Notes and the guarantees thereof are not secured by any of our assets or the assets of our subsidiaries. The indenture governing the Senior Notes permits us to incur secured debt up to specified limits. As a result, the Senior Notes and the guarantees thereof are effectively subordinated to our and our subsidiary guarantors' future secured indebtedness with respect to the collateral that secures such indebtedness, including any borrowings under our revolving credit facility. Upon a default in payment on, or the acceleration of, any of our secured indebtedness, or in the event of a bankruptcy, insolvency, liquidation, dissolution, reorganization or other insolvency proceeding involving us or such guarantor, the proceeds from the sale of collateral securing any secured indebtedness will be available to pay obligations on the Senior Notes only after such secured indebtedness has been paid in full. As a result, the holders of the Senior Notes may receive less, ratably, than the holders of secured debt in the event of a bankruptcy, insolvency, liquidation, dissolution, reorganization or other insolvency proceeding involving us or such guarantor.

Any draw-downs on our $250 million revolving credit facility would be secured debt. We did not have a balance drawn on the revolving credit facility as of December 31, 2021, but utilized $17.3 million of the facility with letters of credit. See the risk factor above "*We are required to obtain governmental permits and other approvals in order to conduct mining operations*" for more information.

The terms of our debt impose restrictions on our operations.

The indenture governing our Senior Notes includes several significant covenants. These covenants could adversely affect us by limiting our ability to plan for or react to market conditions or to meet our capital needs. These covenants, among other things:

- make it more difficult for us to satisfy our obligations with respect to the Senior Notes and our other debt;

- limit our ability to obtain additional financing to fund future working capital, capital expenditures, acquisitions or other general corporate requirements, or require us to make divestiture;

- require a substantial portion of our cash flows to be dedicated to debt service payments instead of other purposes, thereby reducing the amount of cash flows available for working capital, capital expenditures, acquisitions and other general corporate purposes;

- increase our vulnerability to general adverse economic and industry conditions;

- limit our flexibility in planning for and reacting to changes in the industry in which we compete;

- place us at a disadvantage compared to other, less leveraged competitors; and
- increase our cost of borrowing additional funds.

These restrictions may affect our ability to grow in accordance with our strategy. Further, our financial results, our substantial indebtedness and our credit ratings could adversely affect the availability and terms of any financing.

In addition, our revolving credit facility requires us to comply with various covenants, including certain financial ratios, that restrict management's discretion to operate our business in certain circumstances. For example, these restrictions include limitations that could affect our ability to incur additional indebtedness, place liens or mortgages on our assets, sell assets or release collateral. These restrictions could make it more difficult for us to obtain additional financing or take advantage of business opportunities. Furthermore, a breach of any of these covenants could result in an event of default under the agreement governing our revolving credit facility that, if not cured or waived, could give the holders of the defaulted debt the right to terminate commitments to lend and cause all amounts outstanding with respect to the debt to be due and payable immediately. Acceleration of any of our debt could result in cross-defaults under our other debt instruments, including the indenture governing our Senior Notes, as well as certain forward sales contracts which may be outstanding from time to time. Our assets and cash flow may be insufficient to repay borrowings fully under all of our outstanding debt instruments if any of our debt instruments are accelerated upon an event of default, which could force us into bankruptcy or liquidation. In such an event, we may be unable to repay our debt obligations. In addition, in some instances, this would create an event of default under the indenture governing our Senior Notes.

Our variable rate indebtedness subjects us to interest rate risk, which could cause our indebtedness service obligations to increase significantly.

Borrowings under our credit facility are at variable rates of interest and expose us to interest rate risk. If interest rates increase, our debt service obligations on the variable rate indebtedness would increase even though the amount borrowed remained the same, and our net income and cash flows, including cash available for servicing our indebtedness, would correspondingly decrease. Assuming all revolving loans currently available to us were fully drawn, each one percentage point change in interest rates would result in a $2.3 million change in annual cash interest expense on our credit facility.

Key terms of the Senior Notes will be suspended if the Senior Notes achieve investment grade ratings and no default or event of default has occurred and is continuing.

Many of the covenants in the indenture governing the Senior Notes will be suspended if the Senior Notes are rated investment grade by Standard & Poor's and Moody's provided at such time no default or event of default has occurred and is continuing, including those covenants that restrict, among other things, our ability to pay dividends, incur debt and to enter into certain other transactions. We cannot assure you that the Senior Notes will ever be rated investment grade. However, suspension of these covenants would allow us to engage in certain transactions that would not be permitted while these covenants were in force, and the effects of any such transactions will be permitted to remain in place even if the Senior Notes are subsequently downgraded below investment grade.

We may be unable to repurchase Senior Notes in the event of a change of control as required by the indenture.

Upon the occurrence of certain kinds of change of control events specified in the indenture, holders of the Senior Notes will have the right to require us to repurchase all of the Senior Notes at a repurchase price equal to 101% of their principal amount, plus accrued and unpaid interest, if any, to the date of repurchase. Any change of control also would constitute a default under our revolving credit facility. Therefore, upon the occurrence of a change of control, the lenders under our revolving credit facility would have the right to accelerate their loans and, if so accelerated, we would be required to repay all of our outstanding obligations under such facility. We may not be able to pay the Senior Note holders the required price for their notes at that time because we may not have available funds to pay the repurchase price. In addition, the terms of other existing or future debt may prevent us from paying the Senior Note holders. We cannot assure you that we would be able to repay such other debt or obtain consents from the holders of such other debt to repurchase the Senior Notes. Any requirement to offer to purchase any outstanding Senior Notes may result in us having to refinance our outstanding indebtedness, which we may not be able to do. In addition, even if we were able to refinance our outstanding indebtedness, such financing may be on terms unfavorable to us.

Holders of the Senior Notes may not be able to determine when a change of control giving rise to their right to have the Senior Notes repurchased has occurred following a sale of "substantially all" of our assets.

The definition of change of control in the indenture governing the Senior Notes includes a phrase relating to the sale of "all or substantially all" of our assets. There is no precise established definition of the phrase "substantially all" under applicable law. Accordingly, the ability of a holder of Senior Notes to require us to repurchase its notes as a result of a sale of less than all our assets to another person may be uncertain.

Federal and state fraudulent transfer laws may permit a court to void the Senior Notes or any of the guarantees thereof, and if that occurs, holders of the Senior Notes may not receive any payments on the notes.

Federal and state fraudulent transfer and conveyance statutes may apply to the issuance of the Senior Notes and the incurrence of any guarantees of the Senior Notes. Under federal bankruptcy law and comparable provisions of state fraudulent transfer or conveyance laws, which may vary from state to state, the Senior Notes or any guarantees thereof could be voided as a fraudulent transfer or conveyance if we or any existing or future subsidiary guarantors, as applicable, (a) issued the Senior Notes or incurred such guarantee with the intent of hindering, delaying or defrauding creditors or (b) received less than reasonably equivalent value or fair consideration in return for either issuing the Senior Notes or incurring the guarantee and, in the case of (b) only, one of the following is also true at the time thereof:

- we or the subsidiary guarantor, as applicable, were insolvent or rendered insolvent by reason of the issuance of the Senior Notes or the incurrence of the guarantee;
- the issuance of the Senior Notes or the incurrence of the guarantee left us or the subsidiary guarantor, as applicable, with an unreasonably small amount of capital or assets to carry on the business; or
- we or the subsidiary guarantor intended to, or believed that we or such subsidiary guarantor would, incur debts beyond our or such subsidiary guarantor's ability to pay as they mature.

As a general matter, value is given for a transfer or an obligation if, in exchange for the transfer or obligation, property is transferred or a valid antecedent debt is satisfied. A court would likely find that any subsidiary guarantor did not receive reasonably equivalent value or fair consideration for its guarantee to the extent such subsidiary guarantor did not obtain a reasonably equivalent benefit from the issuance of the Senior Notes.

We cannot be certain as to the standards a court would use to determine whether or not we or any subsidiary guarantor was insolvent at the relevant time or, regardless of the standard that a court uses, whether the Senior Notes or any guarantees would be subordinated to our or any subsidiary guarantor's other debt. In general, however, a court would deem an entity insolvent if:

- the sum of its debts, including contingent and unliquidated liabilities, was greater than the fair saleable value of all of its assets;
- the present fair saleable value of its assets was less than the amount that would be required to pay its probable liability on its existing debts, including contingent liabilities, as they become absolute and mature; or
- it could not pay its debts as they became due.

The subsidiary guarantees contain a "savings clause" intended to limit the subsidiary guarantor's liability to the maximum amount that it could incur without causing the incurrence of obligations under its subsidiary guarantee to be a fraudulent transfer. This provision may not be effective to protect any subsidiary guarantees from being avoided under fraudulent transfer law. Furthermore, in *Official Committee of Unsecured Creditors of TOUSA, Inc. v Citicorp North America, Inc*., the U.S. Bankruptcy Court in the Southern District of Florida held that a savings clause similar to the savings clause used in the indenture was unenforceable. As a result, the subsidiary guarantees in that case were found to be fraudulent conveyances. The United States Court of Appeals for the Eleventh Circuit affirmed the liability findings of the Bankruptcy Court without ruling directly on the enforceability of savings clauses generally. If the TOUSA decision were followed by other courts, the risk that the guarantees would be deemed fraudulent conveyances would be significantly increased.

To the extent that any subsidiary guarantee is avoided, then, as to that subsidiary, the guaranty would not be enforceable.

If a court were to find that the issuance of the Senior Notes or the incurrence of any guarantee was a fraudulent transfer or conveyance, the court could (1) void the payment obligations under the Senior Notes or such guarantee, (2) subordinate the Senior Notes or such guarantee to presently existing and future indebtedness of ours or of the related subsidiary guarantor or (3) require the holders of the Senior Notes to repay any amounts received with respect to such guarantee. In the event of a finding that a fraudulent transfer or conveyance occurred, holders of the Senior Notes may not receive any repayment on the Senior Notes. Further, the avoidance of the Senior Notes could result in an event of default with respect to our and our subsidiaries' other debt that could result in acceleration of that debt.

General Risk Factors

Global financial events or developments impacting major industrial or developing countries may have an impact on our business and financial condition in ways that we currently cannot predict.

The COVID-19 pandemic and 2008 credit crisis and related turmoil in the global financial system and ensuing recession had an impact on our business and financial position, and similar events in the future could also impact us. The re-emergence of a financial crisis or recession or reduced economic activity in the United States, China, India and other industrialized or developing countries, or disruption of key sectors of the economy such as oil and gas, may have a significant effect on our results of operations or limit our ability to raise capital through credit and equity markets. The prices of the metals that we produce are affected by a number of factors, and it is unknown how these factors may be impacted by a global financial event or developments impacting major industrial or developing countries.

Tariffs, other potential changes to tariff and import/export regulations, and ongoing trade disputes between the United States and other jurisdictions may have a negative effect on global economic conditions and our business, financial results and financial condition.

In 2018, the United States imposed and enacted tariffs on certain items. Since their enactment, there have been ongoing discussions and activities regarding changes to other U.S. trade policies and treaties. In response, a number of markets, including China, into which we have in the past and may in the future sell our products, have implemented tariffs on U.S. imports, or are threatening to impose tariffs on U.S. imports or to take other measures in response to these U.S. actions. These developments may have a material adverse effect on global economic conditions and the stability of global financial markets, and they may significantly reduce global trade and, in particular, trade between China and the United States. Any of these factors could depress economic activity, restrict our access to customers and have a material adverse effect on our business, financial condition and results of operations. In addition, any actions by foreign markets to implement further trade policy changes, including limiting foreign investment or trade, increasing regulatory scrutiny or taking other actions which impact U.S. companies' ability to obtain necessary licenses or approvals could negatively impact our business.

In September 2018, in response to tariffs on Chinese goods implemented by the United States, China imposed a 10% tariff on lead concentrates and a 20% tariff on silver concentrates, which we produce and ship to China from time to time. However, tariff exemptions were granted to a number of smelters in China in 2020 and 2021, and we sold silver concentrates to China representing approximately 6% and 10% of our total revenues for 2021 and 2020, respectively, which were not subject to tariffs due to the exemptions. We sold no lead or silver concentrates to China in 2019. While to date the direct impact of tariffs has been immaterial on our sales and treatment charges, they may also have an impact on our sales and treatment charges outside of China, and there can be no assurance that the tariff exemptions will continue.

These tariffs are relatively recent and are subject to a number of uncertainties as they are implemented, including future adjustments and changes in the countries excluded from such tariffs. The ultimate reaction of other countries, and businesses in those countries, and the impact of these tariffs or other actions on the United States, China, the global economy and our business, financial condition and results of operations, cannot be predicted at this time, nor can we predict the impact of any other developments with respect to global trade.

Our profitability could be affected by the prices of other commodities.

Our profitability is sensitive to the costs of commodities such as fuel (in particular as used at Greens Creek to generate electricity when hydropower is unavailable), steel, and cement. While the recent prices for such commodities have been stable or in decline, prices have been historically volatile, and material increases in commodity costs could have a significant effect on our results of operations.

Our business depends on availability of skilled miners and good relations with employees.

We are dependent upon the ability and experience of our executive officers, managers, employees, contractors and their employees, and other personnel, and we cannot assure you that we will be able to retain such employees or contractors. We compete with other companies both in and outside the mining industry in recruiting and retaining qualified employees and contractors knowledgeable about the mining business. From time to time, we have encountered, and may in the future encounter, difficulty recruiting skilled mining personnel at acceptable wage and benefit levels in a competitive labor market, and may be required to utilize contractors, which can be more costly. Temporary or extended lay-offs due to mine closures may exacerbate such issues and result in vacancies or the need to hire less skilled or efficient employees or contractors. The loss of skilled employees or contractors or our inability to attract and retain additional highly skilled employees and contractors could have an adverse effect on our business and future operations.

We or our contractors may experience labor disputes, work stoppages or other disruptions in production that could adversely affect our business and results of operations. The Lucky Friday mine is our only operation where some of our employees are subject to a collective bargaining agreement, and the unionized employees were on strike from March 13, 2017 until January 7, 2020, when the union ratified a new collective bargaining agreement, which expires on January 6, 2023. The strike significantly impacted production at the Lucky Friday and caused significant costs and expenses during each year of the strike. Any future strikes or other labor or related disruptions could adversely affect our financial condition and results of operations.

Our information technology systems may be vulnerable to disruption which could place our systems at risk from data loss, operational failure, or compromise of confidential information.

We rely on various information technology systems and on third party developers and contractors in connection with operations, including production, equipment operation and financial support systems. While we regularly monitor the security of our systems, they remain vulnerable to disruption, damage or failure from a variety of sources, including errors by employees or contractors, computer viruses, cyber-attacks including phishing, ransomware and similar malware, misappropriation of data by outside parties, and various other threats. Techniques used to obtain unauthorized access to or sabotage our systems are under continuous and rapid evolution, and we may be unable to detect efforts to disrupt our data and systems in advance. Breaches and unauthorized access carry the potential to cause losses of assets or production, operational delays, equipment failure that could cause other risks to be realized, inaccurate recordkeeping, or disclosure of confidential information, any of which could result in financial losses and regulatory or legal exposure, and could have a material adverse effect on our cash flows, financial condition or results of operations.

Competition from other mining companies may harm our business.

We compete with other mining companies, some of which have greater financial resources than we do or other advantages, in various areas which include:

- attracting and retaining key executives, skilled labor, and other employees;
- for the services of other skilled personnel and contractors and their specialized equipment, components and supplies, such as drill rigs, necessary for exploration and development;
- for contractors that perform mining and other activities and milling facilities which we lease or toll mill through; and
- for rights to mine properties.

Additional issuances of equity securities by us would dilute the ownership of our existing stockholders and could reduce our earnings per share.

We may issue securities in the future in connection with raising capital, acquisitions, strategic transactions or for other purposes. To the extent we issue any additional equity securities (or securities convertible into equity), the ownership of our existing stockholders would be diluted and our earnings per share could be reduced.

If a large number of shares of our common stock are sold in the public market, the sales could reduce the trading price of our common stock and impede our ability to raise future capital.

We cannot predict what effect, if any, future issuances by us of our common stock or other equity will have on the market price of our common stock. Any shares that we may issue may not have any resale restrictions, and therefore could be immediately sold by the holders. The market price of our common stock could decline if certain large holders of our common stock, or recipients of our common stock, sell all or a significant portion of their shares of common stock or are perceived by the market as intending to sell these shares other than in an orderly manner. In addition, these sales could also impair our ability to raise capital through the sale of additional common stock in the capital markets.

Any downgrade in the credit ratings assigned to us or our debt securities could increase future borrowing costs, adversely affect the availability of new financing and may result in increased collateral requirements under our existing surety bond portfolio.

As of February 18, 2022, our Senior Notes were rated "B" with a stable outlook by Standard & Poor's and "Caa1" with a stable outlook by Moody's Investors Service. We cannot assure you that any rating currently assigned by Standard & Poor's or Moody's to us or our debt securities (including the Senior Notes) will remain unchanged for any given period of time or that a rating will not be lowered if, in that rating agency's judgment, future circumstances relating to the basis of the rating so warrant. If we are unable to maintain our outstanding debt and financial ratios at levels acceptable to the credit rating agencies, or should our business prospects or financial results deteriorate, including as a result of declines in silver and gold prices or other factors beyond our control, our ratings could be downgraded by the rating agencies. Downgrading the credit rating of our debt securities or placing us on a watch list for possible future downgrading would likely adversely impact us, including our ability to obtain financing on favorable terms, if at all, increase borrowing costs, result in increased collateral requirements under our surety bond portfolio, and have an adverse effect on the market price of our securities, including our Senior Notes.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Note on New SEC Mining Disclosure Rules

Information concerning our mining properties in this Annual Report on Form 10-K has been prepared in accordance with the requirements of subpart 1300 of Regulation S-K, which first became applicable to us for the fiscal year ended December 31, 2021. These requirements differ significantly from the previously applicable disclosure requirements of SEC Industry Guide 7. Among other differences, subpart 1300 of Regulation S-K requires us to disclose our mineral resources, in addition to our mineral reserves, as of the end of our most recently completed fiscal year both in the aggregate and for each of our individually material mining properties.

You are cautioned that mineral resources do not have demonstrated economic value. Mineral resources are subject to further exploration and development, are subject to additional risks, and no assurance can be given that they will eventually convert to future reserves. Inferred Resources, in particular, have a great amount of uncertainty as to their existence and their economic and legal feasibility. Investors are cautioned not to assume that any part or all of the Inferred Resource exists or is economically or legally mineable. See *Item 1A, Risk Factors*.

Summary

The map below shows the locations of our operations and our exploration projects, as well as our corporate offices located in Coeur d'Alene, Idaho, Vancouver, British Columbia and Val d'Or, Quebec.



The following table summarizes our aggregate metal quantities produced and sold for the last three years:

		Year Ended December 31,		
		2021	2020	2019
Silver -	Ounces produced	12,887,240	13,542,957	12,605,234
	Payable ounces sold	11,633,802	12,305,917	11,548,373
Gold -	Ounces produced	201,327	208,962	272,873
	Payable ounces sold	201,610	202,694	275,060
Lead -	Tons produced	43,010	34,127	24,210
	Payable tons sold	36,707	29,108	19,746
Zinc -	Tons produced	63,617	63,112	58,857
	Payable tons sold	43,626	46,349	39,381

A summary overview of mining operations and exploration and pre-development projects is shown in the following table:

	Location								
Property	Country	State/Province	Ownership	Claims	Permit Conditions	Stage	Mine Type	Commodity	Mineralization Style
Greens Creek	United States	Alaska	100.0%	440 unpatented lode claims, 58 unpatented millsite claims (8,072 acres), 17 patented lode claims and one patented millsite claim (328 acres); Land Exchange Properties (7,301 acres)	Private or USFS administered land, all required permits for production in place	Production	Underground	Ag, Au, Pb, Zn	Massive Sulfide
Lucky Friday	United States	Idaho	100.0%	43 patented lode and millsite claims (710 acres); 53 unpatented lode claims (535 acres)	Private or USFS administered land, all required permits for production in place	Production	Underground	Ag, Pb, Zn	Vein
Casa Berardi	Canada	Quebec	100.0%	394 claims; 48,704 acres (19,710 ha)	All required permits for production in place or in process	Production	Underground/Open Pit	Au	Vein/Shear Zone
San Sebastian	Mexico	Durango	100.0%	31 mining concessions; 99,643 acres (40,324 ha)	All required permits for exploration in place	Exploration	Underground/Open Pit	Ag, Au, Cu, Pb, Zn	Vein
Fire Creek	United States	Nevada	100.0%	890 unpatented lode claims (18,400 acres); leases (409 acres); private land (3,208 acres)	BLM administered land, Plan of Operations and other required State permits in place	Exploration	Underground	Au, Ag	Vein
Hollister	United States	Nevada	100.0%	1,005 unpatented lode claims, 11 unpatented mill site claims; 17,960 acres total	BLM administered land, Plan of Operations and other required State permits in place	Exploration	Underground	Au, Ag	Vein
Midas	United States	Nevada	100.0%	1,489 unpatented lode claims (27,583 acres); private land (2,417 acres)	BLM administered land, Plan of Operations and other required State permits in place	Exploration	Underground	Au, Ag	Vein
Heva - Hosco	Canada	Quebec	100.0%	102 claims; 9,506 acres (3,857 ha)	Annual intervention permits for exploration in place along with authorization for road building	Exploration	Underground/Open Pit	Au	Vein/Shear Zone
San Juan Silver	United States	Colorado	100.0%	131 patented lode or millsite claims, 704 unpatented lode claims; 13,645 total acres	7 Notice-of-Intent areas for Exploration, Mining Plan of Operations (USFS); 112-d2 mining permit (CO DRMS)	Exploration	Underground	Ag, Pb, Zn	Vein
Star	United States	Idaho	100.0%	174 patented lode and millsite claims; 2,376 total acres	Private land, required permits in place for exploration	Exploration	Underground	Ag, Zn, Pb	Vein
Monte Cristo	United States	Nevada	100.0%	344 unpatented lode claims (6,880 acres)	BLM administered land, Notice of Intent required	Exploration	Underground/Open Pit	Au, Ag	Vein
Rock Creek	United States	Montana	100.0%	99 patented lode claims, 463 unpatented lode claims, 5 tunnel sites: 1,809 total acres; Private land: 754 acres	Private or USFS administered land. Some State permits in-place; no Federal permits.	Exploration	Underground	Ag, Cu	Sediment Hosted - Stratabound
				2 patented lode claims, 36.84 acres	Private or USFS administered land.				

Montanore	United States	Montana	100.0%	(22.33 in wilderness, 14.51 outside wilderness)	Some State permits in-place; no Federal permits.	Exploration	Underground	Ag, Cu	Sediment Hosted - Stratabound
Republic	United States	Washington	100.0%	114 patented claims and private land; 2,095 acres surface rights, 3,177 acres of mineral rights	Private or BLM administered land	Exploration	Underground/Open Pit	Au, Ag	Vein
Silver Valley	United States	Idaho	100.0%	Various exploration properties and claim holdings	Private or USFS administered land	Exploration	Underground	Ag, Zn, Pb	Vein
Aurora	United States	Nevada	100.0%	506 unpatented lode claims, 92 patented lode claims, 25 private parcels; 9,928 total acres	Private or USFS administered land, permit work in progress for USFS lands	Exploration	Underground/Open Pit	Au, Ag	Vein
Kinskuch	Canada	British Columbia	100.0%	156 claims; 146,780 acres	Multi-use area-based permit with expiry 31 March 2024	Exploration	Underground/Open Pit	Au, Ag, Cu, Pb, Zn	Vein, Massive Sulfide, Porphyry
Opinaca / Wildcat	Canada	Quebec	50% / 100%	Opinaca: 248 claims (50%; 32,064 acres (12,976 ha)); Wildcat: 235 claims (100%; 30,528 acres (12,354 ha))	Intervention permits for exploration updated every year	Exploration	Underground	Au	Vein/Shear Zone

Hecla is the operator at all mines and exploration properties. Mineral processing plants and related facilities are part of the infrastructure at each operating mine.

The following table summarizes the in-situ mineral reserves for all properties as of December 31, 2021:

Asset	Tons (000)	Silver (oz/ton)	Gold (oz/ton)	Lead %	Zinc %	Silver (000 oz)	Gold (000 oz)	Lead Tons	Zinc Tons
Proven Reserves: (1)									
Greens Creek (2,3)	2	9.6	0.08	1.7	4.5	18	0.1	30	80
Lucky Friday (2,4)	4,691	13.9	—	8.4	3.4	65,313	—	395,290	159,360
Casa Berardi Open Pit (2,5)	4,763	—	0.10	—	—	—	453	—	—
Casa Berardi Underground (2,5)	923	—	0.16	—	—	—	143	—	—
Total Proven	10,379					65,331	596	395,320	159,440
Probable Reserves: (6)									
Greens Creek (2,3)	11,074	11.3	0.09	2.5	6.6	125,201	946	282,220	725,830
Lucky Friday (2,4)	765	12.3	—	7.5	2.8	9,386	—	57,160	21,650
Casa Berardi Open Pit (2,5)	13,371	—	0.07	—	—	—	928	—	—
Casa Berardi Underground (2,5)	1,695	—	0.15	—	—	—	259	—	—
Total Probable	26,905					134,587	2,133	339,380	747,480
Proven and Probable Reserves: (1)									
Greens Creek (2,3)	11,076	11.3	0.09	2.5	6.6	125,219	946	282,250	725,910
Lucky Friday (2,4)	5,456	13.7	—	8.3	3.3	74,699	—	452,450	181,010
Casa Berardi Open Pit (2,5)	18,134	—	0.08	—	—	—	1,381	—	—
Casa Berardi Underground (2,5)	2,618	—	0.15	—	—	—	402	—	—
Total Proven and Probable	37,284					199,918	2,729	734,700	906,920

(1) The term “reserve” means an estimate of tonnage and grade or quality of indicated and measured mineral resources that, in the opinion of the qualified person, can be the basis of an economically viable project. More specifically, it is the economically mineable part of a measured or indicated mineral resource, which includes diluting materials and allowances for losses that may occur when the material is mined or extracted. The term “proven reserves” means the economically mineable part of a measured mineral resource and can only result from conversion of a measured mineral resource. See footnotes 7 and 8 below.

(2) Mineral reserves are based on the following prices unless otherwise stated: $17.00/oz for silver, $1,600/oz for gold, $0.90/lb for lead and $1.15/lb for zinc. Mineral reserves are reported in-situ.

(3) Due to multiple ore metals, and complex combinations of ore types, metal ratios and metallurgical performances at Greens Creek, the cutoff grade is expressed in terms of net smelter return (“NSR”), rather than metal grade. The reserve cut-off grade at Greens Creek is $215 per ton NSR for all zones except Gallagher, which has a cutoff grade of $220 per ton NSR. The cut-off grade calculations include costs associated with mining, processing, surface operations, environmental, general administrative, sustaining capital, and royalty charges, if any. Metallurgical recoveries (actual 2021): 81% for silver, 72% for gold, 82% for lead and 90% for zinc.

(4) Due to multiple ore metals, and complex combinations of ore types, metal ratios and metallurgical performances at Lucky Friday, the cutoff grade is expressed in terms of NSR, rather than metal grade. The reserve NSR cut-off grades for Lucky Friday are $216.19/ton for the 30 Vein and $230.98/ton for the intermediate veins. The cut-off grade calculations include costs associated with mining, processing, surface operations, environmental, general administrative, and sustaining capital. Metallurgical recoveries (actual 2021): 95% for silver, 95% for lead and 90% for zinc.

(5) The average reserve cut-off grades at Casa Berardi are 0.101 oz/ton for gold underground and 0.037 oz/ton for open pit gold. Metallurgical recovery (actual 2021); 85% for gold. USD/CAN exchange rate: 1:1.275.

(6) The term “probable reserves” means the economically mineable part of an indicated and, in some cases, a measured mineral resource. See footnotes 8 and 9 below.

The following table summarizes the in-situ mineral resources (7) for all properties, exclusive of mineral reserves, as of December 31, 2021:

Asset	Tons (000)	Silver (oz/ton)	Gold (oz/ton)	Lead %	Zinc %	Copper %	Silver (000 oz)	Gold (000 oz)	Lead Tons	Zinc Tons	Copper Tons
Measured Resources: (8)											
Greens Creek (11,12)	—	—	—	—	—	—	—	—	—	—	—
Lucky Friday (11,13)	8,652	7.6	—	4.9	2.5	—	65,752	—	425,100	213,480	—
Casa Berardi Open Pit (11,14)	96	—	0.04	—	—	—	—	4	—	—	—
Casa Berardi Underground(11,14)	2,272	—	0.15	—	—	—	—	351	—	—	—
San Sebastian - Oxide (15)	—	—	—	—	—	—	—	—	—	—	—
San Sebastian - Sulfide (15)	—	—	—	—	—	—	—	—	—	—	—
Fire Creek (16,17)	20	0.7	0.50	—	—	—	14	10	—	—	—
Hollister (16,18)	18	4.9	0.59	—	—	—	87	10	—	—	—
Midas (16,19)	2	7.6	0.68	—	—	—	14	1	—	—	—
Heva (20)	—	—	—	—	—	—	—	—	—	—	—
Hosco (20)	—	—	—	—	—	—	—	—	—	—	—
Star (21)	—	—	—	—	—	—	—	—	—	—	—
Total Measured	11,060						65,867	376	425,100	213,480	—

	Tons (000)	Silver (oz/ton)	Gold (oz/ton)	Lead %	Zinc %	Copper %	Silver (000 oz)	Gold (000 oz)	Lead Tons	Zinc Tons	Copper Tons
Indicated Resources: (9)											
Greens Creek (11,12)	8,355	12.8	0.10	3.0	8.4	—	106,670	836	250,040	701,520	—
Lucky Friday (11,13)	1,841	7.6	—	5.1	2.4	—	14,010	—	93,140	44,120	—
Casa Berardi Open Pit (11,14)	420	—	0.03	—	—	—	—	14	—	—	—
Casa Berardi Underground(11,14)	4,976	—	0.14	—	—	—	—	685	—	—	—
San Sebastian - Oxide (15)	1,453	6.5	0.09	—	—	1.2	9,430	135	—	—	—
San Sebastian - Sulfide (15)	1,187	5.5	0.01	1.9	2.9	—	6,579	16	22,420	34,100	14,650
Fire Creek (16,17)	113	1.0	0.45	—	—	—	114	51	—	—	—
Hollister (16,18)	70	1.9	0.58	—	—	—	130	40	—	—	—
Midas (16,19)	76	5.7	0.42	—	—	—	430	32	—	—	—
Heva (20)	1,266	—	0.06	—	—	—	—	76	—	—	—
Hosco (20)	29,287	—	0.04	—	—	—	—	1,201	—	—	—
Star (21)	1,126	2.9	0.00	6.2	7.4	—	3,301	—	69,900	83,410	
Total Indicated	50,170						140,664	3,086	435,500	863,150	14,650

	Tons (000)	Silver (oz/ton)	Gold (oz/ton)	Lead %	Zinc %	Copper %	Silver (000 oz)	Gold (000 oz)	Lead Tons	Zinc Tons	Copper Tons
Measured and Indicated Resources:											
Greens Creek (11,12)	8,355	12.8	0.10	3.0	8.4	—	106,670	836	250,040	701,520	—
Lucky Friday (11,13)	10,493	7.6	—	4.9	2.5	—	79,762	—	518,240	257,600	—
Casa Berardi Open Pit (11,14)	516	—	0.03	—	—	—	—	18	—	—	—
Casa Berardi Underground(11,14)	7,248	—	0.14	—	—	—	—	1,036	—	—	—
San Sebastian - Oxide (15)	1,453	6.5	0.09	—	—	—	9,430	135	—	—	—
San Sebastian - Sulfide (15)	1,187	5.5	0.01	1.9	2.9	1.2	6,579	16	22,420	34,100	14,650
Fire Creek (16,17)	133	1.0	0.46	—	—	—	128	61	—	—	—
Hollister (16,18)	88	2.5	0.57	—	—	—	217	50	—	—	—
Midas (16,19)	78	5.7	0.42	—	—	—	444	33	—	—	—
Heva (20)	1,266	—	0.06	—	—	—	—	76	—	—	—
Hosco (20)	29,287	—	0.04	—	—	—	—	1,201	—	—	—
Star (21)	1,126	2.9	—	6.2	7.4	—	3,301	—	69,900	83,410	—
Total Measured and Indicated	61,230						206,531	3,462	860,600	1,076,630	14,650

	Tons (000)	Silver (oz/ton)	Gold (oz/ton)	Lead %	Zinc %	Copper %	Silver (000 oz)	Gold (000 oz)	Lead Tons	Zinc Tons	Copper Tons
Inferred Resources: (10)											
Greens Creek (11,12)	2,152	12.8	0.08	2.8	6.8	—	27,508	164	60,140	146,020	—
Lucky Friday (11,13)	5,377	7.8	—	5.8	2.4	—	41,872	—	311,850	129,600	—
Casa Berardi Open Pit (11,14)	7,886	—	0.05	—	—	—	—	383	—	—	—
Casa Berardi underground(11,14)	2,239	—	0.18	—	—	—	—	408	—	—	—
San Sebastian - Oxide (15)	3,490	6.4	0.05	—	—	0.9	22,353	182	—	—	—
San Sebastian - Sulfide (15)	385	4.2	0.01	1.6	2.3	—	1,606	5	6,070	8,830	3,330
Fire Creek (16,17)	765	0.5	0.51	—	—	—	394	392	—	—	—
Fire Creek - Open Pit (16,22)	74,584	0.1	0.03	—	—	—	5,232	2,178	—	—	—
Hollister (16,18)	642	3.0	0.42	—	—	—	1,916	273	—	—	—
Midas (16,19)	1,232	6.3	0.50	—	—	—	7,723	615	—	—	—
Heva (20)	2,787	—	0.08	—	—	—	—	216	—	—	—
Hosco (20)	17,726	—	0.04	—	—	—	—	663	—	—	—
Star (21)	3,157	2.9	—	5.6	5.5	—	9,432	—	178,670	174,450	—
San Juan Silver (23)	3,594	10.7	0.01	1.4	1.1	—	40,716	36	51,750	40,800	—
Monte Cristo (24)	913	0.3	0.14	—	—	—	271	131	—	—	—
Rock Creek (25)	100,086	1.5	—	—	—	0.7	148,736	—	—	—	658,680
Montanore (26)	112,185	1.6	—	—	—	0.7	183,346	—	—	—	759,420
Total Inferred	339,200						491,105	5,646	608,480	499,700	1,421,430

(7) The term "mineral resources" means a concentration or occurrence of material of economic interest in or on the Earth's crust in such form, grade or quality, and quantity that there are reasonable prospects for economic extraction. A mineral resource is a reasonable estimate of mineralization, taking into account relevant factors such as cut-off grade, likely mining dimensions, location or continuity, that, with the assumed and justifiable technical and economic conditions, is likely to, in whole or in part, become economically extractable. It is not merely an inventory of all mineralization drilled or sampled.

(8) The term "measured resources" means that part of a mineral resource for which quantity and grade or quality are estimated on the basis of conclusive geological evidence and sampling. The level of geological certainty associated with a measured mineral resource is sufficient to allow a qualified person to apply modifying factors, as defined in this section, in sufficient detail to support detailed mine planning and final evaluation of the economic viability of the deposit. Because a measured mineral resource has a higher level of confidence than the level of confidence of either an indicated mineral resource or an inferred mineral resource, a measured mineral resource may be converted to a proven mineral reserve or to a probable mineral reserve.

(9) The term "indicated resources" means that part of a mineral resource for which quantity and grade or quality are estimated on the basis of adequate geological evidence and sampling. The level of geological certainty associated with an indicated mineral resource is sufficient to allow a qualified person to apply modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Because an indicated mineral resource has a lower level of confidence than the level of confidence of a measured mineral resource, an indicated mineral resource may only be converted to a probable mineral reserve.

(10) The term "inferred resources" means that part of a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. The level of geological uncertainty associated with an inferred mineral resource is too high to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. Because an inferred mineral resource has the lowest level of geological confidence of all mineral resources, which prevents the application of the modifying factors in a manner useful for evaluation of economic viability, an inferred mineral resource may not be considered when assessing the economic viability of a mining project, and may not be converted to a mineral reserve.

(11) Mineral resources are based on $1,700/oz for gold, $21.00/oz for silver, $1.15/lb for lead, $1.35/lb for zinc and $3.00/lb for copper, unless otherwise stated. Mineral resources are reported in-situ and are exclusive of mineral reserves. Mineral resources are reported for all resource projects regardless of the percentage of total measured and indicated resource. The Hosco Project is the only project, other than the mining operations, that contains more than 10% of the aggregate measured and indicated resources.

(12) The resource NSR cut-off grades for Greens Creek are $215/ton for all zones at Greens Creek except the Gallagher Zone at $220/ton; metallurgical recoveries (actual 2021): 81% for silver, 72% for gold, 82% for lead and 90% for zinc.

(13) The resource NSR cut-off grades for Lucky Friday are $170.18 for the 30 Vein, $184.97 for the Intermediate Veins and $207.15 for the Lucky Friday Vein; metallurgical recoveries (actual 2021): 95% for silver, 95% for lead and 90% for zinc.

(14) The average resource cut-off grades at Casa Berardi are 0.089 oz/ton gold (3.06 g/tonne) for underground and 0.036 oz/ton (1.22 g/tonne) for open pit; metallurgical recovery (actual 2021): 85% for gold; USD/CAD exchange rate: 1:1.275.

(15) Indicated resources for most zones at San Sebastian based on $1,500/oz for gold, $21.00/oz for silver, $1.15/lb for lead, $1.35/lb for zinc and $3.00/lb for copper using a cut-off grade of $90.72/ton ($100/tonne); $1700/oz for gold used for Toro, Bronco, and Tigre zones. Metallurgical recoveries based on grade dependent recovery curves: recoveries at the mean resource grade average 89% for silver and 84% for gold for oxide material and 85% for silver, 83% for gold, 81% for lead, 86% for zinc, and 83% for copper for sulfide material. Resources reported at a minimum mining width of 8.2 feet (2.5m) for Middle Vein, North Vein, and East Francine, 6.5ft (1.98m) for El Toro, El Bronco, and El Tigre, and 4.9 feet (1.5 m) for Hugh Zone and Andrea.

(16) Mineral resources for Fire Creek, Hollister and Midas are reported using $1,500/oz for gold and $21.00/oz for silver prices, unless otherwise noted. A minimum mining width is defined as four feet or the vein true thickness plus two feet, whichever is greater.

(17) Fire Creek mineral resources are reported at a gold equivalent cut-off grade of 0.283 oz/ton. Metallurgical recoveries: 90% for gold and 70% for silver.

(18) Hollister mineral resources, including the Hatter Graben are reported at a gold equivalent cut-off grade of 0.238 oz/ton. Metallurgical recoveries: 88% for gold and 66% for silver.

(19) Midas mineral resources are reported at a gold equivalent cut-off grade of 0.237 oz/ton. Metallurgical recoveries: 90% for gold and 70% for silver. A gold-equivalent cut-off grade of 0.1 oz/ton and a gold price of $1,700/oz used for Sinter Zone with resources undiluted.

(20) Measured, indicated and inferred resources at Heva and Hosco are based on $1,500/oz for gold. Resources are without dilution or material loss at a gold cut-off grade of 0.01 oz/ton (0.33 g/tonne) for open pit and 0.088 oz/ton (3.0 g/tonne) for underground. Metallurgical recovery: Heva: 95% for gold, Hosco: 88%for gold.

(21) Indicated and Inferred resources at the Star property are reported using $21.00/oz for silver, $0.95/lb for lead, $1.10/lb for zinc, a minimum mining width of 4.3 feet and a cut-off grade of $100/ton; Metallurgical recovery: 93% for silver, 93% for lead and 87% for zinc.

(22) Inferred open-pit resources for Fire Creek calculated November 30, 2017 using gold and silver recoveries of 65% and 30% for oxide material and 60% and 25% for mixed oxide-sulfide material. Indicated Resources reclassified as Inferred in 2019. Open pit resources are calculated at $1,400 for gold and $19.83 for silver and cut-off grade of 0.01 Au Equivalent oz/ton and is inclusive of 10% mining dilution and 5% ore loss. Open pit mineral resources exclusive of underground mineral resources.

(23) Inferred resources reported at a minimum mining width of 6.0 feet for Bulldog and a cut-off grade of 6.0 equivalent oz/ton silver and 5.0 feet for Equity and North Amethyst vein at a cut-off grade of $50/ton and $100/ton; based on $1,400/oz for gold, $26.50/oz for silver, $0.85/lb for lead, and $0.85/lb for zinc. Metallurgical recoveries based on grade dependent recovery curves: recoveries at the mean resource grade average 88% for silver and 74% for lead for the Bulldog and a constant 85% for gold and 85% for silver for North Amethyst and Equity.

(24) Inferred resource at Monte Cristo reported at a minimum mining width of 5.0 feet; resources based on $1,400/oz for gold, $26.50/oz for silver using a 0.06 oz/ton gold cut-off grade. Metallurgical recovery: 90% for gold and 90% for silver.

(25) Inferred resource at Rock Creek reported at a minimum thickness of 15 feet and a cut-off grade of $24.50/ton NSR; Metallurgical recoveries: 88% for silver and 92% for copper. Resources adjusted based on mining restrictions as defined by USFS, Kootenai National Forest in the June 2003 'Record of Decision, Rock Creek Project'.

(26) Inferred resource at Montanore reported at a minimum thickness of 15 feet and a cut-off grade of $24.50/ton NSR; Metallurgical recoveries: 88% for silver and 92% for copper. Resources adjusted based on mining restrictions as defined by USFS, Kootenai National Forest, Montana DEQ in December 2015 'Joint Final EIS, Montanore Project' and the February 2016 U.S Forest Service - Kootenai National Forest 'Record of Decision, Montanore Project'.

Individual Properties

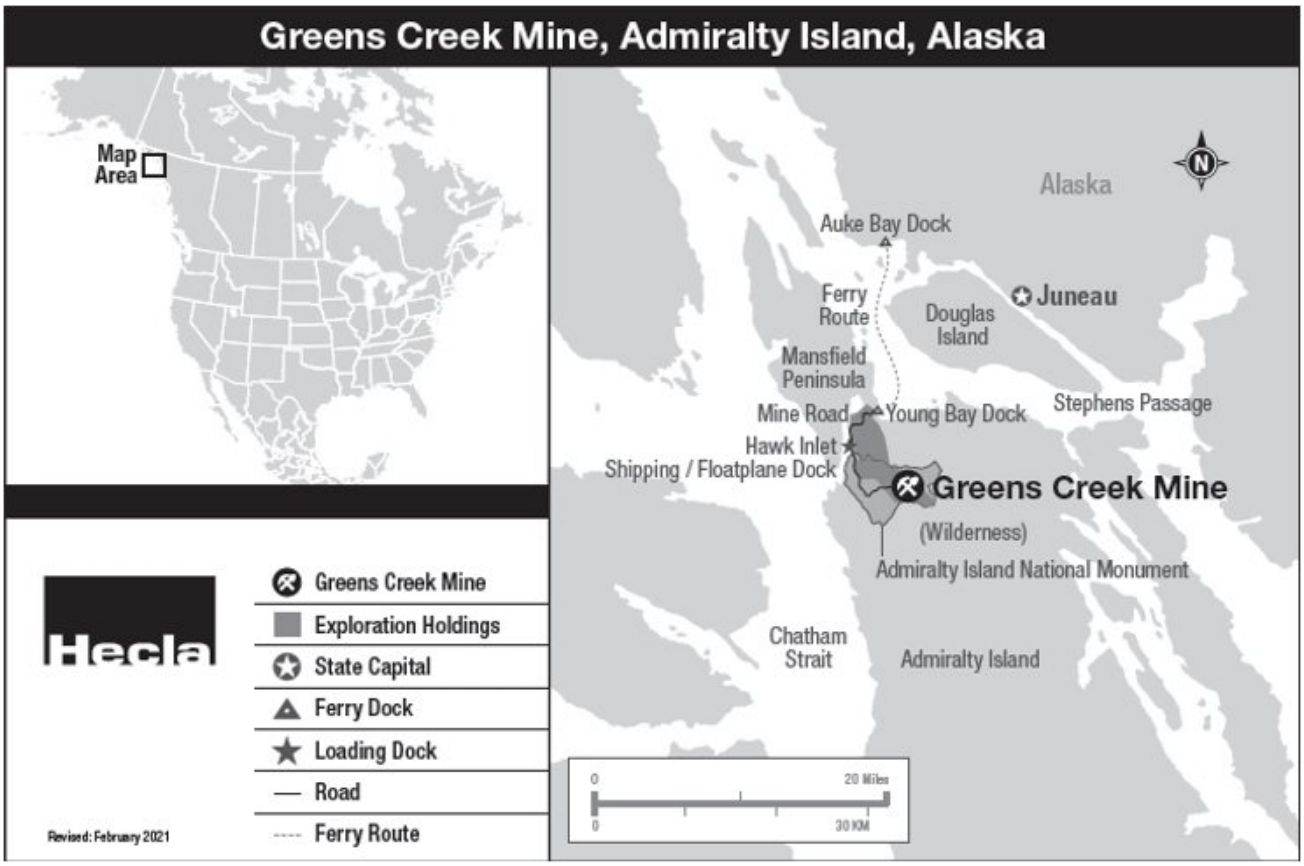
MATERIAL OPERATING PROPERTIES

Greens Creek

We own 100% of the Greens Creek mine, located on Admiralty Island near Juneau in southeast Alaska at 58° 4'57.00"N Latitude, 134°37'57.40"W Longitude (WGS84). Admiralty Island is accessed by boat, float plane, or helicopter. On the island, the mine site and various surface facilities are accessed by 13 miles of all-weather gravel roads. The Greens Creek mine has been in production since 1989, with a temporary care and maintenance period from April 1993 through July 1996. We report Greens Creek as a separate segment in our consolidated financial statements. See *Note 4* of *Notes to Consolidated Financial Statements* and *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations - Results of Operations - Greens Creek* for information on its financial performance.

Greens Creek is classified as a volcanogenic massive sulfide deposit; the orebodies contain silver, zinc, gold and lead, and lie within the Admiralty Island National Monument, an environmentally sensitive area. The Greens Creek property includes 440 unpatented lode mining claims, 58 unpatented millsite claims, 17 patented lode claims and one patented millsite. In addition, the Greens Creek site includes properties under lease from the USFS for a road right-of-way, mine waste area and tailings storage facility. The USFS leases have varying expiration terms. Greens Creek also has title to mineral rights on 7,301 acres of federal land acquired through a land exchange with the USFS. We are currently exploring, but not mining, on such federal land. The claims and leases above comprise a total area of approximately 24 square miles.

Greens Creek consists of the mine, an ore concentrating mill, a tailings storage area, a ship-loading facility, camp facilities, a ferry dock, and other related infrastructure. The map below illustrates the location and access to Greens Creek:



Greens Creek is an underground mine accessed by a ramp from surface which produces approximately 2,300 tons of ore per day. The primary mining methods are cut and fill and longhole stoping. The Greens Creek ore processing facility includes a SAG/ball mill grinding circuit to grind the run of mine ore to liberate the minerals and produce a slurry suitable for differential flotation of mineral concentrates. A gravity circuit recovers free gold that exists as electrum, a gold/silver alloy in the ore. Gravity concentrates are produced from this circuit prior to flotation. Three flotation concentrates are produced: a silver concentrate which contains most of the silver recovered; a zinc concentrate which is low in precious metals content; and a zinc-rich precious metals concentrate that contains gold, silver, zinc, and lead and must be marketed to a smelter utilizing an Imperial Smelting Furnace (ISF) which can simultaneously produce both zinc and lead. Doré is produced from the gravity concentrate by a third-party processor and further refined and sold to precious metal traders. The concentrate products are sold to a number of smelters and traders worldwide. See *Note 4* of *Notes to Consolidated Financial Statements* for information on the significant customers for Greens Creek's products. Concentrates are shipped from the Hawk Inlet marine terminal about nine miles from the mill.

For more information, see Exhibit 96.1, the Technical Report Summary on the Greens Creek Mine, Alaska, U.S.A., prepared for the Company by the Qualified Person under Section 1300 of SEC Regulation S-K ("QP"), SLR International Corporation ("SLR") with an effective date of December 31, 2021.

The employees at Greens Creek are employees of Hecla Greens Creek Mining Company, our wholly-owned subsidiary, and are not represented by a bargaining agent. There were 464 employees at Greens Creek at December 31, 2021.

Underground definition and exploration drilling during 2021 focused on eight of the nine known mineralized zones on the property.

Planned activities to potentially add reserves in 2022 include approximately 80,000 feet of definition drilling in five zones and approximately 20,000 feet of exploration drilling in six zones.

As of December 31, 2021, we have recorded a $37.5 million asset retirement obligation for reclamation and closure costs. We maintained a $92.2 million reclamation and long-term water treatment bond for Greens Creek as of December 31, 2021. The net book value of the Greens Creek property and its associated plant, equipment and mineral interests was approximately $538.9 million as of December 31, 2021. The vintage of the facilities at Greens Creek ranges from the 1980s to 2021.

The current mine plan at Greens Creek utilizes estimates of reserves and resources for approximately 13 years of production.

Information with respect to Greens Creek's production, cost of sales and other direct production costs and depreciation, depletion and amortization, average Cash Cost, After By-product Credits, Per Silver Ounce, All-In Sustaining Costs ("AISC"), After By-product Credits, Per Silver Ounce, and proven and probable ore reserves for the past three years is set forth in the following table.

	Years Ended December 31,		
Production	2021	2020	2019
Ore milled (tons)	841,967	818,408	846,076
Silver (ounces)	9,243,222	10,494,726	9,890,125
Gold (ounces)	46,088	48,491	56,625
Zinc (tons)	53,648	56,814	56,805
Lead (tons)	19,873	21,400	20,112
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 213,113	$ 210,748	$ 209,355
Cash Cost, After By-product Credits, Per Silver Ounce (1)	$ (0.65)	$ 4.88	$ 1.74
AISC, After By-Product Credits, per Silver Ounce (1)	$ 3.19	$ 7.97	$ 5.76
Proven Ore Reserves(2,3,4,5)			
Total tons	2,000	3,200	7,200
Silver (ounces per ton)	9.6	21.8	14.8
Gold (ounces per ton)	0.08	0.10	0.08
Zinc (percent)	4.5	7.8	5.4
Lead (percent)	1.7	3.7	2.6
Contained silver (ounces)	18,000	70,100	106,200
Contained gold (ounces)	100	300	600
Contained zinc (tons)	80	250	390
Contained lead (tons)	30	120	180
Probable Ore Reserves(2,3,4,5)			
Total tons	11,074,000	8,975,100	10,713,400
Silver (ounces per ton)	11.3	12.4	12.2
Gold (ounces per ton)	0.09	0.09	0.09
Zinc (percent)	6.6	7.3	7.3
Lead (percent)	2.5	2.8	2.8
Contained silver (ounces)	125,201,000	111,333,300	130,791,300
Contained gold (ounces)	946,000	827,300	931,600
Contained zinc (tons)	725,830	652,170	778,020
Contained lead (tons)	282,220	254,840	305,010
Total Proven and Probable Ore Reserves(2,3,4,5)			
Total tons	11,076,000	8,978,300	10,720,600
Silver (ounces per ton)	11.3	12.4	12.2
Gold (ounces per ton)	0.09	0.09	0.09
Zinc (percent)	6.6	7.3	7.3
Lead (percent)	2.5	2.8	2.8
Contained silver (ounces)	125,219,000	111,403,400	130,897,500
Contained gold (ounces)	946,100	827,600	932,200
Contained zinc (tons)	725,910	652,420	778,410
Contained lead (tons)	282,250	254,960	305,190

(1) Includes by-product credits from gold, lead and zinc production. Cash Cost, After By-product Credits, Per Silver Ounce and AISC, After By-product Credits, Per Silver Ounce represent non-GAAP measurements that management uses to monitor and evaluate the performance of our mining operations. We believe these measurements provide indicators of economic performance and efficiency at each location and on a consolidated basis, as well as providing a meaningful basis to compare our results to those of other mining companies and other operating mining properties. A reconciliation of cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, to these non-GAAP measures can be found in *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations,* under *Reconciliation of Costs of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP).*

(2) Proven and probable ore reserves are calculated and reviewed in-house and are subject to periodic audit by others, although audits are not performed on an annual basis. Cutoff grade assumptions vary by ore body and are developed based on reserve metals price assumptions, anticipated mill recoveries and smelter payables, and cash operating costs. Due to multiple ore metals, and complex combinations of ore types, metal ratios and metallurgical performances at Greens Creek, the cutoff grade is expressed in terms of NSR, rather than metal grade. The cut-off grade at Greens Creek is $215 per ton NSR for all zones except Gallagher, which has a cutoff grade of $220 per ton NSR. The cut-off grade calculations include costs associated with mining, processing, surface operations, environmental, general administrative, sustaining capital, and royalty charges, if any. Our estimates of proven and probable reserves are based on the following metals prices:

	December 31,		
	2021	2020	2019
Silver (per ounce)	$ 17.00	$ 16.00	$ 14.50
Gold (per ounce)	$ 1,600	$ 1,300	$ 1,300
Lead (per pound)	$ 0.90	$ 0.90	$ 0.90
Zinc (per pound)	$ 1.15	$ 1.15	$ 1.15

(3) Reserves are in-situ materials that incorporate estimates of the amount of waste that must be mined along with the ore and expected mining recovery. The 2021 reserve model assumes average total mill recoveries of 81% for silver, 72% for gold, 90% for zinc and 82% for lead.

(4) The change in reserves in 2021 versus 2020 was due to due to data from new drill holes and changes in NSR coefficient changes and smelter terms, partially offset by continued depletion of the deposit through production. The change in reserves in 2020 versus 2019 was due to continued depletion of the deposit through production and limitations on drilling activities due to COVID-19.

(5) Probable reserves at Greens Creek are based on average drill spacing of 50 to 100 feet. Proven reserves typically require that mining samples for the basis of the ore grade estimates used, while probable reserve grade estimates can be based entirely on drilling results. The proven reserves reported for Greens Creek for 2021 represent stockpiled ore.

Information on in-situ mineral resources for the past three years is set forth in the following table.

	Years Ended December 31,		
	2021	2020	2019
Measured Resources (1,2,3)			
Total tons	—	296,500	75,800
Silver (ounces per ton)	—	12.9	12.5
Gold (ounces per ton)	—	0.11	0.09
Zinc (percent)	—	10.3	9.4
Lead (percent)	—	3.1	2.6
Silver (ounces)	—	3,836,800	948,600
Gold (ounces)	—	33,000	6,800
Zinc (tons)	—	30,500	7,140
Lead (tons)	—	9,310	2,000
Indicated Resources (1,2,3)			
Total tons	8,355,000	8,598,500	8,568,600
Silver (ounces per ton)	12.8	12.9	11.7
Gold (ounces per ton)	0.10	0.10	0.10
Zinc (percent)	8.4	8.2	8.1
Lead (percent)	3.0	3.0	2.8
Silver (ounces)	106,670,300	110,843,800	100,186,600
Gold (ounces)	835,900	848,200	828,100
Zinc (tons)	701,520	708,520	691,750
Lead (tons)	250,040	256,790	242,010

Measured and Indicated Resources (1,2,3)			
Total tons	8,355,000	8,895,000	8,644,400
Silver (ounces per ton)	12.8	12.9	11.7
Gold (ounces per ton)	0.10	0.10	0.10
Zinc (percent)	8.4	8.3	8.1
Lead (percent)	3.0	3.0	2.8
Silver (ounces)	106,670,300	114,680,600	101,135,200
Gold (ounces)	835,900	881,200	834,900
Zinc (tons)	701,520	739,020	698,890
Lead (tons)	250,040	266,100	244,010
Inferred Resources (1,2,3)			
Total tons	2,151,700	1,766,700	1,848,100
Silver (ounces per ton)	12.8	13.2	13.7
Gold (ounces per ton)	0.08	0.08	0.09
Zinc (percent)	6.8	7.0	7.4
Lead (percent)	2.8	2.8	3.1
Silver (ounces)	27,507,500	23,370,400	25,393,300
Gold (ounces)	163,700	145,400	158,500
Zinc (tons)	146,020	123,480	135,880
Lead (tons)	60,140	49,670	56,670

(1) Mineral resources are based on $1,700/oz for gold, $21.00/oz for silver, $1.15/lb for lead, $1.35/lb for zinc and are reported in-situ and exclusive of mineral reserves.

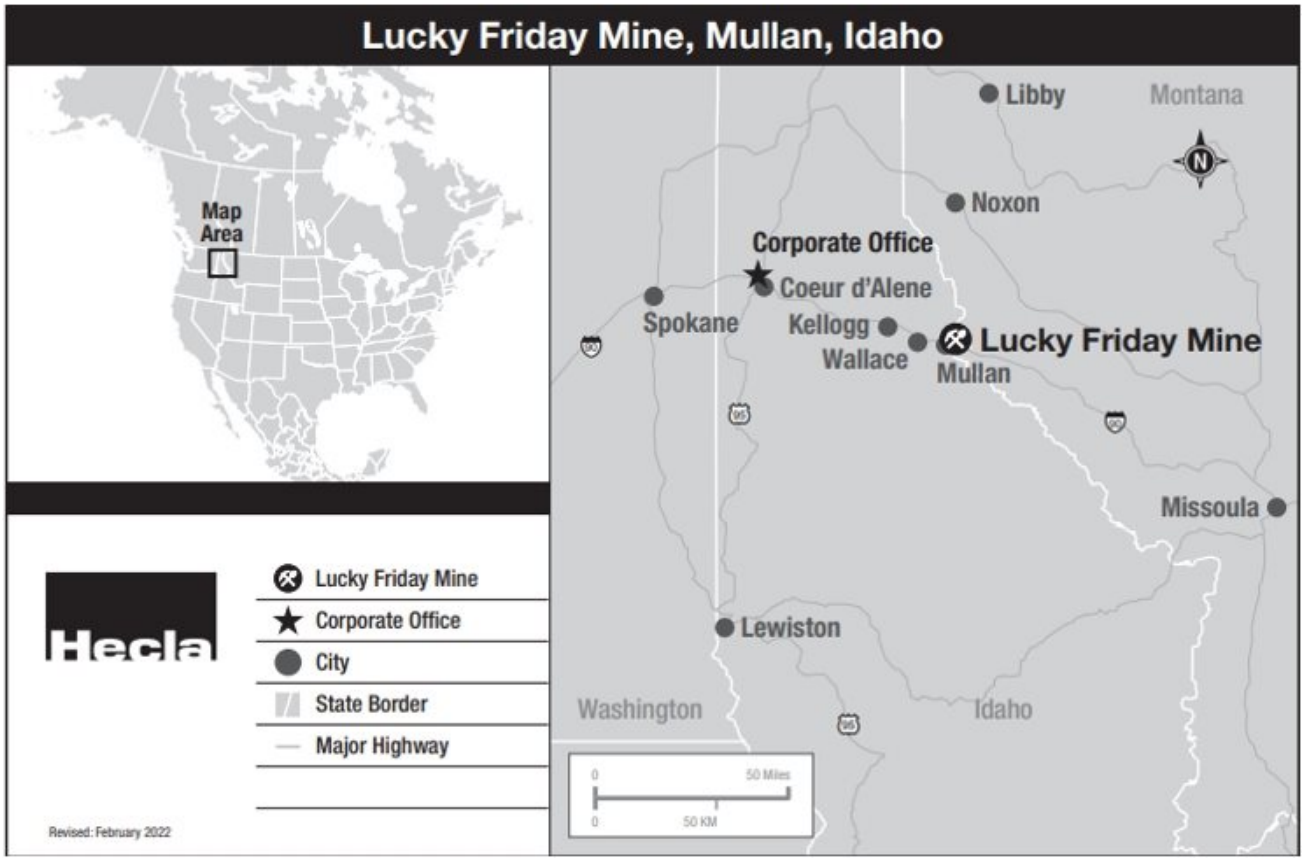
(2) The resource NSR cut-off grades for Greens Creek are $215/ton for all zones except the Gallagher Zone at $220/ton; metallurgical recoveries (actual 2021): 81% for silver, 72% for gold, 82% for lead and 90% for zinc.

(3) Measured resources were not defined for year-end 2021 given mining depletion or conversion of previously reported resources of this class in 2021; indicated resources for silver declined 4% from 2020 given conversion to mineral reserve given higher resource metal prices; inferred resources for silver increased 18% from 2020 given higher resource metal prices and additions from drilling.

Lucky Friday

Since 1958, we have wholly-owned and operated the Lucky Friday mine, a deep underground silver, lead and zinc mine located in the Coeur d'Alene Mining District in northern Idaho at 47°28'15.70"N Latitude, 115°47'0.44"W Longitude (WGS84). Lucky Friday is one-quarter mile east of Mullan, Idaho, and is adjacent to U.S. Interstate 90. We report Lucky Friday as a separate segment in our consolidated financial statements. See *Note 4* of *Notes to Consolidated Financial Statements* and *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations - Results of Operations - Lucky Friday* for information on its financial performance.

The Lucky Friday mine is comprised of 710 acres consisting of 43 patented mining claims and fee lands and 535 acres consisting of 53 unpatented mining claims. We also own or control approximately 26 square miles of mineral interests, which include patented mining and millsite claims, fee lands, and unpatented mining claims, that are adjacent to the Lucky Friday mine property. Below is a map illustrating the location and access to Lucky Friday:



Access to the mining horizons from the surface is by shaft access. Once underground, trackless drifts and ramps are utilized to reach the mining areas. An internal, hoisting shaft was completed in 2017 to extend access at depth in the Gold Hunter area. The principal mining methods in use at Lucky Friday consist of underhand systems with integral paste fill and varying degrees of mechanization. In 2021, we tested and implemented the UCB mining method. The UCB method is a new, productive mining method developed by Hecla for proactive control of fault-slip seismicity in deep, high-stress, narrow-vein mining. The method uses bench drilling and blasting methods to fragment significant vertical and lateral extents of the vein beneath a top cut taken along the strike of the vein and under engineered backfill. The method is accomplished without the use of drop raises or lower mucking drives which may result in local stress concentrations and increased exposure to seismic events. Large blasts using up to 35,000 lbs. of pumped emulsion and programmable electronic detonators fragment up to 350 feet of strike length to a depth of approximately 30 feet. These large blasts proactively induce fault-slip seismicity at the time of the blast and shortly after it. This blasted corridor is then mined underhand for two cuts. As these cuts are mined, little to no blasting is done to advance them. Dilution is controlled by supporting the hanging wall and footwall as the mining progresses through the blasted ore. The entire cycle repeats and stoping advances downdip, under fill, and in a destressed zone. The method allows for greater control of fault-slip seismic events significantly improving safety. In conjunction, a notable productivity increase has been achieved by reducing seismic delays and utilizing bulk mining activities. In 2021, 86% of the tons mined were produced through the UCB method. The underhand cut and fill method was also utilized in 2021. Under this method, once a cut is taken along the strike of the vein, it is backfilled with cemented tailings and the next cut is accessed below from the ramp system. Both methods utilize rubber-tired equipment to access the veins through ramps developed outside of the ore body.

Ore at Lucky Friday is processed using a conventional lead/zinc flotation flowsheet, and the plant capacity currently is estimated at 1,000 tons per day. Ore was processed at an average rate of approximately 882 tons per day, and total mill recovery was approximately 95% for silver, 95% for lead and 90% for zinc during 2021.

For more information, see Exhibit 96.2, the Technical Report Summary on the Lucky Friday Mine, Idaho, U.S.A., prepared for the Company by the QP, SLR with an effective date of December 31, 2021.

At December 31, 2021, there were 353 employees at Lucky Friday. The United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial, and Service Workers International Union is the bargaining agent for Lucky Friday's 271 hourly employees as of December 31, 2021. The current labor agreement expires on January 6, 2023. Following a strike that started in March 2017 and ended in early January 2020, re-staffing of the mine and ramp-up activities were completed during 2020, with a return to full production starting in the fourth quarter of 2020.

As of December 31, 2021, we have recorded a $13.5 million asset retirement obligation for reclamation and closure costs. The net book value of the Lucky Friday property and its associated plant, equipment and mineral interests was approximately $498.6 million as of December 31, 2021. The vintage of the facilities at Lucky Friday ranges from the 1950s to 2021.

The current mine plan at Lucky Friday utilizes estimates of reserves and resources for approximately 14 years of production.

Information with respect to the Lucky Friday's production, cost of sales and other direct production costs and depreciation, depletion and amortization, average Cash Cost, After By-product Credits, Per Silver Ounce, AISC, After By-product Credits, Per Silver Ounce, and proven and probable in -situ ore reserves for the past three years is set forth in the table below.

	Years Ended December 31,		
Production	**2021**	**2020**	**2019**
Ore milled (tons)	321,837	179,208	57,091
Silver (ounces)	3,564,128	2,031,874	632,944
Lead (tons)	23,137	12,727	4,098
Zinc (tons)	9,969	6,298	2,052
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 97,538	$ 56,706	$ 16,621
Cash Cost, After By-product Credits, Per Silver Ounce (1)	$ 6.60	$ 9.34	$ —
AISC, After By-product Credits, Per Silver Ounce (1)	$ 14.34	$ 18.22	$ —
Proven Ore Reserves(2,3,4)			
Total tons	4,691,000	4,392,500	4,184,700
Silver (ounces per ton)	13.9	14.2	15.4
Lead (percent)	8.4	8.8	9.6
Zinc (percent)	3.4	4.1	4.1
Contained silver (ounces)	65,313,000	62,290,100	64,505,700
Contained lead (tons)	395,290	386,210	401,020
Contained zinc (tons)	159,360	180,060	172,880
Probable Ore Reserves(2,3,4)			
Total tons	765,000	1,371,900	1,386,300
Silver (ounces per ton)	12.3	10.7	11.4
Lead (percent)	7.5	7.2	7.6
Zinc (percent)	2.8	3.9	3.7
Contained silver (ounces)	9,386,000	14,701,600	15,815,400
Contained lead (tons)	57,160	99,170	104,720
Contained zinc (tons)	21,650	53,190	50,640
Total Proven and Probable Ore Reserves(2,3,4)			
Total tons	5,456,000	5,764,400	5,571,000
Silver (ounces per ton)	13.7	13.4	14.4
Lead (percent)	8.3	8.4	9.1
Zinc (percent)	3.3	4.0	4.0
Contained silver (ounces)	74,699,000	76,991,700	80,321,100
Contained lead (tons)	452,450	485,380	505,740
Contained zinc (tons)	181,010	233,250	223,520

(1) Includes by-product credits from lead and zinc production. Cash Cost, After By-product Credits, Per Silver Ounce and AISC, After By-product Credits, Per Silver Ounce, represent non-GAAP measurements that management uses to monitor and evaluate the performance of our mining operations. We believe these measurements provide indicators of economic performance and efficiency at each location and on a consolidated basis, as well as providing a meaningful basis to compare our results to those of other mining companies and other operating mining properties. *Costs of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization* is presented for the full year of 2020. However, *Cash Cost, After By-product Credits* and *AISC, After By-product Credits* only reflect results for the fourth quarter of 2020, as production was ramped-up during the first three quarters of 2020 following the end of the strike. A reconciliation of cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, to these non-GAAP measures can be found in *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations,* under *Reconciliation of Costs of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP).*

(2) Proven and probable ore reserves are calculated and reviewed in-house and are subject to periodic audit by others, although audits are not performed on an annual basis. Cutoff grade assumptions vary by ore body and are developed based on reserve metals price assumptions, anticipated mill recoveries and smelter payables, and cash operating costs. Due to multiple ore metals, and complex combinations of ore types, metal ratios and metallurgical performances at Lucky Friday, the cutoff grade is expressed in terms of NSR, rather than metal grade. The cutoff grade at Lucky Friday is $208 per ton NSR. The cut-off grade calculations include costs associated with mining, processing, surface operations, environmental, general administrative, and sustaining capital. Our estimates of proven and probable reserves are based on the following metals prices:

	December 31,		
	2021	**2020**	**2019**
Silver (per ounce)	$ 17.00	$ 16.00	$ 14.50
Lead (per pound)	$ 0.90	$ 0.90	$ 0.90
Zinc (per pound)	$ 1.15	$ 1.15	$ 1.15

(3) Reserves are in-situ materials that incorporate estimates of the amount of waste that must be mined along with the ore and expected mining recovery. The 2021 reserve model assumes average total mill recoveries of 95% for silver, 95% for lead and 90% for zinc.

(4) The change in reserves in 2021 from 2020 was due to inclusion of definition drilling information, partially offset by depletion of the deposit through production. The change in reserve in 2020 from 2019 was due to inclusion of definition drilling information, partially offset by depletion of the deposit through production.

Information on in-situ mineral resources for the past three years is set forth in the following table.

	Years Ended December 31,		
	2021	2020	2019
Measured Resources (1,2,3)			
Total tons	8,652,490	9,007,400	8,060,400
Silver (ounces per ton)	7.6	7.6	7.5
Lead (percent)	4.9	4.8	4.8
Zinc (percent)	2.5	2.4	2.6
Silver (ounces)	65,752,280	68,542,900	60,787,600
Lead (tons)	425,096	430,950	385,040
Zinc (tons)	213,478	218,740	210,730
Indicated Resources (1,2,3)			
Total tons	1,840,500	2,274,900	2,720,000
Silver (ounces per ton)	7.6	7.8	8.0
Lead (percent)	5.1	5.3	5.1
Zinc (percent)	2.4	2.2	2.4
Silver (ounces)	14,010,000	17,843,500	21,640,800
Lead (tons)	93,140	120,390	138,620
Zinc (tons)	44,120	50,970	65,930
Measured and Indicated Resources (1,2,3)			
Total tons	10,492,990	11,282,300	10,780,400
Silver (ounces per ton)	7.6	7.7	7.6
Lead (percent)	4.9	4.9	4.9
Zinc (percent)	2.5	2.4	2.6
Silver (ounces)	79,762,280	86,386,400	82,428,400
Lead (tons)	518,236	551,340	523,660
Zinc (tons)	257,598	269,710	276,660
Inferred Resources (1,2,3)			
Total tons	5,376,900	3,068,600	3,049,600
Silver (ounces per ton)	7.8	8.3	8.6
Lead (percent)	5.8	6.3	6.2
Zinc (percent)	2.4	2.7	2.7
Silver (ounces)	41,871,500	25,359,400	26,155,200
Lead (tons)	311,850	192,200	190,500
Zinc (tons)	129,600	83,350	82,250

(1) Mineral resources are based on $21.00/oz for silver, $1.15/lb for lead, $1.35/lb for zinc and are reported in-situ and exclusive of mineral reserves.

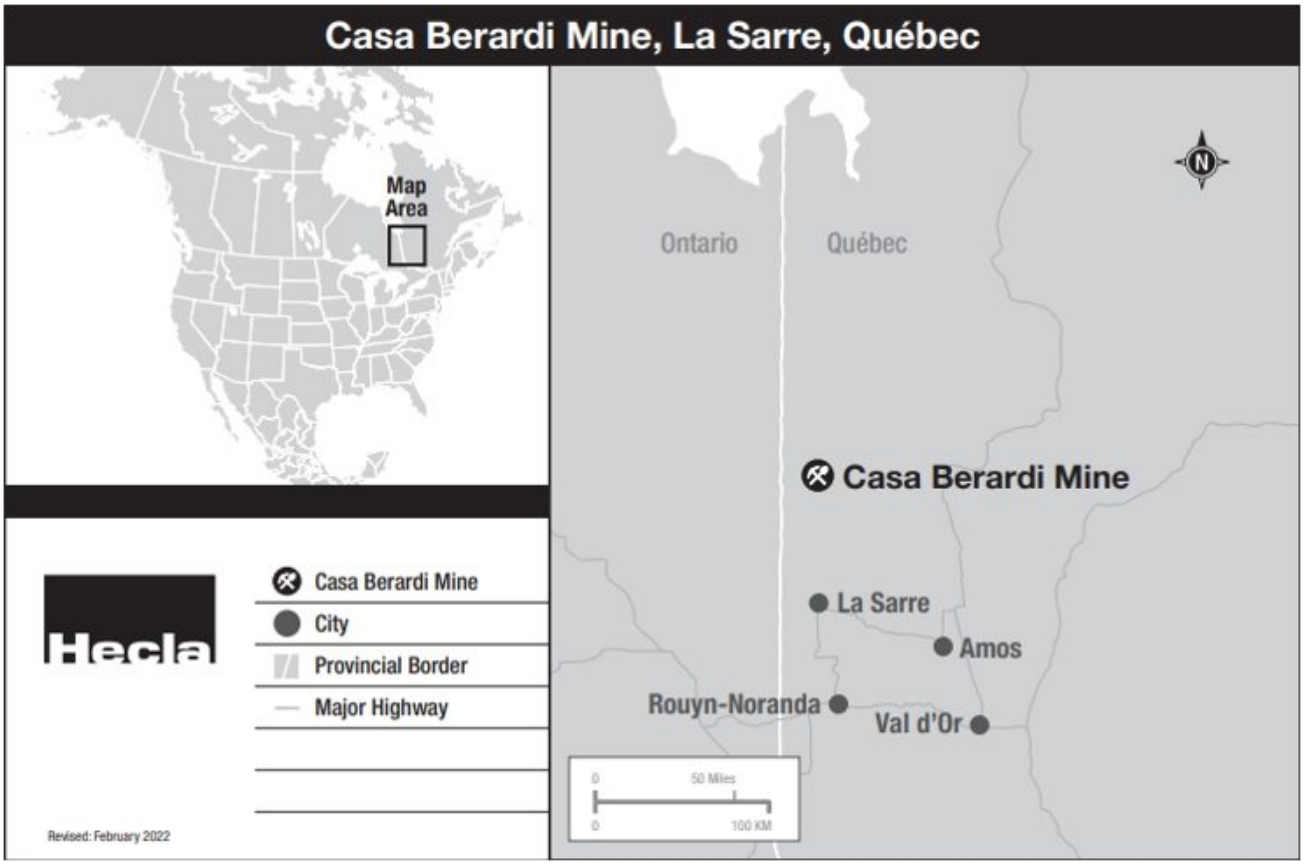
(2) The resource NSR cut-off grades for Lucky Friday are $170.18 for the 30 Vein, $184.97 for the Intermediate Veins and $207.15 for the Lucky Friday Vein; metallurgical recoveries (actual 2021): 95% for silver, 95% for lead and 90% for zinc. The cut-off grade calculations include costs associated with mining, processing, surface operations, environmental, general administrative, and sustaining capital.

(3) Measured and indicated resources for silver declined 8% from 2020 given conversion to mineral reserves given higher resource metal prices; inferred resources increased 65% from 2020 given higher resource metal prices and additions in the upper portions of the 30 Vein previously not reported.

Casa Berardi

Since June 2013, we have owned and operated 100% of Casa Berardi, located 95 kilometers north of La Sarre in the Abitibi Region of northwestern Quebec, Canada at 49°34'0.72"N Latitude, 79°15'56.05"W Longitude (WGS84). The property borders Ontario to the west and covers parts of Casa Berardi, Dieppe, Raymond, D'Estrees, and Puiseaux townships. We report Casa Berardi as a separate segment in our consolidated financial statements. See *Note 4* of *Notes to Consolidated Financial Statements* and *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations - Results of Operations - Casa Berardi* for information on its financial performance.

The mine and mill complex are permitted to process 1,600,000 dry metric tonnes (approximately 1,764,000 tons) of ore per year (4,900 tons per day). The mining operations consist of underground and open pit mines. The surface infrastructures include a cyanidation processing mill (carbon-in-leach), tailings impoundment areas, and other support facilities and infrastructure. The map below illustrates the location and access to Casa Berardi:



Current reserves at the Casa Berardi mine comprise eight zones at the West Mine, spread over a moderate horizontal distance from each other and located at different mine elevations, plus open pit and underground areas at the East Mine.

The ore at Casa Berardi is extracted using a combination of underground and open pit mining methods. The mill utilizes a combination of gravity recovery for coarse gold and cyanidation for fine gold. The ore is crushed and ground to produce a slurry suitable for the subsequent recovery processes. Crushing and grinding is accomplished by a jaw crusher followed by a SAG mill and ball mill. Coarse gold reports to the gravity circuit consisting of Knelson concentrators followed by high intensity leaching and electrowinning. Fine gold reports to the cyanide leach train. Due to the presence of naturally occurring organic carbon in the ore, the Carbon-In-Leach ("CIL") approach is used in a cyanidation circuit. Gold is adsorbed onto carbon in the leach train and later desorbed for electrowinning. Sludge from the electrowinning cells is melted in a furnace to produce doré, the final product produced at Casa Berardi. In 2021, the mill processed 1,528,246 tons, for an average of 4,187 tons per day.

For more information, see Exhibit 96.3, the Technical Report Summary on the Casa Berardi Mine, Northwestern Québec, Canada, prepared for the Company by the QP, SLR with an effective date of December 31, 2021.

The employees at Casa Berardi are employees of Hecla Quebec Inc., our wholly-owned subsidiary, and are not represented by a bargaining agent. There were 675 employees at Casa Berardi at December 31, 2021. We also utilize third-party contractors, which use their employees and equipment, for some of the mining activities at Casa Berardi.

The current mine plan at Casa Berardi utilizes estimates of reserves and resources for approximately 13 years of production, and includes anticipated production from the underground and open pit mine areas.

In-stope and definition underground drilling during 2021 concentrated within the East Mine and West Mine areas to refine orebody shapes and gold grade distributions for mine planning and reserves. Underground exploration drilling in the West Mine focused on expanding mineralization down-plunge and testing extensions to the west and to the east of each zone. Drilling in the East Mine tested extensions of high grade mineralization down plunge and to the east. Surface definition and exploration drilling focused on defining and expanding mineralization within and near the future open pits.

The currently contemplated underground in-stope and definition drilling programs for 2022 are expected to further evaluate current production zones to refine orebody shapes and gold grade distributions for mine planning and reserves. Surface definition drilling planned for 2022 is expected to focus on 134 zone, defining and expanding mineralization between the proposed 134 pit and the Principal pit. Exploration drilling from underground is currently expected to evaluate extensions of mineralization in the East Mine and West Mine zones, while surface drilling is expected to evaluate extensions up plunge, at depth and along strike of the known mineral zones.

The net book value of the Casa Berardi property and its associated plant, equipment and mineral interests was approximately $640.4 million as of December 31, 2021. As of December 31, 2021, we have recorded a $12.5 million asset retirement obligation for reclamation and closure costs. We maintain a surety bond as financial guarantee for future reclamation and closure work.

Information with respect to the Casa Berardi's production, cost of sales and other direct production costs and depreciation, depletion and amortization, average Cash Cost, After By-product Credits, Per Gold Ounce, AISC, After By-product Credits, Per Gold Ounce, and proven and probable in-situ ore reserves for the past three years is set forth in the table below.

	Year Ended December 31,		
Production	**2021**	**2020**	**2019**
Ore milled (tons)	1,528,246	1,283,701	1,378,065
Gold (ounces)	134,511	121,492	134,409
Silver (ounces)	33,571	24,142	31,540
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 229,829	$ 194,414	$ 209,615
Cash Cost, After By-product Credits, Per Gold Ounce (1)	$ 1,125	$ 1,131	$ 1,051
AISC, After By-product Credits, Per Gold Ounce (1)	$ 1,399	$ 1,436	$ 1,354
Proven Ore Reserves(2,3,4)			
Total tons	5,686,000	5,474,900	6,847,000
Gold (ounces per ton)	0.10	0.10	0.09
Contained gold (ounces)	596,000	567,400	603,500
Probable Ore Reserves(2,3,4)			
Total tons	15,066,000	11,295,600	13,780,400
Gold (ounces per ton)	0.08	0.09	0.08
Contained gold (ounces)	1,187,000	974,600	1,114,300
Total Proven and Probable Ore Reserves(2,3,4)			
Total tons	20,752,000	16,770,500	20,627,400
Gold (ounces per ton)	0.09	0.09	0.08
Contained gold (ounces)	1,783,000	1,542,000	1,717,800

(1) Includes by-product credits from silver production. Cash Cost, After By-product Credits, Per Gold Ounce and AISC, After By-product Credits, Per Gold Ounce represent non-GAAP measurements that management uses to monitor and evaluate the performance of our mining operations. We believe these measurements provide indicators of economic performance and efficiency at each location and on a consolidated basis, as well as providing a meaningful basis to compare our results to those of other mining companies and other operating mining properties. A reconciliation of cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, to these non-GAAP measures can be found in *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations,* under *Reconciliation of Cost of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP).*

(2) Proven and probable ore reserves are calculated and reviewed in-house and are subject to periodic audit by others, although audits are not performed on an annual basis. Cutoff grade assumptions vary by ore body and are developed based on reserve metals price assumptions, anticipated mill recoveries and refiner payables, and cash operating costs. The cutoff grade at Casa Berardi is assumed to be 0.101 ounces per ton for underground reserves and 0.037 ounces per ton for open pit reserves. Our estimates of proven and probable reserves are based on the prices of $1,600 per gold ounce for 2021 and $1,300 per gold ounce for 2020 and 2019.

(3) Reserves are in-situ materials that incorporate estimates of the amount of waste that must be mined along with the ore and expected mining recovery. The 2021 reserve model assumes average total mill recoveries for gold of approximately 85% for reserves.

(4) The change in reserves in 2021 compared to 2020 resulted from inclusion of definition drilling information, partially offset by depletion of the deposit through production. The change in 2020 compared to 2019 resulted from depletion of the deposit through production, partially offset by inclusion of definition drilling information.

Information on in-situ mineral resources for the past three years is set forth in the following table.

	Years Ended December 31,		
	2021	2020	2019
Measured Resources (1,2,3)			
Total tons	2,368,200	3,055,300	2,033,600
Gold (ounces per ton)	0.15	0.13	0.13
Gold (ounces)	355,200	401,600	276,500
Indicated Resources (1,2,3)			
Total tons	5,396,100	7,045,500	7,804,400
Gold (ounces per ton)	0.13	0.12	0.10
Gold (ounces)	699,200	846,900	786,000
Measured and Indicated Resources (1,2,3)			
Total tons	7,764,300	10,100,800	9,838,000
Gold (ounces per ton)	0.14	0.12	0.11
Gold (ounces)	1,054,400	1,248,500	1,062,500
Inferred Resources (1,2,3)			
Total tons	10,125,800	11,676,100	14,209,000
Gold (ounces per ton)	0.08	0.08	0.07
Gold (ounces)	790,500	952,600	968,900

(1) Mineral resources are based on $1,700/oz for gold and a USD/CAD exchange rate: 1:1.275 and are reported in-situ and exclusive of mineral reserves.

(2) The average resource cut-off grades at Casa Berardi are 0.089 oz/ton gold (3.06 g/tonne) for underground and 0.036 oz/ton (1.22 g/tonne) for open pit; metallurgical recovery (actual 2021): 85% for gold.

(3) Mineral resources decreased 15% overall from 2020 given mining depletion and conversion to mineral reserves due to higher resource metal prices.

Internal Controls

Exploration and development drilling programs are performed using Industry Standard quality control methods for drilling, sampling, and analytical procedures. Standard operating procedure manuals for geology logging, sampling, and assaying are kept at the operations and updated as required. A secure sample chain-of-custody is established to promote the security of samples during transport from the projects to the analytical facilities. All primary analytical laboratories are ISO 9001 certified and sample preparation and analytical procedures are Industry Standard methods for the metals of interest.

Sample batches sent for analysis are controlled by a system of reference samples of known grade inserted into the sample stream and other control samples. Coarse and fine ‘blank,’ sterile, sample materials are used to monitor contamination at the sample preparation and analytical stages; Standard Reference Materials (“SRM”) of known grades are used to measure accuracy of the analytical results; and pulp duplicate samples and coarse reject duplicate samples are used to monitor precision of the analytical results. Blanks and SRM are inserted according to the analytical batch size and overall number of samples but normally result in a 1:10 to 1:20 insertion rate. Duplicate samples are inserted or requested using a similar 1:10 to 1:20 inclusion rate. As a final measure of assay quality, 5% to 10% of the original samples are sent to a second analytical laboratory for check analysis. Periodically, the Company retains experts to perform audits of the commercial laboratories used in the United States, Mexico and Canada.

The main operating properties store data in SQL-based relational database utilities with built-in logic checks that are implemented as new data is imported. Accurate data entry into the database is confirmed by verification upon data entry/import and again before use in final geology interpretation and resource modeling with checks of new data collected during yearly drilling programs.

Geology and mineral control interpretations, grade estimation parameters, grade and density models, reserve estimation parameters, and modifying factors are peer reviewed within the company. Resource grade models are validated using Industry Standard methods and appropriate documentation and reporting are completed to summarize methods and results. All resource and reserve tabulations at the operations are approved by the local management, with their own sets of controls, and then are compiled by the corporate office which also performs its own set of checks on the final numbers.

All personnel responsible for the management of mineral resource and mineral reserve modeling and approval and reporting of mineral resource and mineral reserve statements are Qualified Persons with relevant experience in the type of mineralization and deposit under consideration and in the specific type of activity undertaken for the company. All are eligible members or licensees in good standing of a recognized professional organization based on their academic qualifications and experience and comply with professional standards of competence and ethics. Hecla encourages continuing professional development and training for current Qualified Persons as well as others in the company to develop other Qualified Persons within the various departments.

As projects advance toward development and production, data density and the geological understanding of the mineral deposit increases. The Company's internal controls limit some risk in the resource estimation process, but there is inherent risk in resource modeling due to mineral deposit heterogeneity, sample size and distribution, mining style and mining factor assumptions, and mineral processing issues. Independent audits of reserve models from an outside specialist are arranged on a periodic basis for an operating property. The senior technical staff can also determine when changes in mineral resource and reserve models or negative mine reconciliations are material and recommend internal or external auditing of the models and modifying factors.

Item 3. Legal Proceedings

For a discussion of our legal proceedings, see *Note 15* of *Notes to Consolidated Financial Statements.*

Item 4. Mine Safety Disclosures

The information concerning mine safety violations or other regulatory matters required by Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Item 104 of Regulation S-K is included in exhibit 95 to this report.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Shares of our common stock are traded on the New York Stock Exchange, Inc. under the symbol "HL." As of February 17, 2022, there were 3,099 stockholders of record of our common stock.

The following table provides information as of December 31, 2021 regarding our compensation plans under which equity securities are authorized for issuance:

	Number of Securities To Be Issued Upon Exercise of Outstanding Options, Warrants and Rights	Weighted Average Exercise Price of Outstanding Options	Number of Securities Remaining Available For Future Issuance Under Equity Compensation Plans
Equity Compensation Plans Approved by Security Holders:			
2010 Stock Incentive Plan	—	N/A	14,857,886
Stock Plan for Non-Employee Directors	—	N/A	2,269,269
Key Employee Deferred Compensation Plan	—	N/A	1,665,037
Total	—	N/A	18,792,192

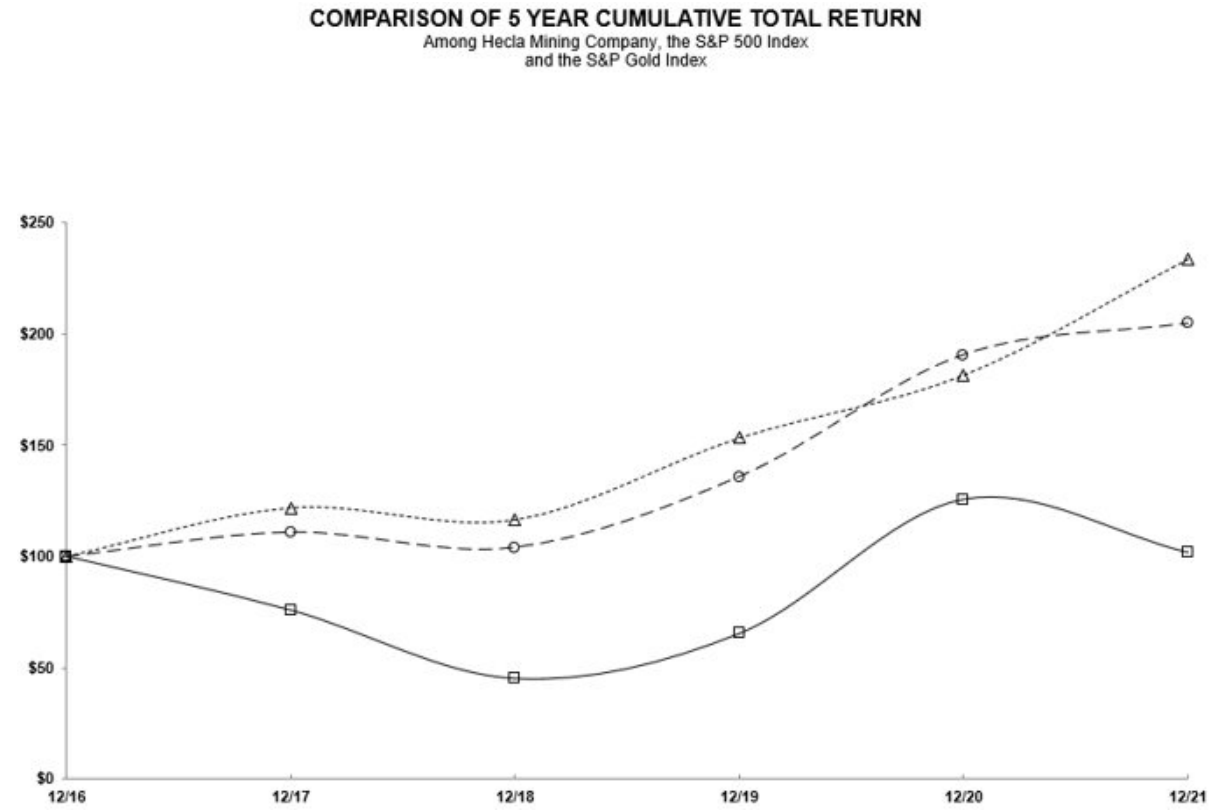
See *Note 12* of *Notes to Consolidated Financial Statements* for information regarding the above plans.

For the years 2021, 2020 and 2019, we issued shares of our common stock on multiple occasions to three of our employee benefit plans in order to fund our obligations under those plans. Each issuance was made pursuant to an exemption from registration under the Securities Act pursuant to Section 4(a)(2) of that Act, followed by the filing of a shelf registration statement on SEC Form S-3 allowing for the public resales of those shares. We did not receive any cash proceeds from any of the above issuances of shares of common stock. The issuances were as follows:

Date	Purchaser	Number of Shares	Value of Shares at Issuance ($)
September 22, 2021	Hecla Mining Company Retirement Plan Trust ("Hecla Plan")	900,000	$4.9 million
	Lucky Friday Pension Plan Trust ("Lucky Friday Plan")	100,000	$0.5 million
January 27, 2021	Hecla Mining Company Pre-2005 Supplemental Excess Retirement Plan and the Hecla Mining Company Post-2004 Supplemental Excess Retirement Plan	3,500,000	$16.8 million
November 20, 2020	Hecla Plan	554,455	$2.8 million
	Lucky Friday Plan	89,109	$0.5 million
August 18, 2020	Hecla Plan	1,653,160	$10.0 million
	Lucky Friday Plan	405,186	$2.4 million
April 9, 2020	Hecla Plan	119,048	$0.3 million
	Lucky Friday Plan	47,619	$0.1 million
May 17, 2019	Hecla Plan	1,754,967	$2.7 million
	Lucky Friday Plan	629,140	$1.0 million

On December 18, 2019, we issued 10,654,856 unregistered shares of our common stock pursuant to an Exchange Agreement as prepayment of CAD$40 million (approximately US$30.5 million as of December 18, 2019) in aggregate principal amount of our Series 2018-A Senior Notes due May 1, 2021 previously held by Ressources Québec. See *Note 8* of *Notes to Consolidated Financial Statements* for more information. The issuance of shares pursuant to the Exchange Agreement was exempt from registration under the Securities Act pursuant to section 3(a)(9) of that Act. We did not receive any cash proceeds from the issuance of the shares. The shares had a total value of approximately USD$33.5 million at the time of issuance.

The following performance graph compares the performance of our common stock during the period beginning December 31, 2016 and ending December 31, 2021 to the S&P 500 and the S&P 500 Gold Index. The graph assumes a $100 investment in our common stock and in each of the indexes at the beginning of the period, and a reinvestment of dividends paid on such investments on a quarterly basis throughout the period.



Date	Hecla Mining	S&P 500	S&P 500 Gold Index
December 2016	$ 100.00	$ 100.00	$ 100.00
December 2017	$ 75.92	$ 121.83	$ 110.90
December 2018	$ 45.28	$ 116.49	$ 104.09
December 2019	$ 65.40	$ 153.17	$ 135.86
December 2020	$ 125.47	$ 181.35	$ 190.60
December 2021	$ 101.66	$ 233.41	$ 204.74

The stock performance information above is "furnished" and shall not be deemed to be "soliciting material" or subject to Rule 14A of the Exchange Act, shall not be deemed "filed" for purposes of Section 18 of the Exchange Act or otherwise subject to the liabilities of that section, and shall not be deemed incorporated by reference in any filing under the Securities Act or the Exchange Act, whether made before or after the date of this report and irrespective of any general incorporation by reference language in any such filing, except to the extent that it specifically incorporates the information by reference.

On May 8, 2012, we announced that our board of directors approved a stock repurchase program. Under the program, we are authorized to repurchase up to 20 million shares of our outstanding common stock from time to time in open market or privately negotiated transactions. See *Note 12* of *Notes to Consolidated Financial Statements* for more information. We made no purchases of our outstanding common stock during the year ended December 31, 2021.

Item 6. Reserved

Not applicable.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following Management's Discussion and Analysis ("MD&A") provides information that management believes is relevant to an assessment and understanding of the consolidated financial condition and results of operations of Hecla Mining Company and its subsidiaries (collectively the "Company," "our," or "we"). We use certain non-GAAP financial performance measures in our MD&A. For a detailed description of these measures, please see "Non-GAAP Financial Performance Measures" at the end of this item. This item should be read in conjunction with our Consolidated Financial Statements and the notes thereto included in this annual report.

Overview

Established in 1891, we believe we are the oldest operating precious metals mining company in the United States. We are the largest silver producer in the United States, producing over 40% of the U.S. silver at our Greens Creek and Lucky Friday operations. We produce gold at our Casa Berardi operation in Quebec, Canada, and Greens Creek, and at our Nevada Operations segment until suspension of production there during 2021. We also produced silver and gold at San Sebastian in Mexico, which was considered an operating segment prior to 2021. Production ceased in the fourth quarter of 2020, and exploration activities are currently ongoing. San Sebastian's activity for all periods presented in this Annual Report on Form 10-K is included in "other". Based upon our geographic footprint, we believe we have low political and economic risk compared to other mines located in other parts of the world. Our exploration interests are also located in the United States, Canada and Mexico, and are primarily located in historical mining districts. Our operating and strategic framework is based on expanding our production and locating and developing new resource potential in a safe and responsible manner.

2021 Highlights

Operational:

- Produced 12.9 million ounces of silver and 201,327 ounces of gold. See *Consolidated Results of Operations* below for information on cost of sales and other direct production costs and depreciation, depletion and amortization and cash costs and AISC, after by-product credits, per silver and gold ounce for 2021, 2020 and 2019.
- Achieved record throughput at Casa Berardi and gold production of 134,511 ounces, as our mill optimization efforts delivered results.
- Developed the UCB mining method at Lucky Friday, which was utilized for approximately 86% of the tons mined in 2021 and assisted in the improvement of silver production at Lucky Friday by 75% compared to 2020.

- Continued our trend of strong safety performance, as our All Injury Frequency Rate ("AIFR") for 2021 was 1.45, 40% below the U.S. national average for MSHA's "metal and nonmetal" category and within 15% of the 1.22 in 2020, which was the lowest level in our history.

- Continued mitigation of the impacts of COVID-19 through the encouragement of vaccinations as they became available in the geographic locations where we operate and refinement of our operational plans and procedures to protect our workforce, operations and communities while maintaining liquidity.

- Purchased 300,000 tonnes of carbon offset credits for a total cost of $0.9 million, of which 76,000 tonnes were retired in order for us to be carbon neutral in 2021, leaving an inventory of carbon credits for future retirement to remain carbon neutral in the near term.

Financial:

- Reported sales of products of $807.5 million, the highest in our history, reflecting a full year's production from Lucky Friday.

- Generated $220.3 million in net cash provided by operating activities, the second highest in our history. See the *Financial Liquidity and Capital Resources* section below for further discussion.

- Reduced the minimum realized silver price threshold of our common stock dividend to $20 from $25 per ounce and added $0.01 per share to the annual silver-linked component, our third dividend increase since June 2020. During 2021, we returned $20.7 million, or 19% of free cash flows to our shareholders.

- Made capital expenditures (excluding lease additions and other non-cash items) of approximately $109.0 million, including $49.6 million at Casa Berardi, $23.9 million at Greens Creek, $29.9 million at Lucky Friday, and $5.5 million at the Nevada Operations.

- Generated $111.3 million in free cash flow with all operations contributing positively. A reconciliation of the non-GAAP measure free cash flow to net cash provided by operating activities, the nearest GAAP measure, is included in the *Reconciliation of Cash Flows From Operating Activities (GAAP) to Free Cash Flow (Non-GAAP)* section below.

- Spent a record $47.9 million on exploration and pre-development activities, which increased our total reserves for silver by approximately 11.5 million ounces, or 6%, and for gold by approximately 330,000 ounces, or 14%. Total measured and indicated resources decreased by 9% for silver (from its record level in 2020) and by 6% for gold, reflecting conversions to reserves during the year. Total inferred resources increased by 8% for silver and 2% for gold.

- Released $58.4 million of valuation allowance on our deferred tax assets, reflecting our current expectation of utilizing these tax assets.

- Achieved the above while increasing our cash balance to $210.0 million, which was $80.2 million higher than at December 31, 2020, with no amount drawn on our revolving credit facility, as of December 31, 2021.

Our average realized silver, gold, lead and zinc prices increased in 2021 compared to 2020. Average realized prices for silver and gold were higher, with prices for lead and zinc lower, in 2020 compared to their annual averages in 2019. See the *Consolidated Results of Operations* section below for information on our average realized metals prices for 2021, 2020 and 2019. Lead and zinc represent important by-products at our Greens Creek and Lucky Friday segments, and gold is also a significant by-product at Greens Creek.

See the *Consolidated Results of Operations* section below for a discussion of the factors impacting income applicable to common stockholders for the three years ended December 31, 2021, 2020 and 2019.

Key Issues Impacting our Business

We seek to achieve our long-term objective of generating financial returns, improving operating performance, and expanding our proven and probable reserves and mineral resources by operating, developing and acquiring long-lived, low-cost mines with large land positions in politically stable jurisdictions. Our strategic plan requires that we manage multiple challenges and risks inherent in conducting mining, development, exploration and metal sales at multiple locations.

We develop our strategic plans in the context of significant uncertainty about future availability of ore to mine and process. To sustain operations, we must find new opportunities that require many years and substantial expenditures from discovery to production. We approach this challenge by investing in exploration and capital in districts with known mineralization. There can be no assurance that we will be able to obtain the permits required to develop or otherwise move forward with exploration projects such as Rock Creek and Montanore. See I*tem 1A. Risk Factors - Legal challenges could prevent the Rock Creek or Montanore projects from ever being developed*.

We strive to achieve excellent mine safety and health performance. We seek to implement this goal by: training employees in safe work practices; establishing, following and improving safety standards; investigating accidents, incidents and losses to avoid recurrence; involving employees in the establishment of safety standards; and participating in the National Mining Association's CORESafety program. We seek to implement reasonable best practices with respect to mine safety and emergency preparedness. We respond to issues outlined in investigations and inspections by MSHA, the Commission of Labor Standards, Pay Equity and Occupational Health and Safety in Quebec, and the Mexico Ministry of Economy and Mining and continue to evaluate our safety practices. There can be no assurance that our practices will mitigate or eliminate all safety risks. Achieving and maintaining compliance with regulations will be challenging and may increase our operating costs. See *Item 1A. Risk Factors - We face substantial governmental regulation, including the Mine Safety and Health Act, various environmental laws and regulations and the 1872 Mining Law.*

The COVID-19 pandemic continued to impact our operational practices in 2021, following its outbreak in 2020, as we continue to incur incremental costs and modify our operational plans to keep our workforce safe. In 2020, the pandemic adversely impacted our expected production of gold at Casa Berardi and exploration drilling at Greens Creek. We incurred additional costs of approximately $2.3 million in 2020. During 2021 we incurred incremental costs of $2.4 million at Casa Berardi and $1.0 million at Greens Creek in response to COVID-19. See each segment section below for information on how those operations have been impacted by COVID-19. To mitigate the impact of COVID-19, we have taken precautionary measures, including implementing operational plans and practices and increasing our cash reserves. As long as they are required, the operational practices implemented could continue to have an adverse impact on our operating results due to additional costs or deferred production and revenues. There is uncertainty related to the potential additional impacts COVID-19 and any subsequent variants could have on our operations and financial results for 2022. See *Item IA. Risk Factors - Natural disasters, public health crises (including COVID-19), political crises, and other catastrophic events or other events outside of our control may materially and adversely affect our business or financial results* and *The COVID-19 virus pandemic may heighten other risks* for information on how restrictions related to COVID-19 have recently affected some of our operations.

Another risk involves metals prices, over which we have no control except, on a limited basis, through the use of derivative contracts. As discussed in the *Critical Accounting Estimates* section below, metals prices are influenced by a number of factors beyond our control. While we believe global economic and industrial trends could result in continued demand for the metals we produce, prices have been volatile and there can be no assurance that current prices will continue.

Volatility in global financial markets poses a significant challenge to our ability to access credit and equity markets, should we need to do so, and to predict sales prices for our products. We utilize forward contracts to manage exposure to declines in the prices of (i) silver, gold, zinc and lead contained in our concentrates that have been shipped but have not yet settled, and (ii) the zinc and lead content that we forecast in future concentrate shipments. In addition, we have $210.0 million of cash and cash equivalents and a $250 million revolving credit agreement, of which $17.3 million was used as of December 31, 2021 for letters of credit, leaving approximately $233.0 million available for borrowing.

We had total long-term debt as of December 31, 2021 of $508.1 million, comprised of (i) our Senior Notes having total principal of $475 million which are due in 2028 and bear interest at a rate of 7.25% per year and (ii) our Series 2020-A Senior Notes due July 9, 2025 (the "IQ Notes") issued to Investissement Québec, a financing arm of the Québec government, which have total principal of CAD$48.2 million and bear interest at a rate of 6.515%. See *Note 9* of *Notes to Consolidated Financial Statements* for more information on our debt arrangements. As discussed in the Financial Liquidity and Capital Resources section below, we believe that we will be able to meet the obligations associated with the Senior Notes, IQ Notes and amounts drawn on our revolving credit facility in the future, if any; however, a number of factors could impact our ability to meet the debt obligations and fund our other projects. See *Item 1A. Risk Factors - We have a substantial amount of debt that could impair our financial health and prevent us from fulfilling our obligations under our existing and future indebtedness*.

Another challenge for us is the risk associated with environmental litigation and ongoing reclamation activities. As described *Item 1A. Risk Factors* and in *Note 15* of *Notes to Consolidated Financial Statements,* it is possible that our estimate of these liabilities may change in the future, affecting our strategic plans. We are involved in various environmental legal matters and the estimate of our environmental liabilities and liquidity needs, as well as our strategic plans, may be significantly impacted as a result of these matters or new matters that may arise. For example, the Rock Creek project received an adverse court decision in April 2021 which has delayed our strategic plan to permit, develop or operate that project. Overall, we strive for compliance with applicable laws and regulations and attempt to resolve environmental litigation on terms as favorable to us as possible.

Reserve and resource estimation is a major risk inherent in mining. Our reserve and resource estimates, which underly (i) our mining and investment plans, (ii) the valuation of a significant portion of our long-term assets and (iii) depreciation, depletion and amortization expense, may change based on economic factors and actual production experience. Until ore is mined and processed, the volumes and grades of our reserves and resources must be considered as estimates. Our reserves are depleted as we mine. Reserves and resources can also change as a result of changes in economic and operating assumptions. See *Item 1A. Risk Factors - Our ore reserve and resource estimates may be imprecise.*

Consolidated Results of Operations

Sales of products by metal for the years ended December 31, 2019, 2020 and 2021, and the approximate variances attributed to differences in metals prices, sales volumes and smelter terms, were as follows:

(in thousands)	Silver	Gold	Base metals	Less: smelter and refining charges	Total sales of products
2019	$ 192,235	$ 388,602	$ 125,433	$ (33,004)	$ 673,266
Variances - 2020 versus 2019:					
Price	53,625	70,219	(14,208)	453	110,089
Volume	14,367	(102,655)	32,616	(8,106)	(63,778)
Smelter terms				(27,704)	(27,704)
2020	260,227	356,166	143,841	(68,361)	691,873
Variances - 2021 versus 2020:					
Price	43,420	6,483	49,028	49	98,980
Volume	(10,001)	(612)	7,854	869	(1,890)
Smelter terms				18,510	18,510
2021	$ 293,646	$ 362,037	$ 200,723	$ (48,933)	$ 807,473

Average market and realized metals prices for 2021, 2020 and 2019 were as follows:

		Average price for the year ended December 31,		
		2021	2020	2019
Silver —	London PM Fix ($/ounce)	$ 25.17	$ 20.51	$ 16.20
	Realized price per ounce	25.24	21.15	16.65
Gold —	London PM Fix ($/ounce)	1,800	1,770	1,392
	Realized price per ounce	1,796	1,757	1,413
Lead —	LME Final Cash Buyer ($/pound)	1.00	0.83	0.91
	Realized price per pound	1.03	0.84	0.91
Zinc —	LME Final Cash Buyer ($/pound)	1.36	1.03	1.16
	Realized price per pound	1.44	1.03	1.14

Average realized prices differ from average market prices primarily because concentrate sales are generally recorded as revenues at the time of shipment at forward prices for the estimated month of settlement, which differ from average market prices. Due to the time elapsed between shipment of concentrates and final settlement with customers, we must estimate the prices at which sales of our metals will be settled. Previously recorded sales are adjusted to estimated settlement metals prices each period through final settlement. We recorded net positive price adjustments to provisional settlements of $9.3 million, $8.0 million and $0.6 million in 2021, 2020 and 2019, respectively. The price adjustments related to silver, gold, zinc and lead contained in our concentrate sales were largely offset by gains and losses on forward contracts for those metals for each year (see *Note 10* of *Notes to Consolidated Financial Statements* for more information). The gains and losses on these contracts are included in revenues and impact the realized prices for silver, gold, lead and zinc. Realized prices are calculated by dividing gross revenues for each metal (which include the price adjustments and gains and losses on the forward contracts discussed above) by the payable quantities of each metal included in products sold during the period.

Total metals production and sales volumes for each period are shown in the following table:

		Year Ended December 31,		
		2021	2020	2019
Silver -	Ounces produced	12,887,240	13,542,957	12,605,234
	Payable ounces sold	11,633,802	12,305,917	11,548,373
Gold -	Ounces produced	201,327	208,962	272,873
	Payable ounces sold	201,610	202,694	275,060
Lead -	Tons produced	43,010	34,127	24,210
	Payable tons sold	36,707	29,108	19,746
Zinc -	Tons produced	63,617	63,112	58,857
	Payable tons sold	43,626	46,349	39,381

The difference between what we report as “ounces/tons produced” and “payable ounces/tons sold” is attributable to the difference between the quantities of metals contained in our products versus the portion of those metals actually paid for by our customers according to the terms of our sales contracts. Differences can also arise from inventory changes incidental to shipping schedules, or variances in ore grades which impact the amount of metals contained in concentrates produced and sold.

Sales, total cost of sales, gross profit, Cash Cost, After By-product Credits, per Ounce ("Cash Cost") (non-GAAP) and All-In Sustaining Cost, After By-product Credits, per Ounce ("AISC") (non-GAAP) at our operations for 2021, 2020 and 2019 were as follows (in thousands, except for Cash Cost and AISC):

	Silver				Gold		
	Greens Creek	Lucky Friday	Other [4]	Total Silver [2]	Casa Berardi	Nevada Operations	Total Gold
2021:							
Sales	$ 384,843	$ 131,488	$ 176	$ 516,507	$ 245,152	$ 45,814	$ 290,966
Cost of sales and other direct production costs and depreciation, depletion and amortization	(213,113)	(97,538)	(247)	(310,898)	(229,829)	(48,945)	(278,774)
Gross profit	$ 171,730	$ 33,950	$ (71)	205,609	$ 15,323	$ (3,131)	$ 12,192
Cash Cost, After By-product Credits, per Silver or Gold Ounce [1]	$ (0.65)	$ 6.60		$ 1.37	$ 1,125	$ 1,137	$ 1,127
AISC, After By-product Credits, per Silver or Gold Ounce [1]	$ 3.19	$ 14.34		$ 9.19	$ 1,399	$ 1,211	$ 1,374
2020:							
Sales	$ 327,820	$ 63,025	$ 32,906	$ 423,751	$ 209,224	$ 58,898	$ 268,122
Cost of sales and other direct production costs and depreciation, depletion and amortization [3]	(210,748)	(56,706)	(24,104)	(291,558)	(194,414)	(44,801)	(239,215)
Gross profit (loss)	$ 117,072	$ 6,319	$ 8,802	132,193	$ 14,810	$ 14,097	$ 28,907
Cash Cost, After By-product Credits, per Silver or Gold Ounce [1]	$ 4.88	$ 9.34		$ 5.18	$ 1,131	$ 716	$ 1,045
AISC, After By-product Credits, per Silver or Gold Ounce [1]	$ 7.97	$ 18.22		11.37	$ 1,436	$ 787	$ 1,302
2019:							
Sales	$ 299,722	$ 16,621	$ 56,210	$ 372,553	$ 192,944	$ 107,769	$ 300,713
Cost of sales and other direct production costs and depreciation, depletion and amortization [3]	(209,355)	(16,621)	(50,509)	(276,485)	(209,615)	(153,336)	(362,951)
Gross profit (loss)	$ 90,367	$ —	$ 5,701	$ 96,068	$ (16,671)	$ (45,567)	$ (62,238)
Cash Cost, After By-product Credits, per Silver or Gold Ounce [1]	$ 1.74	$ —		$ 2.73	$ 1,051	$ 1,096	$ 1,066
AISC, After By-product Credits, per Silver or Gold Ounce [1]	$ 5.76	$ —		$ 9.93	$ 1,354	$ 1,527	$ 1,411

(1) A reconciliation of these non-GAAP measures to cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, can be found below in *Reconciliation of Cost of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP)*.

(2) The calculation of AISC, After By-product Credits, per Ounce for our consolidated silver properties includes corporate costs for general and administrative expense and sustaining exploration and capital costs.

(3) See *Note 3* of *Notes to Consolidated Financial Statements* for information on revisions to amounts previously reported for cost of sales and other direct production costs and depreciation, depletion and amortization.

(4) Includes results for San Sebastian, which was an operating segment prior to 2021.

While revenue from zinc, lead and gold by-products is significant, we believe that identification of silver as the primary product of Greens Creek and Lucky Friday is appropriate because:

- silver has historically accounted for a higher proportion of revenue than any other metal and is expected to do so in the future;
- we have historically presented each of these mines as a primary silver producer, based on the original analysis that justified putting the project into production, and believe that consistency in disclosure is important to our investors regardless of the relationships of metals prices and production from year to year;
- metallurgical treatment maximizes silver recovery;
- the Greens Creek and Lucky Friday deposits are massive sulfide deposits containing an unusually high proportion of silver; and in most of their working areas, Greens Creek and Lucky Friday utilize selective mining methods in which silver is the metal targeted for highest recovery.

Accordingly, we believe the identification of zinc, lead and gold as by-product credits at Greens Creek and Lucky Friday is appropriate because of their lower economic value compared to silver and due to the fact that silver is the primary product we intend to produce. In addition, we have not consistently received sufficient revenue from any single by-product metal to warrant classification of such as a co-product.

We periodically review our revenues to ensure that reporting of primary products and by-products is appropriate. Because for Greens Creek and Lucky Friday we consider zinc, lead and gold to be by-products of our silver production, the values of these metals offset operating costs within our calculations of Cash Cost, After By-product Credits, per Silver Ounce and AISC, After By-product Credits, per Silver Ounce.

We believe the identification of silver as a by-product credit is appropriate at Casa Berardi and the Nevada Operations because of its lower economic value compared to gold and because gold is the primary product we intend to produce there. In addition, we do not receive sufficient revenue from silver at Casa Berardi or the Nevada Operations to warrant classification of such as a co-product. Because we consider silver to be a by-product of our gold production at Casa Berardi and Nevada Operations, the value of silver offsets operating costs within our calculations of Cash Cost, After By-product Credits, per Gold Ounce and AISC, After By-product Credits, per Gold Ounce.

For the year ended December 31, 2021, we reported income applicable to common stockholders of $34.5 million compared to losses of $10.0 million and $95.5 million in 2020 and 2019, respectively. The following factors contributed to those differences:

- Variances in gross profit (loss) at our operations as illustrated in the table above. See the *Greens Creek*, *Lucky Friday*, *Casa Berardi*, and *Nevada Operations* sections below.

- Exploration and pre-development expense of $47.9 million, $18.3 million and $19.1 million in 2021, 2020 and 2019, respectively. In 2021, exploration was primarily at San Sebastian, Casa Berardi, Greens Creek, Nevada Operations and Kinskuch, while pre-development expense included $7.7 million related to development of the decline to allow drilling of the Hatter Graben area in Nevada.

- Provision for closed operations and environmental matters of $14.6 million in 2021 compared to $3.9 million in 2020 and $4.7 million in 2019, with the increase in 2021 due to (i) a $2.1 million increase in the accrual for estimated reclamation costs at the Troy Mine, (ii) a $6.5 million settlement of a lawsuit related to a 1989 agreement entered into by our subsidiary, CoCa Mines, Inc., and its subsidiary, Creede Resources, Inc. and (iii) a $2.9 million increase in the accrual for estimated costs at the Johnny M site in New Mexico (see *Note 15* of *Notes to Consolidated Financial Statements* for more information).

- Other operating expense of $14.2 million, $10.9 million and $4.2 million in 2021, 2020 and 2019, respectively, with the increases in 2021 and 2020 primarily due to costs for projects to identify and implement potential operational improvements at Casa Berardi and Lucky Friday. In addition, in June 2020, we gifted and expensed 650,000 shares of our common stock valued at $2.0 million at the time of the gift to the Hecla Charitable Foundation.

- Ramp-up and suspension costs of $23.0 million, $24.9 million and $12.1 million in 2021, 2020 and 2019, respectively. 2021 includes a full year of care and maintenance for Nevada and San Sebastian. In 2020 Nevada and San Sebastian were placed on care-and-maintenance, with 2020 also including costs related to ramp-up activities at Lucky Friday and government COVID-19 suspension orders impacting Casa Berardi and San Sebastian. 2019 costs were related to the Lucky Friday strike.

- Fair value adjustments, net resulted in a loss of $35.8 million in 2021 compared to $11.8 million in 2020 and $5.4 million in 2019. The components for each period are summarized in the following table (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Loss on derivative contracts	$ (32,655)	$ (22,074)	$ (3,971)
Unrealized (loss) gain on investments in equity securities	(4,295)	10,268	(2,389)
Gain on disposition or exchange of investments	1,158	—	923
Total fair value adjustments, net	$ (35,792)	$ (11,806)	$ (5,437)

- Net foreign exchange gain of $0.4 million in 2021 compared to losses of $4.6 million and $8.2 million in 2020 and 2019, respectively, on translation of our monetary assets and liabilities at Casa Berardi and San Sebastian.

- Interest expense of $41.9 million, $49.6 million and $48.4 million in 2021, 2020 and 2019, respectively. The interest in 2021 and 2020 was primarily related to our Senior Notes, and the interest in 2019 was primarily related to our previously outstanding 2021 Notes (see *Note 9* of *Notes to Consolidated Financial Statements* and *Guarantor Subsidiaries* below). The higher expense in 2020 was primarily due to (i) interest recognized on both the Senior Notes and 2021 Notes for an overlapping period of almost one month, as the Senior Notes were issued on February 19, 2020 and the 2021 Notes were redeemed on March 19, 2020, (ii) $1.7 million in unamortized initial purchaser discount on the 2021 Notes recognized as expense upon their redemption and (iii) higher interest related to amounts drawn on our revolving credit facility.

- Income tax benefit of $29.6 million in 2021 compared to a provision of $8.2 million in 2020 and a benefit of $18.3 million in 2019, with the benefit in 2021 including $58.4 million for a reduction in the valuation allowance for U.S. deferred tax assets. See *Corporate Matters* and *Note 7* of *Notes to Consolidated Financial Statements* for more information.

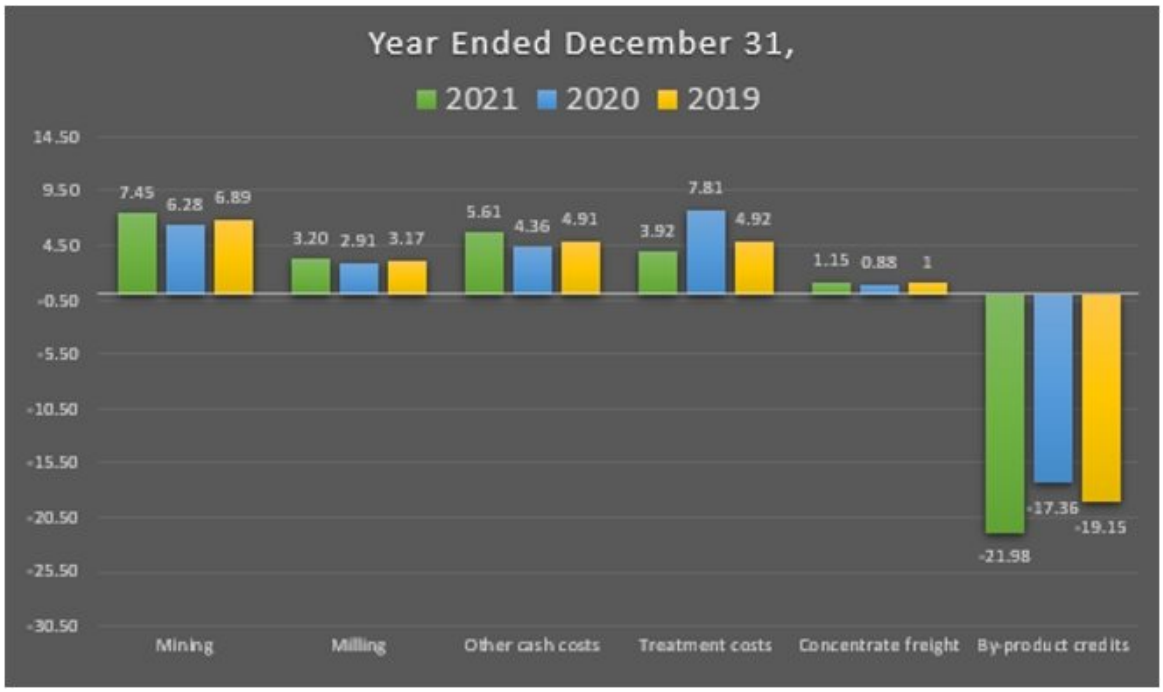
Greens Creek

Dollars are in thousands (except per ounce and per ton amounts)	Years Ended December 31,		
	2021	**2020**	**2019**
Sales	$ 384,843	$ 327,820	$ 299,722
Cost of sales and other direct production costs	(164,403)	(161,056)	(161,768)
Depreciation, depletion and amortization	(48,710)	(49,692)	(47,587)
Cost of sales and other direct production costs and depreciation, depletion and amortization	(213,113)	(210,748)	(209,355)
Gross Profit	$ 171,730	$ 117,072	$ 90,367
Tons of ore milled	841,967	818,408	846,076
Production:			
Silver (ounces)	9,243,222	10,494,726	9,890,125
Gold (ounces)	46,088	48,491	56,625
Zinc (tons)	53,648	56,814	56,805
Lead (tons)	19,873	21,400	20,112
Payable metal quantities sold:			
Silver (ounces)	8,284,551	9,385,404	8,786,377
Gold (ounces)	40,149	42,407	47,934
Zinc (tons)	36,581	41,832	37,848
Lead (tons)	15,489	17,415	16,414
Ore grades:			
Silver ounces per ton	13.51	15.65	14.64
Gold ounces per ton	0.08	0.08	0.10
Zinc percent	7.11	7.58	7.43
Lead percent	2.87	3.13	2.92
Total production cost per ton	$ 177.30	$ 179.37	$ 174.28
Cash Cost, After By-product Credits, per Silver Ounce (1)	$ (0.65)	$ 4.88	$ 1.74
AISC, After By-Product Credits, per Silver Ounce (1)	$ 3.19	$ 7.97	$ 5.76
Capital additions	$ 23,883	$ 19,685	$ 29,323

(1) A reconciliation of these non-GAAP measures to cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, can be found below in *Reconciliation of Cost of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP)*. At Greens Creek, gold, zinc and lead are considered to be by-products of our silver production, and the values of those metals therefore offset operating costs within our calculations of Cash Cost and AISC, After By-product Credits, per Silver Ounce.

The $51.6 million and $78.3 million increases in gross profit for 2021 compared to 2020 and 2019, respectively, were due to higher realized prices for silver, gold, lead and zinc. The higher gross profit for 2021 compared to 2020 was also impacted by favorable changes in concentrate smelter terms which contributed $23.3 million to gross profit. The impacts of the factors above were partially offset by lower metal sales volume primarily due to lower ore grades.

The chart below illustrates the factors contributing to the variances in Cash Cost, After By-product Credits, Per Silver Ounce for 2021 compared to 2020 and 2019:



The following table summarizes the components of Cash Cost, After By-product Credits, per Silver Ounce:

	Years Ended December 31,		
	2021	**2020**	**2019**
Cash Cost, Before By-product Credits, per Silver Ounce	$ 21.33	$ 22.24	$ 20.89
By-product credits per silver ounce	(21.98)	(17.36)	(19.15)
Cash Cost, After By-product Credits, per Silver Ounce	$ (0.65)	$ 4.88	$ 1.74

The following table summarizes the components of AISC, After By-product Credits, per Silver Ounce:

	Years Ended December 31,		
	2021	**2020**	**2019**
AISC, Before By-product Credits, per Silver Ounce	$ 25.17	$ 25.33	$ 24.91
By-product credits per silver ounce	(21.98)	(17.36)	(19.15)
AISC, After By-product Credits, per Silver Ounce	$ 3.19	$ 7.97	$ 5.76

The decrease in Cash Costs and AISC, After By-product Credits, per Silver Ounce in 2021 compared to 2020 and 2019 was primarily due to higher by-product credits and lower treatment costs.

Restrictions imposed by the State of Alaska beginning in late March 2020 in response to the COVID-19 virus pandemic, including the requirement for employees returning to Alaska to self-quarantine for 14 days (changed in June 2020 to 7 days and subsequently discontinued), caused us to revise the normal operating procedures and incur additional costs for staffing operations at Greens Creek, including for quarantining employees from late March 2020 through the second quarter of 2021. In addition, manpower challenges impacted mine operations during the third quarter of 2021, and, although they were substantially mitigated in the fourth quarter, they could continue to have an impact. The changes at Greens Creek have not materially impacted our operations to date; however, restrictions and other challenges related to COVID-19 and increased competition for labor could have a material impact if they continue longer than anticipated or become broader.

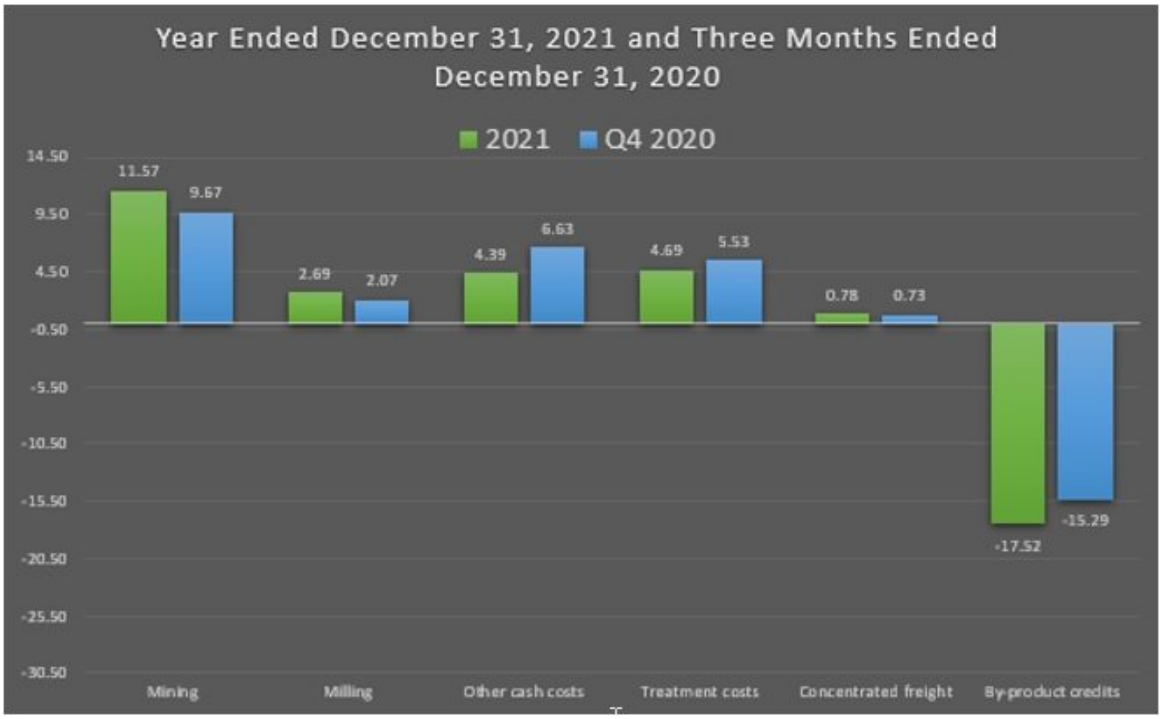
Lucky Friday

Dollars are in thousands (except per ounce and per ton amounts)	Years Ended December 31,		
	2021	**2020**	**2019**
Sales	$ 131,488	$ 63,025	$ 16,621
Cost of sales and other direct production costs	(70,692)	(45,233)	(15,446)
Depreciation, depletion and amortization	(26,846)	(11,473)	(1,175)
Cost of sales and other direct production costs and depreciation, depletion and amortization	(97,538)	(56,706)	(16,621)
Gross profit	$ 33,950	$ 6,319	$ —
Tons of ore milled	321,837	179,208	57,091
Production:			
Silver (ounces)	3,564,128	2,031,874	632,944
Lead (tons)	23,137	12,727	4,098
Zinc (tons)	9,969	6,298	2,052
Payable metal quantities sold:			
Silver (ounces)	3,288,261	1,866,883	517,074
Lead (tons)	21,218	11,692	3,332
Zinc (tons)	7,046	4,517	1,532
Ore grades:			
Silver ounces per ton	11.64	11.85	11.83
Lead percent	7.60	7.49	7.86
Zinc percent	3.44	3.88	4.25
Total production cost per ton	$ 191.50	$ 251.49	$ —
Cash Cost, After By-product Credits, per Silver Ounce (1)	$ 6.60	$ 9.34	$ —
AISC, After By-product Credits, per Silver Ounce (1)	$ 14.34	$ 18.22	$ —
Capital additions	$ 29,885	$ 25,776	$ 8,989

(1) A reconciliation of these non-GAAP measures to cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, can be found below in *Reconciliation of Cost of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP)*. At Lucky Friday, lead and zinc are considered to be by-products of our silver production, and the values of those metals therefore offset operating costs within our calculations of Cash Cost and AISC, After By-product Credits, per Silver Ounce.

The increases in gross profit, ore tonnage and metal production for 2021 compared to 2020 and 2019 are the result of returning to full production during the fourth quarter of 2020 (discussed further below). Sales were higher for 2021 compared to 2020 and 2019 by $68.5 million and $114.9 million, respectively, due to increased production, and higher realized prices for silver, lead and zinc in 2021 compared to the two prior years.

The chart below illustrates the factors contributing to the variances in Cash Cost, After By-product Credits, Per Silver Ounce for 2021 and the fourth quarter of 2020. Total production cost per ton, Cash Cost, After By-product Credits, per Silver Ounce and AISC, After By-product Credits per Silver Ounce are not presented for 2019 and the first three quarters of 2020, as production was limited due to the strike and results are not comparable.



The following table summarizes the components of Cash Cost, After By-product Credits, per Silver Ounce:

	Year Ended December 31, 2021	Three Months Ended December 31, 2020
Cash Cost, Before By-product Credits, per Silver Ounce	$ 24.12	24.63
By-product credits per silver ounce	(17.52)	(15.29)
Cash Cost, After By-product Credits, per Silver Ounce	$ 6.60	$ 9.34

The following table summarizes the components of AISC, After By-product Credits, per Silver Ounce:

	Year Ended December 31, 2021	Three Months Ended December 31, 2020
AISC, Before By-product Credits, per Silver Ounce	$ 31.86	$ 33.51
By-product credits per silver ounce	(17.52)	(15.29)
AISC, After By-product Credits, per Silver Ounce	$ 14.34	$ 18.22

The decreases in Cash Cost and AISC, After By-product Credits, per Silver Ounce in 2021 compared to the fourth quarter of 2020 are due to increased silver production and higher by-product credits.

Following settlement of the unionized employees' strike in early 2020, we commenced restaffing and ramp-up procedures and the mine returned to full production in the fourth quarter of 2020. During the strike, which lasted from March 13, 2017 until January 7, 2020, when the union ratified a new collective bargaining agreement, salaried personnel performed limited production and capital improvements. Costs related to ramp-up activities totaled $8.0 million in 2020, and suspension-related costs during the strike in 2019 totaled $12.1 million, which included non-cash depreciation expense of $6.3 million and $4.3 million, respectively, for those years, and are reported in a separate line item on our consolidated statements of operations. These ramp-up and suspension costs are excluded from the calculation of gross profit, total production cost per ton, Cash Cost, After By-product Credits, per Silver Ounce and AISC, After By-product Credits, per Silver Ounce, when presented.

Casa Berardi

Dollars are in thousands (except per ounce and per ton amounts)	Years Ended December 31,		
	2021	**2020**	**2019**
Sales	$ 245,152	$ 209,224	$ 192,944
Cost of sales and other direct production costs	(149,085)	(133,862)	(143,722)
Depreciation, depletion and amortization	(80,744)	(60,552)	(65,893)
Cost of sales and other direct production costs and depreciation, depletion and amortization	(229,829)	(194,414)	(209,615)
Gross profit (loss)	$ 15,323	$ 14,810	$ (16,671)
Tons of ore milled	1,528,246	1,283,701	1,378,065
Production:			
Gold (ounces)	134,511	121,492	134,409
Silver (ounces)	33,571	24,142	31,540
Payable metal quantities sold:			
Gold (ounces)	135,987	117,671	137,444
Silver (ounces)	30,022	25,659	25,320
Ore grades:			
Gold ounces per ton	0.104	0.117	0.120
Silver ounces per ton	0.03	0.02	0.03
Total production cost per ton	$ 98.60	$ 105.71	$ 101.13
Cash Cost, After By-product Credits, per Gold Ounce (1)	$ 1,125	$ 1,131	$ 1,051
AISC, After By-product Credits, per Gold Ounce (1)	$ 1,399	$ 1,436	$ 1,354
Capital additions	$ 49,617	$ 40,840	$ 36,059

(1) A reconciliation of these non-GAAP measures to cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, can be found below in *Reconciliation of Cost of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP)*. At Casa Berardi, silver is considered to be a by-product of our gold production, and the value of silver therefore offsets operating costs within our calculations of Cash Cost and AISC, After By-product Credits, per Gold Ounce.

Gross profit increased in 2021 compared to 2020 due to higher average realized gold prices and increase gold production, partially offset by higher cost of sales. The increase in gross profit in 2021 compared to 2019 was primarily due to higher average gold prices, partially offset by higher cost of sales. The higher cost of sales in 2021 resulted from increased production costs due to: (i) increase in ore tonnage by 19% and 11% compared to 2020 and 2019, respectively, (ii) mill contractor costs related to maintenance and optimization activities, and (iii) higher underground maintenance costs resulting from repairs and replacements of major components for the production fleet. Depreciation, depletion and amortization expense was also higher in 2021 compared to 2020 and 2019 due to the impact of lower reserves in 2021 on units-of-production depreciation and asset additions, with the increase compared to 2020 also due to higher sales quantities. The lower production in 2020 was partially due to a government COVID-19-related order. We suspended operations at Casa Berardi from March 24, 2020 until April 15, 2020, in response to the Government of Quebec's COVID-19 order for the mining industry. The suspension-related costs totaling $1.6 million for 2020 are reported in a separate line item on our consolidated statements of operations and excluded from the calculations of cost of sales and other direct production costs and depreciation, depletion and amortization, total production cost per ton, and Cash Cost and AISC, After By-product Credits, per Gold Ounce.

Total capital additions increased by $8.8 million and $13.6 million in 2021 compared to 2020 and 2019, respectively, primarily due to growth capital costs incurred for development of the new 160 zone open pit mine. Ore production from the 160 zone pit commenced in the fourth quarter of 2021.

The chart below illustrates the factors contributing to Cash Cost, After By-product Credits, Per Gold Ounce for 2021, 2020 and 2019:



The following table summarizes the components of Cash Cost, After By-product Credits, per Gold Ounce:

	Years Ended December 31,		
	2021	2020	2019
Cash Cost, Before By-product Credits, per Gold Ounce	$ 1,131	$ 1,135	$ 1,055
By-product credits per gold ounce	(6)	(4)	(4)
Cash Cost, After By-product Credits, per Gold Ounce	$ 1,125	$ 1,131	$ 1,051

The following table summarizes the components of AISC, After By-product Credits, per Gold Ounce:

	Years Ended December 31,		
	2021	2020	2019
AISC, Before By-product Credits, per Gold Ounce	$ 1,405	$ 1,440	$ 1,358
By-product credits per gold ounce	(6)	(4)	(4)
AISC, After By-product Credits, per Gold Ounce	$ 1,399	$ 1,436	$ 1,354

The decrease in Cash Cost and AISC, After By-product Credits, per Gold Ounce for 2021 compared to 2020 was due to higher gold production, partially offset by higher production costs, as discussed above, with AISC, After By-product Credits, per Gold Ounce also impacted by lower sustaining capital, offset by higher exploration. The increase in Cash Cost and AISC, After By-product Credits, per Gold Ounce for 2021 compared to 2019 was due to higher production costs, with AISC, After By-product Credits, per Gold Ounce also impacted by higher exploration, partially offset by lower sustaining capital.

Nevada Operations

Dollars are in thousands (except per ounce and per ton amounts)	Year Ended December 31,		
	2021	**2020**	**2019**
Sales	$ 45,814	$ 58,898	$ 107,769
Cost of sales and other direct production costs	(33,604)	(21,956)	(86,312)
Depreciation, depletion and amortization	(15,341)	(22,845)	(67,024)
Cost of sales and other direct production costs and depreciation, depletion and amortization	(48,945)	(44,801)	(153,336)
Gross (loss) profit	$ (3,131)	$ 14,097	$ (45,567)
Tons of ore milled	69,544	27,984	210,397
Production:			
Gold (ounces)	20,728	31,756	66,166
Silver (ounces)	46,319	37,443	181,741
Payable metal quantities sold:			
Gold (ounces)	25,426	35,224	72,924
Silver (ounces)	27,476	45,164	213,526
Ore grades:			
Gold ounces per ton	0.321	1.232	0.361
Silver ounces per ton	0.76	1.70	1.64
Total production cost per ton	$ 132.64	$ 892.09	$ 332.06
Cash Cost, After By-product Credits, per Gold Ounce (1)	$ 1,137	$ 716	$ 1,096
AISC, After By-product Credits, per Gold Ounce (1)	$ 1,211	$ 787	$ 1,527
Capital additions	$ 5,470	$ 4,003	$ 42,184

(1) A reconciliation of these non-GAAP measures to cost of sales and other direct production costs and depreciation, depletion and amortization, the most comparable GAAP measure, can be found below in *Reconciliation of Cost of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP)*. At Nevada Operations, silver is considered to be a by-product of our gold production, and the value of silver therefore offsets operating costs within our calculations of Cash Cost and AISC, After By-product Credits, per Gold Ounce.

The gross loss in 2021 compared to gross profit in 2020 was due to reduced production and higher costs, including inventory write-downs. The lower gross loss in 2021 compared to 2019 was due to write-downs of the values of stockpile, in-process and finished goods inventory to their net realizable value of $9.7 million in 2021 compared to $37.1 million in 2019. The write-downs in 2019 were primarily attributed to development costs incurred for production at the Fire Creek mine, which resulted in the cost of inventory exceeding its net realizable value. Development ceased at Fire Creek in the second quarter of 2019 when the decision was made to limit near-term production to areas of the mine where development was already completed. Mining of non-refractory ore at Fire Creek in areas where development had already been performed was completed in the fourth quarter of 2020. During 2021 production and revenue was generated from processing of the stockpiled non-refractory ore at the Midas mill and third-party processing of refractory ore in a roaster and autoclave facility, respectively. Fire Creek was placed on care-and-maintenance in the second quarter of 2021 after processing of the remaining non-refractory ore stockpile.

Production was suspended at the Hollister mine in the third quarter of 2019 and at the Midas mine and Aurora mill in late 2019. Exploration activities and development of a decline to the Hatter Graben area at Hollister are ongoing. Suspension-related costs are reported in a separate line item on our consolidated statements of operations and excluded from the calculations of cost of sales and other direct production costs and depreciation, depletion and amortization, total production costs per ton and Cash Cost and AISC, After By-product Credits, per Gold Ounce.

See *Item 1A. Risk Factors - Operation, Development, Exploration and Acquisition Risks* for a discussion of certain risks relating to our recent and ongoing analysis of the carrying value of the Nevada assets.

Corporate Matters

Employee Benefit Plans

Our defined benefit pension plans, while providing a significant benefit to our employees, represent a significant liability to us. During 2021, the underfunded status of our plans decreased to a liability of $6.0 million from $44.9 million at December 31, 2020. The decreased liability was attributable to contributions to the plans and returns on plan assets that, combined, exceeded service costs and interest costs, collectively. During 2021, we contributed a total of approximately $22.3 million in shares of our common stock to the plans (see *Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities* for more information). We do not expect to be required to contribute to our defined benefit plans in 2022, but we may choose to do so. See *Note 6* of *Notes to Consolidated Financial Statements* for more information. While the economic variables which will determine future cash requirements are uncertain, we expect contributions to increase in future years under current defined benefit pension plan provisions, and we periodically examine the defined benefit pension plans and supplemental excess retirement plan for affordability and competitiveness.

Income and Mining Taxes

Each reporting period we assess our deferred tax balance based on a review of long-range forecasts and quarterly activity. In 2018, through the acquisition of Klondex Mines Ltd., we acquired the Nevada U.S. Group that did not join the Hecla U.S. tax group. We recognized a full valuation allowance on our separate Hecla U.S. net deferred tax assets at the end of 2017 based on results of tax law changes and maintain a full valuation allowance on Hecla U.S. net deferred tax assets at December 31, 2021.

Our net U.S. deferred tax asset in the Hecla U.S. Group is $31.5 million at December 31, 2021 following a release of valuation allowance of $58.4 million, based on a change in circumstances and weight of applicable evidence reviewed to support a more likely than not conclusion for utilization of the deferred tax assets. We are relying on all available evidence including reversal of deferred taxable temporary differences and a forecast of future taxable income along with a history of positive earnings to support the release.

Our net U.S. deferred tax liability for the Nevada U.S. Group at December 31, 2021 was $31.5 million compared to the $33.9 million net deferred tax liability at December 31, 2020. The $2.4 million decrease is for current period activity in Nevada and an increase in valuation allowance for $14.2 million. The deferred tax liability is primarily related to the excess of the carrying value of the mineral resource assets over the tax bases of those assets for U.S. tax reporting.

Our net Canadian deferred tax liability at December 31, 2021 was $104.2 million, an increase of $5.6 million from the $98.6 million net deferred tax liability at December 31, 2020. The increase was due to current period activity and the impact of weakening of the CAD relative to the USD on remeasurement of the deferred tax liability balance. The deferred tax liability is primarily related to the excess of the carrying value of the mineral resource assets over the tax bases of those assets for Canadian tax reporting.

Our Mexican net deferred tax asset at December 31, 2021 was zero, a decrease of $2.9 million from December 31, 2020. The valuation allowance was increased related to the cessation of production activities at our operations in Mexico.

As a result of the Tax Cuts and Jobs Act ("TCJ Act") enacted in December 2017, our remaining Alternative Minimum Tax ("AMT") credit carryforward of $11.4 million became partially refundable through 2020 and fully refundable in 2021. State and Federal AMT refunds of $0.8 million and $10.0 million were received in 2019 and 2020, respectively, leaving a net AMT state credit receivable of $0.6 million as of December 31, 2020, which was received in January 2021.

As discussed in *Note 7* of *Notes to Consolidated Financial Statements*, our effective tax rate for 2021 was (535)%, reflecting a tax benefit of $29.6 million on pre-tax income of $5.5 million, compared to (652)% for 2020, reflecting a tax expense of $8.2 million on a pre-tax loss of $1.3 million. We are subject to income taxes in the United States and other foreign jurisdictions. The overall effective tax rate will continue to be dependent upon the geographic distribution of our earnings in different jurisdictions, the U.S. deduction for percentage depletion, fluctuation in foreign currency exchange rates and deferred tax asset valuation allowance changes. As a result, the 2022 effective tax rate could vary significantly from that of 2021. The other relevant provisions of the TCJ Act that became effective in 2018 consist of global intangible low-taxed income ("GILTI") tax and base erosion and anti-abuse tax ("BEAT"); however, these provisions have not materially impacted us.

Reconciliation of Cost of Sales and Other Direct Production Costs and Depreciation, Depletion and Amortization (GAAP) to Cash Cost, Before By-product Credits and Cash Cost, After By-product Credits (non-GAAP) and All-In Sustaining Cost, Before By-product Credits and All-In Sustaining Cost, After By-product Credits (non-GAAP)

The tables below present reconciliations between the most comparable GAAP measure of cost of sales and other direct production costs and depreciation, depletion and amortization to the non-GAAP measures of (i) Cash Cost, Before By-product Credits, (ii) Cash Cost, After By-product Credits, (iii) AISC, Before By-product Credits and (iv) AISC, After By-product Credits for our operations and for the Company for the years ended December 31, 2021, 2020 and 2019.

Cash Cost, After By-product Credits, per Ounce and AISC, After By-product Credits, per Ounce are measures developed by precious metals companies (including the Silver Institute and the World Gold Council) in an effort to provide a uniform standard for comparison purposes. There can be no assurance, however, that these non-GAAP measures as we report them are the same as those reported by other mining companies.

Cash Cost, After By-product Credits, per Ounce is an important operating statistic that we utilize to measure each mine's operating performance. We use AISC, After By-product Credits, per Ounce as a measure of our mines' net cash flow after costs for exploration, pre-development, reclamation, and sustaining capital. This is similar to the Cash Cost, After By-product Credits, per Ounce non-GAAP measure we report, but also includes on-site exploration, reclamation, and sustaining capital costs. Current GAAP measures used in the mining industry, such as cost of goods sold, do not capture all the expenditures incurred to discover, develop and sustain silver and gold production. Cash Cost, After By-product Credits, per Ounce and AISC, After By-product Credits, per Ounce also allow us to benchmark the performance of each of our mines versus those of our competitors. As a silver and gold mining company, we also use these statistics on an aggregate basis, aggregating the Greens Creek and Lucky Friday mines to compare our performance with that of other silver mining companies, and aggregating Casa Berardi and Nevada Operations for comparison with other gold mining companies. Similarly, these statistics are useful in identifying acquisition and investment opportunities as they provide a common tool for measuring the financial performance of other mines with varying geologic, metallurgical and operating characteristics.

Cash Cost, Before By-product Credits and AISC, Before By-product Credits include all direct and indirect operating cash costs related directly to the physical activities of producing metals, including mining, processing and other plant costs, third-party refining expense, on-site general and administrative costs and royalties. AISC, Before By-product Credits for each mine also includes on-site exploration, reclamation, and sustaining capital costs. AISC, Before By-product Credits for our consolidated silver properties also includes corporate costs for general and administrative expense and sustaining exploration and capital costs. By-product credits include revenues earned from all metals other than the primary metal produced at each operation. As depicted in the tables below, by-product credits comprise an essential element of our silver unit cost structure, distinguishing our silver operations due to the polymetallic nature of their orebodies.

In addition to the uses described above, Cash Cost, After By-product Credits, per Ounce and AISC, After By-product Credits, per Ounce provide management and investors an indication of operating cash flow and net cash flow, respectively, after consideration of the average price received from production. We also use these measurements for the comparative monitoring of performance of our mining operations period-to-period from a cash flow perspective. However, comparability of Cash Cost, After By-product Credits, per Silver Ounce and AISC, After By-product Credits, per Silver Ounce for 2021 to 2020 and 2019 is impacted by, among other factors, (i) the return to full production at Lucky Friday in the fourth quarter of 2020 and (ii) suspension of production at San Sebastian in the fourth quarter of 2020 and discontinuation of San Sebastian being reported as an operating segment in 2021.

The Casa Berardi, Nevada Operations and combined gold properties information below reports Cash Cost, After By-product Credits, per Ounce and AISC, After By-product Credits, per Ounce for the production of gold, their primary product, and by-product revenues earned from silver, which is a by-product at Casa Berardi and the Nevada Operations. Only costs and ounces produced relating to operations with the same primary product are combined to represent Cash Cost, After By-product Credits, per Ounce and AISC, After By-product Credits, per Ounce. Thus, the gold produced at Casa Berardi and Nevada Operations is not included as a by-product credit when calculating Cash Cost, After By-product Credits, per Silver Ounce and AISC, After By-product Credits, per Silver Ounce for the total of Greens Creek, Lucky Friday and San Sebastian, our combined silver properties. Similarly, the silver produced at our other two operations is not included as a by-product credit when calculating the gold metrics for Casa Berardi and the Nevada Operations. As depicted in the tables below, by-product credits from the silver production at our primary gold properties comprise an element of our gold unit cost structure.

In thousands (except per ounce amounts)	Year Ended December 31, 2021			
	Greens Creek	Lucky Friday[2]	Corporate and other[3]	Total Silver
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 213,113	$ 97,538	$ 247	$ 310,898
Depreciation, depletion and amortization	(48,710)	(26,846)	(152)	(75,708)
Treatment costs	36,099	16,723	—	52,822
Change in product inventory	80	(406)	—	(326)
Reclamation and other costs	(3,466)	(1,039)	(95)	(4,600)
Cash Cost, Before By-product Credits [1]	197,116	85,970	—	283,086
Reclamation and other costs	3,390	1,056		4,446
Exploration	4,591	—	2,226	6,817
Sustaining capital	27,582	26,517	210	54,309
General and administrative	—	—	34,570	34,570
AISC, Before By-product Credits [1]	232,679	113,543	37,006	383,228
By-product credits:				
Zinc	(100,214)	(19,479)		(119,693)
Gold	(72,011)	—		(72,011)
Lead	(30,922)	(42,966)		(73,888)
Total By-product credits	(203,147)	(62,445)		(265,592)
Cash Cost, After By-product Credits	$ (6,031)	$ 23,525	$ —	$ 17,494
AISC, After By-product Credits	$ 29,532	$ 51,098	$ 37,006	$ 117,636
Divided by silver ounces produced	9,243	3,564		12,807
Cash Cost, Before By-product Credits, per Silver Ounce	$ 21.33	$ 24.12		$ 22.11
By-product credits per ounce	(21.98)	(17.52)		(20.74)
Cash Cost, After By-product Credits, per Silver Ounce	$ (0.65)	$ 6.60		$ 1.37
AISC, Before By-product Credits, per Silver Ounce	$ 25.17	$ 31.86		$ 29.93
By-product credits per ounce	(21.98)	(17.52)		(20.74)
AISC, After By-product Credits, per Silver Ounce	$ 3.19	$ 14.34		$ 9.19

In thousands (except per ounce amounts)	Year Ended December 31, 2021		
	Casa Berardi	Nevada Operations[4]	Total Gold
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 229,829	$ 48,945	$ 278,774
Depreciation, depletion and amortization	(80,744)	(15,341)	(96,085)
Treatment costs	1,513	1,731	3,244
Change in product inventory	2,439	(10,907)	(8,468)
Reclamation and other costs	(841)	300	(541)
Cash Cost, Before By-product Credits [1]	152,196	24,728	176,924
Reclamation and other costs	841	1,008	1,849
Exploration	5,326	—	5,326
Sustaining capital	30,643	511	31,154
AISC, Before By-product Credits [1]	189,006	26,247	215,253
By-product credits:			
Silver	(839)	(1,152)	(1,991)
Total By-product credits	(839)	(1,152)	(1,991)
Cash Cost, After By-product Credits	$ 151,357	$ 23,576	$ 174,933
AISC, After By-product Credits	$ 188,167	$ 25,095	$ 213,262
Divided by gold ounces produced	135	21	156
Cash Cost, Before By-product Credits, per Gold Ounce	$ 1,131	$ 1,193	$ 1,140
By-product credits per ounce	(6)	(56)	(13)
Cash Cost, After By-product Credits, per Gold Ounce	$ 1,125	$ 1,137	$ 1,127
AISC, Before By-product Credits, per Gold Ounce	$ 1,405	$ 1,267	$ 1,387
By-product credits per ounce	(6)	(56)	(13)
AISC, After By-product Credits, per Gold Ounce	$ 1,399	$ 1,211	$ 1,374

In thousands (except per ounce amounts)	Year Ended December 31, 2021		
	Total Silver	Total Gold	Total
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 310,898	$ 278,774	$ 589,672
Depreciation, depletion and amortization	(75,708)	(96,085)	(171,793)
Treatment costs	52,822	3,244	56,066
Change in product inventory	(326)	(8,468)	(8,794)
Reclamation and other costs	(4,600)	(541)	(5,141)
Cash Cost, Before By-product Credits (1)	283,086	176,924	460,010
Reclamation and other costs	4,446	1,849	6,295
Exploration	6,817	5,326	12,143
Sustaining capital	54,309	31,154	85,463
General and administrative	34,570	—	34,570
AISC, Before By-product Credits (1)	383,228	215,253	598,481
By-product credits:			
Zinc	(119,693)	—	(119,693)
Gold	(72,011)	—	(72,011)
Lead	(73,888)	—	(73,888)
Silver		(1,991)	(1,991)
Total By-product credits	(265,592)	(1,991)	(267,583)
Cash Cost, After By-product Credits	$ 17,494	$ 174,933	$ 192,427
AISC, After By-product Credits	$ 117,636	$ 213,262	$ 330,898
Divided by ounces produced	12,807	156	
Cash Cost, Before By-product Credits, per Ounce	$ 22.11	$ 1,140	
By-product credits per ounce	(20.74)	(13)	
Cash Cost, After By-product Credits, per Ounce	$ 1.37	$ 1,127	
AISC, Before By-product Credits, per Ounce	$ 29.93	$ 1,387	
By-product credits per ounce	(20.74)	(13)	
AISC, After By-product Credits, per Ounce	$ 9.19	$ 1,374	

In thousands (except per ounce amounts)	Year Ended December 31, 2020			
	Greens Creek	Lucky Friday(2)	Corporate and other (3)	Total Silver
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 210,748	$ 56,706	$ 24,104	$ 291,558
Depreciation, depletion and amortization	(49,692)	(11,473)	(3,548)	(64,713)
Treatment costs	77,122	4,590	287	81,999
Change in product inventory	(3,144)	2,340	(2,357)	(3,161)
Reclamation and other costs (5)	(1,608)	(274)	(1,198)	(3,080)
Lucky Friday cash costs excluded	—	(31,442)	—	(31,442)
Cash Cost, Before By-product Credits (1)	233,426	20,447	17,288	271,161
Reclamation and other costs	3,154	222	418	3,794
Exploration	354	—	1,788	2,142
Sustaining capital	28,797	7,154	337	36,288
General and administrative (5)	—	—	33,759	33,759
AISC, Before By-product Credits (1)	265,731	27,823	53,590	347,144
By-product credits:				
Zinc	(79,413)	(4,273)	—	(83,686)
Gold	(74,615)	—	(12,586)	(87,201)
Lead	(28,193)	(8,421)	—	(36,614)
Total By-product credits	(182,221)	(12,694)	(12,586)	(207,501)
Cash Cost, After By-product Credits	$ 51,205	$ 7,753	$ 4,702	$ 63,660
AISC, After By-product Credits	$ 83,510	$ 15,129	$ 41,004	$ 139,643
Divided by silver ounces produced	10,495	830	955	12,280
Cash Cost, Before By-product Credits, per Silver Ounce	$ 22.24	$ 24.63		$ 22.08
By-product credits per ounce	(17.36)	(15.29)		(16.90)
Cash Cost, After By-product Credits, per Silver Ounce	$ 4.88	$ 9.34		$ 5.18
AISC, Before By-product Credits, per Silver Ounce	$ 25.33	$ 33.51		$ 28.27
By-product credits per ounce	(17.36)	(15.29)		(16.90)
AISC, After By-product Credits, per Silver Ounce	$ 7.97	$ 18.22		$ 11.37

In thousands (except per ounce amounts)	Year Ended December 31, 2020		
	Casa Berardi(6)	Nevada Operations(4)	Total Gold
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 194,414	$ 44,801	$ 239,215
Depreciation, depletion and amortization	(60,552)	(22,845)	(83,397)
Treatment costs	2,591	45	2,636
Change in product inventory	2,226	15,869	18,095
Reclamation and other costs (5)	(773)	(978)	(1,751)
Exclusion of Nevada Operations costs	—	(13,511)	(13,511)
Cash Cost, Before By-product Credits (1)	137,906	23,381	161,287
Reclamation and other costs	386	654	1,040
Exploration	2,231	—	2,231
Sustaining capital	34,431	1,600	36,031
AISC, Before By-product Credits (1)	174,954	25,635	200,589
By-product credits:			
Silver	(499)	(635)	(1,134)
Total By-product credits	(499)	(635)	(1,134)
Cash Cost, After By-product Credits	$ 137,407	$ 22,746	$ 160,153
AISC, After By-product Credits	$ 174,455	$ 25,000	$ 199,455
Divided by gold ounces produced	121	32	153
Cash Cost, Before By-product Credits, per Gold Ounce	$ 1,135	$ 736	$ 1,052
By-product credits per ounce	(4)	(20)	(7)
Cash Cost, After By-product Credits, per Gold Ounce	$ 1,131	$ 716	$ 1,045
AISC, Before By-product Credits, per Gold Ounce	$ 1,440	$ 807	$ 1,309
By-product credits per ounce	(4)	(20)	(7)
AISC, After By-product Credits, per Gold Ounce	$ 1,436	$ 787	$ 1,302

In thousands (except per ounce amounts)	Year Ended December 31, 2020		
	Total Silver	Total Gold	Total
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 291,558	$ 239,215	$ 530,773
Depreciation, depletion and amortization	(64,713)	(83,397)	(148,110)
Treatment costs	81,999	2,636	84,635
Change in product inventory	(3,161)	18,095	14,934
Reclamation and other costs (5)	(3,080)	(1,751)	(4,831)
Cash costs excluded	(31,442)	(13,511)	(44,953)
Cash Cost, Before By-product Credits (1)	271,161	161,287	432,448
Reclamation and other costs	3,794	1,040	4,834
Exploration	2,142	2,231	4,373
Sustaining capital	36,288	36,031	72,319
General and administrative (5)	33,759	—	33,759
AISC, Before By-product Credits (1)	347,144	200,589	547,733
By-product credits:			
Zinc	(83,686)	—	(83,686)
Gold	(87,201)	—	(87,201)
Lead	(36,614)	—	(36,614)
Silver	—	(1,134)	(1,134)
Total By-product credits	(207,501)	(1,134)	(208,635)
Cash Cost, After By-product Credits	$ 63,660	$ 160,153	$ 223,813
AISC, After By-product Credits	$ 139,643	$ 199,455	$ 339,098
Divided by ounces produced	12,280	153	
Cash Cost, Before By-product Credits, per Ounce	$ 22.08	$ 1,052	
By-product credits per ounce	(16.90)	(7)	
Cash Cost, After By-product Credits, per Ounce	$ 5.18	$ 1,045	
AISC, Before By-product Credits, per Ounce	$ 28.27	$ 1,309	
By-product credits per ounce	(16.90)	(7)	
AISC, After By-product Credits, per Ounce	$ 11.37	$ 1,302	

In thousands (except per ounce amounts)	Year Ended December 31, 2019			
	Green Creek	Lucky Friday(2)	Corporate and other (3)	Total Silver
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 209,355	$ 16,621	$ 50,509	$ 276,485
Depreciation, depletion and amortization	(47,587)	(1,175)	(9,772)	(58,534)
Treatment costs	48,487	2,884	760	52,131
Change in product inventory	(1,155)	1,016	(2,953)	(3,092)
Reclamation and other costs	(2,523)	—	(1,588)	(4,111)
Lucky Friday cash costs excluded	—	(19,346)	—	(19,346)
Cash Cost, Before By-product Credits (1)	206,577	—	36,956	243,533
Reclamation and other costs	2,949	—	492	3,441
Exploration	982	—	5,999	6,981
Sustaining capital	35,829	—	2,569	38,398
General and administrative	—	—	35,832	35,832
AISC, Before By-product Credits (1)	246,337	—	81,848	328,185
By-product credits:				
Zinc	(91,435)	—	—	(91,435)
Gold	(69,391)	—	(21,960)	(91,351)
Lead	(28,589)	—	—	(28,589)
Silver	—	—	—	
Total By-product credits	(189,415)	—	(21,960)	(211,375)
Cash Cost, After By-product Credits	$ 17,162	$ —	$ 14,996	$ 32,158
AISC, After By-product Credits	$ 56,922	$ —	$ 59,888	$ 116,810
Divided by silver ounces produced	9,890	—	1,869	11,759
Cash Cost, Before By-product Credits, per Silver Ounce	$ 20.89	$ —		$ 20.71
By-product credits per ounce	(19.15)	—		(17.98)
Cash Cost, After By-product Credits, per Silver Ounce	$ 1.74	$ —		$ 2.73
AISC, Before By-product Credits, per Silver Ounce	$ 24.91	$ —		$ 27.91
By-product credits per ounce	(19.15)	—		(17.98)
AISC, After By-product Credits, per Silver Ounce	$ 5.76	$ —		$ 9.93

In thousands (except per ounce amounts)	Year Ended December 31, 2019		
	Casa Berardi	Nevada Operations(4)	Total
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 209,615	$ 153,336	$ 362,951
Depreciation, depletion and amortization	(65,893)	(67,024)	(132,917)
Treatment costs	1,876	158	2,034
Change in product inventory	(3,371)	(9,008)	(12,379)
Reclamation and other costs	(515)	(2,019)	(2,534)
Cash Cost, Before By-product Credits (1)	141,712	75,443	217,155
Reclamation and other costs	515	1,512	2,027
Exploration	3,450	2,333	5,783
Sustaining capital	36,825	24,652	61,477
AISC, Before By-product Credits (1)	182,502	103,940	286,442
By-product credits:			
Silver	(508)	(2,922)	(3,430)
Total By-product credits	(508)	(2,922)	(3,430)
Cash Cost, After By-product Credits	$ 141,204	$ 72,521	$ 213,725
AISC, After By-product Credits	$ 181,994	$ 101,018	$ 283,012
Divided by gold ounces produced	134	66	200
Cash Cost, Before By-product Credits, per Gold Ounce	$ 1,055	$ 1,140	$ 1,083
By-product credits per ounce	(4)	(44)	(17)
Cash Cost, After By-product Credits, per Gold Ounce	$ 1,051	$ 1,096	$ 1,066
AISC, Before By-product Credits, per Gold Ounce	$ 1,358	$ 1,571	$ 1,428
By-product credits per ounce	(4)	(44)	(17)
AISC, After By-product Credits, per Gold Ounce	$ 1,354	$ 1,527	$ 1,411

In thousands (except per ounce amounts)	Year Ended December 31, 2019		
	Total Silver	Total Gold	Total
Cost of sales and other direct production costs and depreciation, depletion and amortization	$ 276,485	$ 362,951	$ 639,436
Depreciation, depletion and amortization	(58,534)	(132,917)	(191,451)
Treatment costs	52,131	2,034	54,165
Change in product inventory	(3,092)	(12,379)	(15,471)
Reclamation and other costs	(4,111)	(2,534)	(6,645)
Lucky Friday cash costs excluded	(19,346)	—	(19,346)
Cash Cost, Before By-product Credits (1)	243,533	217,155	460,688
Reclamation and other costs	3,441	2,027	5,468
Exploration	6,981	5,783	12,764
Sustaining capital	38,398	61,477	99,875
General and administrative	35,832	—	35,832
AISC, Before By-product Credits (1)	328,185	286,442	614,627
By-product credits:			
Zinc	(91,435)	—	(91,435)
Gold	(91,351)	—	(91,351)
Lead	(28,589)	—	(28,589)
Silver	—	(3,430)	(3,430)
Total By-product credits	(211,375)	(3,430)	(214,805)
Cash Cost, After By-product Credits	$ 32,158	$ 213,725	$ 245,883
AISC, After By-product Credits	$ 116,810	$ 283,012	$ 399,822
Divided by ounces produced	11,759	200	
Cash Cost, Before By-product Credits, per Ounce	$ 20.71	$ 1,083	
By-product credits per ounce	(17.98)	(17)	
Cash Cost, After By-product Credits, per Ounce	$ 2.73	$ 1,066	
AISC, Before By-product Credits, per Ounce	$ 27.91	$ 1,428	
By-product credits per ounce	(17.98)	(17)	
AISC, After By-product Credits, per Ounce	$ 9.93	$ 1,411	

(1) Includes all direct and indirect operating costs related to the physical activities of producing metals, including mining, processing and other plant costs, third-party refining and marketing expense, non-discretionary on-site general and administrative costs, royalties and mining production taxes, before by-product revenues earned from all metals other than the primary metal produced at each operation. AISC, Before By-product Credits also includes on-site exploration, reclamation, and sustaining capital costs.

(2) The unionized employees at Lucky Friday were on strike from March 2017 until January 2020, and production at Lucky Friday had been limited from the start of the strike until the ramp-up was substantially completed in the fourth quarter of 2020. Costs related to ramp-up activities totaling approximately $8.0 million in 2020, and suspension-related costs totaling approximately $12.1 million during the strike in 2019, which include $6.3 million and $4.3 million, respectively, in non-cash depreciation expense for those periods, have been excluded from the calculations of cost of sales and other direct production costs and depreciation, depletion and amortization, Cash Cost, Before By-product Credits, Cash Cost, After By-product Credits, AISC, Before By-product Credits, and AISC, After By-product Credits.

(3) Includes results for San Sebastian, which was an operating segment prior to 2021, and corporate costs. AISC, Before By-product Credits for our consolidated silver properties includes non-discretionary corporate costs for general and administrative expense, exploration and sustaining capital.

(4) Production was suspended at the Hollister mine in the third quarter of 2019 and at the Midas mine and Aurora mill in late 2019, and at the Midas mill and Fire Creek mine in mid-2021. Suspension-related costs at Nevada Operations totaling $20.4 million for 2021 and $13.5 million for 2020 are reported in a separate line item on our consolidated statements of operations and excluded from the calculations of cost of sales and other direct production costs and depreciation, depletion and amortization and Cash Cost and AISC, After By-product Credits, per Gold Ounce. During the second half of 2020, all ore mined at Nevada Operations was stockpiled, with no ore milled and no production reported during the period. As a result, costs incurred at Nevada Operations during the second half of 2020 were excluded from the calculations of Cash Cost and AISC, After By-product Credits, per Gold Ounce.

(5) Excludes the discretionary portion of general and administrative costs for Greens Creek, Casa Berardi, Lucky Friday and corporate of $0.6 million, $0.4 million, $0.1 million and $1.8 million, respectively, for 2020.

(6) In late March 2020, the Government of Quebec ordered the mining industry to reduce to minimum operations as part of the fight against COVID-19, causing us to suspend our Casa Berardi operations from March 24 until April 15, when mining operations resumed, resulting in reduced mill throughput. Suspension-related costs totaling $1.6 million for 2020 are reported in a separate line item on our consolidated statements of operations and excluded from the calculations of cost of sales and other direct production costs and depreciation, depletion and amortization and Cash Cost and AISC, After By-product Credits, per Gold Ounce.

Reconciliation of Cash Provided by Operating Activities (GAAP) to Free Cash Flow (non-GAAP)

The non-GAAP measure of free cash flow is calculated as net cash provided by operating activities (GAAP) less additions to properties, plants, equipment and mineral interests (GAAP). Management believes that, when presented in conjunction with comparable GAAP measures, free cash flow is useful to investors in evaluating our operating performance. The following table reconciles net cash provided by operating activities to free cash flow:

	Year ended December 31,		
	2021	**2020**	**2019**
Net cash provided by operating activities (GAAP)	$ 220,337	$ 180,793	$ 120,866
Less: Additions to properties, plants, equipment and mineral interests (GAAP)	(109,048)	(91,016)	(121,421)
Free cash flow	$ 111,289	$ 89,777	$ (555)

Financial Liquidity and Capital Resources

Liquidity overview

We have a disciplined cash management strategy of maintaining financial flexibility to execute our capital priorities and provide long-term value to our shareholders. Consistent with that strategy, we aim to maintain an acceptable level of net debt and sufficient liquidity to fund debt service costs, operations, capital expenditures, exploration and pre-development projects, while returning cash to stockholders through dividends and potential share repurchases.

At December 31, 2021, we had $210.0 million in cash and cash equivalents, of which $13.8 million was held in foreign subsidiaries' local currency denominated accounts readily convertible to U.S. dollars that we anticipate utilizing for near-term operating, exploration or capital costs by those foreign operations. We also have USD cash and cash equivalent balances held by our foreign subsidiaries that, if repatriated, may be subject to withholding taxes. We expect that there would be no additional tax burden upon repatriation after considering the cash cost associated with the withholding taxes. We believe that our liquidity and capital resources from our U.S. operations are adequate to fund our U.S. operations and corporate activities.

As discussed in *Overview* above, we continue to address the COVID-19 outbreak and face uncertainty related to the potential additional impacts it could have on our operations. The impacts of COVID-19 and increasing or prolonged restrictions, if required, on our operations could require access to additional sources of liquidity, which may not be available to us.

Pursuant to our common stock dividend policy described in *Note 12* of *Notes to Consolidated Financial Statements*, our board of directors declared and paid dividends on common stock totaling $20.1 million in 2021, $8.6 million in 2020, and $4.9 million in 2019. Our dividend policy has a silver-linked component which ties the amount of declared common stock dividends to our realized silver price for the preceding quarter. Another component of our common stock dividend policy anticipates paying an annual minimum dividend. In each of May and September 2021, our Board of Directors approved an increase in our silver-linked dividend policy by $0.01 per year, and in September 2021 also approved a reduction in the minimum realized silver price threshold to $20 from $25 per ounce. We realized silver prices of $25.66, $27.14, $23.97 and $23.49 in the first, second, third and fourth quarters of 2021, respectively, thus satisfying the criterion for the silver-linked dividend component of our common stock dividend policy. As a result, on May 5, 2021 and August 4, 2021, our Board of Directors declared quarterly cash dividends of $0.01125 per share of common stock, consisting of $0.00375 per share for the minimum dividend component and $0.0075 per share for the silver-linked dividend component of our dividend policy, and on November 3, 2021 and February 21, 2022, declared a quarterly cash dividend of $0.00625 per share of common stock, consisting of $0.00375 per share for the minimum dividend component and $0.0025 per share for the silver-linked dividend component of our dividend policy. For illustrative purposes only, the table below summarizes potential dividend amounts under our dividend policy.

Quarterly Average Realized Silver Price ($ per ounce)	Quarterly Silver-Linked Dividend ($ per share)	Annualized Silver-Linked Dividend ($ per share)	Annualized Minimum Dividend ($ per share)	Annualized Dividends per Share: Silver-Linked and Minimum ($ per share)
$ 20	$ 0.0025	$ 0.01	$ 0.015	$ 0.025
$ 25	$ 0.0100	$ 0.04	$ 0.015	$ 0.055
$ 30	$ 0.0150	$ 0.06	$ 0.015	$ 0.075
$ 35	$ 0.0250	$ 0.10	$ 0.015	$ 0.115
$ 40	$ 0.0350	$ 0.14	$ 0.015	$ 0.155
$ 45	$ 0.0450	$ 0.18	$ 0.015	$ 0.195
$ 50	$ 0.0550	$ 0.22	$ 0.015	$ 0.235

The declaration and payment of dividends on common stock is at the sole discretion of our board of directors, and there can be no assurance that we will continue to declare and pay common stock dividends in the future.

Pursuant to our stock repurchase program described in *Note 12* of *Notes to Consolidated Financial Statements*, we are authorized to repurchase up to 20 million shares of our outstanding common stock from time to time in open market or privately negotiated transactions, depending on prevailing market conditions and other factors. The repurchase program may be modified, suspended or discontinued by us at any time. As of December 31, 2021, 934,100 shares had been purchased in prior periods at an average price of $3.99 per share, leaving 19.1 million shares that may yet be purchased under the program. We have not repurchased any shares since June 2014. The closing price of our common stock at February 18, 2022, was $5.10 per share.

Pursuant to our at the market equity distribution agreement ("ATM") described in *Note 12* of *Notes to Consolidated Financial Statements* we may offer and sell up to 60 million shares of our common stock from time to time to or through sales agents. Sales of the shares, if any, will be made by means of ordinary brokers transactions or as otherwise agreed between the Company and the agents as principals. Whether or not we engage in sales from time to time may depend on a variety of factors, including share price, our cash resources, customary black-out restrictions, and whether we have any material inside information. The agreement can be terminated by us at any time. Any shares issued under the equity distribution agreement are registered under the Securities Act of 1933, as amended, pursuant to a shelf registration statement on Form S-3. No shares have been sold under the agreement as of December 31, 2021.

We believe as a result of our cash balances, the performance of our current and expected operations, current metals prices, proceeds from potential at-the-market sales of common stock, and availability of our revolving credit facility, we will be able to meet our obligations and other potential cash requirements during the next 12 months from the date of this report. Our obligations and other uses of cash may include, but are not limited to: debt service obligations related to the Senior Notes, IQ Notes and revolving credit facility (if amounts are drawn); care-and-maintenance and other costs related to addressing the impact of COVID-19 on our operations; capital expenditures at our operations; potential acquisitions of other mining companies or properties; regulatory matters; litigation; potential repurchases of our common stock under the program described above; and payment of dividends on common stock, if declared by our board of directors. We currently estimate that a total of approximately $135 million will be spent on capital expenditures, primarily for equipment, infrastructure, and development at our mines, in 2022. We also estimate that exploration and pre-development expenditures will total approximately $45 million in 2022. Our expenditures for these items and our related plans for 2022 may change based upon our financial position, metals prices, and other considerations. Our ability to fund the activities described above will depend on our operating performance, metals prices, our ability to estimate revenues and costs, sources of liquidity available to us, including the revolving credit facility, and other factors. A sustained downturn in metals prices, significant increase in operational or capital costs or other uses of cash, our inability to access the credit facility or the sources of liquidity discussed above, or other factors beyond our control could impact our plans. See *Item 1A. Risk Factors - An extended decline in metals prices, an increase in operating or capital costs, mine accidents or closures, increasing regulatory obligations, or our inability to convert resources or exploration targets to reserves may cause us to record write-downs, which could negatively impact our results of operations* and *We have a substantial amount of debt that could impair our financial health and prevent us from fulfilling our obligations under our existing and future indebtedness.*

We may defer some capital expenditures and/or exploration and pre-development activities, engage in asset sales or secure additional capital if necessary to maintain liquidity. We also may pursue additional acquisition opportunities, which could require additional equity issuances or other forms of financing. We cannot assure you that such financing will be available to us.

Our liquid assets include (in millions):

	December 31, 2021	December 31, 2020	December 31, 2019
Cash and cash equivalents held in U.S. dollars	$ 196.2	$ 116.4	$ 50.3
Cash and cash equivalents held in foreign currency	13.8	13.4	12.2
Total cash and cash equivalents	210.0	129.8	62.5
Marketable equity securities, current and non-current	14.4	19.3	6.2
Total cash, cash equivalents and investments	$ 224.4	$ 149.1	$ 68.7

Cash and cash equivalents increased by $80.2 million in 2021, discussed below. Cash and cash equivalents held in foreign currencies represents balances in CAD and Mexican Pesos ("MXN"), and increased by $0.4 million in 2021 resulting from an increase in CAD held. The value of current and non-current marketable equity securities decreased by $4.9 million.

	Year Ended December 31,		
	2021	2020	2019
Cash provided by operating activities (in millions)	**$ 220.3**	**$ 180.8**	**$ 120.9**

Cash provided by operating activities increased by $39.5 million in 2021 compared to 2020. The increase was due to higher income, adjusted for non-cash items, partially offset by the impact of working capital and other operating asset and liability changes. Income, adjusted for non-cash items, was higher by $42.9 million primarily due to higher income from operations, which was mainly a result of higher realized silver, gold, lead and zinc prices and lower treatment charges. Working capital and other operating asset and liability changes resulted in a net cash increase of $18.9 million in 2021 compared to an increase in cash of $22.4 million in 2020. Significant variances in working capital changes between 2021 and 2020 resulted from lower cash flows from changes in accounts payable, accruals for incentive compensation and accounts receivable, partially offset by a reduction in inventory.

Cash provided by operating activities increased by $59.9 million in 2020 compared to 2019. The increase was due to higher income, adjusted for non-cash items, partially offset by the impact of working capital and other operating asset and liability changes. Income, adjusted for non-cash items, was higher by $47.6 million primarily due to higher gross profit, which was mainly a result of higher realized silver and gold prices and higher silver production, partially offset by lower realized lead and zinc prices and higher treatment charges. Working capital and other operating asset and liability changes resulted in a net cash increase of $22.4 million in 2020 compared to an increase in cash of $10.1 million in 2019. Significant variances in working capital changes between 2020 and 2019 resulted from lower accounts receivable, higher accounts payable, and higher accruals for incentive compensation and taxes, partially offset by higher product inventory.

	Year Ended December 31,		
	2021	2020	2019
Cash used in investing activities (in millions)	**$ 107.0**	**$ 92.9**	**$ 119.9**

Capital expenditures were $109.0 million in 2021, including $9.1 million for acquisition of royalty interests and land at our operations and excluding non-cash lease additions of $4.9 million, which was $18.0 million higher than capital expenditures in 2020. The increase was due to increased spending at Lucky Friday and Casa Berardi. We recognized $1.8 million in proceeds from the exchange of investments in 2021 and purchased marketable equity securities having a cost basis of $2.2 million during 2020.

Capital expenditures were $91.0 million in 2020, excluding non-cash lease additions of $9.1 million, which was $30.4 million lower than capital expenditures in 2019. The decrease was due to reduced spending at Nevada, Greens Creek and San Sebastian, partially offset by higher capital expenditures at Lucky Friday and Casa Berardi. During 2019, we purchased marketable equity securities having a cost basis of $0.4 million and sold marketable equity securities for proceeds of $1.8 million.

	Year Ended December 31,		
	2021	2020	2019
Cash provided by (used in) financing activities (in millions)	**$ (32.6)**	**$ (19.4)**	**$ 33.2**

We had no borrowings or repayments of debt during 2021. In 2020 and 2019, we had aggregate draws of $210.0 million and $279.5 million, respectively, on our revolving credit facility, with repayments of the same amounts in those years. In addition, in 2020 we received $469.5 million and $36.8 million in net proceeds from the issuance of our Senior Notes and IQ Notes, respectively, and had debt repayments of $506.5 million for redemption of our 2021 Notes. In 2021, 2020 and 2019, we paid total cash dividends on our common and preferred stock of $20.7 million, $9.2 million and $5.5 million, respectively. We made payments on our finance leases of $7.3 million, $6.0 million, and $7.2 million in 2021, 2020, and 2019, respectively. We also purchased shares of our common stock for $4.5 million, $2.7 million, and $2.2 million in 2021, 2020, and 2019, respectively, as a result of our employees' election to utilize net share settlement to satisfy their tax withholding obligations related to incentive compensation paid in stock and vesting of restricted stock units. See *Note 12* of *Notes to Consolidated Financial Statements* for more information.

Exchange rate fluctuations between the U.S. dollar and the Canadian dollar and Mexican peso resulted in a decrease in our cash balance of $0.5 million during 2021, a decrease of $1.1 million during 2020 and an increase of $0.9 million in 2019.

Contractual Obligations and Contingent Liabilities and Commitments

The table below presents our fixed, non-cancelable contractual obligations and commitments primarily related to our Senior Notes, IQ Notes, revolving credit facility, outstanding purchase orders and certain service contract commitments, and lease arrangements as of December 31, 2021 (in thousands):

	Payments Due By Period				
	Less than 1 year	2-3 years	4-5 years	After 5 years	Total
Purchase and contractual obligations (1)	$ 18,932	$ —	$ —	$ —	$ 18,932
Commitment fees (2)	1,717	179	—	—	1,896
Finance lease commitments (3)	6,097	7,578	556	—	14,231
Operating lease commitments (4)	3,153	4,095	2,117	6,418	15,783
Senior Notes (5)	34,438	68,875	68,875	513,742	685,930
IQ Notes (6)	2,479	4,958	39,342	—	46,779
Total contractual cash obligations	$ 66,816	$ 85,685	$ 110,890	$ 520,160	$ 783,551

(1) Consists of open purchase orders and contractual obligations of approximately $4.8 million at Greens Creek, $10.2 million at Lucky Friday, $0.1 million at Casa Berardi, and $3.8 million at the Nevada Operations.

(2) We have a $250 million revolving credit agreement which is currently undrawn. We had $17.3 million in letters of credit outstanding as of December 31, 2021. The amounts in the table above assume no additional amounts will be drawn in future periods, and include only the standby fee on the current undrawn balance. For more information on our credit facility, see *Note 9* of *Notes to Consolidated Financial Statements.*

(3) Includes scheduled finance lease payments of $12.5 million and $1.7 million (including interest) for equipment at Greens Creek and Casa Berardi, respectively. These leases have fixed payment terms and contain bargain purchase options at the end of the lease periods. See *Note 9* of *Notes to Consolidated Financial Statements* for more information.

(4) We enter into operating leases in the normal course of business. Substantially all lease agreements have fixed payment terms based on the passage of time. Some lease agreements provide us with the option to renew the lease or purchase the leased property. Our future operating lease obligations would change if we exercised these renewal options and if we entered into additional operating lease arrangements. See *Note 9* of *Notes to Consolidated Financial Statements* for more information.

(5) On February 19, 2020, we completed an offering of $475 million in aggregate principal amount of our Senior Notes due February 15, 2028. The Senior Notes bear interest at a rate of 7.25% per year with interest payable on February 15 and August 15 of each year, commencing August 15, 2020. See *Note 9* of *Notes to Consolidated Financial Statements* for more information.

(6) On July 9, 2020, we entered into a note purchase agreement pursuant to which we issued our IQ Notes for CAD$50 million (approximately USD$36.8 million at the time of the transaction) in aggregate principal amount. The IQ Notes bear interest on amounts outstanding at a rate of 6.515% per year, payable on January 9 and July 9 of each year, commencing January 9, 2021. See *Note 9* of *Notes to Consolidated Financial Statements* for more information.

We record liabilities for estimated costs associated with mine closure, reclamation of land and other environmental matters. At December 31, 2021, our liabilities for these matters totaled $113.2 million. Future expenditures related to closure, reclamation and environmental expenditures at our other sites are difficult to estimate, although we anticipate we will incur expenditures relating to these obligations over the next 30 years. For additional information relating to our environmental obligations, see *Note 5* of *Notes to Consolidated Financial Statements* and *Item 1A. Risk Factors – Our environmental obligations may exceed the provisions we have made*. As discussed in *Note 15* of *Notes to Consolidated Financial Statements*, we are involved in various other legal proceedings which may result in obligations in excess of provisions we have made.

Critical Accounting Estimates

Our significant accounting policies are described in *Note 2* of *Notes to Consolidated Financial Statements*. As described in such *Note 2*, we are required to make estimates and assumptions that affect the reported amounts and related disclosures of assets, liabilities, revenue, and expenses. Our estimates are based on our experience and our interpretation of economic, political, regulatory, and other factors that affect our business prospects. Actual results may differ significantly from our estimates.

We believe that our most critical accounting estimates are related to future metals prices; obligations for environmental, reclamation, and closure matters; mineral reserves and resources; accounting for business combinations; valuation of deferred tax assets and assumptions used in accounting for our pension plans, as they require us to make assumptions that are highly uncertain at the time the accounting estimates are made and changes in them are reasonably likely to occur from period to period. Management has discussed the development and selection of these critical accounting estimates with the Audit Committee of our board of directors, and the Audit Committee has reviewed the disclosures presented below. In addition, there are other items within our financial statements that require estimation, but are not deemed to be critical. However, changes in estimates used in these and other items could have a material impact on our financial statements.

Future Metals Prices

Metals prices are key components in estimates that determine the valuation of some of our significant assets and liabilities, including properties, plants, equipment and mineral interests, deferred tax assets, and certain accounts receivable. Metals prices are also an important component in the estimation of reserves and resources. As shown above in *Item 1. – Business*, metals prices have historically been volatile. Silver demand arises from investment demand, particularly in exchange-traded funds, industrial demand, and consumer demand. Gold demand arises primarily from investment and consumer demand. Investment demand for silver and gold can be influenced by several factors, including: the value of the U.S. dollar and other currencies, changing U.S. budget deficits, widening availability of exchange-traded funds, interest rate levels, the health of credit markets, and inflationary expectations. Uncertainty related to (i) the political environment in the U.S., (ii) U.S. and global trading policies (including tariffs), (iii) a global economic recovery, (iv) recent uncertainty in China and (v) from the current downturn and continued uncertainty resulting from the COVID-19 outbreak and any subsequent variants, could result in continued investment demand for precious metals. Industrial demand for silver is closely linked to world Gross Domestic Product growth and industrial fabrication levels, as it is difficult to substitute for silver in industrial fabrication. Consumer demand is driven significantly by demand for jewelry and other retail products. We believe that long-term industrial and economic trends, including demand for metals to decarbonize the economy and urbanization and growth of the middle class in countries such as China and India, will result in continued consumer demand for silver and gold and industrial demand for silver. However, the global economy has been significantly impacted by the COVID-19 outbreak, with the ultimate severity and duration of the downturn unknown. There can be no assurance whether these trends will continue or how they will impact prices of the metals we produce. In the past, we have recorded impairments to our asset carrying values because of low prices, and we can offer no assurance that prices will either remain at their current levels or increase.

Processes supporting valuation of our assets and liabilities that are most significantly affected by metals prices include analysis of asset carrying values, depreciation, reserves and resources, and deferred income taxes. On at least an annual basis - and more frequently if circumstances warrant - we examine our depreciation rates, reserve estimates, and the valuation allowances on our deferred tax assets. We examine the carrying values of our assets as changes in facts and circumstances warrant. In our evaluation of carrying values and deferred taxes, we apply several pricing views to our forecasting model, including current prices, analyst price estimates, forward-curve prices, and historical prices (see *Mineral Reserves and Resources*, below, regarding prices used for reserve and resource estimates). Using applicable accounting guidance and our view of metals markets, we use the probability-weighted average of the various methods to determine whether the values of our assets are fairly stated, and to determine the level of valuation allowances, if any, on our deferred tax assets. In addition, estimates of future metals prices are used in the valuation of certain assets in the determination of the purchase price allocations for our acquisitions (see *Business Combinations* below).

Sales of concentrates sold directly to customers are recorded as revenues upon completion of the performance obligations and transfer of control of the product to the customer (generally at the time of shipment) using estimated forward metals prices for the estimated month of settlement. Due to the time elapsed between shipment of concentrates to the customer and final settlement with the customer, we must estimate the prices at which sales of our metals will be settled. Previously recorded sales and trade accounts receivable are adjusted to estimated settlement prices until final settlement by the customer. Changes in metals prices between shipment and final settlement result in changes to revenues and accounts receivable previously recorded upon shipment. As a result, our trade accounts receivable balances related to concentrate sales are subject to changes in metals prices until final settlement occurs. For more information, see *Note 4* of *Notes to Consolidated Financial Statements*.

We utilize financially-settled forward contracts to manage our exposure to changes in prices for silver, gold, zinc and lead. See *Item 7A. – Quantitative and Qualitative Disclosures About Market Risk - Commodity-Price Risk Management* below for more information on our contract programs. Effective November 1, 2021, we designated the contracts for lead and zinc as hedges for accounting purposes, with gains and losses deferred to accumulated other comprehensive income until the hedged product ships. Prior to November 1, 2021, these contracts were not designated as hedges for accounting purposes and were therefore marked-to-market through earnings each period. Changes in silver, gold, zinc and lead prices between the dates that the contracts are entered into and their settlements will result in changes to the fair value asset or liability associated with the contracts, with a corresponding gain or loss for silver and gold contracts recognized in earnings and gain or loss for lead and zinc contracts deferred to accumulated other comprehensive income (loss).

Obligations for Environmental, Reclamation and Closure Matters

Accrued reclamation and closure costs can represent a significant and variable liability on our balance sheet. We have estimated our liabilities under appropriate accounting guidance; however, the ranges of liability could exceed the liabilities recognized. If substantial damages were awarded, claims were settled, or remediation costs incurred in excess of our accruals, our financial results or condition could be materially adversely affected.

Mineral Reserves and Resources

Critical estimates are inherent in the process of determining our reserves and resources. Our reserves and resources are affected largely by our assessment of future metals prices, as well as by engineering and geological estimates of ore grade, accessibility and production cost. See *Item 2. – Properties* above for the metals price assumptions used in our estimates of reserves and resources as of December 31, 2021, 2020 and 2019. Our assessment of reserves and resources occurs at least annually, and periodically utilizes external audits.

Reserves and resources are a key component in the valuation of our properties, plants and equipment. Reserve estimates are used in determining appropriate rates of units-of-production depreciation, with net book value of many assets depreciated over remaining estimated reserves. Reserves and resources are also a key component in forecasts, with which we compare future cash flows to current asset values in an effort to ensure that carrying values are reported appropriately. Our forecasts are also used in determining the level of valuation allowances on our deferred tax assets. Reserves and resources also play a key role in the valuation of certain assets in the determination of the purchase price allocations for acquisitions. Annual reserve and resource estimates are also used to determine conversions of resources and exploration targets beyond the known reserve resulting from business combinations to depreciable reserves, in periods subsequent to the business combinations (see *Business Combinations* below). Reserves and resources are a culmination of many estimates and are not guarantees that we will recover the indicated quantities of metals or that we will do so at a profitable level.

Business Combinations

We are required to allocate the purchase price of acquired companies to the tangible and intangible assets acquired and liabilities assumed based on their estimated fair values at the acquisition date. The valuation of assets acquired and liabilities assumed requires management to make significant estimates and assumptions, especially with respect to long-lived assets (including resources and exploration targets beyond the known reserve). These estimates include future metals prices and mineral reserves and resources, as discussed above. Management may also be required to make estimates related to the valuation of deferred tax assets or liabilities as part of the purchase price allocation for business combinations. In some cases, we use third-party appraisers to determine the fair values of property and other identifiable assets. In addition, costs related to business combinations are included in earnings as incurred, and our financial results for periods in which business combinations are pursued could be adversely affected as a result.

Valuation of Deferred Tax Assets

Our deferred income tax assets include certain future tax benefits. We record a valuation allowance against any portion of those deferred income tax assets when we believe, based on the weight of available evidence, it is more likely than not that some portion or all of the deferred income tax asset will not be realized. We review the likelihood that we will realize the benefit of our deferred tax assets and therefore the need for valuation allowances on a quarterly basis, or more frequently if events indicate that a review is required. In determining the requirement for a valuation allowance, the historical and projected financial results of the legal entity or consolidated group recording the net deferred tax asset is considered, along with all other available positive and negative evidence.

Certain categories of evidence carry more weight in the analysis than others based upon the extent to which the evidence may be objectively verified. We look to the nature and severity of cumulative pretax losses (if any) in the current three-year period ending on the evaluation date or the expectation of future pretax losses and the existence and frequency of prior cumulative pretax losses.

We utilize a rolling twelve quarters of pre-tax income or loss as a measure of our cumulative results in recent years. Concluding that a valuation allowance is not required is difficult when there is significant negative evidence which is objective and verifiable, such as cumulative losses in recent years. However, a cumulative three year loss is not solely determinative of the need for a valuation allowance. We also consider all other available positive and negative evidence in our analysis.

Other factors considered in the determination of the probability of the realization of the deferred tax assets include, but are not limited to:

- Earnings history;
- Projected future financial and taxable income based upon existing reserves and long-term estimates of commodity prices;
- The duration of statutory carry forward periods;
- Prudent and feasible tax planning strategies readily available that may alter the timing of reversal of the temporary difference;
- Nature of temporary differences and predictability of reversal patterns of existing temporary differences; and
- The sensitivity of future forecasted results to commodity prices and other factors.

The Company assesses available positive and negative evidence to estimate if sufficient future taxable income will be generated to utilize the existing deferred tax assets. A significant piece of objective negative evidence is recent pretax losses and/or expectations of future pretax losses. Such objective evidence limits the ability to consider other subjective evidence including projections for future growth. The amount of the deferred tax asset considered realizable, however, could be adjusted if estimates of future taxable income during the carryforward period are increased or if objective negative evidence in the form of cumulative losses is no longer present and additional weight may be given to subjective evidence such as our projections for growth.

See *Note 7* of *Notes to Consolidated Financial Statements* for additional detail on the valuation allowance.

Pension Plan Accounting Assumptions

We are required to make a number of assumptions in estimating the future benefit obligations for, and fair value of assets included in, our pension plans, which impact the amount of liability and net periodic pension cost recognized related to our plans. These include assumptions for applicable discount rates, the expected rate of return on plan assets and the rate of future employee compensation increases. See *Note 6* of *Notes to Consolidated Financial Statements* for more information on the accounting for our pension plans and the related assumptions.

New Accounting Pronouncements

Accounting Standards Updates Adopted

In December 2019, the FASB issued ASU No. 2019-12 Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes. The update contains a number of provisions intended to simplify the accounting for income taxes. The update is effective for fiscal years beginning after December 15, 2020, with early adoption permitted. We adopted the update as of January 1, 2021, which did not have a material impact on our consolidated financial statements or disclosures.

Accounting Standards Updates to Become Effective in Future Periods

In August 2020, the FASB issued ASU No. 2020-06 Debt - Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible Instruments and Contracts in an Entity's Own Equity. The update is to address issues identified as a result of the complexity associated with applying generally accepted accounting principles to certain financial instruments with characteristics of liabilities and equity. The update is effective for fiscal years beginning after December 15, 2021, including interim periods within those fiscal years and with early adoption permitted. We are evaluating the impact of this update on our consolidated financial statements.

Guarantor Subsidiaries

Presented below are Hecla's condensed consolidating financial statements as required by Rule 3-10 of Regulation S-X of the Securities Exchange Act of 1934, as amended, resulting from the guarantees by certain of Hecla's subsidiaries of the Senior Notes and IQ Notes (see *Note 9* of *Notes to Consolidated Financial Statements* for more information). The Guarantors consist of the following of Hecla's 100%-owned subsidiaries: Hecla Limited; Silver Hunter Mining Company; Rio Grande Silver, Inc.; Hecla MC Subsidiary, LLC; Hecla Silver Valley, Inc.; Burke Trading, Inc.; Hecla Montana, Inc.; Revett Silver Company; RC Resources, Inc.; Troy Mine Inc.; Revett Exploration, Inc.; Revett Holdings, Inc.; Mines Management, Inc.; Newhi, Inc.; Montanore Minerals Corp.; Hecla Alaska LLC; Hecla Greens Creek Mining Company; Hecla Admiralty Company; Hecla Juneau Mining Company; Klondex Holdings Inc.; Klondex Gold & Silver Mining Co.; Klondex Midas Holdings Limited; Klondex Aurora Mine Inc.; Klondex Hollister Mine Inc.; and Hecla Quebec, Inc. We completed the offering of the Senior Notes on February 19, 2020 under our shelf registration statement previously filed with the SEC. We issued the IQ Notes in four equal tranches between July and October 2020.

The condensed consolidating financial statements below have been prepared from our financial information on the same basis of accounting as the consolidated financial statements set forth elsewhere in this report. Investments in the subsidiaries are accounted for under the equity method. Accordingly, the entries necessary to consolidate Hecla, the Guarantors, and our non-guarantor subsidiaries are reflected in the intercompany eliminations column. In the course of preparing consolidated financial statements, we eliminate the effects of various transactions conducted between Hecla and its subsidiaries and among the subsidiaries. While valid at an individual subsidiary level, such activities are eliminated in consolidation because, when taken as a whole, they do not represent business activity with third-party customers, vendors, and other parties. Examples of such eliminations include the following:

- ***Investments in subsidiaries***. The acquisition of a company results in an investment in debt or equity capital on the records of the parent company and a contribution to debt or equity capital on the records of the subsidiary. Such investments and capital contributions are eliminated in consolidation.

- ***Capital contributions***. Certain of Hecla's subsidiaries do not generate cash flow, either at all or that is sufficient to meet their capital needs, and their cash requirements are routinely met with inter-company advances from their parent companies. Generally on an annual basis, when not otherwise intended as debt, the boards of directors of such parent companies declare contributions of capital to their subsidiary companies, which increase the parents' investment and the subsidiaries' additional paid-in capital. In consolidation, investments in subsidiaries and related additional paid-in capital are eliminated.

- ***Debt.*** At times, inter-company debt agreements have been established between certain of Hecla's subsidiaries and their parents. The related debt liability and receivable balances, accrued interest expense (if any) and income activity (if any), and payments of principal and accrued interest amounts (if any) by the subsidiary companies to their parents are eliminated in consolidation.

- ***Dividends.*** Certain of Hecla's subsidiaries which generate cash flow routinely provide cash to their parent companies through inter-company transfers. On at least an annual basis, the boards of directors of such subsidiary companies declare dividends to their parent companies, which reduces the subsidiaries' retained earnings and increases the parents' dividend income. In consolidation, such activity is eliminated.

- ***Deferred taxes***. Our ability to realize deferred tax assets and liabilities is considered for two consolidated tax groups of subsidiaries within the United States: The Nevada U.S. Group and the Hecla U.S. Group. Within each tax group, all subsidiaries' estimated future taxable income contributes to the ability of their tax group to realize all such assets and liabilities. However, when Hecla's subsidiaries are viewed independently, we use the separate return method to assess the realizability of each subsidiary's deferred tax assets and whether a valuation allowance is required against such deferred tax assets. In some instances, a parent company or subsidiary may possess deferred tax assets whose realization depends on the future taxable income of other subsidiaries on a consolidated-return basis, but would not be considered realizable if such parent or subsidiary filed on a separate stand-alone basis. In such a situation, a valuation allowance is assessed on that subsidiary's deferred tax assets, with the resulting adjustment reported in the eliminations column of the guarantor and parent's financial statements, as is the case in the financial statements set forth below. The separate return method can result in significant eliminations of deferred tax assets and liabilities and related income tax provisions and benefits. Non-current deferred tax asset balances are included in other non-current assets on the consolidating balance sheets and make up a large portion of that item, particularly for the guarantor balances.

Separate financial statements of the Guarantors are not presented because the guarantees by the Guarantors are joint and several and full and unconditional, except for certain customary release provisions, including: (1) the sale or disposal of all or substantially all of the assets of the Guarantor; (2) the sale or other disposition of the capital stock of the Guarantor; (3) the Guarantor is designated as an unrestricted entity in accordance with the applicable provisions of the indenture; (4) Hecla ceases to be a borrower as defined in the indenture; and (5) upon legal or covenant defeasance or satisfaction and discharge of the indenture.

Condensed Consolidating Balance Sheets

	As of December 31, 2021				
	Parent	Guarantors	Non-Guarantors	Eliminations	Consolidated
			(in thousands)		
Assets					
Cash and cash equivalents	$ 175,108	$ 14,082	$ 20,820	$ —	$ 210,010
Other current assets	3,083	127,277	1,257	—	131,617
Properties, plants, equipment and mineral interests - net	1,913	2,300,651	8,246	—	2,310,810
Intercompany receivable (payable)	(237,252)	(229,707)	219,409	247,550	—
Investments in subsidiaries	1,562,706	—	—	(1,562,706)	—
Other non-current assets	352,280	23,897	(125,731)	(174,075)	76,371
Total assets	$ 1,857,838	$ 2,236,200	$ 124,001	$ (1,489,231)	$ 2,728,808
Liabilities and Stockholders' Equity					
Current liabilities	$ (436,699)	$ 233,456	$ 1,122	$ 362,504	$ 160,383
Long-term debt	508,095	17,200	526	—	525,821
Non-current portion of accrued reclamation	—	99,516	4,456	—	103,972
Non-current deferred tax liability	1,764	436,971	—	(289,029)	149,706
Other non-current liabilities	23,891	3,578	670	—	28,139
Stockholders' equity	1,760,787	1,445,479	117,227	(1,562,706)	1,760,787
Total liabilities and stockholders' equity	$ 1,857,838	$ 2,236,200	$ 124,001	$ (1,489,231)	$ 2,728,808

Condensed Consolidating Statements of Operations

	Year Ended December 31, 2021				
	Parent	Guarantors	Non-Guarantors	Eliminations	Consolidated
			(in thousands)		
Revenues	$ (544)	$ 807,841	$ 176	$ —	$ 807,473
Cost of sales	4,674	(422,444)	(109)	—	(417,879)
Depreciation, depletion, and amortization	(152)	(171,641)	—	—	(171,793)
General and administrative	(13,832)	(19,943)	(795)	—	(34,570)
Exploration and pre-development	(182)	(42,195)	(5,524)	—	(47,901)
Fair value adjustments, net	(34,017)	1,747	(3,522)	—	(35,792)
Equity in earnings of subsidiaries	(225,671)	—	—	225,671	—
Other income (expense)	237,033	(62,790)	(10,495)	(257,760)	(94,012)
(Loss) income before income taxes	(32,691)	90,575	(20,269)	(32,089)	5,526
Benefit (provision) from income and mining taxes	67,786	(292,705)	(3,272)	257,760	29,569
Net income (loss)	35,095	(202,130)	(23,541)	225,671	35,095
Preferred stock dividends	(552)	—	—	—	(552)
Income (loss) applicable to common stockholders	34,543	(202,130)	(23,541)	225,671	34,543
Net income (loss)	35,095	(202,130)	(23,541)	225,671	35,095
Changes in comprehensive income (loss)	4,433	—	—	—	4,433
Comprehensive income (loss)	$ 39,528	$ (202,130)	$ (23,541)	$ 225,671	$ 39,528

Condensed Consolidating Statements of Cash Flows

	Year Ended December 31, 2021				
	Parent	Guarantors	Non-Guarantors	Eliminations	Consolidated
			(in thousands)		
Cash flows from operating activities	$ (289,567)	$ 287,187	$ (16,895)	$ 239,612	$ 220,337
Cash flows from investing activities:					
Additions to properties, plants, equipment and mineral interests	—	(108,905)	(143)	—	(109,048)
Other investing activities, net	176,114	2,888	—	(176,983)	2,019
Cash flows from financing activities:					
Dividends paid to stockholders	(20,672)	—	—	—	(20,672)
Repayments of debt	—	(7,285)	—	—	(7,285)
Other financing activity	219,977	(170,887)	8,898	(62,629)	(4,641)
Effect of exchange rate changes on cash	—	(318)	(212)	—	(530)
Changes in cash, cash equivalents and restricted cash and cash equivalents	85,852	2,680	(8,352)	—	80,180
Beginning cash, cash equivalents and restricted cash and cash equivalents	89,256	12,455	29,172	—	130,883
Ending cash, cash equivalents and restricted cash and cash equivalents	$ 175,108	$ 15,135	$ 20,820	$ —	$ 211,063

Forward-Looking Statements

The foregoing discussion and analysis, as well as certain information contained elsewhere in this report, contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Exchange Act, and are intended to be covered by the safe harbor created thereby. See the discussion in *Special Note on Forward-Looking Statements* included prior to *Item 1*.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

The following discussion about our exposure to market risks and risk-management activities includes forward-looking statements that involve risk and uncertainties, as well as summarizes the financial instruments held by us at December 31, 2021 which are sensitive to changes in commodity prices, foreign exchange rates and interest rates and are not held for trading purposes. Actual results could differ materially from those projected in the forward-looking statements. In the normal course of business, we also face risks that are either non-financial or non-quantifiable (see *Item 1A. Risk Factors* above).

Metals Prices

Changes in the market prices of silver, gold, lead and zinc can significantly affect our profitability and cash flow. As discussed in *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations - Critical Accounting Estimates*, metals prices can fluctuate due to numerous factors beyond our control. As discussed below, we utilize financially-settled forward and put option contracts to manage our exposure to changes in prices for silver, gold, zinc and lead.

Provisional Sales

Sales of all metals products sold directly to customers, including by-product metals, are recorded as revenues when performance obligations have been completed and the transaction price can be determined or reasonably estimated. For concentrate sales, revenues are generally recorded at the time of shipment at forward prices for the estimated month of settlement. Due to the time elapsed between shipment to the customer and the final settlement with the customer we must estimate the prices at which sales of our concentrates will be settled. Previously recorded sales are adjusted to estimated settlement metals prices until final settlement by the customer. Changes in metals prices between shipment and final settlement will result in changes to revenues previously recorded upon shipment. Metals prices can and often do fluctuate widely and are affected by numerous factors beyond our control (see *Item 1A. Risk Factors – A substantial or extended decline in metals prices would have a material adverse effect on us*). At December 31, 2021, metals contained in concentrate sales and exposed to future price changes totaled approximately 2.1 million ounces of silver, 6,224 ounces of gold, 13.8 million pounds of zinc, and 6.3 million pounds of lead. If the price for each metal were to change by 10%, the change in the total value of the concentrates sold would be approximately $11.6 million. However, as discussed in *Commodity-Price Risk Management* below, at times, subject to management's discretion, we utilize a program designed and intended to mitigate the risk of price adjustments with limited mark-to-market financially-settled forward contracts for our silver, gold, zinc and lead sales. Therefore, the impact of changes in prices on the value of concentrates sold would be substantially offset by a gain or loss on forward contracts to the extent such contracts are utilized.

Commodity-Price Risk Management

We may at times use commodity forward sales commitments, commodity swap contracts and commodity put and call option contracts to manage our exposure to fluctuation in the prices of certain metals we produce. Contract positions are designed to ensure that we will receive a defined minimum price for certain quantities of our production, thereby partially offsetting our exposure to fluctuations in market prices. Our risk management policy allows for up to 75% of our planned metals price exposure for five years into the future, with certain other limitations, to be covered under such programs that would establish a ceiling for prices to be realized on future sales. These instruments do, however, expose us to (i) credit risk in the event of non-performance by counterparties for contracts in which the contract price exceeds the spot price of a commodity and (ii) price risk to the extent that the spot price exceeds the contract price for quantities of our production covered under contract positions.

We are currently using financially-settled forward contracts to manage the exposure to changes in prices of silver, gold, zinc and lead contained in our concentrate shipments between the time of shipment and final settlement. In addition, we are using financially-settled forward contracts to manage the exposure to changes in prices of zinc and lead (but not silver and gold) contained in our forecasted future concentrate shipments. The following tables summarize the quantities of metals committed under forward sales contracts at December 31, 2021 and December 31, 2020:

December 31, 2021	**Ounces/pounds under contract (in 000's)**				**Average price per ounce/pound**			
	Silver (ounces)	**Gold (ounces)**	**Zinc (pounds)**	**Lead (pounds)**	**Silver (ounces)**	**Gold (ounces)**	**Zinc (pounds)**	**Lead (pounds)**
Contracts on provisional sales								
2022 settlements	1,814	6	13,371	4,575	$ 23.02	$ 1,812	$ 1.39	$ 0.96
Contracts on forecasted sales								
2022 settlements	—	—	57,706	59,194	N/A	N/A	$ 1.28	$ 0.98
2023 settlements	—	—	76,280	71,650	N/A	N/A	$ 1.29	$ 1.00

December 31, 2020	**Ounces/pounds under contract (in 000's)**				**Average price per ounce/pound**			
	Silver (ounces)	**Gold (ounces)**	**Zinc (pounds)**	**Lead (pounds)**	**Silver (ounces)**	**Gold (ounces)**	**Zinc (pounds)**	**Lead (pounds)**
Contracts on provisional sales								
2021 settlements	1,282	4	23,314	4,905	$ 25.00	$ 1,858	$ 1.19	$ 0.90
Contracts on forecasted sales								
2021 settlements	—	—	41,577	30,876	N/A	N/A	$ 1.17	$ 0.88
2022 settlements	—	—	18,519	—	N/A	N/A	$ 1.28	N/A

Effective November 1, 2021, we designated the contracts for lead and zinc contained in our forecasted future shipments as hedges for accounting purposes, with gains and losses deferred to accumulated other comprehensive loss until the hedged product ships. Prior to November 1, 2021, these contracts were not designated as hedges for accounting purposes and were therefore marked-to-market through earnings each period. The forward contracts for silver and gold contained in our concentrate shipments have not been designated as hedges and are marked-to-market through earnings each period.

At December 31, 2021 and 2020, we recorded the following balances for the fair value of forward and put option contracts held at that time (in millions):

	December 31, 2021			December 31, 2020		
Balance sheet line item:	Contracts in an asset position	Contracts in a liability position	Net asset (liability)	Contracts in an asset position	Contracts in a liability position	Net asset (liability)
Other current assets	$ —	$ —	$ —	$ 0.2	$ (0.2)	$ —
Other non-current assets	—	—	—	0.5	(0.1)	0.4
Current derivatives liability	0.7	(20.1)	(19.4)	0.1	(11.8)	(11.7)
Non-current derivatives liability	0.4	(18.9)	(18.5)	—	—	—

Net unrealized losses of approximately $14.6 million related to the effective portion of the contracts designated as hedges were included in accumulated other comprehensive loss as of December 31, 2021, and are net of related deferred taxes. Unrealized gains and losses will be transferred from accumulated other comprehensive loss to current earnings as the underlying operating expenses are recognized. We estimate approximately $3.4 million in net unrealized losses included in accumulated other comprehensive loss as of December 31, 2021 would be reclassified to current earnings in the next twelve months. We recognized a $0.5 million net loss during 2021 on the contracts utilized to manage exposure to prices of metals in our concentrate shipments, which is included in sales of products. The net loss recognized on the contracts offsets gains related to price adjustments on our provisional concentrate sales, both of which resulted from changes to silver, gold, lead and zinc prices between the time of sale and final settlement.

We recognized a $32.9 million net loss during 2021 on the contracts utilized to manage exposure to changes in prices for forecasted future sales prior to their hedge designation. The net loss on these contracts is included in the fair value adjustments, net line item under other income (expense), as they relate to forecasted future sales, as opposed to sales that have already taken place but are subject to final pricing (as discussed in the preceding paragraph). The net loss for 2021 is the result of increasing zinc and lead prices. During the third quarter of 2019, we settled, prior to their maturity date, contracts in a gain position for cash proceeds to us of approximately $6.7 million, with no such early settlements in 2021 or 2020. These programs, when utilized and the contracts are not settled prior to their maturity, are designed to mitigate the impact of potential future declines in silver, gold, zinc and lead prices from the price levels established in the contracts (see average price information above). When those prices increase compared to the contract prices, we incur losses on the contracts.

Foreign Currency

We operate or have mining interests in Canada and Mexico, which exposes us to risks associated with fluctuations in the exchange rates between the USD and CAD and MXN, respectively. We have determined the functional currency for our Canadian and Mexican operations is the USD. As such, foreign exchange gains and losses associated with the re-measurement of monetary assets and liabilities from CAD and MXN to USD are recorded to earnings each period. For the year ended December 31, 2021, we recognized a net foreign exchange gain of $0.4 million. Foreign currency exchange rates are influenced by a number of factors beyond our control. A 10% change in the exchange rate between the USD and CAD from the rate at December 31, 2021 would have resulted in a change of approximately $11.2 million in our net foreign exchange gain or loss. A 10% change in the exchange rate between the USD and MXN from the rate at December 31, 2021 would have resulted in a change of approximately $0.2 million in our net foreign exchange gain or loss.

We utilize a program to manage our exposure to fluctuations in the exchange rate between the USD and CAD and the impact on our future operating costs denominated in CAD. In November 2021, we initiated a similar program related to future development costs denominated in CAD, and have used a similar program, on a limited basis, related to interest payments on our IQ Notes (see *Note 9* of *Notes to Consolidated Financial Statements*). The programs utilize forward contracts to buy CAD. Each contract related to operating costs is designated as a cash flow hedge, while contracts related to development and interest costs have not been designated as hedges as of December 31, 2021. As of December 31, 2021, we had 166 forward contracts outstanding to buy a total of CAD$318.8 million having a notional amount of US$245.3 million. The CAD contracts are related to cash operating costs at Casa Berardi forecasted to be incurred from 2022 through 2025 and have CAD-to-USD exchange rates ranging between 1.2702 and 1.3753. Our risk management policy allows for up to 75% of our planned cost exposure for five years into the future to be covered under such programs, and for potential additional programs to manage other foreign currency-related exposure areas. These instruments do, however, expose us to (i) credit risk in the form of non-performance by counterparties for contracts in which the contract exchange rate exceeds the spot exchange rate of a currency and (ii) exchange rate risk to the extent that the spot exchange rate exceeds the contract exchange rate for amounts of our operating costs covered under contract positions.

As of December 31, 2021 and 2020, we recorded the following balances for the fair value of the contracts (in millions):

	December 31,	
Balance sheet line item:	**2021**	**2020**
Other current assets	$ 2.7	$ 3.5
Other non-current assets	2.5	4.2

Net unrealized gains of approximately $5.2 million related to the effective portion of the hedges were included in accumulated other comprehensive loss as of December 31, 2021, and are net of related deferred taxes. Unrealized gains and losses will be transferred from accumulated other comprehensive loss to current earnings as the underlying operating expenses are recognized. We estimate approximately $2.7 million in net unrealized gains included in accumulated other comprehensive loss as of December 31, 2021 would be reclassified to current earnings in the next twelve months. Net realized gains of approximately $4.7 million on contracts related to underlying expenses which have been recognized were transferred from accumulated other comprehensive loss and included in cost of sales and other direct production costs in 2021. Net unrealized losses of approximately $0.2 million related to contracts not designated as hedges and no net unrealized gains or losses related to ineffectiveness of the hedges were included in fair value adjustments, net on our consolidated statements of operations and comprehensive income (loss) for the year ended December 31, 2021.

Interest Rates

We have a $250 million credit facility, and amounts drawn on the facility are subject to variable rates of interest based on a spread over the London Interbank Offered Rate or an alternative base rate. Interest rates fluctuate due to economic factors beyond our control. We had no amount drawn under the facility as of December 31, 2021. See *Note 9* of *Notes to Consolidated Financial Statements* for more information on our credit facility.

Item 8. Financial Statements and Supplementary Data

Our Consolidated Financial Statements are included herein beginning on page F-1. Financial statement schedules are omitted as they are not applicable or the information required in the schedule is already included in the Consolidated Financial Statements.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosures

None.

Item 9A. Controls and Procedures

Disclosure Controls and Procedures

An evaluation was performed under the supervision and with the participation of management, including the CEO and Chief Financial Officer ("CFO"), of the effectiveness of the design and operation of our disclosure controls and procedures as required by Exchange Act Rules 13a-15(e) and 15(d)-15(e) as of the end of the reporting period covered by this report. Based on that evaluation, our CEO and CFO concluded that our disclosure controls and procedures, including controls and procedures designed to ensure that information required to be disclosed by us is accumulated and communicated to our management (including our CEO and CFO), were effective as of December 31, 2021 in assuring them in a timely manner that material information required to be disclosed in this report has been properly recorded, processed, summarized and reported.

Management's Annual Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over our financial reporting, which is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles in the United States of America.

Because of its inherent limitations, any system of internal control over financial reporting, no matter how well designed, may not prevent or detect misstatements due to the possibility that a control can be circumvented or overridden or that misstatements due to error or fraud may occur that are not detected. Also, because of changes in conditions, internal control effectiveness may vary over time.

Management assessed the effectiveness of our internal control over financial reporting as of December 31, 2021, using criteria established in Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") and concluded that we have maintained effective internal control over financial reporting as of December 31, 2021, based on these criteria.

Our internal control over financial reporting as of December 31, 2021 has been audited by BDO USA, LLP, an independent registered public accounting firm, as stated in the attestation report which is included herein.

Changes in Internal Control over Financial Reporting

There have been no changes in our internal control over financial reporting during the quarter ended December 31, 2021, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors
Hecla Mining Company
Coeur d'Alene, Idaho

Opinion on Internal Control over Financial Reporting

We have audited Hecla Mining Company's (the "Company's") internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (the "COSO criteria"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheets of the Company as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive income (loss), changes in stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2021, and the related notes and our report dated February 22, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Item 9A, Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit of internal control over financial reporting in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ BDO USA, LLP
Spokane, Washington
February 22, 2022

Item 9B. Other Information

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

In accordance with our restated certificate of incorporation, our board of directors is divided into three classes. The terms of office of the directors in each class expire at different times. The directors are elected for three-year terms. The Effective Dates listed below for each director indicate their current term of office. All officers are elected for a term which ordinarily expires on the date of the meeting of the board of directors immediately following the annual meeting of stockholders. The positions and ages listed below for our current directors and officers are as of the scheduled date of our next annual meeting of stockholders in May 2022. There are no arrangements or understandings between any of the directors or officers and any other person(s) pursuant to which such directors or officers were elected.

	Age at May 26, 2022	Position and Committee Assignments	Effective Dates
Phillips S. Baker, Jr.	62	President and CEO, Director (1)	5/21 — 5/22 5/20 — 5/23
Russell D. Lawlar	42	Senior Vice President, Chief Financial Officer and Treasurer	3/21 — 5/22
Lauren M. Roberts	56	Senior Vice President and Chief Operating Officer	5/21 — 5/22
Michael L. Clary	54	Senior Vice President - Chief Administrative Officer	6/21 — 5/22
Kurt D. Allen	60	Vice President - Exploration	6/21 — 5/22
David C. Sienko	53	Vice President and General Counsel	5/21 — 5/22
Robert D. Brown	53	Vice President – Corporate Development & Sustainability	8/21 — 5/22
Ted Crumley	77	Director and Chairman of the Board (1,4)	5/19 — 5/22
Catherine J. Boggs	67	Director (2,3,4)	5/21 — 5/24
George R. Johnson	73	Director (2,3,5)	5/20 — 5/23
Alice Wong	62	Director (2,5)	2/21 — 5/23
Stephen F. Ralbovsky	68	Director (2,3)	5/21 — 5/24
Terry V. Rogers	75	Director (1,4,5)	5/19 — 5/22
Charles B. Stanley	63	Director (4,5)	5/19 — 5/22

(1) Member of Executive Committee

(2) Member of Audit Committee

(3) Member of Governance and Social Responsibility Committee

(4) Member of Compensation Committee

(5) Member of Health, Safety, Environmental and Technical Committee

Phillips S. Baker, Jr., has been our Chief Executive Officer since May 2003 and has served as our President and as a member of the Board of Directors since November 2001. Mr. Baker served as Chairman of the Board for the National Mining Association from October 2017 to October 2020, and as a director for QEP Resources, Inc. from May 2010 to March 2021. He began his career in the mining industry in 1986 and has been an officer or director of many public companies since 1990.

Russell D. Lawlar was appointed Senior Vice President and Chief Financial Officer in March 2021. He was appointed Treasurer in February 2018. Mr. Lawlar has held various positions of increasing responsibility since 2010, including being the Controller at the Company's Greens Creek operation from February 2015 to February 2018.

Lauren M. Roberts was appointed Senior Vice President and Chief Operating Officer in August 2019. Prior to that, Mr. Roberts was Chief Operating Officer for Kinross Gold Corporation from October 2016 to April 2019, and Senior Vice President, Corporate Development for Kinross Gold Corporation from November 2015 to October 2016. He previously worked for Hecla in various roles from January 1989 to November 1996.

Michael L. Clary was appointed Senior Vice President – Chief Administrative Officer in July 2021. Prior to that, he was Vice President – Human Resources and Senior Counsel from March 2020 to June 2021. Mr. Clary also served in various roles for the Company, including Director – Human Resources and Senior Counsel from July 2018 to March 2020 and Senior Counsel from April 2006 to July 2018. He has also held a number of positions at the Company's operations in both Idaho and Nevada, including Controller/HR Manager at the Lucky Friday mine when he first joined Hecla in February 1994.

Kurt D. Allen was appointed Vice President – Exploration in July 2021. Prior to his appointment he was Director of Exploration from October 2019 to July 2021. Prior to that, Mr. Allen held various geology positions with Hecla in both exploration and operations including Director of New Projects from June 2012 to June 2019. He also held a number of positions at the Company's operations in Idaho, Mexico, and Nevada from June 1987 to June 2012.

David C. Sienko was appointed Vice President and General Counsel in January 2010. Prior to his appointment, Mr. Sienko was a partner with the law firm K&L Gates LLP from 2004 to January 2010, where he specialized in securities, mergers and acquisitions, and corporate governance.

Robert D. Brown was appointed Vice President - Corporate Development & Sustainability in August 2021, and prior to that was Vice President – Corporate Development from January 2016 to August 2021. He was also appointed as President of our Canadian subsidiary, Hecla Canada Ltd. in August 2021, and prior to that was Vice President – Corporate Development of Hecla Canada Ltd. from January 2016 to August 2021. Prior to joining Hecla, Mr. Brown was President of Septemus Consulting Ltd. (a private consulting firm providing technical and corporate support for exploration, development, and production companies) from October 2011 to December 2015.

Ted Crumley has served as a director since 1995 and became Chairman of the Board in May 2006. Mr. Crumley served as the Executive Vice President and Chief Financial Officer of OfficeMax Incorporated (a distributor of office products) from January 2005 until his retirement in December 2005, and as Senior Vice President from November 2004 to January 2005. Prior to that, Mr. Crumley was Senior Vice President and Chief Financial Officer of Boise Cascade Corporation (a wood and paper company), from 1994 to 2004.

Catherine "Cassie" J. Boggs has served as a director since January 2017. Ms. Boggs was the General Counsel at Resource Capital Funds (a mining-focused private equity firm) from January 2011 until her retirement in February 2019. She has served as a board member of Capital Limited (a global drilling company, listed on the London Stock Exchange) since September 2021, and as an Intermittent Expert in mining with the US Department of Commerce's Commercial Law Development Program since November 2019. Ms. Boggs was a board member of Funzeleo (a non-profit dedicated to inspiring and preparing youth for high-demand science and math-based careers) from January 2016 to September 2021, as well as serving as a board member and President of the Rocky Mountain Mineral Law Foundation (a non-profit organization dedicated to the study of laws and regulations relating to mining, oil and gas, energy, public lands, water, environmental and international law) from July 2011 to July 2015. She served on the board of US Energy Corp. (an oil and gas company) from June 2019 to December 2019. She is also currently serving as an Adjunct Professor at the University of Denver, Sturm College of Law.

George R. Johnson has served as a director since March 2016. Mr. Johnson was Senior Vice President of Operations of B2Gold Corporation (a Canadian-based gold producing company) from August 2009 until his retirement in April 2015. He has served on the Board of Directors of B2Gold Corporation since March 2016.

Alice Wong has served as a director since February 2021. Ms. Wong has served as Senior Vice President and Chief Corporate Officer of Cameco Corporation since 2011. She was Cameco's Vice President of Safety, Health, Environment, Quality and Regulatory Relations from 2008 to 2011, and Vice President of Investor, Corporate and Government Relations from 2005 to 2008. She has been a Board member of SaskEnergy Incorporated (a natural gas distribution crown corporation) since December 2016, as well as a member of the Mining Association of Canada since June 2016, Canadian Nuclear Association since January 2013, and Saskatchewan Mining Association since January 2013. In 2021, she was named a Catalyst Honours Champion in recognition of her significant contributions to advancing women and championing inclusion in the workplace and being a role model for inclusive leadership in corporate Canada.

Stephen F. Ralbovsky has served as a director since March 2016. Mr. Ralbovsky has been the founder and principal of Wolf Sky Consulting LLC (a tax consulting firm) since June 2014. Prior to that, he was a partner with PricewaterhouseCoopers LLP (an accounting firm) from February 1987 until his retirement in June 2014, where he concentrated his practice on public companies operating in the mining industry. Mr. Ralbovsky is a part-time Professor of Practice at the University of Arizona James E. Rogers College of Law, where he teaches Global Mining Taxation, and is a member of several organizations, including AICPA, Arizona Society of CPAs, National Mining Association, and Society for Mining, Metallurgy and Exploration.

Terry V. Rogers has served as a director since May 2007. Mr. Rogers was the Senior Vice President and Chief Operating Officer of Cameco Corporation (a uranium producer) from February 2003 until his retirement in June 2007. He also served as a Director for Centerra Gold Inc. (a Canadian gold mining company) and its predecessor company, Cameco Gold, from February 2003 to May 2018.

Charles B. Stanley has served as a director since May 2007. Mr. Stanley is Managing Member of Cutthroat Energy, LLC (a private oil and gas producer). Prior to that, Mr. Stanley was Chief Executive Officer, President and Director of QEP Resources, Inc. (a natural gas and oil exploration and production company) from May 2010 until his retirement in January 2019, and Chairman of QEP's Board of Directors from May 2012 until his retirement in January 2019.

Information with respect to our directors is set forth under the caption "Proposal 1 - Election of Class III Directors" in our proxy statement to be filed pursuant to Regulation 14A for the annual meeting scheduled to be held on May 26, 2022 (the Proxy Statement), which information is incorporated herein by reference.

Reference is made to the information set forth in the first paragraph under the caption "Report of the Audit Committee," and under the caption "Corporate Governance and Related Matters," in the Proxy Statement to be filed pursuant to Regulation 14A, which information is incorporated herein by reference.

Reference is made to the information set forth under the caption "Available Information" in *Item 1* for information about the Company's Code of Conduct, which information is incorporated herein by reference.

There have been no material changes to the procedures by which stockholders may recommend director nominees.

Item 11. Executive Compensation

Reference is made to the information set forth under the caption "Compensation Discussion and Analysis;" the caption "Compensation of Named Executive Officers;" the caption "Compensation of Non-Management Directors;" the caption "Compensation Committee Interlocks and Insider Participation;" and the caption "Compensation Committee Report" in the Proxy Statement to be filed pursuant to Regulation 14A, which information is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Reference is made to the information set forth under the caption "Security Ownership of Certain Beneficial Owners and Management" and the caption "Equity Compensation Plan Information" in the Proxy Statement to be filed pursuant to Regulation 14A, which information is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence

Reference is made to the information set forth under the captions "Certain Relationships and Related Transactions" and "Director Independence" of the Proxy Statement to be filed pursuant to Regulation 14A, which information is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

Reference is made to the information set forth under the caption "Audit and Non-Audit Fees" in the Proxy Statement to be filed pursuant to Regulation 14A, which information is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) (1) Financial Statements

See Index to Financial Statements on Page F-1

(a) (2) Financial Statement Schedules

Not applicable

(a) (3) Exhibits

Hecla Mining Company and Wholly-Owned Subsidiaries

Form 10-K - December 31, 2021

Index to Exhibits

1.1	Equity Distribution Agreement, dated as of February 18, 2021, by and among Hecla Mining Company and the sales agents party thereto. Filed as exhibit 1.1 to Registrant's Current Report on Form 8-K filed on February 18, 2021 (File No. 1-8491) and incorporated herein by reference.
3.1	Restated Certificate of Incorporation of the Registrant. Filed as exhibit 3.1 to Registrant's Form 10-Q for the quarter ended March 31, 2018 (File No. 1-8491) and incorporated herein by reference.
3.2	Bylaws of the Registrant as amended to date. Filed as exhibit 3.2 to Registrant's Current Report on Form 8-K filed on August 23, 2021 (File No. 1-8491) and incorporated herein by reference.
4.1	Designations, Preferences and Rights of Series B Cumulative Convertible Preferred Stock of the Registrant. Included as Annex II to Restated Certificate of Incorporation of Registrant filed as exhibit 3.1 to Registrant's Form 10-Q for the quarter ended March 31, 2018 (File No. 1-8491) and incorporated herein by reference.
4.2	Registration Rights Agreement, dated as of April 29, 2021, between Hecla Mining Company and Waterton Nevada Splitter, LLC. Filed as exhibit 4.1 to Registrant's Registration Statement on Form S-3 filed on May 20, 2021 (File No. 1-8491) and incorporated herein by reference.
4.3	Registration Rights Agreement dated as of September 22, 2021, among Hecla Mining Company, as Issuer, and the Hecla Mining Company Retirement Plan Trust, which is the funding vehicle for the Hecla Mining Company Retirement Plan, a tax-qualified employee benefit pension plan sponsored by Hecla Mining Company, and the Lucky Friday Pension Plan Trust, which is the funding vehicle for the Lucky Friday Pension Plan. Filed as exhibit 4.1 to Registrant's Form 10-Q for the quarter ended September 30, 2021 (File No. 1-8491) and incorporated herein by reference.
4.4	Indenture, dated as of February 19, 2020, by and among Hecla Mining Company and The Bank of New York Mellon Trust Company, N.A., as trustee. Filed as exhibit 4.1 to Registrant's Current Report on Form 8-K filed on February 19, 2020 (File No. 1-8491) and incorporated herein by reference
4.5	First Supplemental Indenture, dated as of February 19, 2020, among Hecla Mining Company, as Issuer, certain subsidiaries of Hecla Mining Company, as Guarantors hereto, and the Bank of New York Mellon Trust, N.A., as Trustee. Filed as exhibit 4.2 to Registrant's Current Report on Form 8-K filed on February 19, 2020 (File No. 1-8491) and incorporated herein by reference.
4.6	Note Purchase Agreement, dated July 9, 2020, among Hecla Mining Company, as Issuer, certain subsidiaries of Hecla Mining Company, as Guarantors thereto, and Investissement Quebec. Filed as exhibit 10.1 to Registrant's Current Report on Form 8-K filed on July 10, 2020 (File No. 1-8491) and incorporated herein by reference.

4.7	Description of Securities. *
10.1	Form of Change of Control Agreement entered into on March 5, 2015, between Registrant and each of Phillips S. Baker, Jr., and David C. Sienko, on February 19, 2016 with Robert D. Brown, on August 5, 2019 with Lauren M. Roberts, on March 1, 2020 with Michael L. Clary, on March 1, 2021 with Russell D. Lawlar, and on July 1, 2021 with Kurt Allen. Filed as exhibit 10.2 to Registrant's Form 10-K for the year ended December 31, 2015 (File No. 1-8491) and incorporated herein by reference. (1)
10.2	Form of Indemnification Agreement dated November 8, 2006, between Registrant and Phillips S. Baker, Jr., and Ted Crumley. Identical Indemnification Agreements were entered into between the Registrant and Charles B. Stanley and Terry V. Rogers on May 4, 2007, David C. Sienko on January 29, 2010, Robert D. Brown on January 4, 2016, Stephen F. Ralbovsky and George R. Johnson on March 1, 2016, Catherine J. Boggs on January 1, 2017, Lauren M. Roberts on August 5, 2019, Alice Wong on February 26, 2021, Michael L. Clary on March 1, 2020, Russell D. Lawlar on March 1, 2021, and Kurt Allen on July 1, 2021. Filed as exhibit 10.7 to Registrant's Form 10-Q for the quarter ended September 30, 2006 (File No. 1-8491) and incorporated herein by reference. (1)
10.3	Hecla Mining Company Key Employee Deferred Compensation Plan (Amended, Restated and Effective May 19, 2021). Filed as Appendix A to Registrant's Definitive Proxy Statement on Schedule 14A filed on April 5, 2021 (File No 1-8491) and incorporated herein by reference. (1)
10.4	Hecla Mining Company 2010 Stock Incentive Plan (Amended and Restated as of August 21, 2021). Filed as exhibit 10.1 to Registrant's Form 10-Q for the quarter ended September 30, 2021 (File No. 1-8491) and incorporated herein by reference. (1)
10.5	Hecla Mining Company Short-Term Incentive Plan. Filed as exhibit 10.1 to Registrant's Form 10-Q for the quarter ended March 31, 2019 (File No. 1-8491) and incorporated herein by reference. (1)
10.6	Hecla Mining Company Executive and Senior Management Long-Term Performance Payment Plan (as Amended and Restated Effective January 1, 2017). Filed as exhibit 10.3 to Registrant's Form 10-Q for the quarter ended March 31, 2017 (File No. 8491) and incorporated herein by reference. (1)
10.7	Hecla Mining Company Retirement Plan for Employees and Supplemental Retirement and Death Benefit Plan. Filed as exhibit 10.17(a) to Registrant's Form 10-K for the year ended December 31, 2008 (File No. 1-8491) and incorporated herein by reference. (1)
10.8(a)	Hecla Mining Company Post-2004 Supplemental Excess Retirement Plan Master Plan Document, effective January 1, 2019. *
10.8(b)	Hecla Mining Company Pre-2005 Supplemental Excess Retirement Plan Master Plan Document, effective January 1, 2019. *
10.9	Hecla Mining Company Nonqualified Plans Master Trust Agreement. Filed as exhibit 10.5(c) to Registrant's Annual Report on Form 10-K for the year ended December 31, 1994 (File No. 1-8491) and incorporated herein by reference. (1)
10.10	Hecla Mining Company Stock Plan for Nonemployee Directors, as amended. Filed as exhibit 10.3 to Registrant's Form 10-Q for the quarter ended June 30, 2017 (File No. 1-8491) and incorporated herein by reference. (1)
21	List of subsidiaries of Registrant. *
23.1	Consent of BDO USA, LLP. *
23.2	Consent of Qualified Person for Technical Report Summary of Greens Creek Mine. *
23.3	Consent of Qualified Person for Technical Report Summary of Lucky Friday Mine. *
23.4	Consent of Qualified Person for Technical Report Summary of Casa Berardi Mine. *
31.1	Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002. *
31.2	Certification pursuant to Section 302 of Sarbanes-Oxley Act of 2002. *
32.1	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002. *
32.2	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002. *
95	Mine safety information listed in Section 1503 of the Dodd-Frank Act. *

96.1	Technical Report Summary on the Greens Creek Mine, Alaska, U.S.A. *
96.2	Technical Report Summary on the Lucky Friday Mine, Idaho, U.S.A. *
96.3	Technical Report Summary on the Casa Berardi Mine, Northwestern Québec, Canada. *
99.1	Contribution Agreement, dated as of September 22, 2021, among Hecla Mining Company, as sponsor of the Hecla Mining Company Retirement Plan, the Retirement Committee, as the named fiduciary of the Hecla Mining Company Retirement Plan, and U.S. Bank National Association, as trustee of the Hecla Mining Company Retirement Plan Trust. Filed as exhibit 99.1 to Registrant's Form 10-Q for the quarter ended September 30, 2021 (File No. 1-8491) and incorporated herein by reference.
99.2	Contribution Agreement, dated as of September 22, 2021, among Hecla Mining Company, Hecla Limited as sponsor of the Lucky Friday Pension Plan, the Pension Committee, as the named fiduciary of the Lucky Friday Pension Plan, and U.S. Bank National Association, as trustee of the Lucky Friday Pension Plan. Filed as exhibit 99.2 to Registrant's Form 10-Q for the quarter ended September 30, 2021 (File No. 1-8491) and incorporated herein by reference.
101.INS	Inline XBRL Instance Document - The instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document. **
101.SCH	Inline XBRL Taxonomy Extension Schema. **
101.CAL	Inline XBRL Taxonomy Extension Calculation. **
101.DEF	Inline XBRL Taxonomy Extension Definition. **
101.LAB	Inline XBRL Taxonomy Extension Labels. **
101.PRE	Inline XBRL Taxonomy Extension Presentation. **
104	Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).

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(1) Indicates a management contract or compensatory plan or arrangement.

*Filed herewith

**XBRL information is furnished and not filed or a part of a registration statement or prospectus for purposes of Section 11 or 12 of the Securities Act of 1933, as amended, is deemed not filed for purposes of Section 18 of the Securities and Exchange Act of 1934, as amended, and otherwise is not subject to liability under these sections.

Item 16. Form 10-K Summary

None.

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

HECLA MINING COMPANY

By: /s/ Phillips S. Baker, Jr.
Phillips S. Baker, Jr., President,
Chief Executive Officer and Director

Date: February 22, 2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

/s/ Phillips S. Baker, Jr.	February 22, 2022	/s/ Ted Crumley	February 22, 2022
Phillips S. Baker, Jr. President, Chief Executive Officer and Director (principal executive officer)	Date	Ted Crumley Director	Date
/s/ Russell D. Lawlar	February 22, 2022	/s/ Charles B. Stanley	February 22, 2022
Russell D. Lawlar Senior Vice President, Chief Financial Officer and Treasurer (principal financial and accounting officer)	Date	Charles B. Stanley Director	Date
/s/ Stephen F. Ralbovsky	February 22, 2022	/s/ Alice Wong	February 22, 2022
Stephen F. Ralbovsky Director	Date	Alice Wong Director	Date
/s/ Terry V. Rogers	February 22, 2022	/s/ Catherine J. Boggs	February 22, 2022
Terry V. Rogers Director	Date	Catherine J. Boggs Director	Date
/s/ George R. Johnson	February 22, 2022		
George R. Johnson Director	Date		

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Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors
Hecla Mining Company
Coeur d'Alene, Idaho

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Hecla Mining Company (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of operations and comprehensive income (loss), changes in stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2021, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021**,** in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") and our report dated February 22, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing a separate opinion on the critical audit matters or on the accounts or disclosures to which they relate.

Accounting for Income Taxes

As described in Notes 2 and 7 to the consolidated financial statements, the Company recorded deferred tax assets of $295.5 million, which are presented net of a valuation allowance of $39.2 million, and a net deferred tax liability of $399.7 million as of December 31, 2021. During 2021, the Company released $58.4 million of valuation allowance on its deferred tax assets in the U.S. jurisdiction. As of December 31, 2021, a $8.9 million valuation allowance remains in the U.S. group, $19.4 million in the Nevada Group, $3.2 million in the Canadian jurisdiction, and $7.7 million in the Mexican jurisdiction.

We identified the Company's estimate of its valuation allowance for the U.S. tax group as a critical audit matter. Specifically, the Company's evaluation of positive and negative evidence and estimates of future taxable income to determine the amount of valuation allowance required on its deferred tax assets involve significant management judgments. Auditing these elements involved especially challenging and subjective auditor judgment due to the nature, and extent of audit effort required to address these matters including the need for specialized knowledge and skill in assessing these estimates.

The primary procedures we performed to address this critical audit matter included:

- Evaluating positive and negative evidence supporting the estimate of the U.S. tax group's deferred tax asset valuation allowance including forecasted taxable income, and trends in metal market pricing.

- Testing the estimates included in management's future taxable income by 1) comparing expected production of base and precious metals, as well as production costs to previous years' actual results, 2) analyzing pricing estimates by obtaining supporting market data from third-party sources, and 3) developing independent expectations of the significant assumptions in management's forecasting models.

- Utilizing personnel with specialized knowledge, and skill to assist in analyzing management's estimate of its valuation allowance for the U.S. tax group.

Mineral Reserves and Resources and Impairment of Long-lived Assets

As discussed in Note 2 to the consolidated financial statements, reserves and resources are a key component in the valuation of properties, plants, equipment, and mineral interests. Management reviews and evaluates the net carrying value of all facilities, including idle facilities upon the occurrence of events or changes in circumstances that indicate that the related carrying amounts may not be recoverable. Tests for recoverability of each property is based on the estimated undiscounted future cash flows that will be generated from operations at each property, the estimated salvage value of the surface plant and equipment, and the value associated with property interests.

We identified the assessment of the net carrying values of the Company's properties and facilities as a critical audit matter, specifically assumptions underlying future cash flows that will be generated from the operations at each property. These assumptions include 1) metals to be recovered from proven and probable ore reserves, 2) metals prices, and 3) market values of mineral interests. Auditing these elements involved especially challenging and subjective auditor judgment due to the nature, and extent of audit effort required to address these matters.

The primary procedures we performed to address this critical audit matter included:

- Evaluating management's determination of properties and facilities with an identified triggering event in 2021 by assessing current operating results, and market prices.

- Assessing management's assumptions for metals prices underlying estimates of future cash flows, and market value of minerals in the carrying value models by comparing to prior five-year trends and agreeing to underlying market data from third-party sources.

- Testing management's assumptions for metals to be recovered from identified resources and exploration targets beyond proven and probable by agreeing the amounts to the Company's reserves and resources report and evaluating management's experts.

/s/ BDO USA, LLP

We have served as the Company's auditor since 2001.

Spokane, Washington
February 22, 2022

Hecla Mining Company and Subsidiaries

Consolidated Statements of Operations and Comprehensive Income (Loss)
(Dollars and shares in thousands, except per share amounts)

	Year Ended December 31,		
	2021	2020	2019
		Revised	Revised
Sales of products	$ 807,473	$ 691,873	$ 673,266
Cost of sales and other direct production costs	417,879	382,663	447,985
Depreciation, depletion and amortization	171,793	148,110	191,451
Total cost of sales	589,672	530,773	639,436
Gross profit	217,801	161,100	33,830
Other operating expenses:			
General and administrative	34,570	35,561	35,832
Exploration and pre-development	47,901	18,295	19,069
Provision for closed operations and environmental matters	14,571	3,929	4,690
Ramp-up and suspension costs	23,012	24,911	12,051
Loss on disposition of properties, plants, equipment and mineral interests	87	572	4,643
Other operating expense	14,240	10,854	4,223
Total other operating expenses	134,381	94,122	80,508
Income (loss) from operations	83,420	66,978	(46,678)
Other expense:			
Fair value adjustments, net	(35,792)	(11,806)	(5,437)
Foreign exchange loss, net	417	(4,605)	(8,236)
Other net expense	(574)	(2,256)	(4,429)
Interest expense, net	(41,945)	(49,569)	(48,447)
Total other expense:	(77,894)	(68,236)	(66,549)
Income (loss) before income taxes	5,526	(1,258)	(113,227)
Income and mining tax benefit (provision)	29,569	(8,199)	18,318
Net income (loss)	35,095	(9,457)	(94,909)
Preferred stock dividends	(552)	(552)	(552)
Income (loss) applicable to common stockholders	$ 34,543	$ (10,009)	$ (95,461)
Comprehensive income (loss):			
Net income (loss)	$ 35,095	$ (9,457)	$ (94,909)
Other comprehensive income (loss), net of tax:			
Unrealized gain (loss) and amortization of prior service on pension plans	16,740	(3,559)	(3,277)
Unrealized (loss) gain on derivative contracts designated as hedge transactions	(12,307)	7,980	8,436
Total change in accumulated other comprehensive income (loss), net	$ 4,433	$ 4,421	$ 5,159
Comprehensive income (loss)	$ 39,528	$ (5,036)	$ (89,750)
Basic income (loss) per common share after preferred dividends	$ 0.06	$ (0.02)	$ (0.19)
Diluted income (loss) per common share after preferred dividends	$ 0.06	$ (0.02)	$ (0.19)
Weighted average number of common shares outstanding – basic	536,192	527,329	490,449
Weighted average number of common shares outstanding – diluted	542,176	527,329	490,449

The accompanying notes are an integral part of the consolidated financial statements.

Hecla Mining Company and Subsidiaries
Consolidated Statements of Cash Flows
(In thousands)

	Year Ended December 31,		
	2021	**2020**	**2019**
		Revised	Revised
Operating activities:			
Net income (loss)	$ 35,095	$ (9,457)	$ (94,909)
Non-cash elements included in net income (loss):			
Depreciation, depletion and amortization	172,651	155,006	196,408
Fair value adjustments, net	15,040	(4,690)	7,079
Adjustment of inventory to net realizable value	6,524	—	1,399
Fee on prepayment of debt with shares of common stock	—	—	2,855
Loss on disposition of properties, plants, equipment and mineral interests	87	572	4,643
Provision for reclamation and closure costs	11,514	6,189	6,914
Deferred income taxes	(48,049)	(3,818)	(29,968)
Stock compensation	6,082	6,458	5,668
Amortization of loan origination fees	1,895	3,666	2,637
Foreign exchange (gain) loss	(79)	2,680	8,025
Other non-cash items	681	1,794	42
Changes in assets and liabilities:			
Accounts receivable	(5,405)	(1,080)	(10,939)
Inventories	16,919	(13,208)	16,146
Other current and non-current assets	(1,678)	2,381	15,618
Accounts payable and accrued liabilities	(795)	19,379	(24,355)
Accrued payroll and related benefits	1,270	14,445	9,226
Accrued taxes	6,457	3,561	(3,155)
Accrued reclamation and closure costs and other non-current liabilities	2,128	(3,085)	7,532
Net cash provided by operating activities	220,337	180,793	120,866
Investing activities:			
Additions to properties, plants, equipment and mineral interests	(109,048)	(91,016)	(121,421)
Purchase of carbon credits	(869)	—	—
Proceeds from sale or exchange of investments	1,811	—	1,760
Proceeds from disposition of properties, plants, equipment and mineral interests	1,077	331	183
Purchases of investments	—	(2,216)	(389)
Net cash used in investing activities	(107,029)	(92,901)	(119,867)
Financing activities:			
Proceeds from issuance of common stock, net of offering costs	—	—	49,019
Dividends paid to common and preferred stockholders	(20,672)	(9,152)	(5,466)
Debt issuance and credit facility fees paid	(116)	(1,356)	(976)
Acquisition of treasury shares from employee equity awards	(4,525)	(2,745)	(2,231)
Borrowings of debt	—	716,327	279,500
Repayments of debt	—	(716,500)	(279,500)
Repayments of finance leases	(7,285)	(5,953)	(7,157)

	Year Ended December 31,		
	2021	2020	2019
		Revised	Revised
Net cash (used in) provided by financing activities	(32,598)	(19,379)	33,189
Effect of exchange rates on cash	(530)	(1,107)	875
Net increase in cash, cash equivalents and restricted cash and cash equivalents	80,180	67,406	35,063
Cash, cash equivalents and restricted cash and cash equivalents at beginning of year	130,883	63,477	28,414
Cash, cash equivalents and restricted cash and cash equivalents at end of year	$ 211,063	$ 130,883	$ 63,477
Supplemental disclosure of cash flow information:			
Cash (paid) received during year for:			
Interest	$ (37,565)	$ (34,853)	$ (42,972)
Income and mining taxes	$ (12,105)	$ 7,913	$ (3,385)
Significant non-cash investing and financing activities:			
Adjustment to common stock and warrants issued for acquisition of another company	$ —	$ —	$ (325)
Addition of finance lease obligations	$ 4,870	$ 9,113	$ 6,506
Recognition of operating lease liabilities and right-of-use assets	$ 4,874	$ —	$ 22,365
Common stock contributed to pension plans	$ 22,250	$ 16,032	$ 3,600
Common stock issued for 401(k) match	$ 4,339	$ 4,624	$ 3,862
Payment of accrued compensation in restricted stock units	$ —	$ 5,096	$ 8,274
Common stock issued for prepayment of debt	$ —	$ —	$ 33,457
Equity securities received from exchange of investments	$ 3,626	$ —	$ —
Marketable equity securities received for sale of mineral interest	$ —	$ —	$ 2,257

See Notes 5 and 12 for additional non-cash investing and financing activities.

The accompanying notes are an integral part of the consolidated financial statements.

Hecla Mining Company and Subsidiaries
Consolidated Balance Sheets
(In thousands, except share and per share data)

	December 31,	
	2021	2020
		Revised
ASSETS		
Current assets:		
Cash and cash equivalents	$ 210,010	$ 129,830
Accounts receivable:		
Trade	36,437	27,864
Taxes		1,584
Other, net	8,149	9,745
Inventories:		
Concentrates, doré, stockpiled ore, and metals in transit and in-process	25,906	57,567
Materials and supplies	41,859	38,608
Other current assets	19,266	19,114
Total current assets	341,627	284,312
Investments	10,844	15,148
Restricted cash and investments	1,053	1,053
Properties, plants, equipment and mineral interests, net	2,310,810	2,378,074
Operating lease right-of-use assets	12,435	10,628
Deferred tax assets	45,562	2,912
Other non-current assets	6,477	8,083
Total assets	$ 2,728,808	$ 2,700,210
LIABILITIES		
Current liabilities:		
Accounts payable and accrued liabilities	$ 68,100	$ 68,516
Accrued payroll and related benefits	28,714	31,807
Accrued taxes	12,306	5,774
Finance leases	5,612	6,491
Operating leases	2,486	3,008
Accrued reclamation and closure costs	9,259	5,582
Accrued interest	14,454	14,157
Derivative liabilities	19,353	11,737
Other current liabilities	99	138
Total current liabilities	160,383	147,210
Finance leases	7,776	9,274
Operating leases	9,950	7,634
Accrued reclamation and closure costs	103,972	110,466
Long-term debt	508,095	507,242
Deferred tax liability	149,706	156,091
Pension liability	4,673	44,144
Derivatives liabilities	18,528	18
Other non-current liabilities	4,938	4,346
Total liabilities	968,021	986,425
Commitments and contingencies (*Notes 5, 6, 9, 10, 14 and 15*)		
STOCKHOLDERS' EQUITY		
Preferred stock, 5,000,000 shares authorized:		
Series B preferred stock, $0.25 par value, 157,816 shares issued and outstanding, liquidation preference — $7,891	39	39
Common stock, $0.25 par value, authorized 750,000,000 shares; issued 2021 — 545,534,760 shares and 2020 — 538,487,415 shares	136,391	134,629
Capital surplus	2,034,485	2,003,576
Accumulated deficit	(353,651)	(368,074)
Accumulated other comprehensive loss, net	(28,456)	(32,889)
Less treasury stock, at cost; 2021 — 7,395,295 and 2020 — 6,821,044 shares issued and held in treasury	(28,021)	(23,496)
Total stockholders' equity	1,760,787	1,713,785
Total liabilities and stockholders' equity	$ 2,728,808	$ 2,700,210

The accompanying notes are an integral part of the consolidated financial statements.

Hecla Mining Company and Subsidiaries
Consolidated Statements of Changes in Stockholders' Equity
For the Years Ended December 31, 2021, 2020 and 2019
(Dollars in thousands)

	Series B Preferred Stock	Common Stock	Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss, net	Treasury Stock	Total
				Revised			
Balances, January 1, 2019	$ 39	$ 121,956	$ 1,880,481	$ (248,845)	$ (42,469)	$ (20,736)	$ 1,690,426
Net loss	—	—	—	(94,909)	—	—	(94,909)
Adjustment to fair value of warrants issued for purchase of another company	—	—	(325)	—	—	—	(325)
Stock issued to directors (253,000 shares)	—	63	392	—	—	—	455
Common stock issued for cash, net of offering costs (21,410,000 shares)	—	5,353	43,666	—	—	—	49,019
Stock issued for 401(k) match (1,882,000 shares)	—	470	3,392	—	—	—	3,862
Restricted stock units granted	—	—	5,213	—	—	—	5,213
Common stock issued for prepayment of debt (10,655,000 shares)	—	2,664	30,793	—	—	—	33,457
Common stock ($0.01 per common share) and Series B Preferred stock ($2.63 per share) dividends declared	—	—	—	(5,466)	—	—	(5,466)
Common stock issued for employee incentive compensation (3,597,000 shares)	—	899	7,375	—	—	(1,595)	6,679
Common stock issued to pension plans (2,384,000 shares)	—	596	3,004	—	—	—	3,600
Restricted stock unit distributions (1,164,000 shares)	—	291	(291)	—	—	(636)	(636)
Other comprehensive income	—	—	—	—	5,159	—	5,159
Balances, December 31, 2019	39	132,292	1,973,700	(349,220)	(37,310)	(22,967)	1,696,534
Net loss	—	—	—	(9,457)	—	—	(9,457)
Stock issued to directors (391,000 shares)	—	97	1,389	—	—	—	1,486
Stock issued for 401(k) match (1,584,000 shares)	—	397	4,227	—	—	—	4,624
Restricted stock units granted	—	—	4,975	—	—	—	4,975
Restricted stock unit distributions (1,702,000 shares)	—	426	(426)	—	—	(1,479)	(1,479)
Common stock ($0.01625 per share) and Series B Preferred stock ($2.63 per share) dividends declared	—	—	—	(9,151)	—	—	(9,151)
Common stock issued for employee incentive compensation (2,800,000 shares)	—	700	4,396	—	—	(1,266)	3,830
Treasury shares issued to charitable foundation (650,000 shares)	—	—	—	(246)	—	2,216	1,970
Common stock issued to pension plans (2,869,000 shares)	—	717	15,315	—	—	—	16,032
Other comprehensive income	—	—	—	—	4,421	—	4,421
Balances, December 31, 2020	39	134,629	2,003,576	(368,074)	(32,889)	(23,496)	1,713,785
Net income	—	—	—	35,095	—	—	35,095
Stock issued to directors (207,000 shares)	—	52	1,792	—	—	—	1,844
Stock issued for 401(k) match (685,000 shares)	—	172	4,167	—	—	—	4,339
Restricted stock units granted	—	—	4,238	—	—	—	4,238
Restricted stock unit distributions (1,653,000 shares)	—	413	(413)	—	—	(4,525)	(4,525)
Common stock ($0.0375 per share) and Series B Preferred stock ($2.63 per share) dividends declared	—	—	—	(20,672)	—	—	(20,672)
Common stock issued to pension plans (4,500,000 shares)	—	1,125	21,125	—	—	—	22,250
Other comprehensive income	—	—	—	—	4,433	—	4,433
Balances, December 31, 2021	$ 39	$ 136,391	$ 2,034,485	$ (353,651)	$ (28,456)	$ (28,021)	$ 1,760,787

The accompanying notes are an integral part of the consolidated financial statements.

Note 1: The Company

Hecla Mining Company, and its affiliates and subsidiaries (collectively, "Hecla," "we," "us" or "the Company"), is the United States leading silver producer currently operating three mines, two silver mines in the United States and a gold mine in Quebec, Canada. The Company also has several exploration and pre-development projects in North America, including Nevada, Montana and Mexico. Hecla Mining Company is a Delaware corporation. Our current holding company structure dates from the incorporation of Hecla Mining Company in 2006 and the renaming of our subsidiary (previously Hecla Mining Company) as Hecla Limited. Hecla Limited was incorporated on October 14, 1891 as an Idaho Corporation in northern Idaho's Silver Valley. We believe we are the oldest operating precious metals mining company in the United States and the largest silver producer in the United States. Our corporate offices are in Coeur d'Alene, Idaho and Vancouver, British Columbia. The cash flow and profitability of the Company's operations are significantly affected by the market price of silver, gold, lead and zinc. The prices of silver, gold, lead and zinc are affected by numerous factors beyond our control.

References to "CAD" and "MXN" refer to the Canadian Dollar and Mexican Peso, respectively.

Note 2: Summary of Significant Accounting Policies

A. Principles of Consolidation, Basis of Presentation and Other Information — Our Consolidated Financial Statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP"), and include our accounts and our wholly-owned subsidiaries' accounts. All significant inter-company balances and transactions have been eliminated in consolidation.

The 2019 novel strain of coronavirus ("COVID-19") was characterized as a global pandemic by the World Health Organization on March 11, 2020, and COVID-19 resulted in travel restrictions and business slowdowns or shutdowns in affected areas. In late March 2020, the Government of Quebec ordered the mining industry to reduce to minimum operations as part of the fight against COVID-19, causing us to suspend our Casa Berardi operations from March 24, 2020 until April 15, 2020 when mining operations resumed. In early April 2020, the Government of Mexico issued a similar order causing us to suspend our San Sebastian operations until May 30, 2020. In addition, restrictions imposed by the State of Alaska in late March 2020 caused us to revise the normal operating procedures for staffing operations at Greens Creek. These suspension orders impacted us in the first half of 2020 by curtailing our expected production of gold at Casa Berardi by approximately 11,700 ounces, which resulted in a reduction in related revenue for that period. We continued to incur costs at Casa Berardi and San Sebastian while operations were suspended. At Casa Berardi and San Sebastian, suspension costs in 2020 totaled $1.6 million and $1.8 million, respectively. At Greens Creek, we incurred costs of approximately $1.0 million in 2021 and $2.3 million in 2020 related to quarantining employees from late March 2020 through the second quarter of 2021. In addition, silver production at Greens Creek in the third quarter of 2021 was 30% lower than in the third quarter of 2020 due to reduced ore grades as a result of mine sequencing, which was impacted by manpower challenges due to COVID-19 and increased competition for labor which we expect to mitigate through schedule changes and other means. At Casa Berardi, we incurred costs of approximately $2.4 million in 2021 related to COVID-19 procedures. At the Lucky Friday, San Sebastian and Nevada Operations units, COVID-19 procedures have been implemented without a significant impact on operating or suspension costs or production. It is possible that future restrictions at any of our operations could have an adverse impact on future operations or financial results beyond 2021.

We have taken precautionary measures to mitigate the impact of COVID-19, including implementing operational plans and practices. As long as they are required, the operational practices implemented could continue to have an adverse impact on our operating results due to deferred production and revenues or additional costs. We continue to monitor the rapidly evolving situation and guidance from federal, state, local and foreign governments and public health authorities and may take additional actions based on their recommendations. The extent of the impact of COVID-19 on our business and financial results will also depend on future developments, including the duration and spread of the outbreak and the success of the current vaccination programs being rolled out within the markets in which we operate and the related impact on prices, demand, creditworthiness and other market conditions and governmental reactions, all of which are highly uncertain.

In the third quarter of 2021, we identified immaterial errors impacting amounts reported for accumulated depreciation, depletion and amortization ("DDA") and DDA expense for Casa Berardi from June 1, 2013 through June 30, 2021. In connection with this DDA adjustment, we also revised our previously issued financial statements for recognition of deferred taxes related to the reclassification of certain state mining income taxes effective January 1, 2021, from *Cost of sales and other direct production costs* to *Income and mining tax provision*. Certain amounts in the condensed consolidated financial statements and notes thereto for the prior period have been revised to correct these immaterial errors. See *Note 3* for more information on the errors and revisions made to amounts reported for the prior periods.

B. Assumptions and Use of Estimates — Preparing financial statements requires management to make estimates and assumptions that affect the reported amounts and related disclosure of assets, liabilities, revenue and expenses at the date of the consolidated financial statements and reporting periods. We consider our most critical accounting estimates to be future metals prices; obligations for environmental, reclamation and closure matters and mineral reserves and resources. Other significant areas requiring the use of management assumptions and estimates relate to reserves for contingencies and litigation; asset impairments, including long-lived assets and investments; valuation of deferred tax assets; and post-employment, post-retirement and other employee benefit assets and liabilities. We have based our estimates on historical experience and various other assumptions that we believe to be reasonable. Accordingly, actual results may differ materially from these estimates under different assumptions or conditions.

C. Cash and Cash Equivalents — Cash and cash equivalents consist of all cash balances and highly liquid investments with a remaining maturity of three months or less when purchased and are carried at fair value. Cash and cash equivalents are invested in money market funds, certificates of deposit, U.S. government and federal agency securities, municipal securities and corporate bonds.

D. Investments — We determine the appropriate classification of our investments at the time of purchase and re-evaluate such determinations at each reporting date. Current investments are comprised of marketable equity securities and are carried at fair value. Marketable securities we anticipate selling within the next twelve months are included in other current assets. Gains and losses on the sale of securities are recognized on a specific identification basis. Gains and losses are included as a component of a separate line item, "fair value adjustments, net," on our consolidated statements of operations and comprehensive income (loss).

E. Inventories — Major types of inventories include materials and supplies and metals product inventory, which is determined by the stage at which the ore is in the production process (stockpiled ore, in-process and finished goods). Product inventories are stated at the lower of full cost of production or estimated net realizable value based on current metals prices. Materials and supplies inventories are stated at cost.

Stockpiled ore inventory represents ore that has been mined, hauled to the surface, and is available for further processing. Stockpiles are measured by estimating the number of tons added and removed from the stockpile, the amount of contained metal ounces or pounds (based on assay data) and the estimated metallurgical recovery rates (based on the expected processing method). Costs are allocated to a stockpile based on relative values of material stockpiled and processed using current mining costs incurred up to the point of stockpiling the ore, including applicable overhead, depreciation, depletion and amortization relating to mining operations, and removed at each stockpile's average cost per recoverable unit.

In-process inventory represents material that is currently in the process of being converted to a saleable product. Conversion processes vary depending on the nature of the ore and the specific processing facility, but include mill in-circuit, flotation, and carbon-in-leach. In-process material is measured based on assays of the material fed into the process and the projected recoveries of the respective processing plants. In-process inventory is valued at the lower of the average cost of the material fed into the process attributable to the source material coming from the mine and stockpile plus the in-process conversion costs, including applicable amortization relating to the process facilities incurred to that point in the process, or net realizable value.

Finished goods inventory includes doré and concentrates at our operations, doré in transit to refiners or at refiners waiting to be processed, and bullion in our accounts at refineries.

F. Restricted Cash and Investments — Restricted cash and investments primarily represent investments in money market funds, certificates of deposit, and bonds of U.S. government agencies and are restricted primarily for reclamation funding or surety bonds. Restricted cash balances are carried at fair value. Non-current restricted cash and investments is reported in a separate line on the consolidated balance sheets and totaled $1.1 million at December 31, 2021 and 2020, respectively.

G. Properties, Plants, Equipment and Mineral Interests – Costs are capitalized when it has been determined an ore body can be economically developed. The development stage begins at new projects when our management and/or board of directors makes the decision to bring a mine into commercial production, and ends when the production stage, or exploitation of reserves, begins. Expenditures incurred during the development and production stages for new assets, new facilities, alterations to existing facilities that extend the useful lives of those facilities, and major mine development expenditures are capitalized, including primary development costs such as costs of building access ways, shaft sinking, lateral development, drift development, ramps and infrastructure developments. Costs to improve, alter, or rehabilitate primary development assets which appreciably extend the life, increase capacity, or improve the efficiency or safety of such assets are also capitalized.

The costs of removing overburden and waste materials to access the ore body at an open-pit mine prior to the production stage are referred to as "pre-stripping costs." Pre-stripping costs are capitalized during the development stage. Where multiple open pits exist at an operation utilizing common facilities, pre-stripping costs are capitalized at each pit. The production stage of a mine commences when saleable materials, beyond a de minimis amount, are produced. Stripping costs incurred during the production stage are treated as variable production costs included as a component of inventory, to be recognized in cost of sales and other direct production costs in the same period as the revenue from the sale of inventory.

Costs for exploration, pre-development, secondary development at operating mines, including drilling costs related to those activities (discussed further below), and maintenance and repairs on capitalized properties, plants and equipment are charged to operations as incurred. Exploration costs include those relating to activities carried out in search of previously unidentified resources or exploration targets, (a) at undeveloped concessions, or (b) at operating mines already containing proven and probable reserves, where a determination remains pending as to whether new target deposits outside of the existing reserve areas can be economically developed. Pre-development activities involve costs incurred in the exploration stage that may ultimately benefit production, such as underground ramp development, which are expensed due to the lack of evidence of economic viability, which is necessary to demonstrate future recoverability of these expenses. At an underground mine, secondary development costs are incurred for preparation of an ore body for production in a specific ore block, stope or work area, providing a relatively short-lived benefit only to the mine area they relate to, and not to the ore body as a whole. Primary development costs benefit long-term production, multiple mine areas, or the ore body as a whole, and are therefore capitalized.

Drilling, development and related costs are either classified as exploration, pre-development or secondary development, as defined above, and charged to operations as incurred, or capitalized, based on the following criteria:

- whether the costs are incurred to further define resources or exploration targets at and adjacent to existing reserve areas or intended to assist with mine planning within a reserve area;
- whether the drilling or development costs relate to an ore body that has been determined to be commercially mineable, and a decision has been made to put the ore body into commercial production; and
- whether, at the time the cost is incurred: (a) the expenditure embodies a probable future benefit that involves a capacity, singly or in combination with other assets, to contribute directly or indirectly to future net cash inflows, (b) we can obtain the benefit and control others' access to it, and (c) the transaction or event giving rise to our right to or control of the benefit has already occurred.

If all of these criteria are met, drilling, development and related costs are capitalized. Drilling and development costs not meeting all of these criteria are expensed as incurred. The following factors are considered in determining whether or not the criteria listed above have been met, and capitalization of drilling and development costs is appropriate:

- completion of a favorable economic study and mine plan for the ore body targeted;
- authorization of development of the ore body by management and/or the board of directors; and
- there is a justifiable expectation, based on applicable laws and regulations, that issuance of permits or resolution of legal issues and/or contractual requirements necessary for us to have the right to or control of the future benefit from the targeted ore body have been met.

Drilling and related costs of approximately $5.2 million, $4.4 million, and $14.4 million for the years ended December 31, 2021, 2020 and 2019, respectively, met our criteria for capitalization listed above at our production stage properties.

When assets are retired or sold, the costs and related allowances for depreciation and amortization are eliminated from the accounts and any resulting gain or loss is reflected in current period net income (loss).

Our mineral interests, which are tangible assets, include acquired undeveloped mineral interests and royalty interests. Undeveloped mineral interests include: (i) resources which are measured, indicated or inferred with insufficient drill spacing or quality to qualify as proven and probable reserves; and (ii) inferred material and exploration targets not immediately adjacent to existing proven and probable reserves but accessible within the immediate mine infrastructure. Residual values for undeveloped mineral interests represent the expected fair value of the interests at the time we plan to convert, develop, further explore or dispose of the interests and are evaluated at least annually.

H. Depreciation, Depletion and Amortization — Capitalized costs are depreciated or depleted using the straight-line method or units-of-production method at rates sufficient to depreciate such costs over the shorter of estimated productive lives of such facilities or the useful life of the individual assets. Productive lives range from 3 to 14 years, but do not exceed the useful life of the individual asset. Determination of expected useful lives for amortization calculations are made on a property-by-property or asset-by-asset basis at least annually. Our estimates for reserves and resources are a key component in determining our units-of-production depreciation rates, with net book value of many assets depreciated over remaining estimated reserves. Reserves are estimates made by our professional technical personnel of the amount of metals that they believe could be economically and legally extracted or produced at the time of the reserve determination (discussed in *J. Proven and Probable Ore Reserves* below). Our estimates of proven and probable ore reserves and resources may change, possibly in the near term, resulting in changes to depreciation, depletion and amortization rates in future reporting periods.

Undeveloped mineral interests and value beyond proven and probable reserves are not amortized until such time as there are proven and probable reserves or the related mineralized material is converted to proven and probable reserves. At that time, the basis of the mineral interest is amortized on a units-of-production basis. Pursuant to our policy on impairment of long-lived assets (discussed further below), if it is determined that an undeveloped mineral interest cannot be economically converted to proven and probable reserves and its carrying value exceeds its estimated undiscounted future cash flows, the basis of the mineral interest is reduced to its fair value and an impairment loss is recorded to expense in the period in which it is determined to be impaired.

I. Impairment of Long-lived Assets — Management reviews and evaluates the net carrying value of all facilities, including idle facilities, for impairment upon the occurrence of events or changes in circumstances that indicate that the related carrying amounts may not be recoverable. We perform the test for recoverability of each property based on the estimated undiscounted future cash flows that will be generated from operations at each property, the estimated salvage value of the surface plant and equipment, and the value associated with property interests.

Although management has made what it believes to be a reasonable estimate of factors based on current conditions and information, assumptions underlying future cash flows, which includes the estimated value of resources and exploration targets, are subject to significant risks and uncertainties. Estimates of undiscounted future cash flows are dependent upon, among other factors, estimates of: (i) metals to be recovered from proven and probable ore reserves and identified resources and exploration targets beyond proven and probable reserves, (ii) future production and capital costs, (iii) estimated metals prices (considering current and historical prices, forward pricing curves and related factors) over the estimated remaining mine life and (iv) market values of mineral interests. It is possible that changes could occur in the near term that could adversely affect our estimate of future cash flows to be generated from our operating properties. If estimated undiscounted cash flows are less than the carrying value of a property, an impairment loss is recognized for the difference between the carrying value and fair value of the property.

J. Proven and Probable Ore Reserves — At least annually, management reviews the reserves used to estimate the quantities and grades of ore at our mines which we believe can be recovered and sold economically. Management's calculations of proven and probable ore reserves are based on financial, engineering and geological estimates, including future metals prices and operating costs, and an assessment of our ability to obtain the permits required to mine and process the material. From time to time, management obtains external audits or reviews of reserves.

Reserve estimates will change as existing reserves are depleted through production, as additional reserves are proven and added to the estimates and as market prices of metals, production or capital costs, smelter terms, the grade or tonnage of the deposit, throughput, dilution of the ore or recovery rates change.

K. Leases — Contractual arrangements are assessed at inception to determine if they represent or contain a lease. Right-of-use ("ROU") assets related to operating leases are separately reported in the Consolidated Balance Sheets. ROU assets related to finance leases are included in Properties, plants, equipment and mineral interests, net. Separate current and non-current liabilities for operating and finance leases are reported on the Consolidated Balance Sheets.

Operating and finance lease ROU assets and lease liabilities are recognized at the lease commencement date based on the present value of the future lease payments over the lease term. When the rate implicit to the lease cannot be readily determined, we utilize our incremental borrowing rate in determining the present value of the future lease payments. The incremental borrowing rate is derived from information available at the lease commencement date and represents the rate of interest that we would have to pay to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. The ROU asset includes any lease payments made and lease incentives received prior to the commencement date. Operating lease ROU assets also include any cumulative prepaid or accrued rent when the lease payments are uneven throughout the lease term. The ROU assets and lease liabilities may include options to extend or terminate the lease when it is reasonably certain that we will exercise that option.

L. Income and Mining Taxes — We provide for federal, state and foreign income taxes currently payable, as well as those deferred, due to timing differences between reporting income and expenses for financial statement purposes versus tax purposes. Federal, state and foreign tax benefits are recorded as a reduction of income taxes, when applicable. We record deferred tax liabilities and assets for expected future tax consequences of temporary differences between the financial statement carrying amounts and the tax bases of those assets and liabilities, as well as operating loss and tax credit carryforwards, using enacted tax rates in effect in the years in which the differences are expected to reverse.

We evaluate uncertain tax positions in a two-step process, whereby (i) it is determined whether it is more likely than not that the tax positions will be sustained based on the technical merits of the position and (ii) for those tax positions that meet the more-likely-than-not recognition threshold, the largest amount of tax benefit that is greater than 50% likely of being realized upon ultimate settlement with the related tax authority would be recognized.

We evaluate our ability to realize deferred tax assets by considering the sources and timing of taxable income, including the reversal of existing temporary differences, the ability to carryback tax attributes to prior periods, qualifying tax-planning strategies, and estimates of future taxable income exclusive of reversing temporary differences. In determining future taxable income, the Company's assumptions include the amount of pre-tax operating income according to different state, federal and international taxing jurisdictions, the origination of future temporary differences, and the implementation of feasible and prudent tax-planning strategies. Should we determine that a portion of our deferred tax assets will not be realized, a valuation allowance is recorded in the period that such determination is made. When we determine, based on the existence of sufficient evidence, that more or less of the deferred tax assets are more likely than not to be realized, an adjustment to the valuation allowance is made in the period such a determination is made.

We classify as income taxes mine license taxes incurred in the states of Alaska and Idaho, the net proceeds taxes incurred in Nevada, mining duties in Mexico, and resource taxes incurred in Quebec, Canada.

For additional information, see *Note 7 — Income Taxes*.

M. Reclamation and Remediation Costs (Asset Retirement Obligations) — At our operating properties, we record a liability for the present value of our estimated environmental remediation costs, and the related asset created with it, in the period in which the liability is incurred. The liability is accreted and the asset is depreciated over the life of the related assets. Adjustments for changes resulting from the passage of time and changes to either the timing or amount of the original present value estimate underlying the obligation are made in the period incurred.

At our non-operating properties, we accrue costs associated with environmental remediation obligations when it is probable that such costs will be incurred and they are reasonably estimable. Accruals for estimated losses from environmental remediation obligations have historically been recognized no later than completion of the remediation feasibility study for such facility and are charged to current earnings under provision for closed operations and environmental matters. Costs of future expenditures for environmental remediation are not discounted to their present value unless subject to a contractually obligated fixed payment schedule. Such costs are based on management's current estimate of amounts to be incurred when the remediation work is performed, within current laws and regulations.

Future closure, reclamation and environmental-related expenditures are difficult to estimate in many circumstances, due to the early stage nature of investigations, uncertainties associated with defining the nature and extent of environmental contamination, the application of laws and regulations by regulatory authorities, and changes in reclamation or remediation technology. We periodically review accrued liabilities for such reclamation and remediation costs as evidence becomes available indicating that our liabilities have potentially changed. Changes in estimates at our non-operating properties are reflected in current period net income (loss).

N. Revenue Recognition and Trade Accounts Receivable — Sales of all metals products sold directly to customers, including by-product metals, are recorded as revenues and accounts receivable upon completion of the performance obligations and transfer of control of the product to the customer. For sales of metals from refined doré, the performance obligation is met, the transaction price is known, and revenue is recognized at the time of transfer of control of the agreed-upon metal quantities to the customer by the refiner. For sales of unrefined doré and carbon material, the performance obligation is met, the transaction price is known, and revenue is recognized at the time of transfer of title and control of the doré or carbon containing the agreed-upon metal quantities to the customer. For concentrate sales, the performance obligation is met, the transaction price can be reasonably estimated, and revenue is recognized generally at the time of shipment at estimated forward prices for the anticipated month of settlement. Due to the time elapsed from shipment to the customer and the final settlement with the customer, we must estimate the prices at which sales of our concentrates will be settled. Previously recorded sales and accounts receivable are adjusted to estimated settlement metals prices until final settlement by the customer. As discussed in *P. Risk Management Contracts* below, we seek to mitigate this exposure by using financially-settled forward contracts for some of the metals contained in our concentrate shipments.

Refining, selling and shipping costs related to sales of doré, metals from doré, and carbon are recorded to cost of sales as incurred. Sales and accounts receivable for concentrate shipments are recorded net of charges by the customers for treatment, refining, smelting losses, and other charges negotiated by us with the customers. Charges are estimated by us upon shipment of concentrates based on contractual terms, and actual charges typically do not vary materially from our estimates. Costs charged by customers include fixed costs per ton of concentrate, and price escalators which allow the customers to participate in the increase of lead and zinc prices above a negotiated baseline.

See *Note 4* for more information on our sales of products.

O. Foreign Currency — The functional currency for our operations located in the U.S., Mexico and Canada is the U.S. dollar ("USD") for all periods presented. Accordingly, for Casa Berardi in Canada and San Sebastian in Mexico, we have translated our monetary assets and liabilities at the period-end exchange rate, and non-monetary assets and liabilities at historical rates, with income and expenses translated at the average exchange rate for the current period. All translation gains and losses have been included in the current period net income (loss). Expenses incurred at our foreign operations and denominated in CAD and MXN expose us to exchange rate fluctuations between those currencies and the USD. As discussed in *P. Risk Management Contracts* below, we seek to mitigate this exposure by using financially-settled forward contracts to sell CAD and MXN.

We recognized a total net foreign exchange gain of $0.4 million for the year ended December 31, 2021 and losses of $4.6 million and $8.2 million for the years ended December 31, 2020 and 2019, respectively.

P. Risk Management Contracts — We use derivative financial instruments as part of an overall risk-management strategy as a means of managing exposure to changes in metals prices and exchange rate fluctuations between the USD and CAD and MXN. We do not hold or issue derivative financial instruments for speculative trading purposes. We measure derivative contracts as assets or liabilities based on their fair value. Amounts recognized for the fair value of derivative asset and liability positions with the same counterparty and which would be settled on a net basis are offset against each other on our consolidated balance sheets. Gains or losses resulting from changes in the fair value of derivatives in each period are recorded either in current earnings or other comprehensive income ("OCI"), depending on the use of the derivative, whether it qualifies for hedge accounting and whether that hedge is effective. Amounts deferred in OCI are reclassified to sales of products (for metals price-related contracts) or cost of sales (for foreign currency-related contracts). Ineffective portions of any change in fair value of a derivative are recorded in current period other operating income (expense). For derivatives qualifying as hedges, when the hedged items are sold, extinguished or terminated, or it is determined the hedged transactions are no longer likely to occur, gains or losses on the derivatives are reclassified from OCI to current earnings. As of December 31, 2021 and 2020, our foreign currency-related forward contracts qualified for hedge accounting, with unrealized gains and loss related to the effective portion of the contracts included in OCI. Our base metals price-related forward contracts were designated as hedges effective November 1, 2021. Prior to November 1, 2021 our metals price-related forward contracts and put option contracts did not qualify for hedge accounting and all unrealized gains and losses were therefore reported in earnings.

See *Note 10* for additional information on our foreign exchange and metal derivative contracts as of December 31, 2021.

Q. Stock Based Compensation — The fair values of equity instruments granted to employees that have vesting periods are expensed over the vesting periods on a straight-line basis. The fair values of instruments having no vesting period are expensed when granted. Stock-based compensation expense is recorded among general and administrative expenses, exploration and cost of sales and other direct production costs.

For additional information on our restricted stock unit compensation, see *Note 12.*

R. Basic and Diluted Income (Loss) Per Common Share — We calculate basic income (loss) per share on the basis of the weighted average number of shares of common stock outstanding during the period. Diluted income per share is calculated using the weighted average number of shares of common stock outstanding during the period plus the effect of potential dilutive common shares during the period using the treasury stock and if-converted methods.

See *Note 8* for additional information.

S. Comprehensive Income (Loss) — In addition to net income (loss), comprehensive income (loss) includes certain changes in equity during a period, such as adjustments to minimum pension liabilities, adjustments to recognize the over-funded or under-funded status of our defined benefit pension plans, the change in fair value of derivative contracts designated as hedge transactions, and cumulative unrecognized changes in the fair value of available for sale debt investments, net of tax, if applicable.

T. Reclassifications — Certain amounts in prior years have been reclassified to conform with the 2021 presentation.

U. New Accounting Pronouncements —

Accounting Standards Updates Adopted

In December 2019, the FASB issued ASU No. 2019-12 Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes. The update contains a number of provisions intended to simplify the accounting for income taxes. The update is effective for fiscal years beginning after December 15, 2020, with early adoption permitted. We adopted the update as of January 1, 2021, which did not have a material impact on our consolidated financial statements or disclosures.

Accounting Standards Updates to Become Effective in Future Periods

In August 2020, the FASB issued ASU No. 2020-06 Debt - Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible Instruments and Contracts in an Entity's Own Equity. The update is to address issues identified as a result of the complexity associated with applying generally accepted accounting principles to certain financial instruments with characteristics of liabilities and equity. The update is effective for fiscal years beginning after December 15, 2021, including interim periods within those fiscal years and with early adoption permitted. We are evaluating the impact of this update on our consolidated financial statements.

Note 3. Revision of Previously Issued Financial Statements for Immaterial Misstatements

Casa Berardi DDA

In the third quarter of 2021, we determined accumulated DDA and DDA expense at Casa Berardi, an operation within our Hecla Quebec Inc. subsidiary, were overstated for the periods from June 1, 2013 through June 30, 2021 as a result of errors in calculation from the date of acquisition of Casa Berardi. DDA was overstated by approximately $38.2 million in the aggregate over 8 years as a result of errors in the calculation of straight-line depreciation on machinery, equipment and buildings.

We assessed the materiality of the effect of the errors on our prior quarterly and annual financial statements, both quantitatively and qualitatively, in accordance with the SEC's Staff Accounting Bulletin ("SAB") No. 99, "Materiality," and SAB No. 108, "Considering the Effects of Prior Year Misstatements when Quantifying Misstatements in Current Year Financial Statements," and concluded the errors were not material to any of our previously issued financial statements. Consequently, we concluded we would correct these errors prospectively and revise our financial statements when the consolidated balance sheets, statements of operations and comprehensive income and cash flows for such prior periods are included in future filings (the "Revisions"). The Revisions had no net impact on our sales or net cash provided by operating activities for any period presented. The impact of these misstatements on prior periods is more fully disclosed below.

Reclassification of State Mining Income Taxes

We reclassified certain state mining income taxes from *Cost of sales and other direct production costs* to *Income and mining tax provision* effective January 1, 2021. In connection with the revision of our historical financial statements for the correction of the DDA adjustment described above, we revised our previously issued financial statements for this reclassification that required us to recognize previously unrecognized deferred taxes.

The following tables present a summary of the impact, by financial statement line item, of the Revisions as of and for the years ended December 31, 2020 and 2019:

(in thousands, except per share amounts)	As of and for the Year Ended December 31, 2020		
	As Previously Reported	Adjustment	As Revised
Consolidated Balance Sheet			
Inventories: Concentrates, doré, and stockpiled ore	$ 57,936	$ (369)	$ 57,567
Total current assets	284,681	(369)	284,312
Properties, plants, equipment and mineral interests, net	2,345,219	32,855	2,378,074
Total assets	**2,667,724**	**32,486**	2,700,210
Accrued taxes	8,349	(2,575)	5,774
Total current liabilities	149,785	(2,575)	147,210
Deferred tax liability	132,475	23,616	156,091
Total liabilities	965,384	21,041	986,425
Accumulated deficit	(379,519)	11,445	(368,074)
Total shareholders' equity	1,702,340	11,445	1,713,785
Total liabilities and shareholders' equity	**2,667,724**	**32,486**	2,700,210
Consolidated Statements of Operations and Comprehensive Income (Loss)			
Cost of sales and other direct production costs	389,040	(6,377)	382,663
Depreciation, depletion and amortization	157,130	(9,020)	148,110
Total cost of sales	546,170	(15,397)	530,773
Gross profit	145,703	15,397	161,100
Income from operations	**51,581**	**15,397**	66,978
Loss before income and mining taxes	**(16,655)**	**15,397**	(1,258)
Income and mining tax provision	(135)	(8,064)	(8,199)
Net loss	(16,790)	7,333	(9,457)
Loss applicable to common shareholders	**(17,342)**	**7,333**	(10,009)
Comprehensive loss	(12,369)	7,333	(5,036)
Basic loss per common share after preferred dividends	**(0.03)**	**0.01**	(0.02)
Diluted loss per common share after preferred dividends	**(0.03)**	**0.01**	(0.02)
Consolidated Statements of Cash Flows			
Net loss	(16,790)	7,333	(9,457)
Depreciation, depletion and amortization	164,026	(9,020)	155,006
Deferred income taxes	(5,505)	1,687	(3,818)
Cash provided by operating activities	**180,793**	—	180,793

(in thousands, except per share amounts)	As of and for the Year Ended December 31, 2019		
	As Previously Reported	Adjustment	As Revised
Consolidated Balance Sheet			
Inventories: Concentrates, doré, and stockpiled ore	$ 30,364	$ (286)	$ 30,078
Total current assets	179,124	(286)	178,838
Properties, plants, equipment and mineral interests, net	2,423,698	23,752	2,447,450
Total assets	**2,637,308**	**23,466**	2,660,774
Deferred tax liability	138,282	19,355	157,637
Total liabilities	944,885	19,355	964,240
Accumulated deficit	(353,331)	4,111	(349,220)
Total shareholders' equity	1,692,423	4,111	1,696,534
Total liabilities and shareholders' equity	**2,637,308**	**23,466**	2,660,774
Consolidated Statements of Operations and Comprehensive Income (Loss)			
Cost of sales and other direct production costs	$ 450,349	$ (2,364)	$ 447,985
Depreciation, depletion and amortization	199,518	(8,067)	191,451
Total cost of sales	649,867	(10,431)	639,436
Gross profit	23,399	10,431	33,830
Loss from operations	**(57,109)**	**10,431**	**(46,678)**
Loss before income and mining taxes	**(123,658)**	**10,431**	**(113,227)**
Income and mining tax benefit	24,101	(5,783)	18,318
Net loss	(99,557)	4,648	(94,909)
Loss applicable to common shareholders	**(100,109)**	**4,648**	**(95,461)**
Comprehensive loss	(94,398)	4,648	(89,750)
Basic loss per common share after preferred dividends	**(0.20)**	**0.01**	**(0.19)**
Diluted loss per common share after preferred dividends	**(0.20)**	**0.01**	**(0.19)**
Consolidated Statements of Cash Flows			
Net loss	(99,557)	4,648	(94,909)
Depreciation, depletion and amortization	204,475	(8,067)	196,408
Deferred income taxes	(33,387)	3,419	(29,968)
Cash provided by operating activities	**120,866**	—	**120,866**

Note 4: Business Segments, Sales of Products and Significant Customers

We discover, acquire and develop mines and other mineral interests and produce and market concentrates, containing silver, gold (in the case of Greens Creek), lead and zinc, (ii) carbon material containing silver and gold, and (iii) doré containing silver and gold. We are currently organized and managed in four reportable segments being: Greens Creek, Lucky Friday, Casa Berardi and the Nevada Operations.

General corporate activities not associated with operating mines and their various exploration activities, as well as idle properties and San Sebastian, a former operating mine and reportable segment, are presented as "other." Interest expense, interest income and income taxes are considered general corporate items, and are not allocated to our segments.

The tables below present information about our reportable segments as of and for the years ended December 31, 2021, 2020 and 2019 (in thousands).

	2021	2020	2019
Net sales to unaffiliated customers:			
Greens Creek	$ 384,843	$ 327,820	$ 299,722
Lucky Friday	131,488	63,025	16,621
Casa Berardi	245,152	209,224	192,944
Nevada Operations	45,814	58,898	107,769
Other	176	32,906	56,210
Total sales to unaffiliated customers	$ 807,473	$ 691,873	$ 673,266
Income (loss) from operations:			
Greens Creek (1)	$ 164,666	$ 114,607	$ 87,232
Lucky Friday	31,683	(1,711)	(12,520)
Casa Berardi (1)	5,807	10,379	(25,432)
Nevada Operations	(46,115)	(6,674)	(49,224)
Other	(72,621)	(49,623)	(46,734)
Total income (loss) from operations (1)	$ 83,420	$ 66,978	$ (46,678)
Capital additions (excluding non-cash items):			
Greens Creek	$ 23,883	$ 19,685	$ 29,570
Lucky Friday	29,885	25,776	8,989
Casa Berardi	49,617	40,840	36,059
Nevada Operations	5,470	4,003	42,953
Other	193	712	3,850
Total capital additions	$ 109,048	$ 91,016	$ 121,421

Depreciation, depletion and amortization:			
Greens Creek	$ 48,710	49,692	$ 47,587
Lucky Friday	26,846	11,473	1,175
Casa Berardi (1)	80,744	60,552	65,893
Nevada Operations	15,341	22,845	67,024
Other	152	3,548	9,772
Total depreciation, depletion and amortization (1)	$ 171,793	$ 148,110	$ 191,451
Other significant non-cash items:			
Greens Creek	$ 3,653	$ 3,103	$ 2,868
Lucky Friday	1,048	881	996
Casa Berardi	1,284	(1,741)	5,203
Nevada Operations	7,740	2,039	2,911
Other (1)	(20,030)	8,569	(2,684)
Total other significant non-cash items	$ (6,305)	$ 12,851	$ 9,294
Identifiable assets:			
Greens Creek	$ 589,944	$ 610,360	$ 639,047
Lucky Friday	516,545	520,463	440,615
Casa Berardi (1)	701,868	727,008	726,977
Nevada Operations	468,985	513,309	528,466
Other	451,466	329,070	325,669
Total identifiable assets (1)	$ 2,728,808	$ 2,700,210	$ 2,660,774

The following are our long-lived assets by geographic area as of December 31, 2021 and 2020 (in thousands):

	2021	2020
United States	$ 1,662,689	$ 1,701,307
Canada (1)	640,367	668,643
Mexico	7,754	8,124
Total long-lived assets (1)	$ 2,310,810	$ 2,378,074

(1) Amounts reported as of and for the years ended December 31, 2020 and 2019 have been revised. See *Note 3* for more information.

Our products consist of metal concentrates and carbon material, which we sell to custom smelters, metal traders and third-party processors, and unrefined bullion bars (doré), which may be sold as doré or further refined before sale to precious metal traders. Revenue is recognized upon the completion of the performance obligations and transfer of control of the product to the customer.

For sales of metals from refined doré, which we currently have at Casa Berardi, the performance obligation is met, the transaction price is known, and revenue is recognized at the time of transfer of control of the agreed-upon metal quantities to the customer by the refiner. For sales of unrefined doré in 2019 at our Nevada Operations, the performance obligation was met, the transaction price was known, and revenue was recognized at the time of transfer of title and control of the doré containing the agreed-upon metal quantities to the customer. Refining, selling and shipping costs related to sales of doré and metals from doré are recorded to cost of sales as incurred.

For sales of carbon materials, which we had at our Nevada Operations commencing in 2020, transfer of control takes place, the performance obligation is met, the transaction price is known, and revenue is recognized generally at the time of arrival at the customer's facility.

For concentrate sales, which we currently have at Greens Creek and Lucky Friday, the performance obligation is met, the transaction price can be reasonably estimated, and revenue is recognized generally at the time of shipment. Concentrates sold at Lucky Friday typically leave the mine and are received by the customer within the same day. However, there is a period of time between shipment of concentrates from Greens Creek and their physical receipt by the customer, and judgment is required in determining when control has been transferred to the customer and the performance obligation has been met for those shipments. We have determined control is met, title is transferred and the performance obligation is met upon shipment of concentrate parcels from Greens Creek because, at that time, 1) legal title is transferred to the customer, 2) the customer has accepted the parcel and obtained the ability to realize all of the benefits from the product, 3) the concentrate content specifications are known, have been communicated to the customer, and the customer has the significant risks and rewards of ownership of it, 4) it is very unlikely a concentrate parcel from Greens Creek will be rejected by a customer upon physical receipt, and 5) we have the right to payment for the parcel.

Judgment is also required in identifying our concentrate sales performance obligations. Most of our concentrate sales involve "frame contracts" with smelters that can cover multiple years and specify certain terms under which individual parcels of concentrates are sold. However, some terms are not specified in the frame contracts and/or can be renegotiated as part of annual amendments to the frame contract. We have determined parcel shipments represent individual performance obligations satisfied at the point in time when control of the shipment is transferred to the customer.

The consideration we receive for our concentrate sales fluctuates due to changes in metals prices between the time of shipment and final settlement with the customer. However, we are able to reasonably estimate the transaction price for the concentrate sales at the time of shipment using forward prices for the month of settlement, and previously recorded sales and accounts receivable are adjusted to estimated settlement metals prices until final settlement with the customer. Also, it is unlikely a significant reversal of revenue for any one concentrate parcel will occur. As such, we use the expected value method to price the parcels until the final settlement date occurs, at which time the final transaction price is known. At December 31, 2021, metals contained in concentrate sales and exposed to future price changes totaled 2.1 million ounces of silver, 6,224 ounces of gold, 27.5 million pounds of zinc, and 12.7 million pounds of lead. However, as discussed in *Note 10*, we seek to mitigate the risk of price adjustments by using financially-settled forward contracts for some of our sales.

Sales and accounts receivable for concentrate shipments are recorded net of charges for treatment, refining, smelting losses, and other charges negotiated by us with the customers, which represent components of the transaction price. Charges are estimated by us upon shipment of concentrates based on contractual terms, and actual charges typically do not vary materially from our estimates. Costs charged by customers include fixed treatment and refining costs per ton of concentrate and may include price escalators which allow the customers to participate in the increase of lead and zinc prices above a negotiated baseline. Costs for shipping concentrates to customers are recorded to cost of sales as incurred.

Sales of metal concentrates and metal products are made principally to custom smelters, third-party processors and metal traders. The percentage of sales contributed by each segment is reflected in the following table:

	Year Ended December 31,		
	2021	**2020**	**2019**
Greens Creek	47.6%	47.4%	44.5%
Lucky Friday	16.3%	9.1%	2.5%
Casa Berardi	30.4%	30.2%	28.7%
Nevada Operations	5.7%	8.5%	16.0%
Other	—%	4.8%	8.3%
	100%	100%	100%

Sales of products by metal for the years ended December 31, 2021, 2020 and 2019 were as follows (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Silver	$ 293,646	$ 260,227	$ 192,235
Gold	362,037	356,166	388,602
Lead	75,431	48,776	35,777
Zinc	125,292	95,065	89,656
Less: Smelter and refining charges	(48,933)	(68,361)	(33,004)
Sales of products	$ 807,473	$ 691,873	$ 673,266

The following is sales information by geographic area based on the location of smelters and metal traders (for concentrate shipments) and the location of parent companies (for doré sales to metal traders) for the years ended December 31, 2021, 2020 and 2019 (in thousands):

	2021	2020	2019
United States	$ 71,278	$ 115,378	$ 53,612
Canada	419,090	321,896	379,095
Japan	63,588	39,418	48,841
Netherlands	—	(923)	38,420
Korea	203,115	166,402	154,581
China	50,945	66,082	—
Total, excluding gains/losses on forward contracts	$ 808,016	$ 708,253	$ 674,549

Sales by significant product type for the years ended December 31, 2021, 2020 and 2019 were as follows (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Doré and metals from doré	$ 313,337	$ 266,536	$ 340,912
Carbon	4,117	60,302	37,645
Silver concentrate	345,732	281,050	200,456
Zinc concentrate	112,448	76,481	74,160
Precious metals concentrate	32,382	23,884	21,376
Total, excluding gains/losses on forward contracts	$ 808,016	$ 708,253	$ 674,549

Sales of products for 2021, 2020 and 2019 included net losses of $0.5 million, $16.4 million, and $1.3 million, respectively, on derivative contracts for silver, gold, lead and zinc contained in our sales. See *Note 10* for more information.

Sales from continuing operations to significant metals customers as a percentage of total sales were as follows for the years ended December 31, 2021, 2020 and 2019:

	Year Ended December 31,		
	2021	2020	2019
CIBC	37.2%	32.7%	23.1%
Teck Metals Ltd.	21.5%	16.1%	8.2%
Ocean Partners	6.2%	13.9%	5.7%
Korea Zinc	21.6%	13.3%	17.4%
Scotia	—%	2.9%	24.0%

Our trade accounts receivable balance related to contracts with customers was $36.4 million at December 31, 2021 and $27.9 million at December 31, 2020, and included no allowance for doubtful accounts.

We have determined our contracts do not include a significant financing component. For doré sales and sales of metal from doré, payment is received at the time the performance obligation is satisfied. Payment for carbon sales is received within a relatively short period of time after the performance obligation is satisfied. The amount of consideration for concentrate sales is variable, and we receive payment for a significant portion of the estimated value of concentrate parcels within a relatively short period of time after the performance obligation is satisfied.

We do not incur significant costs to obtain contracts, nor costs to fulfill contracts which are not addressed by other accounting standards. Therefore, we have not recognized an asset for such costs as of December 31, 2021 or December 31, 2020.

Note 5: Environmental and Reclamation Activities

The liabilities accrued for our reclamation and closure costs at December 31, 2021 and 2020 were as follows (in thousands):

	2021	2020
Operating properties:		
Greens Creek	$ 37,474	$ 42,716
Lucky Friday	13,543	12,818
Casa Berardi	12,497	11,730
Nevada Operations	27,068	26,062
Non-operating properties:		
San Sebastian	4,451	6,882
Troy mine	4,813	5,340
Johnny M	8,947	6,065
Republic	1,500	1,500
All other sites	2,938	2,935
Total	113,231	116,048
Reclamation and closure costs, current	(9,259)	(5,582)
Reclamation and closure costs, long-term	$ 103,972	$ 110,466

The activity in our accrued reclamation and closure cost liability for the years ended December 31, 2021, 2020 and 2019 was as follows (in thousands):

Balance at January 1, 2019	$ 108,389
Accruals for estimated costs	472
Accretion expense	7,122
Revision of estimated cash flows due to changes in reclamation plans	(4,522)
Payment of reclamation obligations	(3,087)
Balance at December 31, 2019	108,374
Accretion expense	5,912
Revision of estimated cash flows due to changes in reclamation plans	2,543
Payment of reclamation obligations	(781)
Balance at December 31, 2020	116,048
Accruals for estimated costs	4,952
Accretion expense	6,454
Revision of estimated cash flows due to changes in reclamation plans	(8,781)
Payment of reclamation obligations	(5,442)
Balance at December 31, 2021	$ 113,231

Asset Retirement Obligations

Below is a reconciliation as of December 31, 2021 and 2020 (in thousands) of the asset retirement obligations ("ARO") relating to our operating properties, which are included in our total accrued reclamation and closure costs of $113.2 million and $116.0 million, respectively, discussed above. The estimated reclamation and closure costs were discounted using credit adjusted, risk-free interest rates ranging from 5.75% to 14.5% from the time we incurred the obligation to the time we expect to pay the retirement obligation.

	2021	2020
Balance January 1	$ 100,208	$ 91,831
Changes in obligations due to changes in reclamation plans	(8,781)	2,543
Accretion expense	6,451	5,912
Payment of reclamation obligations	(2,845)	(78)
Balance at December 31	$ 95,033	$ 100,208

In 2021, we revised the AROs at Greens Creek, Lucky Friday and Casa Berardi to reflect updates to the estimated timing for reclamation and closure of the mines, resulting in a decreases in the ARO asset and liability of $8.6 million and $0.1 million for Greens Creek and Casa Berardi, respectively, and an increase in the ARO for Lucky Friday of $0.3 million.

In 2021, we updated the ARO at Nevada Operations to reflect a revised plan for reclamation and closure of the mines having total estimated undiscounted costs of approximately $35.2 million, an increase from the $34.2 million in the previous plan. However, as a result of discounting, the change resulted in a decrease in the ARO asset and liability of $0.3 million.

The AROs related to the changes described above were discounted using a credit adjusted, risk-free interest rate of between 2.75% and 7.5% and inflation rates ranging from 2% to 4%.

Note 6: Employee Benefit Plans

Pensions and Other Post-retirement Plans

We sponsor defined benefit pension plans covering substantially all U.S. employees and a Supplemental Excess Retirement Plan ("SERP") covering certain eligible employees. The following tables provide a reconciliation of the changes in the plans' benefit obligations and fair value of assets over the two-year period ended December 31, 2021, and the funded status as of December 31, 2021 and 2020 (in thousands):

	Pension Benefits	
	2021	2020
Change in benefit obligation:		
Benefit obligation at beginning of year	$ 192,954	$ 172,909
Service cost	5,820	5,334
Interest cost	4,990	5,618
Amendments	550	—
Change due to mortality change	548	(1,521)
Change due to discount rate change	(5,865)	17,040
Actuarial return (loss)	4,342	121
Benefits paid	(7,477)	(6,547)
Benefit obligation at end of year	195,862	192,954
Change in fair value of plan assets:		
Fair value of plan assets at beginning of year	148,052	116,067
Actual return on plan assets	27,049	14,801
Employer contributions	22,250	23,731
Benefits paid	(7,477)	(6,547)
Fair value of plan assets at end of year	189,874	148,052
Underfunded status at end of year	$ (5,988)	$ (44,902)

The following table provides the amounts recognized in the consolidated balance sheets as of December 31, 2021 and 2020 (in thousands):

	Pension Benefits	
	2021	2020
Current liabilities:		
Accrued benefit liability	$ (1,315)	$ (758)
Non- current pension liability:		
Accrued benefit liability	(4,673)	(44,144)
Accumulated other comprehensive loss	29,966	53,085
Net amount recognized	$ 23,978	$ 8,183

The benefit obligation and prepaid benefit costs were calculated by applying the following weighted average assumptions:

	Pension Benefits		
	2021		2020
Discount rate: net periodic pension cost	2.64%		3.32%
Discount rate: projected benefit obligation	2.86%		2.64%
Expected rate of return on plan assets	6.40%		6.45%
Rate of compensation increase: net periodic pension cost	5.00%/2.00%	(1)	2.00%
Rate of compensation increase: projected benefit obligation	5.00%/2.00%	(1)	2.00%

(1) 5.00% for 2022, 2.00% per year thereafter.

The above assumptions were calculated based on information as of December 31, 2021 and 2020, the measurement dates for the plans. The discount rate is based on the yield curve for investment-grade corporate bonds as published by the U.S. Treasury Department. The expected rate of return on plan assets is based upon consideration of the plan's current asset mix, historical long-term return rates and the plan's historical performance. Our current assumption for the rate on plan assets is 7.25%. The vested benefit obligation is determined based on the actuarial present value of benefits to which employees are currently entitled, based on employees' expected date of separation or retirement.

Net periodic pension cost for the plans consisted of the following in 2021, 2020, and 2019 (in thousands):

	Pension Benefits		
	2021	2020	2019
Service cost	$ 5,820	$ 5,334	$ 4,401
Interest cost	4,990	5,618	6,482
Expected return on plan assets	(9,252)	(7,489)	(5,982)
Amortization of prior service benefit	394	117	61
Amortization of net gain from earlier periods	4,502	4,652	4,389
Net periodic pension cost	$ 6,454	$ 8,232	$ 9,351

The service cost component of net periodic pension cost is included in the same line items of our consolidated financial statements as other employee compensation costs. The net expense of $0.6 million, $2.9 million and $5.0 million for 2021, 2020, and 2019, respectively, related to all other components of net periodic pension cost is included in other (expense) income on our consolidated statements of operations and comprehensive (loss) income.

Each defined benefit pension plan's statement of investment policy delineates the responsibilities of the board, the committee which administers the plan, the investment manager(s), and investment adviser/consultant, and provides guidelines on investment management. Investment objectives are established for each of the asset categories included in the pension plans with comparisons of performance against appropriate benchmarks. Each plan's policy calls for investments to be supervised by qualified investment managers. The investment managers are monitored on an ongoing basis by our outside consultant, with formal reporting to us and the consultant performed each quarter. The policy sets forth the following allocation of assets:

	Target	Maximum
Large cap U.S. equities	17%	20%
Small cap U.S. equities	8%	10%
Non-U.S. equities	25%	30%
U.S. Fixed income	18%	23%
Emerging markets debt	5%	8%
Real estate	15%	18%
Absolute return	5%	7%
Company stock/Real return	7%	13%

Each defined benefit pension plan's statement of investment policy and objectives aspires to achieve the assumed long term rate of return on plan assets established by the plan's actuary plus one percent.

Accounting guidance has established a hierarchy of assets measured at fair value on a recurring basis. The three levels included in the hierarchy are:

Level 1: quoted prices in active markets for identical assets or liabilities

Level 2: significant other observable inputs

Level 3: significant unobservable inputs

The fair values by asset category in each pension plan, along with their hierarchy levels, are as follows as of December 31, 2021 (in thousands):

	Hecla plans				Lucky Friday			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Investments measured at fair value								
Interest-bearing cash	$ 1,835	$ —	$ —	$ 1,835	$ 305	$ —	$ —	$ 305
Common stock	8,869	—	—	8,869	1,580	—	—	1,580
Mutual funds	96,957	—	—	96,957	15,707	—	—	15,707
Total investments in the fair value hierarchy	107,661	—	—	107,661	17,592	—	—	17,592
Investments measured at net asset value								
Real estate funds				19,119				4,482
Hedge funds				12,866				2,828
Common collective funds				20,626				4,700
Total investments measured at net asset value				52,611				12,010
Total fair value	$ 107,661	$ —	$ —	$ 160,272	$ 17,592	$ —	$ —	$ 29,602

The fair values by asset category in each defined benefit pension plan, along with their hierarchy levels, were as follows as of December 31, 2020 (in thousands):

	Hecla				Lucky Friday			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Investments measured at fair value								
Interest-bearing cash	$ 367	$ —	$ —	$ 367	$ 111	$ —	$ —	$ 111
Common stock	13,947	—	—	13,947	3,203	—	—	3,203
Mutual funds	69,994	—	—	69,994	15,786	—	—	15,786
Total investments in the fair value hierarchy	84,308	—	—	84,308	19,100	—	—	19,100
Investments measured at net asset value								
Real estate funds				12,708				3,428
Hedge funds				5,823				1,215
Common collective funds				17,545				3,925
Total investments measured at net asset value				36,076				8,568
Total fair value	$ 84,308	$ —	$ —	$ 120,384	$ 19,100	$ —	$ —	$ 27,668

Generally, investments are valued based on information provided by fund managers to each plan's trustee as reviewed by management and its investment advisers. Mutual funds and equities are valued based on available exchange data. Commingled equity funds consist of publicly-traded investments.

Fair value for real estate funds, hedge funds and common collective equity funds is measured using the net asset value per share (or its equivalent) practical expedient ("NAV"), and has not been categorized in the fair value hierarchy. There are no unfunded commitments related to these investments. There are no restrictions on redemptions of these funds as of December 31, 2021, except as limited by the redemption terms discussed below. The following summarizes information on the asset classes measured using NAV:

	Investment strategy	Redemption terms
Real estate funds	Invest in real estate properties among the four major property types (office, industrial, retail and multi-family)	Allowed quarterly with notice of between 45 and 60 days
Hedge funds	Invest in a variety of asset classes which aim to diversify sources of returns	Allowed quarterly with notice of 90 days
Common collective funds	Invest in U.S. large cap or small/medium cap public equities in actively traded managed equity portfolios	Allowed daily or with notice of 30 days

The following are estimates of future benefit payments, which reflect expected future service as appropriate, related to our pension plans (in thousands):

Year Ending December 31,	Pension Plans
2022	$ 8,816
2023	8,765
2024	8,944
2025	9,135
2026	9,212
Years 2027-2031	45,880

During 2021, we contributed $16.8 million and $5.5 million in shares of our common stock to our SERP and our defined benefit pension plans, respectively. We do not expect to be required to contribute to our defined benefit plans in 2022, but we may choose to do so.

The following table indicates whether our pension plans had accumulated benefit obligations ("ABO") in excess of plan assets, or plan assets exceeded ABO (amounts are in thousands).

	December 31, 2021		December 31, 2020	
	ABO Exceeds Plan Assets	Plan Assets Exceed ABO	ABO Exceeds Plan Assets	Plan Assets Exceed ABO
Projected benefit obligation	$ 195,862	$ —	$ 192,954	$ —
Accumulated benefit obligation	191,597	—	189,931	—
Fair value of plan assets	189,873	—	148,051	—

For the pension plans, the following amounts are included in "Accumulated other comprehensive loss, net" on our balance sheet as of December 31, 2021, that have not yet been recognized as components of net periodic benefit cost (in thousands):

	Pension Benefits
Unamortized net (gain)/loss	$ 28,386
Unamortized prior service cost	1,580

Non-U.S. employees are not eligible to participate in the defined benefit pension plans that we maintain for U.S. employees. Canadian employees participate in Canada's public retirement income system, which includes the following components: (i) the Canada (or Quebec) Pension Plan, which is an employee and employer contributory, earnings-related social insurance program, and (ii) the Old Age Security program. Mexican employees participate in Mexico's public retirement income system, which is based on contributions the employee, employer and the government submit to the retirement savings system. The system is administered through savings accounts managed by private fund managers selected by the participant.

Capital Accumulation Plans

Our Capital Accumulation Plan ("Hecla 401(k) Plan") is available to all U.S. salaried and certain hourly employees upon employment. We make a matching contribution in the form of cash or stock of 100% of an employee's contribution up to 6% of eligible earnings. Our matching contributions were approximately $4.3 million in 2021, $4.6 million in 2020, and $3.9 million in 2019 in Hecla common stock.

We also maintain a 401(k) plan that is available to all hourly employees at Lucky Friday after completion of six months of service. When an employee meets eligibility requirements we make a matching cash contribution of 55% of the employee's contribution up to, but not exceeding, 5% of the employee's eligible earnings. Our matching contributions were approximately $0.5 million in 2021, $10,000 in 2020, and $10,000 in 2019.

Note 7: Income and Mining Taxes

Major components of our income and mining tax benefit (provision) for the years ended December 31, 2021, 2020 and 2019 are as follows (in thousands):

	2021	2020 Revised	2019 Revised
Current:			
Domestic	$ (7,073)	$ (7,246)	$ (3,065)
Foreign	(6,316)	(8,745)	(9,427)
Total current income and mining tax provision	(13,389)	(15,991)	(12,492)
Deferred:			
Domestic	43,708	5,096	13,962
Foreign	(750)	2,696	16,848
Total deferred income and mining tax benefit	42,958	7,792	30,810
Total income and mining tax benefit (provision)	$ 29,569	$ (8,199)	$ 18,318

Domestic and foreign components of income (loss) before income and mining taxes for the years ended December 31, 2021, 2020 and 2019 are as follows (in thousands):

	2021	2020 Revised	2019 Revised
Domestic	$ 38,003	$ (1,400)	$ (51,165)
Foreign	(32,477)	142	(62,062)
Total	$ 5,526	$ (1,258)	$ (113,227)

The annual tax benefit (provision) is different from the amount that would be provided by applying the statutory federal income tax rate to our pretax income (loss). The reasons for the difference are (in thousands):

	2021		2020		2019	
			Revised		Revised	
Computed "statutory" benefit (provision)	$ (1,161)	21%	$ 264	21%	$ 23,778	21%
Percentage depletion	8,076	(146)	5,327	423	3,030	3
Change in valuation allowance	38,058	(689)	786	62	686	—
State taxes, net of federal tax benefit	(5,844)	106	(1,164)	(93)	2,648	2
Foreign currency remeasurement of monetary assets and liabilities	(3,625)	66	(4,824)	(383)	(8,629)	(8)
Rate differential on foreign earnings	2,445	(44)	2,362	188	3,999	4
Compensation	1,094	(20)	(458)	(36)	(1,056)	(1)
Mining and other taxes	(6,990)	126	(9,245)	(735)	(4,887)	(4)
Other	(2,484)	45	(1,247)	(99)	(1,251)	(1)
Total benefit (provision)	$ 29,569	(535%	$ (8,199)	(652%	$ 18,318	16%

At December 31, 2021 and 2020, the net deferred tax liability was approximately 104.1 million and $153.2 million, respectively. The individual components of our net deferred tax assets and liabilities are reflected in the table below (in thousands).

	December 31,	
	2021	2020
		Revised
Deferred tax assets:		
Accrued reclamation costs	$ 31,558	$ 32,938
Deferred exploration	17,959	11,623
Foreign net operating losses	18,152	13,303
Domestic net operating losses	213,637	198,438
Pension and benefit obligation	1,824	12,341
Foreign exchange loss	19,542	19,808
Foreign tax credit carryforward	2,493	3,358
Miscellaneous	29,505	18,385
Total deferred tax assets	334,670	310,194
Valuation allowance	(39,152)	(77,210)
Total deferred tax assets	295,518	232,984
Deferred tax liabilities:		
Miscellaneous	(2,751)	(2,551)
Properties, plants and equipment	(396,911)	(383,612)
Total deferred tax liabilities	(399,662)	(386,163)
Net deferred tax liability	$ (104,144)	$ (153,179)

As part of the Klondex acquisition in July 2018, we acquired a U.S. consolidated tax group (the "Nevada U.S. Group") that did not join the existing consolidated U.S. tax group of Hecla Mining Company and subsidiaries ("Hecla U.S. Group"). Under acquisition accounting, we recorded a net deferred tax liability of $55.2 million. Net operating losses acquired as of the acquisition date are subject to limitation under Internal Revenue Code Section 382. However, the annual limitation is not expected to have a material impact on our ability to utilize the losses.

We evaluated the positive and negative evidence available to determine the amount of valuation allowance required on our deferred tax assets. At December 31, 2021, the balance of our valuation allowances was approximately $39.2 million, following release of $58.4 million of Hecla U.S. Group valuation allowance, reflecting our estimate of future taxable income in the Hecla U.S. Group and our ability to utilize net operating losses and other deferred tax assets in future periods. Several factors support the release of the U.S. Group valuation allowance in 2021, including (i) a history of positive earnings and a clear upward trend over the last three years, (ii) the end of a labor strike and return to full production at a significant U.S. mine, the Lucky Friday mine, and (iii) scheduling of deferred tax liabilities and forecast of future taxable income to support utilization of the majority of deferred tax assets, with the exception of $8.9 million of valuation allowance retained on a portion of loss carryforward, foreign tax credit carryforward and certain state tax attributes. Our long-range planning and forecast process, which is finalized in the fourth quarter, is required to evaluate a forecast of future taxable income; thus, the fourth quarter was the appropriate time to lift the valuation allowance. In the Nevada U.S. Group, the scheduling of reversing deferred tax assets and liabilities determined that existing tax loss carryforwards subject to the limitation of eighty percent reduction of taxable income may be limited in the future. A valuation allowance was recorded for $19.4 million. Due to cessation of operations in Mexico at the end of 2020, we are uncertain when a source of taxable income will be available in that jurisdiction. Therefore, a valuation allowance was recognized on deferred tax assets in Mexico for $7.7 million. As of December 31, 2021, a $3.2 million valuation allowance remains in Canadian jurisdictions. The changes in the valuation allowance for the years ended December 31, 2021, 2020 and 2019, are as follows (in thousands):

	2021	2020	2019
Balance at beginning of year	$ (77,210)	$ (86,634)	$ (94,981)
Valuation allowance on deferred tax assets acquired with the Klondex acquisition	—	—	5,905
(Increase) decrease related to non-recognition of deferred tax assets due to uncertainty of recovery and (increase) related to non-utilization of net operating loss carryforwards	(20,304)	786	686
Decrease related to either or a combination of (i) utilization, (ii) release due to future benefit, and (iii) expiration of deferred tax assets as applicable	58,362	8,638	1,756
Balance at end of year	$ (39,152)	$ (77,210)	$ (86,634)

As of December 31, 2021, for U.S. income tax purposes, we have federal and state net operating loss carryforwards of $869.2 million and $470.6 million, respectively. U.S. net operating loss carryforwards for periods arising before December 31, 2017 have a 20-year expiration period, the earliest of which could expire in 2022. U.S. net operating loss carryforwards of $381.2 million arising in 2018 and future periods have an indefinite carryforward period. We have foreign and provincial net operating loss carryforwards of approximately $69.7 million each, which expire between 2031 and 2041. Our utilization of U.S. net operating loss carryforwards may be subject to annual limitations if there is a change in control as defined under Internal Revenue Code Section 382. As of December 31, 2021, no change in control has occurred in the Hecla U.S. group. Net operating losses acquired with the Nevada U.S. Group are subject to limitation under Internal Revenue Code Section 382. However, the annual limitation is not expected to have a material impact on our ability to utilize the losses.

We file income tax returns in the U.S. federal jurisdiction, and various state and foreign jurisdictions. We are no longer subject to income tax examinations by U.S. federal and state tax authorities for years prior to 2005, or examinations by foreign tax authorities for years prior to 2015. We are currently under examination in certain local tax jurisdictions. However, we do not anticipate any material adjustments.

We had no unrecognized tax benefits as of December 31, 2021 or 2020. Due to the net operating loss carryover provision, coupled with the lack of any unrecognized tax benefits, we have not provided for any interest or penalties associated with any unrecognized tax benefits. If interest and penalties were to be assessed, our policy is to charge interest to interest expense, and penalties to other operating expense. It is not anticipated that there will be any significant changes to unrecognized tax benefits within the next 12 months.

Note 8: Income (Loss) per Common Share

We calculate basic income (loss) per share using, as the denominator, the weighted average number of common shares outstanding during the period. Diluted income (loss) per share uses, as its denominator, the weighted average number of common shares outstanding during the period plus the effect of potential dilutive common shares during the period using the treasury stock method for options, warrants, and restricted stock units, and if-converted method for convertible preferred shares.

Potential dilutive common shares include outstanding restricted stock unit awards, stock units, warrants and convertible preferred stock for periods in which we have reported net income. For periods in which we reported net losses, potential dilutive common shares are excluded, as their conversion and exercise would not reduce earnings per share. Under the if-converted method, preferred shares would not dilute earnings per share in any of the periods presented.

The following table represents net income (loss) per common share – basic and diluted (in thousands, except income (loss) per share):

	Year ended December 31,		
	2021	2020	2019
		Revised	Revised
Numerator			
Net income (loss)	$ 35,095	$ (9,457)	$ (94,909)
Preferred stock dividends	(552)	(552)	(552)
Net income (loss) applicable to common shares	$ 34,543	$ (10,009)	$ (95,461)
Denominator			
Basic weighted average common shares	536,192	527,329	490,449
Dilutive stock options, restricted stock units, and warrants	5,984	—	—
Diluted weighted average common shares	542,176	527,329	490,449
Basic income (loss) per common share	**$ 0.06**	**$ (0.02)**	**$ (0.19)**
Diluted income (loss) per common share	**$ 0.06**	**$ (0.02)**	**$ (0.19)**

For the year ended December 31, 2021, the calculation of diluted income per common share included (i) 2,317,007 unvested restricted stock units during the period, (ii) 1,557,503 warrants to purchase one share of common stock and (iii) 2,166,964 deferred shares that were dilutive. For the years ended December 31, 2020 and 2019, all outstanding restricted stock units, warrants and deferred shares were excluded from the computation of diluted loss per share, as our reported net losses for those periods would cause their conversion and exercise to have no effect on the calculation of loss per share.

Note 9: Debt, Credit Facility and Leases

Debt Summary

Our debt as of December 31, 2021 and 2020 consisted of our 7.25% Senior Notes due February 15, 2028 ("Senior Notes") and our Investissement Quebec Series 2020-A Senior Notes due July 9, 2025 (the "IQ Notes"). These debt arrangements are discussed further below. The following tables summarize our long-term debt balances as of December 31, 2021 and 2020 (in thousands):

	December 31, 2021		
	Senior Notes	IQ Notes	Total
Principal	$ 475,000	$ 38,051	$ 513,051
Unamortized discount/premium and issuance costs	(5,552)	596	(4,956)
Long-term debt balance	$ 469,448	$ 38,647	$ 508,095

	December 31, 2020		
	Senior Notes	IQ Notes	Total
Principal	$ 475,000	$ 37,886	$ 512,886
Unamortized discount/premium and issuance costs	(6,462)	818	(5,644)
Long-term debt balance	$ 468,538	$ 38,704	$ 507,242

The following table summarizes the scheduled annual future payments, including interest, for the Senior Notes and IQ Notes as of December 31, 2021 (in thousands). The amounts for the IQ Notes are stated in USD based on the USD/CAD exchange rate as of December 31, 2021.

	Senior Notes	IQ Notes
2022	$ 34,438	$ 2,479
2023	34,438	2,479
2024	34,438	2,479
2025	34,438	39,342
2026	34,438	—
2027	34,438	—
2028	479,302	—
Total	$ 685,930	$ 46,779

Senior Notes

On February 19, 2020, we completed an offering of $475 million in aggregate principal amount of our Senior Notes under our shelf registration statement previously filed with the SEC. The Senior Notes are governed by the Indenture, dated as of February 19, 2020, as amended, among Hecla and certain of our subsidiaries and The Bank of New York Mellon Trust Company, N.A., as trustee. On March 19, 2020, the net proceeds from the offering of the Senior Notes ($469.5 million) were used, together with cash on hand, to redeem all of our previously-outstanding 2021 Notes.

The Senior Notes are recorded net of a 1.16% initial purchaser discount totaling $5.5 million. The Senior Notes bear interest at a rate of 7.25% per year from the date of issuance or from the most recent payment date on which interest has been paid or provided for. Interest on the Senior Notes is payable on February 15 and August 15 of each year, commencing August 15, 2020. During 2021, 2020 and 2019, interest expense on the statement of operations and comprehensive income (loss) related to the Senior Notes and 2021 Notes and amortization of the initial purchaser discount and fees related to the issuance of the Senior Notes and 2021 Notes totaled $35.4 million, $40.2 million and $36.3 million, respectively. Interest expense for 2020 included amounts recorded for (i) interest recognized on both the Senior Notes and 2021 Notes for an overlapping period of approximately one month, as the Senior Notes were issued on February 19, 2020 and the 2021 Notes were redeemed on March 19, 2020, and (ii) $1.7 million in unamortized initial purchaser discount on the 2021 Notes upon redemption.

The Senior Notes are guaranteed on a senior unsecured basis by certain of our subsidiaries (the “Guarantors”). The Senior Notes and the guarantees are, respectively, Hecla's and the Guarantors' general senior unsecured obligations and are subordinated to all of Hecla's and the Guarantors' existing and future secured debt to the extent of the assets securing that secured debt. In addition, the Senior Notes are effectively subordinated to all of the liabilities of Hecla's subsidiaries that are not guaranteeing the Senior Notes, to the extent of the assets of those subsidiaries.

The Senior Notes will be redeemable in whole or in part, at any time and from time to time on or after February 15, 2023, on the redemption dates and at the redemption prices specified in the Indenture, plus accrued and unpaid interest, if any, to the date of redemption. After February 15, 2023, we may redeem some or all of the Senior Notes at the following redemption prices (expressed as a percentage of the principal amount) plus accrued interest, if any, to the redemption date: (i) 105.438% for the twelve-month period beginning after February 15, 2023, (ii) 103.625% for the twelve-month period beginning after February 15, 2024, (iii) 101.813% for the twelve-month period beginning after February 15, 2025, and (iv) 100.000% after February 15, 2026. We may redeem up to 35% of the Senior Notes before February 15, 2023 with the net cash proceeds of certain equity offerings.

Upon the occurrence of a change of control (as defined in the Indenture), each holder of Senior Notes will have the right to require us to purchase all or a portion of such holder's Senior Notes pursuant to a change of control offer (as defined in the Indenture), at a purchase price equal to 101% of the principal amount thereof plus accrued and unpaid interest, if any, to the date of purchase, subject to the rights of holders of the Senior Notes on the relevant record date to receive interest due on the relevant interest payment date.

IQ Notes

On July 9, 2020, we entered into a note purchase agreement pursuant to which we issued CAD$50 million (approximately USD$36.8 million at the time of the transaction) in aggregate principal amount of our IQ Notes to Investissement Québec, a financing arm of the Québec government. Because the IQ notes are denominated in CAD, the reported USD-equivalent principal balance will change with movements in the exchange rate. The IQ Notes were issued at a premium of 103.65%, or CAD$1.8 million, implying an effective annual yield of 5.74% and an aggregate principal amount to be repaid of CAD$48.2 million. The IQ Notes were issued in four equal installments of CAD$12.5 million on July 9, August 9, September 9 and October 9, 2020, with the first installment issued net of CAD$0.6 million in fees. The IQ Notes bear interest on amounts outstanding at a rate of 6.515% per year, payable on January 9 and July 9 of each year, commencing January 9, 2021. The IQ Notes are senior and unsecured and are pari passu in all material respects with the Senior Notes, including with respect to guarantees of the IQ Notes by certain of our subsidiaries. The net proceeds from the IQ Notes are available for general corporate purposes, including open market purchases of a portion of the Senior Notes and to pay for capital expenditures at Casa Berardi. Under the note purchase agreement for the IQ Notes and subject to a force majeure event, we are required to invest in the aggregate CAD$100 million at Casa Berardi and other exploration and development projects in Quebec over the four-year period commencing on July 9, 2020. During 2021 and 2020, interest expense related to the IQ Notes, including premium and origination fees, totaled $2.3 million and $0.9 million.

Ressources Québec Notes

In December 2019, we prepaid our CAD$40 million 4.68% Resources Quebec Notes (“RQ Notes”) through issuance of approximately 10.7 million shares of our common stock having a total value of approximately CAD$43.8 million (approximately USD$33.5 million). In 2019, interest expense related to the RQ Notes, including discount and origination fees, totaled $4.2 million, including $2.9 million related to the prepayment of the RQ Notes.

Credit Facility

In July 2018, we entered into a $250 million senior secured revolving credit facility which replaced our previous $100 million credit facility. The facility has a term ending on February 7, 2023. The credit facility is collateralized by all of our personal property, including our cash and investment accounts and the equity interests in our domestic subsidiaries and the Canadian subsidiaries that own the Casa Berardi mine. The credit facility is also secured by substantially all of the real and personal property of our subsidiaries holding the rights to our Greens Creek mine, the Casa Berardi mine and our Nevada operations, including mortgages on such mines and pledges of our joint venture interests holding 100% ownership of the Greens Creek mine, all of our rights and interests in the joint venture agreement relating to the Greens Creek mine, and all of our rights and interests in the assets of the Greens Creek joint venture. Below is information on the interest rates, standby fee, and financial covenant terms under our current credit facility in place as of December 31, 2021:

Interest rates:	
Spread over the London Interbank Offered Rate	2.25 - 4.00%
Spread over alternative base rate	1.25 - 3.00%
Standby fee per annum on undrawn amounts	0.5625 - 1.00%
Covenant financial ratios:	
Senior leverage ratio (debt secured by liens/EBITDA)	not more than 2.50:1
Leverage ratio (total debt less unencumbered cash/EBITDA)	not more than 4.00:1
Interest coverage ratio (EBITDA/interest expense)	not less than 3.00:1

We are also able to obtain letters of credit under the facility, and for any such letters we are required to pay a participation fee of between 2.25% and 4.00% of the amount of the letters of credit based on our total leverage ratio, as well as a fronting fee to each issuing bank of 0.20% annually on the average daily dollar amount of any outstanding letters of credit. There were $17.3 million in letters of credit outstanding as of December 31, 2021.

We believe we were in compliance with all covenants under the credit facility agreement as of December 31, 2021. There were no amounts outstanding under the credit facility as of December 31, 2021 and 2020.

Finance Leases

We have entered into various lease agreements, primarily for equipment at our operations, which we have determined to be finance leases. At December 31, 2021, the total liability associated with the finance leases, including certain purchase option amounts, was $13.4 million (2020: $15.8 million), with $5.6 million (2020: $6.5 million) of the liability classified as current and $7.8 million (2020: $9.3 million) classified as non-current. The assets related to these leases are recorded in properties, plants, equipment and mineral interests, net, on our consolidated balance sheets and totaled $18.3 million as of December 31, 2021 (2020: $22.3 million), net of accumulated depreciation. Expense during 2021, 2020 and 2019 related to finance leases included $8.9 million, $7.4 million and $5.9 million, respectively, for amortization of the related assets, and $0.6 million, $0.6 million and $0.7 million, respectively, for interest expense. The total obligation for future minimum finance lease payments was $14.2 million at December 31, 2021, with $0.8 million attributed to interest. Our finance leases as of December 31, 2021 had a weighted average remaining term of approximately 2 years and a weighted average discount rate of approximately 6.3%.

At December 31, 2021, the annual maturities of finance lease commitments, including interest, were (in thousands):

Twelve-month period ending December 31,	
2022	$ 6,097
2023	4,422
2024	3,156
2025	556
Total	14,231
Less: imputed interest	(843)
Net finance lease obligation	$ 13,388

Operating Leases

We have entered into various lease agreements, primarily for equipment, buildings and other facilities, and land at our operations and corporate offices, which we have determined to be operating leases. Some of the operating leases allow for extension of the lease beyond the current term at our option. We have considered the likelihood and estimated duration of the extension options in determining the lease term for measurement of the liability and right-of-use asset. For our operating leases as of December 31, 2021, we have assumed a discount rate of 5.8%. At December 31, 2021, the total liability balance associated with the operating leases was $12.4 million (2020: $10.6 million), with $2.5 million (2020: $3.0 million) of the liability classified as current and the remaining $10.0 million (2020: $7.6 million) classified as non-current. The right-of-use assets for our operating leases are recorded as a non-current asset on our consolidated balance sheets and totaled $12.4 million and $10.6 million as of December 31, 2021 and 2020, respectively. During 2021, 2020 and 2019, operating lease expense, and cash paid for operating leases included in net cash provided by operating activities, totaled $3.9 million, $7.2 million and $7.5 million, respectively. The total obligation for future minimum operating lease payments, including assumed extensions beyond the current lease terms, was $15.8 million at December 31, 2021. The weighted-average remaining lease term for our operating leases as of December 31, 2021 was approximately 6.5 years.

At December 31, 2021, the annual maturities of undiscounted operating lease payments, including assumed extensions beyond the current lease terms, were (in thousands):

Twelve-month period ending December 31,		
2022	$	3,153
2023		3,011
2024		1,084
2025		1,058
2026		1,059
More than 5 years		6,418
Total		15,783
Effect of discounting		(3,347)
Operating lease liability	$	12,436

Note 10: Derivative Instruments

General

Our current risk management policy provides that up to 75% of:

- our future foreign currency-related operating and capital cost exposure for five years into the future may be hedged and for potential additional programs to manage other foreign currency-related exposure areas;
- our planned lead and zinc metals price exposure for five years into the future, with certain other limitations, may be covered under derivatives programs that would establish prices to be realized on future metals sales; and
- our planned silver and gold metals price exposure for five years into the future, with certain other limitations, may be covered under derivatives programs that would establish a floor, but not a ceiling, for prices to be realized on future metals sales. We currently do not utilize this program.

In addition, our risk management policy provides that price exposure between the time of shipment and final settlement on silver, gold, lead and zinc contained in our concentrate shipments may be covered under derivatives programs that would establish prices to be realized on those sales.

These instruments expose us to (i) credit risk in the form of non-performance by counterparties for contracts in which the contract price exceeds the spot price of the hedged commodity or foreign currency and (ii) price risk to the extent that the spot price exceeds the contract price for quantities of our production and/or forecasted costs covered under contract positions.

Foreign Currency

Our wholly-owned subsidiaries owning the Casa Berardi and San Sebastian mines are USD-functional entities which routinely incur expenses denominated in CAD and MXN, respectively, and such expenses expose us to exchange rate fluctuations between the USD and CAD and MXN. We utilize a program to manage our exposure to fluctuations in the exchange rate between the USD and CAD and the impact on our future operating costs denominated in CAD. In November 2021, initiated a program related to future development costs denominated in CAD, and have used a similar program, on a limited basis, related to interest payments on our IQ Notes (see *Note 9*). The programs utilize forward contracts to buy CAD. Each contract related to operating costs is designated as a cash flow hedge, while contracts related to development and interest costs have not been designated as hedges as of December 31, 2021. As of December 31, 2021, we had 166 forward contracts outstanding to buy a total of CAD$318.8 million having a notional amount of US$245.3 million. The CAD contracts are related to forecasted cash operating costs at Casa Berardi forecasted to be incurred from 2022 through 2025 and have USD-to-CAD exchange rates ranging between 1.2702 and 1.3753.

As of December 31, 2021 and 2020, we recorded the following balances for the fair value of the contracts (in millions):

	December 31,	
Balance sheet line item:	**2021**	**2020**
Other current assets	$ 2.7	$ 3.5
Other non-current assets	2.5	4.2

Net unrealized gains of approximately $5.2 million related to the effective portion of the hedges were included in accumulated other comprehensive loss as of December 31, 2021. Unrealized gains and losses will be transferred from accumulated other comprehensive loss to current earnings as the underlying operating expenses are recognized. We estimate approximately $2.7 million in net unrealized gains included in accumulated other comprehensive loss as of December 31, 2021 would be reclassified to current earnings in the next twelve months. Net realized gains of approximately $4.7 million on contracts related to underlying expenses which have been recognized were transferred from accumulated other comprehensive loss and included in cost of sales and other direct production costs for the year ended December 31, 2021. Net unrealized losses of approximately $0.2 million related to contracts not designated as hedges and no net unrealized gains or losses related to ineffectiveness of the hedges were included in fair value adjustments, net on our consolidated statements of operations and comprehensive income (loss) for the year ended December 31, 2021.

Metals Prices

We are currently using financially-settled forward contracts to manage the exposure to:

- changes in prices of silver, gold, zinc and lead contained in our concentrate shipments between the time of shipment and final settlement; and
- changes in prices of zinc and lead (but not silver and gold) contained in our forecasted future concentrate shipments.

The following tables summarize the quantities of metals committed under forward sales contracts at December 31, 2021 and 2020:

December 31, 2021	**Ounces/pounds under contract (in 000's)**				**Average price per ounce/pound**			
	Silver (ounces)	**Gold (ounces)**	**Zinc (pounds)**	**Lead (pounds)**	**Silver (ounces)**	**Gold (ounces)**	**Zinc (pounds)**	**Lead (pounds)**
Contracts on provisional sales								
2022 settlements	1,814	6	13,371	4,575	$ 23.02	$ 1,812	$ 1.39	$ 0.96
Contracts on forecasted sales								
2022 settlements	—	—	57,706	59,194	N/A	N/A	$ 1.28	$ 0.98
2023 settlements	—	—	76,280	71,650	N/A	N/A	$ 1.29	$ 1.00

December 31, 2020	Ounces/pounds under contract (in 000's)				Average price per ounce/pound			
	Silver (ounces)	Gold (ounces)	Zinc (pounds)	Lead (pounds)	Silver (ounces)	Gold (ounces)	Zinc (pounds)	Lead (pounds)
Contracts on provisional sales								
2022 settlements	1,282	4	23,314	4,905	$ 25.00	$ 1,858	$ 1.19	$ 0.90
Contracts on forecasted sales								
2022 settlements	—	—	41,577	30,876	N/A	N/A	$ 1.17	$ 0.88
2023 settlements	N/A	N/A	18,519	—	N/A	N/A	$ 1.28	N/A

Effective November 1, 2021, we designated the contracts for lead and zinc contained in our forecasted future shipments as hedges for accounting purposes, with gains and losses deferred to accumulated other comprehensive loss until the hedged product ships. Prior to November 1, 2021, these contracts did not qualify for hedge accounting and were therefore marked-to-market through earnings each period. The forward contracts for silver and gold contained in our concentrate shipments have not been designated as hedges and are marked-to-market through earnings each period.

At December 31, 2021 and 2020, we recorded the following balances for the fair value of forward and put option contracts held at that time (in millions):

	December 31, 2021			December 31, 2020		
Balance sheet line item:	Contracts in an asset position	Contracts in a liability position	Net asset (liability)	Contracts in an asset position	Contracts in a liability position	Net asset (liability)
Other current assets	$ —	$ —	$ —	$ 0.2	$ (0.2)	$ —
Other non-current assets	—	—	—	0.5	(0.1)	0.4
Current derivatives liability	0.7	(20.1)	(19.4)	0.1	(11.8)	(11.7)
Non-current derivatives liability	0.4	(18.9)	(18.5)	—	—	—

Net unrealized losses of approximately $14.6 million related to the effective portion of the contracts designated as hedges were included in accumulated other comprehensive loss as of December 31, 2021, and are net of related deferred taxes. Unrealized gains and losses will be transferred from accumulated other comprehensive loss to current earnings as the underlying operating expenses are recognized. We estimate approximately $3.4 million in net unrealized losses included in accumulated other comprehensive loss as of December 31, 2021 would be reclassified to current earnings in the next twelve months. We recognized a $0.5 million net loss during 2021 on the contracts utilized to manage exposure to changes in prices of metals in our concentrate shipments, which is included in sales of products. The net loss recognized on the contracts offsets gains related to price adjustments on our provisional concentrate sales due to changes to silver, gold, lead and zinc prices between the time of sale and final settlement.

We recognized a $32.9 million net loss during 2021 on the contracts utilized to manage exposure to changes in prices for forecasted future sales prior to their hedge designation. The net loss on these contracts is included in the fair value adjustments, net line item under other income (expense), as they relate to forecasted future sales, as opposed to sales that have already taken place but are subject to final pricing as discussed in the preceding paragraph. The net loss for 2021 is the result of increasing silver, gold, zinc and lead prices. During the third quarter of 2019 we settled, prior to their maturity date, contracts in a gain position for cash proceeds to us of approximately $6.7 million, with no such early settlements in 2021 or 2020. These programs, when utilized and the contracts are not settled prior to their maturity, are designed to mitigate the impact of potential future declines in silver, gold, lead and zinc prices from the price levels established in the contracts (see average price information above). When those prices increase compared to the contracts, we incur losses on the contracts.

Credit-risk-related Contingent Features

Certain of our derivative contracts contain cross default provisions which provide that a default under our revolving credit agreement would cause a default under the derivative contract. As of December 31, 2021, we have not posted any collateral related to these contracts. The fair value of derivatives in a net liability position related to these arrangements was $39.1 million as of December 31, 2021, and includes accrued interest but excludes any adjustment for nonperformance risk. If we were in breach of any of these provisions at December 31, 2021, we could have been required to settle our obligations under the agreements at their termination value of $39.1 million.

Note 11: Fair Value Measurement

Fair value adjustments, net is comprised of the following:

	Year Ended December 31,		
	2021	**2020**	**2019**
Loss on derivative contracts	$ (32,655)	$ (22,074)	$ (3,971)
Unrealized (loss) gain on investments in equity securities	(4,295)	10,268	(2,389)
Gain on disposition or exchange of investments	1,158	—	923
Total fair value adjustments, net	$ (35,792)	$ (11,806)	$ (5,437)

Accounting guidance has established a hierarchy for inputs used to measure assets and liabilities at fair value on a recurring basis. The fair value hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets and liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). The three levels included in the hierarchy are:

Level 1: quoted prices in active markets for identical assets or liabilities;

Level 2: significant other observable inputs; and

Level 3: significant unobservable inputs.

The table below sets forth our assets and liabilities (in thousands) that were accounted for at fair value on a recurring basis and the fair value calculation input hierarchy level that we have determined applies to each asset and liability category. See *Note 6* for information on the fair values of our defined benefit pension plan assets.

	Balance at December 31, 2021	Balance at December 31, 2020	Input Hierarchy Level
Assets:			
Cash and cash equivalents:			
Money market funds and other bank deposits	$ 210,010	$ 129,830	Level 1
Current and non-current investments:			
Equity securities – mining industry	14,470	19,389	Level 1
Trade accounts receivable:			
Receivables from provisional concentrate sales	36,437	27,864	Level 2
Derivative contracts - other current assets and other non-current assets:			
Metal forward and put option contracts	—	381	Level 2
Foreign exchange contracts	5,207	7,647	Level 2
Restricted cash balances:			
Certificates of deposit and other deposits	1,053	1,053	Level 1
Total assets	$ 267,177	$ 186,164	
Liabilities			
Derivative contracts - current derivative liabilities and other non-current liabilities:			
Metal forward and put option contracts	$ 37,873	$ 11,737	Level 2
Foreign exchange contracts	8	19	Level 2
Total liabilities	$ 37,881	$ 11,756	

Cash and cash equivalents consist primarily of money market funds and are valued at cost, which approximates fair value, and a small portion consists of municipal bonds having maturities of less than 90 days, which are recorded at fair value.

Current and non-current restricted cash balances consist primarily of certificates of deposit, U.S. Treasury securities, and other deposits and are valued at cost, which approximates fair value.

Our current and non-current investments consist of marketable equity securities of companies in the mining industry which are valued using quoted market prices for each security.

Trade accounts receivable include amounts due to us for shipments of concentrates, doré, metals sold from doré, and carbon material sold to customers. Revenues and the corresponding accounts receivable for sales of metals products are recorded when title and risk of loss transfer to the customer (generally at the time of ship loading, or at the time of arrival at the customer for trucked products). Sales of concentrates are recorded using estimated forward prices for the anticipated month of settlement applied to our estimate of payable metal quantities contained in each shipment. Sales are recorded net of estimated treatment and refining charges, which are also impacted by changes in metals prices and quantities of contained metals. We estimate the prices at which sales of our concentrates will be settled due to the time elapsed between shipment and final settlement with the customer. Receivables for previously recorded concentrate sales are adjusted to reflect estimated forward metals prices at the end of each period until final settlement by the customer. We obtain the forward metals prices used each period from a pricing service. Changes in metals prices between shipment and final settlement result in changes to revenues previously recorded upon shipment.

We use financially-settled forward contracts to manage exposure to changes in the exchange rate between the USD and CAD, and the impact on CAD-denominated operating and capital costs incurred at Casa Berardi (see *Note 10* for more information). The contracts related to operating costs qualify for hedge accounting, while the contracts related to capital costs have not been designated as hedges. Unrealized gains and losses related to the effective portion of the contracts designated as hedges are included in accumulated other comprehensive loss, and unrealized gains and losses related to the contracts not designated as hedges and the ineffective portion of the contracts designated as hedges are included in earnings each period. The fair value of each contract represents the present value of the difference between the forward exchange rate for the contract settlement period as of the measurement date and the contract settlement exchange rate.

We use financially-settled forward contracts to manage the exposure to changes in prices of silver, gold, zinc and lead contained in our concentrate shipments that have not reached final settlement. We also use financially-settled forward contracts to manage the exposure to changes in prices of zinc and lead (but not silver and gold) contained in our forecasted future concentrate shipments (see *Note 10* for more information). Effective November 1, 2021, we designated the contracts for lead and zinc as hedges for accounting purposes, with gains and losses deferred to accumulated other comprehensive income until the hedged product ships. The forward contracts for silver and gold contained in our concentrate shipments have not been designated as hedges and are marked-to-market through earnings each period. The fair value of each forward contract represents the present value of the difference between the forward metal price for the contract settlement period as of the measurement date and the contract settlement metal price.

At December 31, 2021, our Senior Notes and IQ Notes were recorded at their carrying values of $469.4 million and $38.6 million, respectively, net of unamortized initial purchaser discount/premium and issuance costs. The estimated fair values of our Senior Notes and IQ Notes were $510.6 million and $40.5 million, respectively, at December 31, 2021. Quoted prices, which we consider to be Level 1 inputs, are utilized to estimate the fair value of the Senior Notes. Unobservable inputs which we consider to be Level 3, including an assumed current annual yield of 5.65%, are utilized to estimate the fair value of the IQ Notes. See *Note 9* for more information.

Note 12: Stockholders' Equity

Common Stock

Subject to the rights of the holders of any outstanding shares of preferred stock, each share of common stock is entitled to: (i) one vote on all matters presented to the stockholders, with no cumulative voting rights; (ii) receive such dividends as may be declared by the board of directors out of funds legally available therefor; and (iii) in the event of our liquidation or dissolution, share ratably in any distribution of our assets.

Dividends

In September 2011 and February 2012, our board of directors ("Board") adopted a common stock dividend policy that has two components: (1) a dividend that links the amount of dividends on our common stock to our average quarterly realized silver price in the preceding quarter, and (2) a minimum annual dividend of $0.01 per share of common stock, in each case, payable quarterly, if and when declared. In September 2020, we amended the dividend policy to (1) reduce the minimum quarterly realized silver price threshold for the first component above from $30 per ounce to $25 per ounce, and (2) increased the minimum annual dividend from $0.01 per share to $0.015 per share. In each of May and September 2021, our Board approved an increase in our silver-linked dividend policy by $0.01 per year, and in September 2021 also approved a reduction in the minimum realized silver price threshold to $20 from $25 per ounce. For illustrative purposes only, the table below summarizes potential per share dividend amounts at different quarterly average realized price levels according to the first component of the policy, as amended:

Quarterly Average Realized Silver Price ($ per ounce)	Quarterly Silver-Linked Dividend ($ per share)	Annualized Silver-Linked Dividend ($ per share)	Annualized Minimum Dividend ($ per share)	Annualized Dividends per Share: Silver-Linked and Minimum ($ per share)
$ 20	$ 0.0025	$ 0.01	$ 0.015	$ 0.025
$ 25	$ 0.0100	$ 0.04	$ 0.015	$ 0.055
$ 30	$ 0.0150	$ 0.06	$ 0.015	$ 0.075
$ 35	$ 0.0250	$ 0.10	$ 0.015	$ 0.115
$ 40	$ 0.0350	$ 0.14	$ 0.015	$ 0.155
$ 45	$ 0.0450	$ 0.18	$ 0.015	$ 0.195
$ 50	$ 0.0550	$ 0.22	$ 0.015	$ 0.235

Total quarterly common stock dividends declared by our Board for the years ended December 31, 2021, 2020 and 2019 amounted to $20.1 million, $8.6 million and $4.9 million respectively. The common stock dividend declared by the Board in the third quarter of 2020 and each subsequent quarter has included the silver-linked component, as the realized silver price was above the minimum thresholds applicable to each of those quarters. Prior to 2011, no dividends had been declared on our common stock since 1990. The declaration and payment of common stock dividends is at the sole discretion of our Board.

At-The-Market Equity Distribution Agreement

Pursuant to an equity distribution agreement dated February 18, 2021, we may offer and sell up to 60 million shares of our common stock from time to time to or through sales agents. Sales of the shares, if any, will be made by means of ordinary brokers transactions or as otherwise agreed between the Company and the agents as principals. Whether or not we engage in sales from time to time may depend on a variety of factors, including share price, our cash resources, customary black-out restrictions, and whether we have any material inside information. The agreement can be terminated by us at any time. Any shares issued under the equity distribution agreement are registered under the Securities Act of 1933, as amended, pursuant to a shelf registration statement on Form S-3. No shares have been sold under the agreement as of December 31, 2021.

Common Stock Repurchase Program

In 2012 our Board approved a stock repurchase program under which we are authorized to repurchase up to 20 million shares of our outstanding common stock from time to time in open market or privately negotiated transactions, depending on prevailing market conditions and other factors. The repurchase program may be modified, suspended or discontinued by us at any time. As of December 31, 2021, a total of 934,100 shares have been repurchased under the program, at an average price of $3.99 per share. No shares were purchased under the program during the periods covered by these financial statements.

Preferred Stock

We have 157,816 shares of Series B Preferred Stock ("Preferred Stock") outstanding which are listed on the New York Stock Exchange. The Preferred Stock ranks senior to our common stock with respect to dividend payments, and amounts due upon liquidation, dissolution or winding up. While the Preferred Stock remains outstanding, we cannot authorize the creation or issuance of any class or series of stock that ranks senior to the Preferred Stock with respect to dividend payments, and amounts due upon liquidation, dissolution or winding up, without the consent of 66 2/3% of the Preferred Stockholders. Preferred Stockholders are entitled to receive, when, as and if declared by our Board, an annual cash dividend of $3.50 per share of Preferred Stock, payable quarterly in arrears. Dividends are cumulative from the date of issuance, regardless of whether we have assets legally available for such payment. Interest is not payable on any accumulated dividends. The Preferred Stock is redeemable at our option at $50 per share of Preferred Stock, plus any unpaid dividends up to the date of redemption. The Preferred Stock has a liquidation preference of $50 per share of Preferred stock, or $7.9 million, plus an amount per share equal to all dividends undeclared and unpaid thereon to the date of final distribution. Except in limited circumstances, the Preferred Stockholders have no voting rights. Each share of Preferred Stock is convertible, in whole or in part, at the holder's option into our common stock at a conversion price of $15.55 per common stock.

Stock Award Plans

We use stock-based compensation plans to aid us in attracting, retaining and motivating our employees, as well as to provide incentives more directly linked to increases in stockholder value. These plans provide for the grant of options to purchase shares of our common stock, the issuance of restricted stock units, performance-based shares and other equity-based awards.

Stock-based compensation expense amounts recognized for the years ended December 31, 2021, 2020 and 2019 were approximately $6.1 million, $6.5 million, and $5.7 million, respectively. Over the next twelve months, we expect to recognize approximately $3.6 million in additional compensation expense as outstanding restricted stock units and performance-based shares vest.

Stock Incentive Plan

During 2010, our stockholders voted to approve the adoption of our 2010 Stock Incentive Plan and to reserve up to 20,000,000 shares of common stock for issuance under the plan. In the second quarter of 2019, our stockholders voted to approve an amendment to the plan to restore the number of shares of common stock available for issuance under the 2010 plan to the original 20,000,000 shares (along with other changes). The Board has broad authority under the 2010 plan to fix the terms and conditions of individual agreements with participants, including the duration of the award and any vesting requirements. As of December 31, 2021, there were 14,857,886 shares available for future grant under the 2010 plan.

Directors' Stock Plan

In 2017, we adopted the amended and restated Hecla Mining Company Stock Plan for Non-Employee Directors (the "Directors' Stock Plan"), which may be terminated by our board of directors at any time. Each non-employee director is credited each year with that number of shares determined by dividing $120,000 by the average closing price for our common stock on the New York Stock Exchange for the prior calendar year. A minimum of 25% of the shares credited each year is held in trust for the benefit of each director until delivered to the director. Each director may elect, prior to the first day of the applicable year, to have a greater percentage contributed to the trust for that year. Delivery of the shares from the trust occurs upon the earliest of: (1) death or disability; (2) retirement; (3) a cessation of the director's service for any other reason; (4) a change in control; or (5) at the election of the director at any time, provided, however, that shares must be held in the trust for at least two years prior to delivery. During 2021, 2020, and 2019, 414,750, 391,244, and 252,819 shares, respectively, were credited to the non-employee directors. During 2021, 2020 and 2019, $1.8 million, $1.5 million, and $0.5 million, respectively, was charged to general and administrative expense associated with the shares issued to the non-employee directors. At December 31, 2021, there were 2,269,269 shares available for grant in the future under the plan.

Restricted Stock Units

Unvested restricted stock units granted by the Board to employees are summarized as follows:

	Shares	Weighted Average Grant Date Fair Value per Share
Unvested, January 1, 2019	2,689,468	$ 4.14
Granted (unvested)	3,312,481	$ 1.85
Canceled	(803,683)	$ 2.62
Distributed (vested)	(1,201,098)	$ 4.00
Unvested, December 31, 2019	3,997,168	$ 2.46
Granted (unvested)	1,688,111	$ 3.03
Canceled	(70,236)	$ 2.08
Distributed (vested)	(1,678,909)	$ 2.83
Unvested, December 31, 2020	3,936,134	$ 2.55
Granted (unvested)	629,437	$ 7.88
Canceled	(770,416)	$ 2.82
Distributed (vested)	(1,772,803)	$ 2.60
Unvested, December 31, 2021	2,022,352	$ 3.97

The 2,022,352 unvested units at December 31, 2021 are scheduled to vest as follows:

1,295,620	in June 2022
567,257	in June 2023
159,475	in June 2024

Unvested units will be forfeited by participants upon termination of employment in advance of vesting, with the exception of termination due to retirement if certain criteria are met. Since the earliest grant date of unvested units (which was 2019), we have recognized approximately $4.1 million in compensation expense, including approximately $3.4 million recognized in 2021, and expect to record an additional $3.9 million in compensation expense over the remaining vesting period related to these units. The latest vesting date for unvested units as of December 31, 2021 is June 2024.

Performance-Based Shares

We periodically grant performance-based share awards to certain executive employees. The value of the awards (if any) is based on the ranking of the market performance of our common stock relative to the performance of the common stock of a group of peer companies over a three-year measurement period. The number of shares to be issued (if any) is based on the value of the awards divided by the share price at grant date. The compensation cost is measured using a Monte Carlo simulation to estimate their value at grant date, and the expense related to the performance-based awards (if any) will be recognized on a straight-line basis over the thirty months following that date of the award.

Unvested performance-based share awards granted by the Board to employees are summarized as follows:

	Shares	Weighted Average Grant Date Fair Value per Share
Unvested, January 1, 2019	660,769	$ 3.27
Granted (unvested)	775,714	$ —
Canceled	(270,329)	$ 1.09
Distributed (vested)	(113,636)	$ 6.13
Unvested, December 31, 2019	1,052,518	$ 1.11
Granted (unvested)	298,680	$ 0.62
Distributed (vested)	(165,165)	$ 3.35
Unvested, December 31, 2020	1,186,033	$ 0.68
Granted (unvested)	122,462	$ 13.70
Canceled	(174,108)	$ 0.76
Distributed (vested)	(218,015)	$ 2.37
Unvested, December 31, 2021	916,372	$ 2.00

Since the earliest grant date of unvested units (which was 2019), we have recognized approximately $0.4 million in compensation expense, with all of that amount recognized in 2021, and expect to record an additional $1.4 million in compensation expense over the remaining vesting period related to these awards. The latest vesting date for unvested units as of December 31, 2021 is December 31, 2023.

In connection with the vesting of restricted stock units, performance-based shares and other stock grants, employees have in the past, at their election and when permitted by us, chosen to satisfy their tax withholding obligations through net share settlement, pursuant to which we withhold the number of shares necessary to satisfy such withholding obligations and pay the obligations in cash. Pursuant to such net settlements, in 2021, we withheld 574,251 shares valued at approximately $4.5 million, or approximately $7.88 per share. In 2020, we withheld 1,183,773 shares valued at approximately $2.7 million, or approximately $2.32 per share. These shares become treasury shares unless we cancel them.

Warrants

We have 4,136,000 warrants outstanding since the Klondex acquisition in July 2018. Each warrant entitles the warrant holder to purchase one share of our common stock. The warrants have the following key terms:

Number of warrants	Exercise price	Expiration date
2,068,000	$ 1.57	February 2029
2,068,000	$ 8.02	April 2032

Common stock contributed to the Hecla Charitable Foundation

In 2020, we gifted 650,000 shares of our common stock, valued at $2.0 million at the time of the gift, to the Hecla Charitable Foundation (the “Foundation”), and recognized expense for that amount.

Note 13: Accumulated Other Comprehensive Loss

The following table lists the beginning balance, yearly activity and ending balance of each component of "Accumulated other comprehensive loss, net" (in thousands):

	Unrealized Gains (Losses) On Securities	Changes in fair value of derivative contracts designated as hedge transactions	Adjustments For Pension Plans	Total Accumulated Other Comprehensive Loss, Net
Balance January 1, 2019	$ (13)	$ (8,784)	$ (33,672)	(42,469)
2019 change	—	8,436	(3,277)	5,159
Balance December 31, 2019	(13)	(348)	(36,949)	(37,310)
2020 change	—	7,980	(3,559)	4,421
Balance December 31, 2020	(13)	7,632	(40,508)	(32,889)
2021 change	—	(12,307)	16,740	4,433
Balance December 31, 2021	$ (13)	$ (4,675)	$ (23,768)	$ (28,456)

The amounts above are net of the income tax effect of such balances and activity as summarized in the following table (in thousands):

	Income Tax Effect of:			
	Unrealized Gains (Losses) On Securities	Changes in fair value of derivative contracts designated as hedge transactions	Adjustments For Pension Plans	Total Accumulated Other Comprehensive Loss, Net
Balance January 1, 2019	$ —	$ —	$ 12,575	$ 12,575
2019 change	—	—	—	—
Balance December 31, 2019	—	—	12,575	12,575
2020 change	—	—	—	—
Balance December 31, 2020	—	—	12,575	12,575
2021 change	—	4,689	(6,379)	(1,690)
Balance December 31, 2021	$ —	$ 4,689	$ 6,196	$ 10,885

See *Note 6* for more information on our employee benefit plans and *Note 10* for more information on our derivative instruments.

Note 14: Properties, Plants, Equipment and Mineral Interests, and Lease Commitments

Properties, Plants, Equipment and Mineral Interests

Our major components of properties, plants, equipment, and mineral interests are (in thousands):

	December 31,	
	2021	2020
		Revised
Mining properties, including asset retirement obligations	$ 818,582	$ 818,819
Development costs	549,666	526,714
Plants and equipment	1,446,183	1,410,209
Land	34,931	32,983
Mineral interests	972,754	969,589
Construction in progress	86,903	66,090
	3,909,019	3,824,404
Less accumulated depreciation, depletion and amortization	1,598,209	1,446,330
Net carrying value	$ 2,310,810	$ 2,378,074

During 2021, we incurred total capital expenditures of approximately $109.0 million. This excludes non-cash items for equipment acquired under finance leases and adjustments for asset retirement obligations, and includes acquisitions of mineral interests and land. The expenditures included $29.9 million at Lucky Friday, $23.9 million at Greens Creek, $49.6 million at Casa Berardi and $5.5 million at the Nevada Operations.

Mineral interests include amounts for value beyond proven and probable reserves ("VBPP") related to mines and exploration or pre-development interests acquired by us which are not depleted until the mineralized material they relate to is converted to proven and probable reserves. As of December 31, 2021, mineral interests included VBPP assets of $323.6 million, $382.9 million and $132.6 million, respectively, at Casa Berardi, Nevada Operations and Greens Creek, along with various other properties.

Finance Leases

We periodically enter into lease agreements, primarily for equipment at our operations, which we have determined to be finance leases. As of December 31, 2021 and 2020, we have recorded $78.9 million and $74.0 million, respectively, for the gross amount of assets acquired under the finance leases and $60.6 million and $51.7 million, respectively, in accumulated depreciation on those assets, classified as plants and equipment in *Properties, plants, equipment and mineral interests*. See *Note 8* for information on future obligations related to our finance leases.

***Note 15*: Commitments, Contingencies, and Obligations**

General

We follow GAAP guidance in determining our accruals and disclosures with respect to loss contingencies, and evaluate such accruals and contingencies for each reporting period. Accordingly, estimated losses from loss contingencies are accrued by a charge to income when information available prior to issuance of the financial statements indicates that it is probable that a liability could be incurred and the amount of the loss can be reasonably estimated. Legal expenses associated with the contingency are expensed as incurred. If a loss contingency is not probable or reasonably estimable, disclosure of the loss contingency is made in the financial statements when it is at least reasonably possible that a material loss could be incurred.

Johnny M Mine Area near San Mateo, McKinley County and San Mateo Creek Basin, New Mexico

In May 2011, the EPA made a formal request to Hecla Mining Company for information regarding the Johnny M Mine Area near San Mateo, McKinley County, New Mexico, and asserted that Hecla Mining Company may be responsible under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") for environmental remediation and past costs the EPA has incurred at the site. Mining at the Johnny M Mine was conducted for a limited period of time by a predecessor of our subsidiary, Hecla Limited. In August 2012, Hecla Limited and the EPA entered into a Settlement Agreement and Administrative Order on Consent for Removal Action ("Consent Order"), pursuant to which Hecla Limited agreed to pay (i) $1.1 million to the EPA for its past response costs at the site and (ii) any future response costs at the site under the Consent Order, in exchange for a covenant not to sue by the EPA. Hecla Limited paid the $1.1 million to the EPA for its past response costs and in December 2014 submitted to the EPA the Engineering Evaluation and Cost Analysis ("EE/CA") for the site which recommended on-site disposal of mine-related material. In January 2021, the EPA contacted Hecla Limited to begin negotiations on a new consent order to design and implement the on-site disposal response action recommended in the EE/CA. Based on the foregoing, we believe it is probable that Hecla Limited will incur a liability for the CERCLA removal action and we increased our accrual to $9.0 million in the first quarter of 2021 ($6.1 million at December 31, 2020) primarily representing estimated costs to begin design and implementation of the remedy. It is possible that Hecla Limited's liability will be more than $9.0 million, and any increase in liability could have a material adverse effect on Hecla Limited's or our results of operations or financial position.

The Johnny M Mine is in an area known as the San Mateo Creek Basin ("SMCB"), which is an approximately 321 square mile area in New Mexico that contains numerous legacy uranium mines and mills. In addition to Johnny M, Hecla Limited's predecessor was involved at other mining sites within the SMCB. The EPA appears to have deferred consideration of listing the SMCB site on CERCLA's National Priorities List ("Superfund") by removing the site from its emphasis list, and is working with various potentially responsible parties ("PRPs") at the site in order to study and potentially address perceived groundwater issues within the SMCB. The EE/CA discussed above relates primarily to contaminated rock and soil at the Johnny M site, not groundwater and not elsewhere within the SMCB site. It is possible that Hecla Limited's liability at the Johnny M Site, and for any other mine site within the SMCB at which Hecla Limited's predecessor may have operated, will be greater than our current accrual of $9.0 million due to the increased scope of required remediation.

In July 2018, the EPA informed Hecla Limited that it and several other PRPs may be liable for cleanup of the SMCB site or for costs incurred by the EPA in cleaning up the site. The EPA stated it has incurred approximately $9.6 million in response costs to date. Hecla Limited cannot with reasonable certainty estimate the amount or range of liability, if any, relating to this matter because of, among other reasons, the lack of information concerning the site, including the relative contributions of contamination by the various PRPs.

Carpenter Snow Creek and Barker-Hughesville Sites in Montana

In July 2010, the EPA made a formal request to Hecla Mining Company for information regarding the Carpenter Snow Creek Superfund site located in Cascade County, Montana. The Carpenter Snow Creek site is located in a historic mining district, and in the early 1980s Hecla Limited leased 6 mining claims and performed limited exploration activities at the site. Hecla Limited terminated the mining lease in 1988.

In June 2011, the EPA informed Hecla Limited that it believes Hecla Limited, and several other PRPs, may be liable for cleanup of the site or for costs incurred by the EPA in cleaning up the site. The EPA stated in the letter that it has incurred approximately $4.5 million in response costs and estimated that total remediation costs may exceed $100 million. Hecla Limited cannot with reasonable certainty estimate the amount or range of liability, if any, relating to this matter because of, among other reasons, the lack of information concerning the site, including the relative contributions of contamination by various other PRPs.

In February 2017, the EPA made a formal request to Hecla Mining Company for information regarding the Barker-Hughesville Mining District Superfund site located in Judith Basin and Cascade Counties, Montana. Hecla Limited submitted a response in April 2017. The Barker-Hughesville site is located in a historic mining district, and between approximately June and December 1983, Hecla Limited was party to an agreement with another mining company under which limited exploration activities occurred at or near the site.

In August 2018, the EPA informed Hecla Limited that it and several other PRPs may be liable for cleanup of the site or for costs incurred by the EPA in cleaning up the site. The EPA did not include an amount of its alleged response costs to date. Hecla Limited cannot with reasonable certainty estimate the amount or range of liability, if any, relating to this matter because of, among other reasons, the lack of information concerning past or anticipated future costs at the site and the relative contributions of contamination by various other PRPs.

Litigation Related to Klondex Acquisition

On May 24, 2019, a purported Hecla stockholder filed a putative class action lawsuit in U.S. District Court for the Southern District of New York against Hecla and certain of our executive officers, one of whom is also a director. The complaint, purportedly brought on behalf of all purchasers of Hecla common stock from March 19, 2018 through and including May 8, 2019, asserts claims under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 and Rule 10b-5 promulgated thereunder and seeks, among other things, damages and costs and expenses. Specifically, the complaint alleges that Hecla, under the authority and control of the individual defendants, made certain material false and misleading statements and omitted certain material information regarding Hecla's Nevada Operations. The complaint alleges that these misstatements and omissions artificially inflated the market price of Hecla common stock during the class period, thus purportedly harming investors. Filings with the court regarding our motion to dismiss the lawsuit were completed in the first quarter of 2021. We cannot predict the outcome of this lawsuit or estimate damages if plaintiffs were to prevail. We believe that these claims are without merit and intend to defend them vigorously.

Debt

See *Note 9* for information on the commitments related to our debt arrangements as of December 31, 2021.

Other Commitments

Our contractual obligations as of December 31, 2021 included open purchase orders and commitments at December 31, 2021 of approximately $10.2 million, $0.1 million, $4.8 million and $3.8 million for various capital and non-capital items at the Lucky Friday, Casa Berardi, Greens Creek and Nevada Operations, respectively. We also have total commitments of approximately $14.2 million relating to scheduled payments on finance leases, including interest, primarily for equipment at our Greens Creek, Lucky Friday, Casa Berardi and Nevada Operations, and total commitments of approximately $15.8 million relating to payments on operating leases (see *Note 9* for more information). As part of our ongoing business and operations, we are required to provide surety bonds, bank letters of credit, and restricted deposits for various purposes, including financial support for environmental reclamation obligations and workers compensation programs. As of December 31, 2021, we had surety bonds totaling $182.5 million and letters of credit totaling $17.3 million in place as financial support for future reclamation and closure costs, self-insurance, and employee benefit plans. The obligations associated with these instruments are generally related to performance requirements that we address through ongoing operations. As the requirements are met, the beneficiary of the associated instruments cancels or returns the instrument to the issuing entity. Certain of these instruments are associated with operating sites with long-lived assets and will remain outstanding until closure of the sites. We believe we are in compliance with all applicable bonding requirements and will be able to satisfy future bonding requirements as they arise.

Other Contingencies

We also have certain other contingencies resulting from litigation, claims, EPA investigations, and other commitments and are subject to a variety of environmental and safety laws and regulations incident to the ordinary course of business. We currently have no basis to conclude that any or all of such contingencies will materially affect our financial position, results of operations or cash flows. However, in the future, there may be changes to these contingencies, or additional contingencies may occur, any of which might result in an accrual or a change in current accruals recorded by us, and there can be no assurance that their ultimate disposition will not have a material adverse effect on our financial position, results of operations or cash flows.

Note 16: Subsequent Events

On February 15, 2021, the Company acquired 2.5 million shares of a Canadian junior exploration mining company for cash consideration of approximately $5.25 million.

DESCRIPTION OF THE REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

As of December 31, 2021, Hecla Mining Company ("we," "us," "Hecla" or the "Company") has two classes of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), our Common Stock and Series B Cumulative Convertible Preferred Stock ("Preferred Stock").

Common Stock

The following description of our Common Stock is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to our Restated Certificate of Incorporation (the "Certificate") and our Bylaws (the "Bylaws"), as amended, each of which are incorporated by reference as an exhibit to our Form 10-K of which this Exhibit 4.5 is a part. We encourage you to read our Certificate, our Bylaws and the applicable provisions of the Delaware General Corporation Law, Title 8, for additional information.

Authorized Capital Shares; Listing

Our Certificate authorizes us to issue 750,000,000 shares of Common Stock, $0.25 par value per share. All of our currently outstanding shares of Common Stock are listed on the New York Stock Exchange ("NYSE") under the symbol "HL." The outstanding shares of our Common Stock are fully paid and nonassessable.

Voting Rights

Holders of Common Stock are entitled to one vote per share on all matters voted on by the stockholders, including the election of directors. Our Common Stock does not have cumulative voting rights. There are certain provisions in the Certificate and Bylaws that can only be revised through the affirmative vote of the holders of at least 80% of the voting power of the then outstanding shares of our capital stock entitled to vote generally in the election of directors (currently only holders of Common Stock). These include the last sentence of Section 4 of Article IV, and Articles V, VI, VII and VIII of the Certificate and Sections 4 and 6 of Article II, Sections 1, 2 and 3 of Article III and the last sentence of Article VI of the Bylaws.

Dividend Rights

Subject to the rights of holders of outstanding shares of Preferred Stock, the holders of Common Stock are entitled to receive dividends, if any, as may be declared from time to time by the Board of Directors in its discretion out of funds legally available for the payment of dividends.

Liquidation Rights

Subject to any preferential rights of outstanding shares of Preferred Stock, holders of Common Stock will share ratably in all assets legally available for distribution to our stockholders in the event of dissolution.

Other Rights and Preferences

Our Common Stock has no sinking fund or redemption provisions or preemptive, conversion or exchange rights. Holders of Common Stock may act by unanimous written consent.

Preferred Stock

The following description of our Preferred Stock and is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to our Certificate and our Bylaws, each of which are incorporated by reference as an exhibit to our Form 10-K of which this Exhibit 4.5 is a part. We encourage you to read our Certificate, our Bylaws and the applicable provisions of the Delaware General Corporation Law, Title 8, for additional information.

Our Certificate authorizes us to issue 5,000,000 shares of Preferred Stock, par value $0.25 per share. The Preferred Stock is issuable in series with such voting rights, if any, designations, powers, preferences and other rights and such qualifications, limitations and restrictions as may be determined by our Board of Directors. The Board may fix the number of shares constituting each series and increase or decrease the number of shares of any series. All of our shares of our Preferred Stock are listed on the NYSE under the symbol “HL PB.”

Ranking

The Preferred Stock ranks senior to our Common Stock and any shares of Series A Junior Participating Preferred Stock (none of which have ever been issued) with respect to payment of dividends, and amounts due upon liquidation, dissolution or winding up.

While any shares of Preferred Stock are outstanding, we may not authorize the creation or issuance of any class or series of stock that ranks senior to the Preferred Stock as to dividends or amounts due upon liquidation, dissolution or winding up without the consent of the holders of 66 2/3% of the outstanding shares of Preferred Stock and any other series of preferred stock ranking on a parity with the Preferred Stock as to dividends and amounts due upon liquidation, dissolution or winding up, voting as a single class without regard to series.

Dividends

Preferred shareholders are entitled to receive, when, as and if declared by the Board of Directors out of our assets legally available therefore, cumulative cash dividends at the rate per annum of $3.50 per share of Preferred Stock. Dividends on the Preferred Stock are payable quarterly in arrears on October 1, January 1, April 1 and July 1 of each year (and, in the case of any undeclared and unpaid dividends, at such additional times and for such interim periods, if any, as determined by the Board of Directors, at such annual rate. Dividends are cumulative from the date of the original issuance of the Preferred Stock, whether or not in any dividend period or periods we have assets legally

Redemption

The Preferred Stock is redeemable at our option, in whole or in part, at $50 per share, plus, in each case, all dividends undeclared and unpaid on the Preferred Stock up to the date fixed for redemption.

Liquidation Preference

The holders of Preferred Stock are entitled to receive, in the event that we are liquidated, dissolved or wound up, whether voluntary or involuntary, $50 per share of Preferred Stock plus an amount per share equal to all dividends undeclared and paid thereon to the date of final distribution to such holders (the "Liquidation Preference"), and no more. Until the Preferred shareholders have been paid the Liquidation Preference in full, no payment will be made to any holder of Junior Stock upon our liquidation, dissolution or winding up. The term "junior stock" means our Common Stock and any other class of our capital stock issued and outstanding that ranks junior as to the payment of dividends or amounts payable upon liquidation, dissolution and winding up to the Preferred Stock.

Voting Rights

Except in certain circumstances and as otherwise from time to time required by applicable law, the holders of Preferred Stock have no voting rights and their consent is not required for taking any corporation action. When and if the Preferred shareholders are entitled to vote, each holder will be entitled to one vote per share.

Conversion

Each share of Preferred Stock is convertible, in whole or in part at the option of the holders thereof, into shares of common stock at a conversion price of $15.55 per share of Common Stock (equivalent to a conversion rate of 3.2154 shares of common stock for each share of Preferred Stock. The right to convert shares of Preferred Stock called for redemption will terminate at the close of business on the day preceding a redemption date (unless we default in payment of the redemption price).

No Preemptive Rights

Holders of shares of our Preferred Stock do not have preemptive rights or other rights to subscribe for unissued or treasury shares or securities convertible into such shares, and no redemption or sinking fund provisions are applicable.

Certain Provisions of the Certificate and Bylaws

Provisions with Possible Anti-Takeover Effects

The provisions in our Certificate and our Bylaws could make it more difficult for a third party to acquire control of us. These impediments include:

- the classification of our Board of Directors into three classes serving staggered three-year terms, which makes it more difficult to quickly replace board members;
- the ability of our Board of Directors to issue shares of preferred stock with rights as it deems appropriate without shareholder approval;
- a provision that special meetings of our Board of Directors may be called only by our chief executive officer or a majority of our Board of Directors;
- a provision that special meetings of shareholders may only be called pursuant to a resolution approved by a majority of our entire Board of Directors;
- a prohibition against action by written consent of our shareholders;
- a provision that our board members may only be removed for cause and by an affirmative vote of at least 80% of the outstanding voting stock;
- a provision that our shareholders comply with advance-notice provisions to bring director nominations or other matters before meetings of our shareholders;

- a prohibition against certain business combinations with an acquirer of 15% or more of our Common Stock for three years after such acquisition unless the stock acquisition or4 the business combination is approved by our board prior to the acquisition of the 15% interest or after such acquisition our board and the holders of two-thirds of the other Common Stock approve the business combination; and

- a prohibition against our entering into certain business combinations with interested shareholders without the affirmative vote of the holders of at least 80% of the voting power of the then outstanding shares of voting stock.

Classified Board of Directors

As indicated above, our Board of Directors is classified into three classes serving staggered three-year terms.

Provisions Discriminating Against any Existing or Prospective Holder of Common Stock

As indicated above, the Certificate contains two such provisions:

- Article VIII contains a prohibition against certain business combinations with an acquirer of 15% or more of our Common Stock for three years after such acquisition unless the stock acquisition or the business combination is approved by our board prior to the acquisition of the 15% interest or after such acquisition our board and the holders of two-thirds of the other Common Stock approve the business combination; and

- The Certificate does not include language opting out of Section 203 of the Delaware General Corporation Law which requires the affirmative vote of the holders of at least 80% of the voting power of the then outstanding shares of voting stock prior to our entering into certain business combinations with interested shareholders without the affirmative vote of the holders of at least 80% of the voting power of the then outstanding shares of voting stock.

Hecla
Mining Company

Post-2004 Supplemental Excess Retirement Plan

Effective January 1, 2019

Hecla
Mining Company
Post-2004 Supplemental Excess Retirement Plan
Master Plan Document

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Hecla
Mining Company
Post-2004 Supplemental Excess Retirement Plan

PURPOSE

Hecla Mining Company, a Delaware corporation (the "Company"), sponsors the Hecla Mining Company Supplemental Excess Retirement Plan, effective January 1, 1995 and as subsequently amended (the "1995 Plan"), to provide specified benefits to a select group of management and highly compensated employees who contribute materially to the continued growth, development and future business success of the Company, and its subsidiaries, if any, that sponsor the 1995 Plan. To clarify the application of Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), the 1995 Plan is being amended and restated as two plans - the new Hecla Mining Company Post-2004 Supplemental Excess Retirement Plan (the "Post-2004 Plan") and the Hecla Mining Company Pre-2005 Supplemental Excess Retirement Plan (the "Pre-2005 Plan"), which is the successor to the 1995 Plan. This, the Post-2004 Plan, is intended to be "unfunded" within the meaning of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"). Accordingly, it is intended that the Post-2004 Plan be a "top hat plan" that is exempt from the requirements of Parts II, III and IV of Title I of ERISA pursuant to §§ 201(2), 301(a)(3) and 401(a)(1) of ERISA. The Post-2004 Plan is intended to comply with the applicable requirements of Section 409A of the Code governing nonqualified plans, as created by Congress' enactment of the American Jobs Creation Act of 2004. Reference to any section of the Code or ERISA shall be deemed to incorporate any required amendment of such section as necessary to maintain the Post-2004 Plan's compliance with the foregoing laws.

The portion of the 1995 Plan governing benefits earned and vested after December 31, 2004 is hereby amended and restated as the Post-2004 Plan effective January 1, 2019. The Post-2004 Plan expands the class of eligible employees to include Canadian Participants and governs both: (i) benefits earned after December 31, 2004 and (ii) benefits earned before January 1, 2005 and Post-2004 Plan benefits for Participants that first become vested after December 31, 2004. Benefits earned and vested under the 1995 Plan before January 1, 2005 shall be governed by the Pre-2005 Plan, as set forth in a separate document.

ARTICLE 1
Definitions

For purposes hereof, unless otherwise clearly apparent from the context, the following phrases or terms shall have the following indicated meanings:

> "Actuarial Equivalent" shall mean the actuarial equivalent value of an amount payable in a different form and/or at a different date computed on the basis of the actuarial assumptions used from time to time in the Pension Plan. No Participant shall be deemed to have any right, vested or nonvested, regarding the continued use of previously adopted actuarial assumptions.

"Beneficiary" shall mean, for purposes of an unmarried Participant's Cash Balance Account benefit, the person or persons (natural or otherwise) designated by or for a Participant, entitled under this Plan to receive benefits from the Participant's Cash Balance Account after the Participant's death. For all other purposes, "beneficiary" shall mean a Participant's spouse as of the earlier of (a) a Participant's date of death or (b) the date benefits commence, as determined under the laws of the relevant jurisdiction.

"Board" shall mean the board of directors of the Company.

"Canadian Participant" shall mean a Canadian-based employee who primarily is not subject to US taxation and has been designated as eligible for the Post-2004 Plan by the Company in its sole discretion.

"Cash Balance Account" shall mean "Cash Balance Account" as defined in the Pension Plan, but as adjusted by:

(a) Determining a Participant's Cash Balance Account under the Pension Plan except that the limitations under Code Sections 401(a)(17) and 415 shall not be taken into account in determining the amount under this subsection (a) and the compensation used to determine the accrued benefit shall include, if it does not already do so, any amounts deferred by the Participant under any nonqualified deferred compensation plan sponsored by the Participant's Employer during the year(s) for which compensation is determined and used for determining such accrued benefit; less

(b) An amount equal to the Participant's Cash Balance Account under the Pension Plan by taking into account all limitations required by the Pension Plan and applicable law.

"Claimant" shall have the meaning set forth in Section 7.1.

"Code" shall mean the Internal Revenue Code of 1986, as may be amended from time to time.

"Committee" shall mean the committee described in Article 6.

"Company" shall mean Hecla Mining Company, a Delaware corporation.

"Disability" or "Disabled" shall mean (a) a Participant's inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, or (b) a Participant's receipt of income replacement benefits, by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, for a period of not less than three (3) months under an accident and health plan covering employees of the Employer, as determined by the Committee in its sole discretion. A Participant will not be considered Disabled if the disability resulted from his having been engaged in a criminal enterprise, habitual drunkenness, addition to narcotics, a self-inflected injury, or resulted from military service.

"Early Retirement" shall mean when a Participant ceases to be an Employee of all Employers on or after his or her Early Retirement Date and before his or her Normal Retirement Date.

"Early Retirement Benefit" shall mean the benefit described in Section 3.1(b).

"Early Retirement Date" shall mean the date a Participant accrues at least ten (10) years of aggregate Years of Service and attains at least age fifty-five (55).

"Employer(s)" shall mean the Company and/or any of its subsidiaries that have been selected by the Board to participate in the Post-2004 Plan.

"ERISA" shall mean the Employee Retirement Income Security Act of 1974, as may be amended from time to time.

"Joint and Survivor Annuity" shall mean a benefit that is the Actuarial Equivalent of the Participant's Vested SERP Benefit and that is payable monthly in the form of an annuity for the life of the Participant with a survivor annuity for the life of such Participant's Beneficiary.

"Life Annuity" shall mean a benefit that is the Actuarial Equivalent of the Participant's Vested SERP Benefit and that is payable monthly in the form of an annuity for the life of the Participant.

"Normal Retirement" shall mean when a Participant ceases to be an Employee of all Employers on his or her Normal Retirement Date.

"Normal Retirement Date" shall mean the date a Participant attains age sixty-five (65).

"Participant" shall mean (a) any employee who is selected to participate in the Post-2004 Plan and completes any forms required by the Company from time to time or (b) a Canadian Participant.

"Pension Plan" shall mean the Hecla Mining Company Retirement Plan, originally effective January 1, 1947, as amended from time to time.

"Post-2004 Plan" shall mean the Company's Post-2004 Supplemental Excess Retirement Plan, which shall be evidenced by this instrument and by each Post-2004 Plan Agreement, as amended from time to time.

"Post-2004 Plan Agreement" shall mean a written agreement, as may be amended from time to time, which may be entered into by and between an Employer and a Participant.

"Plan Year" shall mean each year beginning on January 1 and ending on December 31.

"Postponed Retirement" shall mean when a Participant ceases to be an Employee of all Employers after his or her Normal Retirement Date.

"Postponed Retirement Date" shall mean the date of the Participant's termination of employment after his or her Normal Retirement Date.

"Retirement" or "Retires" shall mean, in each instance, Early Retirement, Normal Retirement or Postponed Retirement, as applicable.

"Retirement Date" shall mean the date a Participant ceases to be an employee of all Employers by reason of Retirement.

"SERP Benefit" shall mean a single Life Annuity, based on the life of the Participant, that is payable monthly, commences at age sixty-five (65) and is equal in amount to the difference between (a) and (b) below:

(a) An amount equal to a Participant's Vested normal retirement benefit for a traditional pension participant under the Pension Plan, determined as if he or she had retired on his or her Normal Retirement Date, without being married, except that the benefit limitations under Code Sections 401(a)(17) and 415 shall not be taken into account in determining the amount under this subsection (a) and the compensation used to determine the normal retirement benefit for a traditional pension participant shall include, if it does not already do so, any amounts deferred by the Participant under any nonqualified deferred compensation plan sponsored by the Participant's Employer during the year(s) for which compensation is determined and used for determining such normal retirement benefit for a traditional pension participant; less

(b) An amount equal to the Participant's Vested normal retirement benefit for a traditional pension participant under the Pension Plan determined as if he or she had retired on his or her Normal Retirement Date, without being married, and by taking into account all limitations required by the Pension Plan and applicable law.

Notwithstanding the foregoing to the contrary, the SERP Benefit for a Canadian Participant shall equal the Accrued Benefit (as defined in the Pension Plan) the Canadian Participant would have accrued as a Traditional Pension Participant (as defined in the Pension Plan) under the Pension Plan if an eligible employee and his or her accrued benefit were not subject to any limitation imposed by the Internal Revenue Service.

"Termination of Employment" shall mean a Participant ceasing to be an employee of all Employers, voluntarily or involuntarily, but shall exclude cessation of employment with all Employers as a result of Retirement, death or Disability.

"Vested" shall mean the extent to which a Participant is vested in his or her benefits under the Post-2004 Plan and shall be determined in the same manner as vesting is determined under the Pension Plan.

"Year of Service" shall mean "Year of Service" as defined in the Pension Plan.

ARTICLE 2
Eligibility

2.1 **Selection by Committee**. Participation in the Post-2004 Plan shall be limited primarily to a select group of management and highly compensated employees of the Employers. From that group, the Committee shall select, in its sole discretion, employees to participate in the Post-2004 Plan.

2.2 **Commencement of Participation**. Provided an employee selected to participate in the Post-2004 Plan has met all enrollment requirements set forth in the Post-2004 Plan and required by the Committee, including returning all required documents to the Committee, that employee shall commence participation in the Post-2004 Plan on the date specified by the Committee. If a selected employee fails to meet all such requirements prior to that date, that employee shall not be eligible to participate in the Post-2004 Plan until the completion of those requirements.

ARTICLE 3
Benefits

3.1 **Benefits**. A Participant with a Cash Balance Account, whether married or unmarried, will be entitled to the Vested portion of his or her Cash Balance Account as of the date the Participant incurs a Termination of Employment for any reason in the form described in Section 3.2. For Participants with a SERP Benefit, an unmarried Participant (as determined in accordance with the terms and conditions of the Pension Plan) will be entitled to one of the following benefits paid in the form of a Life Annuity and a married Participant will be entitled to one of the following benefits paid in the form of a 50% Joint and Survivor Annuity with the Beneficiary as the joint annuitant, provided that the applicable eligibility requirements for that benefit are met:

(a) **Normal Retirement Benefit**. If a Participant retires on his or her Normal Retirement Date, he or she shall be entitled to a normal retirement benefit, which benefit shall be equal to his or her Vested SERP Benefit.

(b) **Early Retirement Benefit**. If a Participant qualifies for Early Retirement, the Participant shall be entitled to an early retirement benefit, which benefit shall be equal to his or her Vested SERP Benefit, as reduced in accordance with the provisions of the Pension Plan for the commencement of benefit payments before the Participant's Normal Retirement Date.

(c) **Postponed Benefit**. If a Participant retires after his or her Normal Retirement Date, he or she shall be entitled to a postponed retirement benefit, which benefit shall be equal to his or her Vested SERP Benefit after giving effect to any adjustments set forth in the provisions of the Pension Plan for the commencement of benefit payments after the Participant's Normal Retirement Date.

(d) **Disability Benefit**. Subject to the limitations set forth in the Pension Plan with respect to a Participant's eligibility for a disability benefit (including examination requirements and the termination of benefits upon the occurrence of certain events), if a Participant completes at least ten (10) Years of Service, becomes Disabled while actively employed by an Employer and is not receiving any worker's compensation act, occupational disease law, military or other similar benefits for his or her Disability, he or she shall be entitled to a disability benefit under the Post-2004 Plan, which shall be equal to the Participant's Vested SERP Benefit, calculated using his or her Years of Service accumulated up to the first day of the month coincident with or following the date the Participant has been determined to be Disabled and has terminated employment.

(e) **Termination Benefit**. If a Participant completes the required Years of Service as set forth in Pension Plan provisions regarding deferred vested benefits, he or she shall be entitled to a termination benefit that is equal to his or her Vested SERP Benefit, determined as of the date of his or her Termination of Employment.

3.2 **Cash Balance Account - Form of Benefit and Time of Payment**. Notwithstanding any provision of the Plan to the contrary, Participants with a Cash Balance Account, will be paid the Cash Balance Account in a lump sum on the Participant's Early Retirement Date or Normal Retirement Date if the Participant is eligible for Early Retirement or Normal Retirement on the date he or she incurs a Termination of Employment or on the Participant's Normal Retirement Date if the Participant is not eligible for Early Retirement or Normal Retirement on his or her Termination of Employment. Notwithstanding the foregoing, in the event that a Participant with a Cash Balance Account that incurs a Termination of Employment as a result of his or her death, the Participant's Beneficiary shall be paid the balance of the Participant's Cash Balance Account as a lump sum on the first day of the month following the month in which the Participant dies.

3.3 **SERP Benefit - Pre-Retirement Death Benefit**. If a married Participant dies prior to commencing the payment of his or her SERP Benefit (other than a Disability Benefit), the Participant's Beneficiary shall be entitled to a pre-retirement death benefit equal to the survivor portion of a Joint and Survivor Annuity, determined assuming that the Participant separated from service on the earlier of his or her actual Termination of Employment date or date of death and (A) if eligible for Early Retirement at death, determined as of the date of death or (B) if not eligible for Early Retirement at death, determined as of the date the Participant would have reached his or her Normal Retirement Date had he or she lived, and the survivor portion of the annuity was fifty percent (50%) of the annuity that the Participant would have received. Notwithstanding the foregoing, if a Participant with a Vested SERP Benefit dies while he or she is actively employed with the Employer, the Participant's Beneficiary shall receive 50% of the SERP Benefit accrued by the Participant as of the date of the Participant's death.

3.4 **SERP Benefit - Form of Benefit and Time of Payment.**

(a) **Retirement**. The SERP Benefit monthly benefit payments to be paid as a result of a Participant's Retirement or upon a Disabled Participant's attaining his or her Normal Retirement Date shall commence on:

i. if the Participant is eligible for an Early Retirement Benefit, on the Participant's Early Retirement Date;

ii. for a Disabled Participant receiving a benefit under Section 3.4(b), on his or her Normal Retirement Date; or

iii. in all other cases that a Participant is eligible for a benefit under this Post-2004 Plan as a result of his or her Retirement, the later of: (A) the Participant's Normal Retirement Date and (B) the Participant's Postponed Retirement Date; and

shall continue until (X) in the case of a Joint and Survivor Annuity, the first day of the calendar month in which the Retired Participant, or his or her Beneficiary, dies, whichever is later, or (Y) in the case of an Single Life Annuity, the first day of the calendar month in which the Retired Participant dies.

(b) **Disability**. The SERP Benefit monthly benefit payments to be paid as a result of the Participant's Disability shall commence on the first day of the month coincident with or following the date he or she is determined Disabled as if the Participant had incurred a Termination of Employment on that date and continue until the first day of the calendar month when the Participant (i) is no longer Disabled, (ii) attains his or her Normal Retirement Date or (iii) dies. If the monthly benefit payments being paid as a result of a Participant's Disability cease due to the Participant attaining his or her Normal Retirement Date, his or her SERP Benefit shall be determined and paid in accordance with the Retirement provisions of Section 3.4(a) as if he or she incurred a Termination of Employment on the date he or she became Disabled.

(c) **Termination of Employment**. Unless the Participant is eligible for Early Retirement, Normal Retirement, Postponed Retirement, or incurs a Disability, the monthly benefit payments to be paid as a result of the Participant's Termination of Employment shall commence on the Participant's Normal Retirement Date.

(d) **Death**. SERP Benefits payable to a Participant's Beneficiary as a result of his or her death before SERP Benefit payments begin shall be paid monthly, in the amount stated in Section 3.3, beginning on the first day of the month following the month in which the Participant dies if he or she is eligible for Early Retirement at his or her death, otherwise such benefits shall be paid on the first day of the month following the month in which the Participant would have attained his or her Normal Retirement Date had he or she lived, and shall continue until the first day of the calendar month in which the Participant's Beneficiary dies.

3.5 **Special Election**. Notwithstanding anything in Sections 3.2 or 3.4 above to the contrary, if a Participant makes a written election, in accordance with the rules and procedures of the Committee, the lump sum or monthly benefit payments, as applicable, to be paid the Participant may be deferred until the first day of any month after his or her Early Retirement and before his or her Normal Retirement Date if eligible for Early Retirement on termination of employment; provided, however, that (A) the election is made at least twelve (12) months before the date on which the payment is scheduled to begin, (B) with respect to a payment that is not on account of death or Disability, the election does not provide for the receipt of such amounts earlier than five (5) years from the date such payment would otherwise have been paid and (C) the election will not take effect for at least twelve (12) months after the election is made.

3.6 **Small Amount**. The Committee shall pay the Participant's benefits, if any, under the Post-2004 Plan in a lump sum provided that:

(a) the payment results in the termination and liquidation of the entirety of the Participant's interest under the Post-2004 Plan, including all agreements, methods, programs, or other arrangements with respect to which deferrals of compensation are treated as having been deferred under a single nonqualified deferred compensation plan under § 1.409A-1(c)(2); and

(b) the payment is not greater than the applicable dollar amount under Section 402(g)(1)(B) of the Code.

Any payment of a small amount under this Section 3.6 of the Post-2004 Plan shall be made in strict accordance with the requirements of Section 409A of the Code and the Treasury Regulations issued thereunder. To the extent to the foregoing statutory guidance prohibits said payment, no such payment shall be permitted hereunder.

3.7 **Limitation on Benefits**. Notwithstanding the foregoing provisions of this Article 3, in no event shall a Participant or his or her Beneficiary receive more than one form of benefit under this Article 3.

3.8 **Withholding and Payroll Taxes**. The Employers may withhold from any and all benefits paid under this Article 3, all federal, state and local income, employment and other taxes required to be withheld by the Employer in connection with the benefits paid hereunder, in amounts to be determined in the sole discretion of the Employers.

3.9 **Coordination of Benefits**. Despite the foregoing terms and conditions of this Article 3, in the event of a conflict between the terms and conditions of the Pension Plan and the Post-2004 Plan with respect to the determination of benefits, the Committee, in its sole discretion, may adjust a Participant's benefits under this Article 3 so that the Participant receives a benefit under the Post-2004 Plan that, based on the terms and conditions of the Pension Plan, is in excess of the Participant's benefits under the Pension Plan as a result of the inapplicability of Sections 401(a)(17) and 415 of the Code to the Post-2004 Plan.

3.10 **Canadian Participants**. Notwithstanding any provision of the Post-2004 Plan to the contrary, for Canadian Participants, the rights and features, including timing and form of payment, shall be identical to the provisions applicable to the accrued benefit of a Traditional Pension Participant (as defined in the Pension Plan) under the Pension Plan as determined by the Company in its sole discretion. These terms and conditions are incorporated by reference.

ARTICLE 4
Termination, Amendment or Modification of the Post-2004 Plan

4.1 **Termination**. Each Employer reserves the right to terminate the Post-2004 Plan at any time with respect to its participating employees by the actions of its board of directors. Despite the foregoing, the termination of the Plan shall not decrease or restrict a Participant's, or a Participant's Beneficiary's (if the Participant has died and the Beneficiary is entitled to a benefit) Cash Balance Account or Vested SERP Benefit, determined on an Actuarial Equivalent basis. No amendment, discontinuance or termination of the Post-2004 Plan shall affect or otherwise accelerate the timing, form and manner of payments of a Cash Balance Account or Vested SERP Benefit in existence as of the date such amendment, discontinuance or termination is adopted by the Board or Committee, but instead such payments shall occur in accordance with the terms of the Post-2004 Plan in effect at the time such resolution is adopted, except to the extent that acceleration would be permitted upon a Post-2004 Plan termination in accordance with Section 409A of the Code, the treasury regulations thereunder and applicable Internal Revenue Service guidance.

4.2 **Amendment**. The Company may, at any time, amend or modify the Post-2004 Plan in whole or in part with respect to its participating employees by the actions of its Board; provided, however, that no amendment or modification shall be effective to decrease or restrict a Participant's then Cash Balance Account or Vested SERP Benefit, determined on an Actuarial Equivalent basis. The amendment or modification of the Post-2004 Plan shall not affect any Participant or his or her Beneficiary who has become entitled to the payment of benefits under the Post-2004 Plan as of the date of the amendment or modification.

4.3 **Termination of Post-2004 Plan Agreement**. Absent the earlier termination, modification or amendment of the Post-2004 Plan, the Post-2004 Plan Agreement of any Participant shall terminate upon the full payment of the applicable benefit as provided under Article 3.

ARTICLE 5
Other Benefits and Agreements

5.1 **Coordination with Other Benefits**. The benefits provided for a Participant under the Post-2004 Plan are in addition to any other benefits available to such Participant under any other plan or program for employees of the Employers. The Post-2004 Plan shall supplement and shall not supersede, modify or amend any other such plan or program except as may otherwise be expressly provided.

ARTICLE 6
Administration of the Post-2004 Plan

6.1 **Committee Duties**. The Plan shall be administered by a Committee which shall consist of the Board, or such committee as the Board shall appoint. Members of the Committee may be Participants under the Post-2004 Plan. The Committee shall also have the discretion and authority to (a) make, amend, interpret and enforce all appropriate rules and regulations for the administration of the Post-2004 Plan and (b) decide or resolve any and all questions including interpretations of the Post-2004 Plan, as may arise in connection with the Post-2004 Plan.

6.2 **Agents**. In the administration of the Post-2004 Plan, the Committee may employ agents and delegate to them such administrative duties as it sees fit, (including acting through a duly appointed representative), and may from time to time consult with counsel who may be counsel to any Employer.

6.3 **Binding Effect of Decisions**. The decision or action of the Committee with respect to any question arising out of or in connection with the administration, interpretation and application of the Post-2004 Plan and the rules and regulations promulgated hereunder shall be final and conclusive and binding upon all persons having any interest in the Post-2004 Plan.

6.4 **Indemnity of Committee**. All Employers shall indemnify and hold harmless the members of the Committee against any and all claims, losses, damages, expenses or liabilities arising from any action or failure to act with respect to the Post-2004 Plan, except in the case of willful misconduct by the Committee or any of its members.

6.5 **Employer Information**. To enable the Committee to perform its functions, each Employer shall supply full and timely information to the Committee on all matters relating to the compensation of its Participants, the date and circumstances of the retirement, Disability, death or Termination of Employment of its Participants, and such other pertinent information as the Committee may reasonably require.

ARTICLE 7
Claims Procedures

7.1 **Presentation of Claim**. Any Participant or the Beneficiary of a deceased Participant (such Participant or Beneficiary being referred to below as a "Claimant") may deliver to the Committee a written claim for a determination with respect to the amounts distributable to such Claimant from the Post-2004 Plan. If such a claim relates to the contents of a notice received by the Claimant, the claim must be made within sixty (60) days after such notice was received by the Claimant. The claim must state with particularity the determination desired by the Claimant. All other claims must be made within one-hundred and eighty (180) days of the date on which the event that caused the claim to arise occurred. The claim must state with particularity the determination desired by the Claimant.

7.2 **Initial Claim Determination**. Within 90 days after the Claimant delivers the claim, the Claimant will receive either a decision or a notice for extension describing special circumstances requiring additional time to process the claim (up to 180 days from the day the Claimant delivered the claim). Any notice for extension will describe the special circumstances (such as the need to hold a hearing) requiring more time and the date by which the Committee expects to render a decision. If the Claimant's claim is denied in whole or in part, the Claimant will receive a written notice set forth in a manner calculated to be understood by the Claimant specifying:

i. the specific reason(s) for the denial of the claim, or any part of it;

ii. specific reference(s) to pertinent provisions of the Post-2004 Plan upon which such denial was based;

iii. a description of any additional material or information necessary for the Claimant to perfect the claim, and an explanation of why such material or information is necessary; and

iv. an explanation of the claim review procedure set forth in Section 7.3 below, including a statement of the Claimant's right to bring a civil action under Section 502(a) of ERISA following a denial of the claim on appeal.

7.3 **Review of a Denied Claim**. Within sixty (60) days after receiving a notice from the Committee that a claim has been denied, in whole or in part, a Claimant (or the Claimant's duly authorized representative) may file with the Committee a written request for a review of the denial of the claim. Thereafter, but not later than thirty (30) days after the review procedure began, the Claimant (or the Claimant's duly authorized representative):

(a) may review pertinent documents;

(b) may submit written comments or other documents; and/or

(c) may request a hearing, which the Committee, in its sole discretion, may grant.

7.4 **Decision on Review**. Within 60 days after the Claimant delivers the request for review, the Claimant will receive either a decision or a notice for extension describing special circumstances requiring additional time to process the Claimant's claim (up to 120 days from the day the Claimant delivered the request for review). Any notice for extension will describe the special circumstances (such as the need to hold a hearing) requiring more time and the date by which the Committee expects to render a decision on appeal. Such decision must be written in a manner calculated to be understood by the Claimant, and it must contain:

(a) specific reasons for the decision;

(b) specific reference(s) to the pertinent Post-2004 Plan provisions upon which the decision was based;

(c) a statement that the Claimant may receive on request all relevant records at no charge;

(d) a statement of the Claimant's right to sue under Section 502(a) of ERISA; and

(e) such other matters as the Committee deems relevant.

7.5 **Disability Claims and Review of Claims Determinations**. With respect to any claim and review of a denied claim that involves a determination of disability, the Committee will decide such claim and review any request for review of a denied claim within the procedures established for disability claims and appeals under the Pension Plan.

7.6 **Legal Action**. A Claimant's compliance with the foregoing provisions of this Article 7 is a mandatory prerequisite to a Claimant's right to commence any legal action with respect to any claim for benefits under the Post-2004 Plan. If a Claimant shall fail to file a timely request for appeal according to the procedures herein outlined above, such Claimant shall have no rights of review and shall have no right to bring action in any court, and the denial of the claim shall become final and binding on all persons for all purposes. No action shall be commenced by a Claimant seeking judicial review of an adverse determination or by any other Claimant more than one year after the earlier of the date: (a) the decision became final; (b) the Claimant had exhausted his or her administrative remedies under this Article; or (c) final proof of claim was due. Any claim or action by a Participant or Beneficiary relating to or arising under the Plan shall only be brought in the US District Court for Kootenai County, Idaho, and this court shall have personal jurisdiction over any Participant or Beneficiary named in the action.

ARTICLE 8
Trust

8.1 **Establishment of Rabbi Trust**. One or more of the entities constituting the Employer may choose (but are not required) to contribute assets to a rabbi trust, the assets of which will be subject to the claims of such entity's creditors in the event of insolvency. The Employer may, but shall not be required to, establish a reserve of assets to provide funds for payments under the Post-2004 Plan. Establishing a reserve or rabbi trust shall have no effect on the operation of the Post-2004 Plan or upon the status of Participants as unsecured general creditors of the Employer. Rights to payments will not be limited to assets held in any reserve or rabbi trust.

8.2 **Interrelationship of the Post-2004 Plan and the Rabbi Trust**. The provisions of the Post-2004 Plan and the Post-2004 Plan Agreement shall govern the rights of a Participant to receive distributions pursuant to the Post-2004 Plan. The provisions of the rabbi trust shall govern the rights of the Employers, Participants and the creditors of the Employers to the assets transferred to the rabbi trust. Each Employer shall at all times remain liable to carry out its obligations under the Post-2004 Plan. Each Employer's obligations under the Post-2004 Plan may be satisfied with rabbi trust assets distributed pursuant to the terms of the rabbi trust, and any such distribution shall reduce the Employer's obligations under the Post-2004 Plan.

ARTICLE 9
Miscellaneous

9.1 **Unsecured General Creditor**. Participants and their Beneficiaries, successors and assigns shall have no legal or equitable rights, interests or claims in any property or assets of an Employer. Any and all of an Employer's assets shall be, and remain, the general, unpledged unrestricted assets of the Employer. An Employer's obligation under the Post-2004 Plan shall be merely that of an unfunded and unsecured promise to pay money in the future.

9.2 **Employer's Liability**. An Employer's liability for the payment of benefits shall be defined only by the Post-2004 Plan and the Post-2004 Plan Agreement, as entered into between the Employer and a Participant. An Employer shall have no obligation to a Participant under the Post-2004 Plan except as expressly provided in the Post-2004 Plan and his or her Post-2004 Plan Agreement.

9.3 **409A Compliance**. The Post-2004 Plan is intended to comply with Section 409A of the Code ("Section 409A") or an exemption thereunder and shall be construed and administered in accordance with Section 409A. Any payments to be made under the Post-2004 Plan upon a Termination of Employment shall only be made if such Termination of Employment constitutes a "separation from service" under Section 409A. Notwithstanding the foregoing, the Company makes no representations that the payments and benefits provided under the Post-2004 Plan comply with Section 409A and in no event shall the Company be liable for all or any portion of any taxes, penalties, interest or other expenses that may be incurred by the Participant on account of non-compliance with Section 409A. Notwithstanding any other provision of the Post-2004 Plan, if at the time of the Participant's Termination of Employment, he is a "specified employee", determined in accordance with Section 409A, any payments and benefits provided under the Post-2004 Plan that constitute "nonqualified deferred compensation" subject to Section 409A that are provided to the Participant on account of his separation from service shall not be paid until the first payroll date to occur following the six-month anniversary of the Participant's termination date ("Specified Employee Payment Date"). The aggregate amount of any payments that would otherwise have been made during such six-month period shall be paid in a lump sum on the Specified Employee Payment Date and thereafter, any remaining payments shall be paid without delay in accordance with their original schedule. If the Participant dies during the six-month period, any delayed payments shall be paid to the Participant's beneficiary in a lump sum upon the Participant's death.

9.4 **Nonassignability**. Neither a Participant, a Beneficiary, nor any other person shall have any right to commute, sell, assign, transfer, pledge, anticipate, mortgage or otherwise encumber, transfer, hypothecate or convey in advance of actual receipt, the amounts, if any, payable hereunder, or any part thereof, which are, and all rights to which are, expressly declared to be unassignable and non-transferable. No part of the amounts payable shall, prior to actual payment, be subject to seizure or sequestration for the payment of any debts, judgments, alimony or separate maintenance owed by a Participant, Beneficiary, or any other person, nor be transferable by operation of law in the event of a Participant's, Beneficiary's, or any other person's bankruptcy or insolvency. The foregoing limitation precludes, among other things, a Participant who is getting (or has gotten) a divorce from transferring any portion of his or her interest under the Post-2004 Plan to his or her spouse or ex-spouse (except by naming the spouse or ex-spouse as a Beneficiary, if applicable).

9.5 **Not a Contract of Employment**. The terms and conditions of the Post-2004 Plan shall not be deemed to constitute a contract of employment between any Employer and the Participant. Such employment is hereby acknowledged to be an "at will" employment relationship that can be terminated at any time for any reason, with or without cause. Nothing in the Post-2004 Plan shall be deemed to give a Participant the right to be retained in the service of any Employer or to interfere with the right of any Employer to discipline or discharge the Participant at any time.

9.6 **Furnishing Information**. A Participant or his or her Beneficiary will cooperate with the Committee by furnishing any and all information requested by the Committee and take such other actions as may be requested in order to facilitate the administration of the Post-2004 Plan and the payments of benefits hereunder.

9.7 **Terms**. Whenever any words are used herein in the masculine, they shall be construed as though they were in the feminine in all cases where they would so apply; and whenever any words are used herein in the singular or in the plural, they shall be construed as though they were used in the plural or the singular, as the case may be, in all cases where they would so apply.

9.8 **Captions**. The captions of the articles, sections and paragraphs of the Post-2004 Plan are for convenience only and shall not control or affect the meaning or construction of any of its provisions.

9.9 **Governing Law**. Subject to ERISA, the provisions of the Post-2004 Plan shall be construed and interpreted according to the laws of the State of Idaho.

9.10 **Notice**. Any notice or filing required or permitted to be given to the Committee under the Post-2004 Plan shall be sufficient if in writing and hand-delivered, or sent by registered or certified mail, to the address below:

Hecla Mining Company Post-2004 Supplemental Excess Retirement Plan
6500 North Mineral Drive, Ste. 200
Coeur d'Alene, Idaho 83815-9408
Attn: Director, Human Resources

Such notice shall be deemed given as of the date of delivery or, if delivery is made by mail, as of the date shown on the postmark on the receipt for registration or certification.

Any notice or filing required or permitted to be given to a Participant under the Post-2004 Plan shall be sufficient if in writing and hand-delivered, or sent by mail, to the last known address of the Participant.

9.11 **Successors**. The provisions of the Post-2004 Plan shall bind and inure to the benefit of the Participant's Employer and its successors and assigns and the Participant and the Participant's Beneficiary.

9.12 **Beneficiary's Interest**. The interest in the benefits hereunder of a Beneficiary of a Participant who has predeceased the Participant shall automatically pass to the Participant and shall not be transferable by such Beneficiary in any manner, including but not limited to such Beneficiary's will, nor shall such interest pass under the laws of intestate succession.

9.13 **Validity**. In case any provision of the Post-2004 Plan shall be illegal or invalid for any reason, said illegality or invalidity shall not affect the remaining parts hereof, but the Post-2004 Plan shall be construed and enforced as if such illegal and invalid provision had never been inserted herein.

9.14 **Incompetence**. If the Committee determines in its discretion that a benefit under the Post-2004 Plan is to be paid to a minor, a person declared incompetent or to a person incapable of handling the disposition of that person's property, the Committee may direct payment of such benefit to the guardian, legal representative or person having the care and custody of such minor, incompetent or incapable person. The Committee may require proof of minority, incompetency, incapacity or guardianship, as it may deem appropriate prior to distribution of the benefit. Any payment of a benefit shall be a payment for the account of the Participant and the Participant's Beneficiary, as the case may be, and shall be a complete discharge of any liability under the Post-2004 Plan for such payment amount.

9.15 **Court Order**. The Committee is authorized to make any payments directed by court order in any action in which the Post-2004 Plan or the Committee has been named as a party.

9.16 **Distribution in the Event of Taxation**.

(a) **General**. If, for any reason, all or any portion of a Participant's benefit under the Post-2004 Plan becomes taxable to the Participant prior to receipt, a Participant may petition the Committee for a distribution of that portion of his or her benefit that has become taxable. Upon the grant of such a petition, which grant shall not be unreasonably withheld, a Participant's Employer shall distribute to the Participant immediately available funds in an amount equal to the taxable portion of his or her benefit (which amount shall not exceed a Participant's unpaid Vested SERP Benefit under the Post-2004 Plan). If the petition is granted, the tax liability distribution shall be made within 90 days of the date when the Participant's petition is granted. Such a distribution shall affect and reduce the benefits to be paid under the Post-2004 Plan.

(b) **Rabbi Trust**. If any rabbi trust terminates and benefits are distributed from the rabbi trust to a Participant in accordance with that Section, the Participant's benefits under the Post-2004 Plan shall be reduced to the extent of such distributions.

IN WITNESS WHEREOF, the Company has signed this Post-2004 Plan document on _____, 2019.

HECLA MINING COMPANY

_____

[Name]
[Title]

Hecla
Mining Company

Pre-2005 Supplemental Excess Retirement Plan

Effective January 1, 2019

Hecla
Mining Company
Post-2004 Supplemental Excess Retirement Plan
Master Plan Document

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Hecla
Mining Company
Post-2004 Supplemental Excess Retirement Plan

PURPOSE

Hecla Mining Company, a Delaware corporation (the "Company"), sponsors the Hecla Mining Company Supplemental Excess Retirement Plan, effective January 1, 1995 and as subsequently amended (the "1995 Plan"), to provide specified benefits to a select group of management and highly compensated employees who contribute materially to the continued growth, development and future business success of the Company, and its subsidiaries, if any, that sponsor the 1995 Plan. To clarify the application of Section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), the 1995 Plan is being amended and restated as two plans - the new Hecla Mining Company Post-2004 Supplemental Excess Retirement Plan (the "Post-2004 Plan") and the Hecla Mining Company Pre-2005 Supplemental Excess Retirement Plan (the "Pre-2005 Plan"), which is the successor to the 1995 Plan. As such, and for the avoidance of doubt, any participation under the 1995 Plan shall carryforward and be automatically honored by the Pre-2005 Plan. This, the Pre-2005 Plan, is intended to be "unfunded" within the meaning of the Employee Retirement Income Security Act of 1974, as amended ("ERISA"). Accordingly, it is intended that the Pre-2005 Plan be a "top hat plan" that is exempt from the requirements of Parts II, III and IV of Title I of ERISA pursuant to §§ 201(2), 301(a)(3) and 401(a)(1) of ERISA. Reference to any section of the Code or ERISA shall be deemed to incorporate any required amendment of such section as necessary to maintain the Pre-2005 Plan's compliance with the foregoing laws. The Pre-2005 Plan is intended to be grandfathered under Section 409A of the Code governing nonqualified plans, as created by Congress' enactment of the American Jobs Creation Act of 2004.

The portion of the 1995 Plan governing benefits earned and vested before January 1, 2005 is hereby amended and restated as the Pre-2005 Plan effective January 1, 2019. For: (i) benefits earned after December 31, 2004 and (ii) benefits earned before January 1, 2005 that first become vested after December 31, 2004, the governing portion of the 1995 Plan has been amended and restated as the Post-2004 Plan. The terms of the Post-2004 Plan are set forth in a separate document.

ARTICLE 1
Definitions

For purposes hereof, unless otherwise clearly apparent from the context, the following phrases or terms shall have the following indicated meanings:

> "Actuarial Equivalent" shall mean the actuarial equivalent value of an amount payable in a different form and/or at a different date computed on the basis of the actuarial assumptions used from time to time in the Pension Plan. No Participant shall be deemed to have any right, vested or nonvested, regarding the continued use of previously adopted actuarial assumptions.

"Annuity Starting Date" means the first day of the first period for which payment of a SERP Benefit under the Pre-2005 Plan is scheduled to commence, either as a result of a written election or by operation of the Pre-2005 Plan. Generally, a Participant's Annuity Starting Date shall be the date the Participant elected payment of his or her SERP Benefit to commence, in accordance with election procedures established by the Committee, which shall only be after all events have occurred that entitle the Participant to such payment. In the case of a deferred annuity, the Annuity Starting Date shall be the date on which the annuity payments are scheduled to commence. The payment of any disability retirement benefit is to be disregarded in determining the Annuity Starting Date.

"Board" shall mean the board of directors of the Company.

"Claimant" shall have the meaning set forth in Section 7.1.

"Code" shall mean the Internal Revenue Code of 1986, as may be amended from time to time.

"Committee" shall mean the committee described in Article 6.

"Company" shall mean Hecla Mining Company, a Delaware corporation.

"Disability" or "Disabled" shall mean (a) a Participant's inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, or (b) a Participant's receipt of income replacement benefits, by reason of any medically determinable physical or mental impairment that can be expected to result in death or can be expected to last for a continuous period of not less than twelve (12) months, for a period of not less than three (3) months under an accident and health plan covering employees of the Employer, as determined by the Committee in its sole discretion. A Participant will not be considered Disabled if the disability resulted from his having been engaged in a criminal enterprise, habitual drunkenness, addition to narcotics, a self-inflected injury, or resulted from military service.

"Early Retirement" shall mean a Participant, who has at least ten (10) years of aggregate Years of Service, ceasing to be an Employee of all Employers and elects to commence benefit payments as a result of his or her election to retire on or after his or her Early Retirement Date or Early Retirement Date With 30 Years of Service Date, as applicable, and before Normal Retirement.

"Early Retirement Benefit" shall mean the benefit described in Section 3.1(b).

"Early Retirement Date" shall mean the first of the month coincident or next following the date a Participant accrues at least ten (10) years of aggregate Years of Service and attains at least age fifty-five (55).

"Early Retirement With 30 Years of Service Date" shall mean the date on which a Participant is entitled to retire under Section 4.1(b)(i) of the Pension Plan.

"Employer(s)" shall mean the Company and/or any of its subsidiaries that have been selected by the Board to participate in the Pre-2005 Plan.

"ERISA" shall mean the Employee Retirement Income Security Act of 1974, as may be amended from time to time.

"Joint and Survivor Annuity" shall mean a benefit that is the Actuarial Equivalent of the Participant's Vested SERP Benefit and that is payable monthly in the form of an annuity for the life of the Participant with a survivor annuity for the life of such Participant's Spouse.

"Life Annuity" shall mean a benefit that is the Actuarial Equivalent of the Participant's Vested SERP Benefit and that is payable monthly in the form of an annuity for the life of the Participant.

"Normal Retirement" shall mean when (i) a Participant ceases to be an Employee of all Employers and (ii) elects to commence benefit payments on his or her Normal Retirement Date.

"Normal Retirement Date" shall mean the first of the month coincident or next following the date a Participant attains age sixty-five (65).

"Participant" shall mean any employee who was selected to participate in the Pre-2005 Plan and completes any forms required by the Company from time to time.

"Pension Plan" shall mean the Hecla Mining Company Retirement Plan, originally effective January 1, 1947, as amended from time to time.

"Pre-2005 Plan" shall mean the Company's Pre-2005 Supplemental Excess Retirement Plan, which shall be evidenced by this instrument and by each Pre-2005 Plan Agreement, as amended from time to time.

"Pre-2005 Plan Agreement" shall mean a written agreement, as may be amended from time to time, which may be entered into by and between an Employer and a Participant.

"Plan Year" shall mean each year beginning on January 1 and ending on December 31.

"Postponed Retirement" shall mean when (i) a Participant ceases to be an Employee of all Employers and (ii) elects to commence benefit payments after his or her Normal Retirement Date.

"Postponed Retirement Date" shall mean the first of the month coincident or next following the date after his or her Normal Retirement Date.

"Retirement" or "Retires" shall mean, in each instance, Early Retirement, Normal Retirement or Postponed Retirement, as applicable.

"SERP Benefit" shall mean a single Life Annuity, based on the life of the Participant, that is payable monthly, commences at age sixty-five (65) and is equal in amount to the difference between (a) and (b) below:

(a) An amount equal to a Participant's Vested normal retirement benefit for a traditional pension participant under the Pension Plan, determined as if he or she had retired on his or her Normal Retirement Date, without being married, except that the benefit limitations under Code Sections 401(a)(17) and 415 shall not be taken into account in determining the amount under this subsection (a) and the compensation used to determine the normal retirement benefit for a traditional pension participant shall include, if it does not already do so, any amounts deferred by the Participant under any nonqualified deferred compensation plan sponsored by the Participant's Employer during the year(s) for which compensation is determined and used for determining such normal retirement benefit for a traditional pension participant; less

(b) An amount equal to the Participant's Vested normal retirement benefit for a traditional pension participant under the Pension Plan determined as if he or she had retired on his or her Normal Retirement Date, without being married, and by taking into account all limitations required by the Pension Plan and applicable law.

"Spouse" shall mean the individual, if any, to whom the Participant is lawfully married on the date of the Participant's death, or on the Participant's Annuity Starting Date, whichever is earlier. A Participant's marital status is determined under applicable state law.

"Termination of Employment" shall mean a Participant ceasing to be an employee of all Employers, voluntarily or involuntarily, but shall exclude cessation of employment with all Employers as a result of Retirement, death or Disability.

"Vested" shall mean the extent to which a Participant is vested in his or her benefits under the Pre-2005 Plan and shall be determined in the same manner as vesting is determined under the Pension Plan.

"Year of Service" shall mean "Year of Service" as defined in the Pension Plan.

ARTICLE 2
Eligibility

2.1 **Selection by Committee**. Participation in the Pre-2005 Plan shall be limited primarily to a select group of management and highly compensated employees of the Employers. From that group, the Committee shall select, in its sole discretion, employees to participate in the Pre-2005 Plan.

2.2 **Commencement of Participation**. Provided an employee selected to participate in the Pre-2005 Plan has met all enrollment requirements set forth in the Pre-2005 Plan and required by the Committee, including returning all required documents to the Committee, that employee shall commence participation in the Pre-2005 Plan on the date specified by the Committee. If a selected employee fails to meet all such requirements prior to that date, that employee shall not be eligible to participate in the Pre-2005 Plan until the completion of those requirements.

ARTICLE 3
Benefits

3.1 **Benefits**. An unmarried Participant (as determined in accordance with the terms and conditions of the Pension Plan) will be entitled to one of the following benefits paid in the form of a Life Annuity and a married Participant will be entitled to one of the following benefits paid in the annuity form elected by the Participant, as available under the Pension Plan, provided that the applicable eligibility requirements for that benefit are met:

(a) **Normal Retirement Benefit**. If a Participant retires on his or her Normal Retirement Date, he or she shall be entitled to a normal retirement benefit, which benefit shall be equal to his or her Vested SERP Benefit.

(b) **Early Retirement Benefit**. Except as provided in Section 3.1(c) below, if a Participant completes at least ten (10) Years of Service and thereafter takes Early Retirement, the Participant shall be entitled to an early retirement benefit, which benefit shall be equal to his or her Vested SERP Benefit, as reduced in accordance with the provisions of the Pension Plan for the commencement of benefit payments before the Participant's Normal Retirement Date.

(c) **Special Early Retirement Benefit**. If a Participant completes at least thirty (30) Years of Service and:

i. retires on the first day of any month following his or her sixtieth (60th) birthday, he or she shall be entitled to an early retirement benefit, which benefit shall be equal to his or her Vested SERP Benefit; or

ii. has not attained the age of sixty (60) and has been terminated by his or her Employers as a result of a reduction in the workforce, he or she shall be entitled to an early retirement benefit, which shall be equal to either (1) his or her Vested SERP Benefit, if benefit payments commence after he or she has attained age sixty (60), or (2) a benefit determined in accordance with Section 3.1(b) above, if benefit payments commence after he or she has reached age fifty-five (55) and before he or she has attained age sixty (60).

(d) **Postponed Benefit**. If a Participant retires after his or her Normal Retirement Date, he or she shall be entitled to a postponed retirement benefit, which benefit shall be equal to his or her Vested SERP Benefit after giving effect to any adjustments set forth in the provisions of the Pension Plan for the commencement of benefit payments after the Participant's Normal Retirement Date.

(e) **Disability Benefit**. Subject to the limitations set forth in the Pension Plan with respect to a Participant's eligibility for a disability benefit (including examination requirements and the termination of benefits upon the occurrence of certain events), if a Participant completes at least ten (10) Years of Service, becomes Disabled while actively employed by an Employer and is not receiving any worker's compensation act, occupational disease law, military or other similar benefits for his or her Disability, he or she shall be entitled to a disability benefit under the Pre-2005 Plan, which shall be equal to the Participant's Vested SERP Benefit, calculated using his or her Years of Service accumulated up to the first day of the month coincident with or following the date the Participant has been determined to be Disabled and has incurred a Termination of Employment. If, as of the date the Participant is determined to be Disabled, a Participant has not completed at least ten (10) Years of Service, he or she will be credited with additional Years of Service for purposes of determining his or her eligibility for a Disability benefit under the Pre-2005 Plan in accordance with the provisions of the Pension Plan regarding calculation of service for purposes of eligibility for a disability benefit but not for purposes of computing the value of the disability benefit. Despite the foregoing, this benefit shall be subject to such continued eligibility conditions or requirements set forth for a disability benefit under the Pension Plan.

(f) **Termination Benefit**. If a Participant completes the required Years of Service as set forth in Pension Plan provisions regarding deferred vested benefits, he or she shall be entitled to a termination benefit that is equal to his or her Vested SERP Benefit, determined as of the date of his or her Termination of Employment, as adjusted in accordance with the Pension Plan for payments, if any, that commence before or after the Participant's Normal Retirement Date.

3.2 **Pre-Retirement Death Benefit**. If a married Participant dies prior to his or her Annuity Starting Date, the Participant's Spouse shall be entitled to a pre-retirement death benefit equal to the survivor portion of a fifty percent (50%) Joint and Survivor Annuity, determined assuming that the Participant died on the later of: (A) the day following the earliest day that he or she could have taken Early Retirement and (B) the date of his or her death. Notwithstanding the foregoing, if a Participant with a Vested SERP Benefit dies while he or she is actively employed with the Employer, the Participant's Spouse shall receive fifty percent (50%) of the SERP Benefit accrued by the Participant as of the date of the Participant's death.

3.3 **Form of Benefit and Time of Payment**.

(a) **Retirement**. The SERP Benefit monthly benefit payments to be paid as a result of a Participant's Retirement or upon a Disabled Participant's attaining his or her Normal Retirement Date shall commence on the Annuity Starting Date following the Participant's: (i) Early Retirement Date, (ii) Early Retirement With Thirty (30) Years of Service Date, (iii) Normal Retirement Date, or (iv) Postponed Retirement Date, as applicable, and shall continue until (X) in the case of a Joint and Survivor Annuity, the first day of the calendar month in which the Retired Participant, or his or her Spouse, dies, whichever is later, or (Y) in the case of an Single Life Annuity, the first day of the calendar month in which the Retired Participant dies.

(b) **Disability**. The SERP Benefit monthly benefit payments to be paid as a result of the Participant's Disability shall commence on the first day of the month coincident with or following the date he or she is determined Disabled as if the Participant had incurred a Termination of Employment on that date and continue until the first day of the calendar month when the Participant (i) is no longer Disabled, (ii) attains his or her Normal Retirement Date or (iii) dies. If the monthly benefit payments being paid as a result of a Participant's Disability cease due to the Participant attaining his or her Normal Retirement Date, his or her SERP Benefit shall be determined and paid in accordance with the Retirement provisions of Section 3.3(a) as if he or she incurred a Termination of Employment on the date he or she became Disabled.

(c) **Termination of Employment**. The monthly benefit payments to be paid as a result of the Participant's Termination of Employment shall commence on the Participant's Normal Retirement Date, unless the Participant has elected at any time prior to one year before his or her Termination of Employment that his or her termination benefit, as calculated in Section 3.1(f) above, will be paid at an earlier time. In electing an earlier time, the Participant may not select a date that is earlier than his or her Early Retirement Date (determined as if he or she had continued employment with one or more of the Employers).

(d) **Death**. The monthly benefit payments to be paid to a Participant's Spouse as a result of his or her death shall begin on the later of: (i) the first day of the month in which the Participant would have become eligible for Early Retirement or (ii) the date of the Participant's death, and shall continue until the first day of the calendar month in which the Participant's Spouse dies.

3.4 **Special Election**. Notwithstanding anything in Sections 3.2 or 3.3 above to the contrary, if a Participant makes a written election, in accordance with the rules and procedures of the Committee, at least one year prior to the earlier of his or her Early Retirement or Termination of Employment, the monthly benefit payments to be paid to the Participant may be deferred until the first day of:

(a) Any month after his or her Early Retirement or Early Retirement With Thirty (30) Years of Service Date, as the case may be, and before his or her Normal Retirement Age, with respect to a benefit under Section 3.1(b) or Section 3.1(c)(i); or

(b) A month following the Participant's sixtieth (60th) birthday, but not later than a Participant's Normal Retirement Date, with respect to a benefit under Section 3.1(c)(ii).

3.5 **Small Amount**. The Committee shall pay the Participant's benefits, if any, under the Pre-2005 Plan in a lump sum provided that: (i) the payment results in the termination and liquidation of the entirety of the Participant's interest under the Pre-2005 Plan and (ii) the payment is not greater than the applicable dollar amount under Section 402(g)(1)(B) of the Code.

3.6 **Limitation on Benefits**. Notwithstanding the foregoing provisions of this Article 3, in no event shall a Participant or his or her Spouse receive more than one form of benefit under this Article 3.

3.7 **Withholding and Payroll Taxes**. The Employers may withhold from any and all benefits paid under this Article 3, all federal, state and local income, employment and other taxes required to be withheld by the Employer in connection with the benefits paid hereunder, in amounts to be determined in the sole discretion of the Employers.

3.8 **Coordination of Benefits**. Despite the foregoing terms and conditions of this Article 3, in the event of a conflict between the terms and conditions of the Pension Plan and the Pre-2005 Plan with respect to the determination of benefits, the Committee, in its sole discretion, may adjust a Participant's benefits under this Article 3 so that the Participant receives a benefit under the Pre-2005 Plan that, based on the terms and conditions of the Pension Plan, is in excess of the Participant's benefits under the Pension Plan as a result of the inapplicability of Sections 401(a)(17) and 415 of the Code to the Pre-2005 Plan.

ARTICLE 4
Termination, Amendment or Modification of the Pre-2005 Plan

4.1 **Termination**. Each Employer reserves the right to terminate the Pre-2005 Plan at any time with respect to its participating employees by the actions of its board of directors. Despite the foregoing, the termination of the Plan shall not decrease or restrict a Participant's, or a Participant's Spouse's (if the Participant has died and the Spouse is entitled to a benefit) Vested SERP Benefit, determined on an Actuarial Equivalent basis. For each Participant or Spouse who is receiving payments under this Pre-2005 Plan at the time of the termination, the Employer shall have the right to accelerate such payments by paying the Actuarial Equivalent value of such payments, and, upon the completion of those payments, the Participant's Plan Agreement shall terminate. For all other Participants and Spouses, upon the termination the Pre-2005 Plan, all Plan Agreements shall terminate and the Actuarial Equivalent of a Participant's Vested SERP Benefit shall be paid in a form and at a time determined by the Committee.

4.2 **Amendment**. The Company may, at any time, amend or modify the Pre-2005 Plan in whole or in part with respect to its participating employees by the actions of its Board; provided, however, that no amendment or modification shall be effective to decrease or restrict a Participant's then Vested SERP Benefit, determined on an Actuarial Equivalent basis. The amendment or modification of the Pre-2005 Plan shall not affect any Participant or his or her Spouse who has become entitled to the payment of benefits under the Pre-2005 Plan as of the date of the amendment or modification; provided, however, that the Employer shall have the right to accelerate payments by paying the Actuarial Equivalent value of such payments either as a lump sum or in some other accelerated form of payment.

4.3 **Termination of Pre-2005 Plan Agreement**. Absent the earlier termination, modification or amendment of the Pre-2005 Plan, the Pre-2005 Plan Agreement of any Participant shall terminate upon the full payment of the applicable benefit as provided under Article 3.

ARTICLE 5
Other Benefits and Agreements

5.1 **Coordination with Other Benefits**. The benefits provided for a Participant under the Pre-2005 Plan are in addition to any other benefits available to such Participant under any other plan or program for employees of the Employers. The Pre-2005 Plan shall supplement and shall not supersede, modify or amend any other such plan or program except as may otherwise be expressly provided.

ARTICLE 6
Administration of the Pre-2005 Plan

6.1 **Committee Duties**. The Plan shall be administered by a Committee which shall consist of the Board, or such committee as the Board shall appoint. Members of the Committee may be Participants under the Pre-2005 Plan. The Committee shall also have the discretion and authority to (a) make, amend, interpret and enforce all appropriate rules and regulations for the administration of the Pre-2005 Plan and (b) decide or resolve any and all questions including interpretations of the Pre-2005 Plan, as may arise in connection with the Pre-2005 Plan.

6.2 **Agents**. In the administration of the Pre-2005 Plan, the Committee may employ agents and delegate to them such administrative duties as it sees fit, (including acting through a duly appointed representative), and may from time to time consult with counsel who may be counsel to any Employer.

6.3 **Binding Effect of Decisions**. The decision or action of the Committee with respect to any question arising out of or in connection with the administration, interpretation and application of the Pre-2005 Plan and the rules and regulations promulgated hereunder shall be final and conclusive and binding upon all persons having any interest in the Pre-2005 Plan.

6.4 **Indemnity of Committee**. All Employers shall indemnify and hold harmless the members of the Committee against any and all claims, losses, damages, expenses or liabilities arising from any action or failure to act with respect to the Pre-2005 Plan, except in the case of willful misconduct by the Committee or any of its members.

6.5 **Employer Information**. To enable the Committee to perform its functions, each Employer shall supply full and timely information to the Committee on all matters relating to the compensation of its Participants, the date and circumstances of the retirement, Disability, death or Termination of Employment of its Participants, and such other pertinent information as the Committee may reasonably require.

ARTICLE 7
Claims Procedures

7.1 **Presentation of Claim**. Any Participant or the Spouse of a deceased Participant (such Participant or Spouse being referred to below as a "Claimant") may deliver to the Committee a written claim for a determination with respect to the amounts distributable to such Claimant from the Pre-2005 Plan. If such a claim relates to the contents of a notice received by the Claimant, the claim must be made within sixty (60) days after such notice was received by the Claimant. The claim must state with particularity the determination desired by the Claimant. All other claims must be made within one-hundred and eighty (180) days of the date on which the event that caused the claim to arise occurred. The claim must state with particularity the determination desired by the Claimant.

7.2 **Initial Claim Determination**. Within 90 days after the Claimant delivers the claim, the Claimant will receive either a decision or a notice for extension describing special circumstances requiring additional time to process the claim (up to 180 days from the day the Claimant delivered the claim). Any notice for extension will describe the special circumstances (such as the need to hold a hearing) requiring more time and the date by which the Committee expects to render a decision. If the Claimant's claim is denied in whole or in part, the Claimant will receive a written notice set forth in a manner calculated to be understood by the Claimant specifying:

i. the specific reason(s) for the denial of the claim, or any part of it;

ii. specific reference(s) to pertinent provisions of the Pre-2005 Plan upon which such denial was based;

iii. a description of any additional material or information necessary for the Claimant to perfect the claim, and an explanation of why such material or information is necessary; and

iv. an explanation of the claim review procedure set forth in Section 7.3 below, including a statement of the Claimant's right to bring a civil action under Section 502(a) of ERISA following a denial of the claim on appeal.

7.3 **Review of a Denied Claim**. Within sixty (60) days after receiving a notice from the Committee that a claim has been denied, in whole or in part, a Claimant (or the Claimant's duly authorized representative) may file with the Committee a written request for a review of the denial of the claim. Thereafter, but not later than thirty (30) days after the review procedure began, the Claimant (or the Claimant's duly authorized representative):

(a) may review pertinent documents;

(b) may submit written comments or other documents; and/or

(c) may request a hearing, which the Committee, in its sole discretion, may grant.

7.4 **Decision on Review**. Within 60 days after the Claimant delivers the request for review, the Claimant will receive either a decision or a notice for extension describing special circumstances requiring additional time to process the Claimant's claim (up to 120 days from the day the Claimant delivered the request for review). Any notice for extension will describe the special circumstances (such as the need to hold a hearing) requiring more time and the date by which the Committee expects to render a decision on appeal. Such decision must be written in a manner calculated to be understood by the Claimant, and it must contain:

(a) specific reasons for the decision;

(b) specific reference(s) to the pertinent Pre-2005 Plan provisions upon which the decision was based;

(c) a statement that the Claimant may receive on request all relevant records at no charge;

(d) a statement of the Claimant's right to sue under Section 502(a) of ERISA; and

(e) such other matters as the Committee deems relevant.

7.5 **Disability Claims and Review of Claims Determinations**. With respect to any claim and review of a denied claim that involves a determination of disability, the Committee will decide such claim and review any request for review of a denied claim within the procedures established for disability claims and appeals under the Pension Plan.

7.6 **Legal Action**. A Claimant's compliance with the foregoing provisions of this Article 7 is a mandatory prerequisite to a Claimant's right to commence any legal action with respect to any claim for benefits under the Pre-2005 Plan. If a Claimant shall fail to file a timely request for appeal according to the procedures herein outlined above, such Claimant shall have no rights of review and shall have no right to bring action in any court, and the denial of the claim shall become final and binding on all persons for all purposes. No action shall be commenced by a Claimant seeking judicial review of an adverse determination or by any other Claimant more than one year after the earlier of the date: (a) the decision became final; (b) the Claimant had exhausted his or her administrative remedies under this Article; or (c) final proof of claim was due. Any claim or action by a Participant or Spouse relating to or arising under the Plan shall only be brought in the US District Court for Kootenai County, Idaho, and this court shall have personal jurisdiction over any Participant or Spouse named in the action.

ARTICLE 8
Trust

8.1 **Establishment of Rabbi Trust**. One or more of the entities constituting the Employer may choose (but are not required) to contribute assets to a rabbi trust, the assets of which will be subject to the claims of such entity's creditors in the event of insolvency. The Employer may, but shall not be required to, establish a reserve of assets to provide funds for payments under the Pre-2005 Plan. Establishing a reserve or rabbi trust shall have no effect on the operation of the Pre-2005 Plan or upon the status of Participants as unsecured general creditors of the Employer. Rights to payments will not be limited to assets held in any reserve or rabbi trust.

8.2 **Interrelationship of the Pre-2005 Plan and the Rabbi Trust**. The provisions of the Pre-2005 Plan and the Pre-2005 Plan Agreement shall govern the rights of a Participant to receive distributions pursuant to the Pre-2005 Plan. The provisions of the rabbi trust shall govern the rights of the Employers, Participants and the creditors of the Employers to the assets transferred to the rabbi trust. Each Employer shall at all times remain liable to carry out its obligations under the Pre-2005 Plan. Each Employer's obligations under the Pre-2005 Plan may be satisfied with rabbi trust assets distributed pursuant to the terms of the rabbi trust, and any such distribution shall reduce the Employer's obligations under the Pre-2005 Plan.

ARTICLE 9
Miscellaneous

9.1 **Unsecured General Creditor**. Participants and their Spouses, successors and assigns shall have no legal or equitable rights, interests or claims in any property or assets of an Employer. Any and all of an Employer's assets shall be, and remain, the general, unpledged unrestricted assets of the Employer. An Employer's obligation under the Pre-2005 Plan shall be merely that of an unfunded and unsecured promise to pay money in the future.

9.2 **Employer's Liability.** An Employer's liability for the payment of benefits shall be defined only by the Pre-2005 Plan and the Pre-2005 Plan Agreement, as entered into between the Employer and a Participant. An Employer shall have no obligation to a Participant under the Pre-2005 Plan except as expressly provided in the Pre-2005 Plan and his or her Pre-2005 Plan Agreement.

9.3 **Section 409A**. The Pre-2005 Plan is intended to be exempt from Section 409A of the Code ("Section 409A") as it governs only benefits earned and vested prior to Section 409A's effective date. However, to the extent any benefit under the Pre-2005 Plan is determined to be subject to Section 409A, such benefit shall be administered and paid in accordance with the Post-2004 Plan as if the benefit was governed by such plan.

9.4 **Nonassignability**. Neither a Participant, a Spouse, nor any other person shall have any right to commute, sell, assign, transfer, pledge, anticipate, mortgage or otherwise encumber, transfer, hypothecate or convey in advance of actual receipt, the amounts, if any, payable hereunder, or any part thereof, which are, and all rights to which are, expressly declared to be unassignable and non-transferable. No part of the amounts payable shall, prior to actual payment, be subject to seizure or sequestration for the payment of any debts, judgments, alimony or separate maintenance owed by a Participant, Spouse, or any other person, nor be transferable by operation of law in the event of a Participant's, Spouse's, or any other person's bankruptcy or insolvency. The foregoing limitation precludes, among other things, a Participant who is getting (or has gotten) a divorce from transferring any portion of his or her interest under the Pre-2005 Plan to his or her Spouse or ex-Spouse.

9.5 **Not a Contract of Employment**. The terms and conditions of the Pre-2005 Plan shall not be deemed to constitute a contract of employment between any Employer and the Participant. Such employment is hereby acknowledged to be an "at will" employment relationship that can be terminated at any time for any reason, with or without cause. Nothing in the Pre-2005 Plan shall be deemed to give a Participant the right to be retained in the service of any Employer or to interfere with the right of any Employer to discipline or discharge the Participant at any time.

9.6 **Furnishing Information**. A Participant or his or her Spouse will cooperate with the Committee by furnishing any and all information requested by the Committee and take such other actions as may be requested in order to facilitate the administration of the Pre-2005 Plan and the payments of benefits hereunder.

9.7 **Terms**. Whenever any words are used herein in the masculine, they shall be construed as though they were in the feminine in all cases where they would so apply; and whenever any words are used herein in the singular or in the plural, they shall be construed as though they were used in the plural or the singular, as the case may be, in all cases where they would so apply.

9.8 **Captions**. The captions of the articles, sections and paragraphs of the Pre-2005 Plan are for convenience only and shall not control or affect the meaning or construction of any of its provisions.

9.9 **Governing Law.** Subject to ERISA, the provisions of the Pre-2005 Plan shall be construed and interpreted according to the laws of the State of Idaho.

9.10 **Notice**. Any notice or filing required or permitted to be given to the Committee under the Pre-2005 Plan shall be sufficient if in writing and hand-delivered, or sent by registered or certified mail, to the address below:

Hecla Mining Company Pre-2005 Supplemental Excess Retirement Plan
6500 North Mineral Drive, Ste. 200
Coeur d'Alene, Idaho 83815-9408
Attn: Director, Human Resources

Such notice shall be deemed given as of the date of delivery or, if delivery is made by mail, as of the date shown on the postmark on the receipt for registration or certification.

Any notice or filing required or permitted to be given to a Participant under the Pre-2005 Plan shall be sufficient if in writing and hand-delivered, or sent by mail, to the last known address of the Participant.

9.11 **Successors**. The provisions of the Pre-2005 Plan shall bind and inure to the benefit of the Participant's Employer and its successors and assigns and the Participant and the Participant's Spouse.

9.12 **Spouse's Interest**. The interest in the benefits hereunder of a Spouse of a Participant who has predeceased the Participant shall automatically pass to the Participant and shall not be transferable by such Spouse in any manner, including but not limited to such Spouse's will, nor shall such interest pass under the laws of intestate succession.

9.13 **Validity**. In case any provision of the Pre-2005 Plan shall be illegal or invalid for any reason, said illegality or invalidity shall not affect the remaining parts hereof, but the Pre-2005 Plan shall be construed and enforced as if such illegal and invalid provision had never been inserted herein.

9.14 **Incompetence**. If the Committee determines in its discretion that a benefit under the Pre-2005 Plan is to be paid to a minor, a person declared incompetent or to a person incapable of handling the disposition of that person's property, the Committee may direct payment of such benefit to the guardian, legal representative or person having the care and custody of such minor, incompetent or incapable person. The Committee may require proof of minority, incompetency, incapacity or guardianship, as it may deem appropriate prior to distribution of the benefit. Any payment of a benefit shall be a payment for the account of the Participant and the Participant's Spouse, as the case may be, and shall be a complete discharge of any liability under the Pre-2005 Plan for such payment amount.

9.15 **Court Order**. The Committee is authorized to make any payments directed by court order in any action in which the Pre-2005 Plan or the Committee has been named as a party.

9.16 **Distribution in the Event of Taxation.**

(a) **General**. If, for any reason, all or any portion of a Participant's benefit under the Pre-2005 Plan becomes taxable to the Participant prior to receipt, a Participant may petition the Committee for a distribution of that portion of his or her benefit that has become taxable. Upon the grant of such a petition, which grant shall not be unreasonably withheld, a Participant's Employer shall distribute to the Participant immediately available funds in an amount equal to the taxable portion of his or her benefit (which amount shall not exceed a Participant's unpaid Vested SERP Benefit under the Pre-2005 Plan). If the petition is granted, the tax liability distribution shall be made within 90 days of the date when the Participant's petition is granted. Such a distribution shall affect and reduce the benefits to be paid under the Pre-2005 Plan.

(b) **Rabbi Trust**. If any rabbi trust terminates and benefits are distributed from the rabbi trust to a Participant in accordance with that Section, the Participant's benefits under the Pre-2005 Plan shall be reduced to the extent of such distributions.

IN WITNESS WHEREOF, the Company has signed this Pre-2005 Plan document on _____, 2019.

HECLA MINING COMPANY

_____

[Name]
[Title]

Exhibit 21.

SUBSIDIARIES[1]

Name	State/Country of Incorporation	Ownership Percentage
Hecla Limited	Delaware	100%
Hecla Admiralty Company	Delaware	100%
Hecla Greens Creek Mining Company	Delaware	100%
Hecla Juneau Mining Company	Delaware	100%
Hecla Alaska LLC	Delaware	100%
Hecla Canada Ltd.	Federal Canadian	100%
Hecla Silver Valley, Inc.	Delaware	100%
Mines Management, Inc.	Idaho	100%
Newhi, Inc.	Washington	100%
Montanore Minerals Corp.	Delaware	100%
Silver Hunter Mining Company	Delaware	100%
Rio Grande Silver, Inc.	Delaware	100%
Hecla MC Subsidiary, LLC	Delaware	100%
Hecla Montana, Inc.	Delaware	100%
Revett Silver Company	Montana	100%
Troy Mine Inc.	Montana	100%
RC Resources, Inc.	Montana	100%
Revett Exploration, Inc.	Montana	100%
Revett Holdings, Inc.	Montana	100%
Burke Trading Inc.	Delaware	100%
Industrias Hecla, S.A. de C.V.	Mexico	100%
Mineral Hecla, S.A. de C.V.	Mexico	100%
Hecla Quebec Inc.	Federal Canadian	100%
Klondex Mines Unlimited Liability Company	Federal Canadian	100%
Klondex Holdings (USA) Inc.	Nevada	100%
Klondex Gold & Silver Mining Co.	Nevada	100%
Klondex Midas Holdings Limited	Nevada	100%
Klondex Midas Operations Inc.	Nevada	100%
Klondex Aurora Mine Inc.	Nevada	100%
Klondex Hollister Mine Inc.	Nevada	100%

[1] Determined in accordance with Item 601 of Regulation S-K

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

Hecla Mining Company
Coeur d'Alene, Idaho

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-236537, 333-248973, 333-260870, 333-256327 and 333-253255) and Form S8 (Nos. 333-218744, 333-229840, 333-231905 and 333-256328) of Hecla Mining Company of our reports dated February 22, 2022, relating to the consolidated financial statements and the effectiveness of Hecla Mining Company's internal control over financial reporting, which appear in this Form 10-K.

/s/ BDO USA, LLP
Spokane, Washington
February 22, 2022

Exhibit 23.2

Consent of Qualified Person

In connection with the Hecla Mining Company Annual Report on Form 10-K for the year ended December 31, 2021 and any amendments or supplements and/or exhibits thereto (collectively, the "Form 10-K"), the undersigned consents to:

(i) the filing and use of the technical report summary titled "Technical Report Summary on the Greens Creem Mine, Alaska, U.S.A." (the "TRS"), with an effective date of December 31, 2021, as an exhibit to and referenced in the Form 10-K;

(ii) the incorporation by reference of the TRS in the Registration Statements on Form S-3 (No. 333-236537, 333-248973, 333-260870, 333-256327 and 333-253255) and Form S8 (Nos. 333-218744, 333-229840, 333-231905 and 333-256328) (the "Registration Statements");

(iii) the use of and references to our name, including our status as an expert or "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the Securities and Exchange Commission), in connection with the TRS, Form 10-K and the Registration Statements; and

(iv) any extracts or summaries of the TRS included or incorporated by reference in the Form 10-K and the Registration Statements, and the use of any information derived, summarized, quoted or referenced from the TRS, or portions thereof, that was prepared by us, that we supervised the preparation of, and/or that was reviewed and approved by us, that is included or incorporated by reference in the Form 10-K and the Registration Statements.

Dated: February 22, 2022

By: /s/ SLR International Corporation

Name: SLR International Corporation

Exhibit 23.3

Consent of Qualified Person

In connection with the Hecla Mining Company Annual Report on Form 10-K for the year ended December 31, 2021 and any amendments or supplements and/or exhibits thereto (collectively, the "Form 10-K"), the undersigned consents to:

(i) the filing and use of the technical report summary titled "Technical Report Summary on the Lucky Friday Mine, Idaho, U.S.A." (the "TRS"), with an effective date of December 31, 2021, as an exhibit to and referenced in the Form 10-K;

(ii) the incorporation by reference of the TRS in the Registration Statements on Form S-3 (No. 333-236537, 333-248973, 333-260870, 333-256327 and 333-253255) and Form S8 (Nos. 333-218744, 333-229840, 333-231905 and 333-256328) (the "Registration Statements");

(iii) the use of and references to our name, including our status as an expert or "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the Securities and Exchange Commission), in connection with the TRS, Form 10-K and the Registration Statements; and

(iv) any extracts or summaries of the TRS included or incorporated by reference in the Form 10-K and the Registration Statements, and the use of any information derived, summarized, quoted or referenced from the TRS, or portions thereof, that was prepared by us, that we supervised the preparation of, and/or that was reviewed and approved by us, that is included or incorporated by reference in the Form 10-K and the Registration Statements.

Dated: February 22, 2022

By: /s/ SLR International Corporation

Name: SLR International Corporation

Exhibit 23.4

Consent of Qualified Person

In connection with the Hecla Mining Company Annual Report on Form 10-K for the year ended December 31, 2021 and any amendments or supplements and/or exhibits thereto (collectively, the "Form 10-K"), the undersigned consents to:

(i) the filing and use of the technical report summary titled "Technical Report Summary on the Casa Berardi Mine, Northwestern Québec, Canada" (the "TRS"), with an effective date of December 31, 2021, as an exhibit to and referenced in the Form 10-K;

(ii) the incorporation by reference of the TRS in the Registration Statements on Form S-3 (No. 333-236537, 333-248973, 333-260870, 333-256327 and 333-253255) and Form S8 (Nos. 333-218744, 333-229840, 333-231905 and 333-256328) (the "Registration Statements");

(iii) the use of and references to our name, including our status as an expert or "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the Securities and Exchange Commission), in connection with the TRS, Form 10-K and the Registration Statements; and

(iv) any extracts or summaries of the TRS included or incorporated by reference in the Form 10-K and the Registration Statements, and the use of any information derived, summarized, quoted or referenced from the TRS, or portions thereof, that was prepared by us, that we supervised the preparation of, and/or that was reviewed and approved by us, that is included or incorporated by reference in the Form 10-K and the Registration Statements.

Dated: February 22, 2022

By: /s/ SLR International Corporation

Name: SLR International Corporation

Exhibit 31.1

CERTIFICATIONS

I, Phillips S. Baker, Jr., certify that:

1. I have reviewed this annual report on Form 10-K of Hecla Mining Company;

2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2022

/s/ Phillips S. Baker, Jr.
Phillips S. Baker, Jr.
President, Chief Executive Officer and Director

Exhibit 31.2

CERTIFICATIONS

I, Russell D. Lawlar, certify that:

1. I have reviewed this annual report on Form 10-K of Hecla Mining Company;

2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 22, 2022

/s/ Russell D. Lawlar
Russell D. Lawlar
Senior Vice President, Chief Financial Officer and Treasurer

EXHIBIT 32.1

CERTIFICATIONS

I, Phillips S. Baker, Jr., President, Chief Executive Officer and Director of Hecla Mining Company ("Hecla"), certify that to my knowledge:

1. This annual report of Hecla on Form 10-K ("report") fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the report fairly presents, in all material respects, the financial condition and results of operations of Hecla.

Date: February 22, 2022

/s/ Phillips S. Baker, Jr.
Phillips S. Baker, Jr.
President, Chief Executive Officer and Director

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906 has been provided to Hecla Mining Company and will be retained by Hecla and furnished to the Securities and Exchange Commission or its staff upon request.

The foregoing certification is being furnished in accordance with Securities and Exchange Commission Release No. 34-47551 and shall not be considered filed as part of the Form 10-K.

EXHIBIT 32.2

CERTIFICATIONS

I, Russell D. Lawlar, Senior Vice President, Chief Financial Officer and Treasurer of Hecla Mining Company ("Hecla"), certify that to my knowledge:

1. This annual report of Hecla on Form 10-K ("report") fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the report fairly presents, in all material respects, the financial condition and results of operations of Hecla.

Date: February 22, 2022

/s/ Russell D. Lawlar
Russell D. Lawlar
Senior Vice President, Chief Financial Officer and Treasurer

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906 has been provided to Hecla Mining Company and will be retained by Hecla and furnished to the Securities and Exchange Commission or its staff upon request.

The foregoing certification is being furnished in accordance with Securities and Exchange Commission Release No. 34-47551 and shall not be considered filed as part of the Form 10-K.

Mine Safety Disclosures

Our mines are operated subject to the regulation of the Federal Mine Safety and Health Administration ("MSHA"), under the Federal Mine Safety and Health Act of 1977 (the "Mine Act"). In July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act") was signed into law, and amended in December 2011. When MSHA believes a violation of the Mine Act has occurred, it may issue a citation for such violation, including a civil penalty or fine, and the mine operator must abate the alleged violation.

As required by the reporting requirements of the Dodd-Frank Act, as amended, the table below presents the following information for the year ended December 31, 2021.

Mine	Section 104 S&S Citations	Section 104(b) Orders	Section 104(d) Citations and Orders	Section 110(b)(2) Violations	Section 107(a) Orders	Total Dollar Value of MSHA Assessments Proposed	Total Number Of Mining Related Fatalities	Received Notice of Pattern of Violations Under Section 104(e)	Received Notice of Potential to have Patterns Under Section 104(e)	Legal Actions Pending as of Last Day of Period	Legal Actions Initiated During Period	Legal Actions Resolved During Period
Greens Creek	0	0	0	—	—	$ 5,511	—	no	no	0	0	0
Lucky Friday	6	0	0	—	—	$ 7,041	—	no	no	0	1	1
Troy	0	0	0	—	—	$ 0	—	no	no	0	0	0
Fire Creek	0	0	0	---	---	$ 550	---	no	no	0	0	0
Hollister	0	0	0	--	--	$ 1,250	---	no	no	0	0	0
Midas	0	0	0	---	---	$ 0	---	no	no	0	0	0
Aurora	0	0	0	---	---	$ 0	---	no	no	0	0	0

Exhibit 96.1

Technical Report Summary on the Greens Creek Mine, Alaska, USA S-K 1300 Report

Hecla Mining Company
SLR Project No: 101.00632.00020
February 21, 2022



Technical Report Summary on the Greens Creek Mine, Alaska, USA

SLR Project No: 101.00632.00020

Prepared by
SLR International Corporation
1658 Cole Blvd, Suite 100
Lakewood, CO 80401
for

Hecla Mining Company
6500 N. Mineral Drive, Suite 200
Coeur d'Alene
Idaho, USA 83815

Effective Date – December 31, 2021
Signature Date - February 21, 2022

FINAL

Distribution: 1 copy – Hecla Mining Company
1 copy – SLR International Corporation

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1.0 EXECUTIVE SUMMARY

1.1 Summary

SLR International Corporation (SLR) was retained by Hecla Mining Company (Hecla) to prepare an independent Technical Report Summary (TRS) for the Greens Creek Mine (Greens Creek or the Property), located in southeastern Alaska, USA The purpose of this TRS is to support the disclosure of the Greens Creek Mineral Resource and Mineral Reserve estimates as of December 31, 2021. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary. SLR visited the Property on September 21 and 22, 2021.

Hecla was established in 1891 and has its headquarters in Coeur d'Alene, Idaho, USA. Hecla owns and operates 100% of the Property via ownership through several Hecla corporate entities. Hecla is listed on the New York Stock Exchange (NYSE) and currently reports Mineral Reserves of lead, zinc, silver, and gold in SEC filings.

The Property includes the Greens Creek mine and a processing plant (or mill). The mine primarily produces silver, with accompanying zinc, gold, and lead extracted from sediment and volcanic hosted, stratiform massive sulfide deposits using underground mining methods. The plant is a conventional flotation concentrator that produces a gravity gold concentrate, a silver concentrate, a zinc concentrate and a precious metals concentrate comprising precious and base metals.

Greens Creek commenced operations in 1989 with Rio Tinto Zinc as the operator. In 2008, Hecla acquired Kennecott Minerals' (Kennecott) interest and became the sole owner of the Property. Except for a three year hiatus between 1993 to 1996, the mine has been in continuous operation since 1989 and as of December 31, 2020 the mine has produced a total of approximately 1.95 million tons (Mst) Zn, approximately 0.76 tons Pb, approximately 322 million ounces (Moz) Ag, and approximately 2.66 Moz Au in the plant feed.

For 2021, mine production occurred at a rate of approximately 2,100 tons per day (stpd) to 2,300 stpd using cut and fill and longhole stoping as the primary mining methods. Greens Creek has produced 9.2 Moz Ag in 2021.

1.1.1 Conclusions

SLR offers the following conclusions by area.

1.1.1.1 Geology and Mineral Resources

- Exploration activities have been successful in identifying a number of additional massive sulfide lenses at depth beyond the initial mineralization discovered on surface. To date, economic mineralization has been located in nine deposits that are located in spatial proximity to a contact between footwall phyllitic rocks (interpreted as altered mafic volcanic and volcaniclastic rocks) and hanging wall clastic sedimentary units. Large portions of this favorable mine contact have not been fully evaluated by diamond drilling at depth.

- The understanding of the genetic aspects of the Greens Creek mineralization continues to evolve and improve as a result of the academic studies completed to date. The level of knowledge is likely to continue to improve with additional studies.

- The understanding of the complex folding and faulting history of the host rocks and massive sulfide mineralization also continues to improve with further studies and collection of additional drilling information.

- As prepared by Hecla, and reviewed and accepted by SLR, the Greens Creek Indicated Mineral Resources are estimated to total approximately 8.36 Mst at an average grade of approximately 12.8 oz/ton Ag, 0.10 oz/ton Au, 3.0% Pb, and 8.4% Zn. Inferred Mineral Resources are estimated at approximately 2.15 Mst at an average grade of approximately 12.8 oz/ton Ag, 0.08 oz/ton Au, 2.8% Pb, and 6.8% Zn. All Mineral Resources are effective as of December 31, 2021 and are stated exclusive of Mineral Reserves.

- Mineral Resources have been classified in accordance with S-K 1300 definitions for Mineral Resources.

- The geological data and procedures are adequate for the estimation of Mineral Resources and comply with industry standards.

- The "Reasonable Prospects for Economic Extraction" requirement for Mineral Resources as defined in S-K 1300 is satisfied by the application of polygons as reporting criteria for eight of the nine mineralized deposits such that:

    - All blocks >$215 net smelter return (NSR)/ton immediately adjacent to the designed Mineral Reserve shapes were enclosed.

    - All blocks >$215 NSR/ton that may be separated from the designed Mineral Reserve shapes were enclosed if the blocks were observed to be continuous in 3D to contain a total of approximately 20,000 tons or more. Where these blocks were only a single block wide (five feet), they were not enclosed.

    - No blocks >$215 NSR/ton immediately adjacent to as-builts were enclosed unless those blocks were determined to be sufficiently continuous and wide enough to support a separate stope.

    - Once blocks were selected in the appropriate model, they were reported without any dilution from neighboring blocks with <$215 NSR/ton values.

- The "Reasonable Prospects for Economic Extraction" requirement for Mineral Resources as defined in S-K 1300 is satisfied for the Gallagher deposit by application of similar criteria, however, using an increased cut-off value of $220 NSR/ton.

1.1.1.2 Mining and Mineral Reserves

- Mineral Reserve estimates, as prepared by Hecla and reviewed and accepted by SLR, have been classified in accordance with S-K 1300 definitions for Mineral Reserves. Mineral Reserves as of December 31, 2021 total 11.08 Mst grading 11.3 oz/ton Ag, 0.085 oz/ton Au, 2.6% Pb, and 6.5% Zn and containing 125.2 Moz Ag, 0.946 Moz Au, 282,000 tons Pb and 726,000 tons Zn at an NSR cut-off value of $215 NSR/ton.

- The Mineral Reserves are divided into nine separate zones, each constituting between 3% and 27% of total Mineral Reserve tons. The largest zone is 200S followed by South-West.

- Mineral Reserves are estimated by qualified professionals using modern mine planning software in a manner consistent with industry best practices.
- SLR verified that Hecla's selected metal prices for estimating Mineral Reserves are consistent with independent forecasts from banks and other lenders.
- Mineral Reserve estimates do not include Inferred material which historically have constituted a large portion of ore mined at Greens Creek.
- Greens Creek is a well established mine with many years of operating experience, providing the necessary expertise to extract, safely and economically, the Mineral Reserves.
- Mining at Greens Creek primarily utilizes cut and fill, and drift and fill techniques, supplemented by longhole stoping where orebody geometry permits. The mining methods used are appropriate to the deposit style and employ conventional mining tools and mechanization. All areas are backfilled with either paste or rock fill depending on future confinement and strength requirements.
- Stopes are designed to a minimum mining width governed by mining equipment. Two dilution factors are applied to all mining shapes; 6% to account for overbreak into surrounding rock, and 6% to account for overbreak into adjacent backfill. Background metal grades for waste and tailings are applied, respectively.
- Extraction for all mining methods is assumed to be 100% based on operating experience.
- Greens Creek tends to mine a significant amount of material outside of the Mineral Reserves each year. This is typically Inferred Resources at the margins of Mineral Reserves, and additional reserve grade material not previously identified by the definition diamond drilling program.
- The equipment and infrastructure requirements for life of mine (LOM) operations are well understood. Conventional underground mining equipment is used to support the underground mining activities.
- The underground equipment fleet is standard to the industry and has been proven on site. Numerous crucial units have recently been replaced or overhauled as part of the mobile equipment rebuild/replacement schedule.
- The predicted mine life to 2035 is achievable based on the projected Mineral Reserves estimated. SLR is of the opinion however, that maintaining the planned production rate is optimistic and will be particularly difficult as the number of active mining areas drops toward the end of the LOM.

1.1.1.3 Mineral Processing

- The plant is a conventional but complex semi-autogenous grinding (SAG) mill-ball mill grinding and flotation concentrator producing silver, zinc and precious metals (PM) flotation concentrates and gold concentrate using gravity spiral concentrators. The plant is compact and efficient, using particle size monitoring and on-stream analysis for grinding and flotation process control.
- The target grind size for rougher flotation is 80% passing (P_{80}) 70 µm to 85 µm and 95% passing (P_{95}) 140 µm to 160 µm. A particle size monitor is used to monitor cyclone overflow on a continuous basis.
- A gravity circuit comprising three stages of gravity spiral concentrators treats part of the grinding circuit cyclone underflow producing a precious metals concentrate that is shipped off site for intensive leaching, electrowinning, and doré casting. The gravity concentrates typically recover 15% to 20% of the gold in the mill feed and less than 1% of the silver.

- Naturally floating carbonaceous material is removed from the flotation feed using column flotation cells, improving the performance of the lead flotation cells.
- The first stage of both lead and zinc rougher flotation uses column flotation cells. The concentrate from the lead rougher column is final concentrate and flows directly to the concentrate thickeners. Zinc column concentrates may also be of final concentrate grade and can be pumped to the concentrate thickener.
- The lead and zinc rougher concentrates are reground to P_{80} 20 µm (98% passing 38 µm) using Metso Outotec Vertimills prior to cleaning. A unit flotation cell is installed in the lead Vertimill regrinding circuit circulating load to recover galena, gold and silver from the lead regrind cyclone underflow and to reduce overgrinding. The unit cell concentrates flow by gravity to the silver concentrate thickener.
- Lead and zinc roughing and cleaning circuits are similar using conventional mechanical cells.
- The PM flotation circuit treats the lead and zinc circuit cleaner tailings. The lead cleaner tailings feeds a lead PM rougher and cleaner circuit followed by Woodgrove swing cells before joining the zinc cleaner tailings in the PM rougher column cell feeding the PM flotation circuit.
- Flotation circuit performance is monitored by on-stream analysis of eighteen flotation circuit streams for lead, zinc, copper, silver, iron, and percent solids every 15 minutes using an on-stream analyzer. Mass flow is calculated on each concentrate stream providing an estimated concentrate mass yield for each concentrate.
- On-stream assays for all streams are used with feed tonnage and concentrate mass flow estimates to determine an estimated on-line mass balance. Daily composites of on-stream analysis samples are collected and assayed to monitor and correct on-stream analyzer (OSA) calibration.
- The Greens Creek metallurgical department provides flotation grade targets to the operators, which then adjust rougher and cleaner mass yields by manual control of reagent addition.
- Reagents are pumped from the reagent mixing and storage area to head tanks at appropriate locations in the flotation circuit. The head tanks are equipped with computerized solenoid discharge valves for gravity addition of flotation reagents. Flocculants are added by positive displacement pumps and CO_2 is added using customized mixing systems to inject CO_2 into a water stream.
- Tailings filtration is a very important operation at Greens Creek. All filter presses are equipped for diaphragm pressing and cake blowing using regular plant air and are mounted on four load cells to determine cake weight, monitor the degree of slurry filling, degree of completion of diaphragm press and air blow cycles, completeness of cake discharge, and the weight of cake produced on each cycle.
- Tailings filtration is a potential limiting operation in the plant. Tailings filtration is carried out in presses of similar design, with each press yielding four tons to 4.5 tons of filter cake at 11% to 12% moisture every seven to eight minutes. Tailings are sent to the surface batch plant to satisfy the mine's backfilling requirements. Excess tailings filter cake is trucked to the dry stack tailings disposal facility (TDF) for placement and compaction according to an engineered design.
- Mill production, ore grades and recoveries are consistent for both the five year and 10 year LOM plan. The average annual production for the period is 950,000 tons of ore with total lead, zinc, silver and gold recoveries of 81%, 89%, 80%, and 69%, respectively. The plant is projected to produce approximately 12 Moz Ag and 83,000 oz Au per year, with most of the precious metals reporting to the silver concentrate, and 18% of the gold reporting to the gravity concentrate. The primary grades of the silver, zinc, and PM concentrates are 27.5% Pb, 47.5% Zn, and 25% Zn, respectively.

1.1.1.4 Infrastructure

- Greens Creek has the appropriate infrastructure to support the current LOM plan to 2032.
- Modifications to the plan of operations and engineering are necessary to optimize the waste storage capacity at Site 23.
- Early-stage engineering studies are in progress to determine modifications to the plan of operations to accommodate additional material beyond the current Greens Creek Mineral Reserve life.
- Engineering studies to gain an understanding of options for final disposal of historic waste rock piles, include the potential for impoundment in the TDF or underground disposal.

1.1.1.5 Environment

- Hecla maintains a comprehensive environmental management and compliance program. All permits required for the current Greens Creek operations are in place, and mine staff continually monitor permits/regulated conditions and file required reports with the applicable regulatory agencies at the federal, state, and local level.
- Greens Creek represents one of the longest concurrent environmental baseline databases available used in assessing compliance and impact.
- Hecla's Environmental Management System (EMS) follows a 13 element plan-do-check-act approach that ensures continuous improvement around issues including obligation registers, management of change, air quality, water and waste management, energy management, training, and reporting. This system promotes a culture of environmental awareness and innovation throughout the company. The EMS program is benchmarked against ISO-14001 and complements Canada's Towards Sustainable Mining (TSM) program. On a related matter, there appears to be good cross-discipline support for the overall environmental program.
- Hecla has sufficiently addressed the environmental impact of the operation, and subsequent closure and remediation. No Notice(s) of Violation were reported during 2021 and Hecla works cooperatively with federal, state, and local agencies regarding permitting, regulatory oversite, and inspections.
- Hecla has developed a reclamation/closure plan to meet internal Hecla and regulatory requirements. The most recent cost estimates to perform this work is $108.2 million (November 2021 Asset Retirement Obligation (ARO)). Financial Assurance instruments are in place to ensure closure commitments are guaranteed should Hecla be unable to perform its obligations.
- Hecla reports that community relationships are good, and that it maintains open communication with the public for the purpose of providing information to interested residents and visitors.

1.1.2 Recommendations

SLR offers the following recommendations by area.

1.1.2.1 Geology and Mineral Resources

1. For future Mineral Resource updates apply a metal price deck to the creation of mineralization wireframes that aligns with the prices used to prepare the Mineral Resource statements.

2. Evaluate the impact of treating any unsampled intervals for the non-payable metals (such as barium, calcium, and iron) as null values upon the calculation of the block density values.

1.1.2.2 Mining and Mineral Reserves

1. Use a single set of metal prices for Mineral Reserve reporting and LOM planning to maintain cut-off grade consistency.

2. Update backfill metal grades in future LOM plans to reflect expected tailings grades.

3. Evaluate actual extraction (recovery) from longhole stoping areas and consider applying a modifying factor if appropriate.

4. Treat waste material and Inferred material in a similar manner with respect to metal grade assignment.

5. Continue to investigate the resource model accuracy through reconciliation analysis and strive to improve lead and zinc grade estimates.

6. Continue to identify production areas suitable for longhole mining in the LOM plan to take advantage of the production efficiencies gained through bulk mining.

7. Create a long range plan (LRP) with Inferred material removed. Stoping areas and supporting development should be designed to maximize the recovery of Mineral Reserves. These designs can be augmented with additional designs that target the recovery of Inferred material and used to develop a LRP that can be used as a comparison against the LOM plan. SLR is of the opinion that following this methodology will:

    - Result in a more robust LOM plan that is more likely to be achieved.

    - Allow for more accurate reporting of Mineral Reserve grades and tons, and production and development costs.

1.1.2.3 Mineral Processing

1. Maintain continuous communication between the plant and the mine to understand the feed materials being delivered to the blending stockpiles at the plant.

2. Prioritize plans to upgrade or replace the existing automated tailings filters. Tailings filtration is a limiting operation in the plant and achieving the throughput rates and cake moistures is dependent on operations and maintenance of the filtration equipment and the material types being processed.

1.1.2.4 Environment

1. Track and participate in the development of new environmental and mine permitting regulations that could impact operations.

2. Continue to perform internal and external audits of environmental compliance.
3. Evaluate opportunities for concurrent reclamation to minimize financial obligations at closure.
4. Continue to update reclamation and closure cost estimates on a regular basis.

1.2 Economic Analysis

1.2.1 Economic Criteria

An after-tax cash flow projection has been prepared from the LOM production schedule and capital and operating cost estimates and is summarized in Table 1-2. A summary of the key criteria is provided in following subsections.

1.2.1.1 Physicals

- Total mill feed processed: 11.1 Mst
- Average processing rate: 2,300 stpd with following production profile presented in Table 1-1.

Table 1-1: Production Summary
Hecla Mining Company – Greens Creek Mine

Commodity	Head Grade	% Recovery	Recovered Metal	Annual Production	Payable Metal
Gold	0.09 oz/ton	72.8	0.69 Moz	52,000 oz/year	0.58 Moz
Silver	11.3 oz/ton	76.5	95.7 Moz	7.3 Moz/year	85.6 Moz
Lead	2.5%	78.4	443 Mlb	34 Mlb/year	338 Mlb
Zinc	6.6%	86.1	1,250 Mlb	94 Mlb/year	865 Mlb

1.2.1.2 Revenue

- Metal prices used in the economic analysis are constant US$1,650/oz Au, US$21/oz Ag, US$0.95/lb Pb, and US$1.25/lb Zn.
- Revenue is calculated assuming the above metal price forecast and incorporates a $2.7 million hedge loss for lead and zinc over the first three years of the cash flow.
- Average LOM concentrate freight cost: $57/wet metric tonne with cost, insurance, and freight (CIF) basis to customer's discharge points.
- Average LOM benchmark treatment charge: $115/dry metric tonne (dmt) Ag concentrate, $190/dmt Zn to $202/dmt Zn and precious metal concentrates.
- Average LOM refining costs for concentrates: $0.07/dmt.
- Average doré refining cost: $2.10/oz Au.

1.2.1.3 Capital and Operating Costs

- Mine life of 14 years
- LOM capital costs of $294.2 million
- LOM site operating cost of $194.70/ton milled

- LOM closure/reclamation $92.8 million, including $87.3 million for final reclamation in the year after final production

1.2.1.4 Taxation and Royalties

Mining companies conducting business in Alaska are primarily subject to U.S. corporate income tax, Alaska State income tax, and Alaska Mining License tax. The State of Alaska levies a mining license tax on mining net income received in connection with mining properties and activities in Alaska, at a rate of $4,000 plus 7% over $100,000. The U.S. corporate income tax rate is 21% and the Alaska state income tax rate is 9.4%.

No income tax payable is anticipated to be payable over the LOM. Hecla plans to use a combination of existing and forecasted depreciation expenses, allocation of expenses from other entities within the consolidate tax group, percentage depletion allowances, and existing net operating losses to generate zero annual taxable income over the LOM. The mine will, however, still incur $35 million in Alaskan mining taxes over the LOM.

The Property is subject to an 2.5% NSR royalty to a third party (Bristol Royalty) over approximately 11.2% of production.

1.2.2 Cash Flow Analysis

SLR has reviewed Hecla's Greens Creek Reserves only model and has prepared its own unlevered after-tax LOM cash flow model based on the information contained in this TRS to confirm the physical and economic parameters of the mine.

The Greens Creek economics have been evaluated using the discounted cash flow method by considering annual processed tonnages and ore grade. The associated process recovery, metal prices, operating costs, refining and transportation charges, and sustaining capital expenditures were also considered.

The indicative economic analysis results, presented in Table 1-2 with no allowance for inflation, present a pre-tax and after-tax NPV, using a 5% discount rate, of $772 million and $747 million, respectively. The SLR QP is of the opinion that a 5% discount/hurdle rate for after-tax cash flow discounting of long lived precious/base metal operations in a politically stable region is reasonable, appropriate, and commonly used. For this cash flow analysis, the internal rate of return (IRR) and payback period are not applicable as there is no negative initial cash flow (no initial investment to be recovered) as Greens Creek has been in operation for a number of years.

Table 1-2: Life of Mine Indicative Economic Results
Hecla Mining Company – Greens Creek Mine

Description	Value
Realized Market Prices	
Au (US$/oz)	$1,650
Ag (US$/oz)	$21.00
Pb (US$/lb)	$0.95
Zn (US$/lb)	$1.25
Payable Metal	
Au (Moz)	0.58
Ag (Moz)	86
Pb (Mlb)	338
Zn (Mlb)	865
Total Gross Revenue	**4,156**
Mine Cost	(1,035)
Mill Cost	(402)
Surface Operations Cost	(298)
Environmental Cost	(44)
G & A Cost	(376)
Concentrate Freight Cost	(115)
Offsite Costs	(429)
Bristol Royalty	(10)
Total Operating Costs	**(2,709)**
Operating Margin (EBITDA)	**1,447**
Tax Payable	(35)
Operating Cash Flow	**1,412**
Capital Expenditures	(294)
Closure/Reclamation Costs	(93)
Total Capital	**(387)**
Pre-tax Free Cash Flow	1,060
Pre-tax NPV at 5%	**772**
After-tax Free Cash Flow	1,025
After-tax NPV at 5%	**747**

1.2.3 Sensitivity Analysis

The Greens Creek after-tax cumulative cash flow discounted at five percent (NPV_5) was analyzed for sensitivity to variations in revenue and operating and capital cost assumptions. The results of the sensitivity analysis demonstrate that the Mineral Reserve estimates are most sensitive to variations in metals prices, less sensitive to changes in metals grades and recoveries, and least sensitive to fluctuations in operating and capital costs.

1.3 Technical Summary

1.3.1 Property Description

Greens Creek is located on Admiralty Island, approximately 18 miles (29 km) to the southwest of Juneau, Alaska. The Property is 100% owned and operated by Hecla subsidiaries. The total land package encompasses 16,140 acres (ac) (6,530 hectares (ha)). The Property includes mineral tenures that are administered under either Alaskan State law, or under Federal permits.

1.3.2 Land Tenure

The Property includes 440 unpatented lode mining claims, 58 unpatented mill site claims, 17 patented lode claims, one patented mill site and other fee lands, notably the Hawk Inlet historic cannery site. Hecla also holds title to mineral rights on 7,301 ac (2,955 ha) of Federal land acquired through a land exchange with the United States Forest Service (USFS).

Bristol Resources, Inc. holds a 2.5% NSR royalty based on 11.2142% of the Greens Creek Joint Venture. This royalty is the sole responsibility of the Hecla Juneau Mining Company ownership interest (12.5164%).

Under the land exchange, production from news discoveries on the exchanged lands will be subject to Federal royalties included in the Land Exchange Agreement. The royalty is only due on production from Mineral Reserves that are not part of Greens Creek's extralateral rights. Thus far, there has been no production, and no payments of the royalty have been triggered.

Per the Greens Creek Land Exchange Act of 1995, (Public Law 104-123), properties in the land exchange are subject to a royalty payable to the USFS that is calculated on the basis of net island receipts (NIR). NIR are equal to revenues from metals extracted from the land exchange properties less transportation and treatment charges (e.g., smelting, refining, penalties, assaying) incurred after loading at Admiralty Island.

The NIR royalty is 3% if the average value of the Mineral Reserve mined during a year is greater than $120/ton ($132/t) of ore, and 0.75% if the value is $120/ton ($132/t) or less. The benchmark of $120/ton ($132/t) was adjusted annually according to the US Gross Domestic Product (GDP) Implicit Price Deflator until the year 2016, after which time it became a fixed rate of $161/ton.

1.3.3 History

Mineralization was discovered at the Big Sore copper sub-crop in 1974. Mining operations commenced in 1989 but ceased in 1993 due to low metal prices. In 1996, the mine was re-opened, and production has continued uninterrupted to date. Greens Creek has had a number of various holders to the mineral interests in the Property that have carried out various exploration, drilling, and development programs over time. Hecla obtained a 100% interest in the Project in 2008 and has continually operated the mine since then.

1.3.4 Geological Setting, Mineralization, and Deposit

The Greens Creek sulfide mineralization is localized on the Mississippian/Late Triassic contact marked by the Hyd basal conglomerate. This erosional unconformity is referred to as the "mine contact" by the mine geologists Though mineralization and significant alteration extend into the footwall mafic rocks and though some lenses of mineralization occur in the overlying argillites, the bulk of mineable material is located immediate to the mine contact.

The mine contact is variably mineralized over the claim block and nearly continuously mineralized in the mine area. Three main trends of mineralization have been traced along the mine contact with multiple centers of mineralization along those trends.

In general, the mineralized bodies are zoned over a silica flooded, pyrite-rich footwall phyllite (SPs). Semi-massive stringer mineralization is often present in the footwall below significant massive sulfide centers. The central mineralization immediately above the stringers is rich in copper, iron, arsenic, and gold and called massive pyritic ore lithology (MFP) due to the high pyrite content. Grading immediately outward from the MFP zones are the base metal (Zn-Pb) and silver rich mineral zones (MFB). Massive carbonate-rich material (WCA) is present within the MFB and towards the MFB's outer margins. More distal mineralization is characterized by quartz and barite-rich white mineral styles, WSI and WBA, respectively. While minable grades exist within all the mineral types, the MFB, MFP, and WBA types typically have the highest overall grades. Base metals typically are lower in the white mineral type though some baritic material can have high sphalerite contents. Baritic material (WBA) is observed to be particularly silver rich while the white siliceous mineral style (WSI) is typically of the lowest grade.

Ore minerals are dominantly comprised of sphalerite, galena, tetrahedrite, electrum, and proustite-pyrargyrite. A weak, epigenetic, high sulfidation event overprinted portions of the mineral deposit producing bornite, covellite, chalcocite and stromeyerite.

1.3.5 Exploration

Exploration commenced on the Property in 1973 and continued through to Hecla's acquisition of a 100% ownership in the land package in 2008. Since 2008, Hecla has completed a number of surface and underground core drilling programs, auger and mobile metal-ion (MMI) soil geochemistry, ground and borehole pulse electromagnetic (EM) geophysical surveys, and compilation of historic geophysical survey information. Reconnaissance-scale and detail-scale geologic mapping have been completed by Dr. Norm Duke, Dr. John Proffett, and various Hecla geologists.

A total of 8,202 drill holes totaling to 4,024,918 ft (1,226,795 m) have been completed over the entire Project area from 1975 to 2020. Of these drill holes, 412 drill holes totaling 508,454 ft (154,977 m) are surface-based holes drilled for exploration or Mineral Resource development purposes. Underground exploration or Mineral Resource definition drill holes total 5,462 for 2,996,378 ft (913,296 m) and are typically drilled on 50 ft to 200 ft (15 m to 60 m) spaced vertical sections. The remaining 2,328 drill holes, totaling 520,088 ft (158,523 m), are underground pre-production drill holes that are drilled on cross-sections and plan-views spaced from 20 ft to 50 ft (15m to 60 m).

1.3.6 Mineral Resource Estimates

Mineral Resource estimates have been prepared for each of the nine deposits found on the Property. The Mineral Resource estimation workflow adopts a NSR strategy in which the key payable metals are gold, silver, lead, and zinc. Each of these four metals contribute to the overall value of the material in approximately equal amounts.

A two-stage approach is undertaken when preparing the mineralization wireframe outlines for the nine deposits. The wireframing process begins with the creation of wireframe outlines using a modelling threshold of $50 NSR/ton so as to outline continuous volumes of mineralized material. A second set of mineralization wireframes are created using a threshold value of $140 NSR/ton that outline the higher grade portions of the mineralization. Grades are estimated using the ordinary kriging (OK) interpolation method for gold, silver, lead, and zinc using information from capped, composited drill hole data. Grades are also estimated for non-payable metals and elements such as barium, calcium, and iron. No capping values are applied to non-payable metals.

Density values are calculated using a formula that considers the estimated barium, calcium, iron, lead, and zinc grades for each block. Mineral Resources have been classified in accordance with the S-K 1300 definitions for Mineral Resources. Classification criteria are set after considering the continuity of the grades of silver and zinc from available drill hole sample information.

Mineral Resource statements are prepared exclusive of Mineral Reserves using block models that have been depleted for mining activities as of December 31, 2021. The Mineral Resource estimates were prepared by Hecla and reviewed and accepted by SLR. Mineral Resources are stated using a threshold value of $215 NSR/ton for all zones except for the Gallagher deposit, where a threshold value of $220 NSR/ton is applied. The Greens Creek Mineral Resource estimate as of December 31, 2021 is presented in Table 1-3.

Table 1-3: Summary of Mineral Resources – December 31, 2021
Hecla Mining Company – Greens Creek Mine

Category	Tonnage (000 ton)	Grade				Contained Metal			
		(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	(oz Au)	(oz Ag)	(ton Pb)	(ton Zn)
Measured	-	-	-	-	-	-	-	-	-
Indicated	8,355	0.10	12.8	3.0	8.4	835,900	106,670,300	250,040	701,520
Measured + Indicated	**8,355**	**0.10**	**12.8**	**3.0**	**8.4**	**835,900**	**106,670,300**	**250,040**	**701,520**
Inferred	2,152	0.08	12.8	2.8	6.8	163,700	27,507,500	60,140	146,020

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves and do not have demonstrated economic viability.
4. Mineral Resources are 100% attributable to Hecla.
5. Mineral Resource block models are prepared from drilling and sample data current as of October 31, 2021; all Mineral Resources have been depleted for mining as of December 31, 2021.
6. Mineral Resources are based on the following metal prices and cut-off assumptions: $1,700/oz Au, $21/oz Ag, $1.15/lb Pb, $1.35/lb Zn, NSR cut-off of $215 NSR/ton for all zones except the Gallagher Zone, which used a $220 NSR/ton cut-off.
7. The reasonable prospects for economic extraction requirement for Mineral Resources is satisfied by application of criteria that consider the spatial continuity of blocks above the nominated cut-off value as well as the practical aspects of extraction by means of underground mining methods.
8. Totals may not agree due to rounding.

The SLR QP is of the opinion that with consideration of the recommendations summarized in Sections 1 and 23 of this TRS, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

1.3.7 Mineral Reserve Estimates

Mineral Reserve estimates, as prepared by Hecla and reviewed and accepted by SLR, have been classified in accordance with the definitions for Mineral Reserves in S-K 1300. As shown in Table 1-4, Mineral Reserves as of December 31, 2021 total 11.08 Mst grading 11.3 oz/ton Ag, 0.085 oz/ton Au, 2.6% Pb, and 6.5% Zn and containing 125.2 Moz Ag, 0.946 Moz Au, 282,000 tons Pb and 726,000 tons Zn at an NSR cut-off value of US$215/ton.

Table 1-4: Summary of Mineral Reserves – December 31, 2021
Hecla Mining Company – Greens Creek Mine

Category	Tonnage (000 ton)	Grade				Contained Metal			
		Ag (oz/ton)	Au (oz/ton)	Pb (%)	Zn (%)	Ag (000 oz)	Au (000 oz)	Pb (000 tons)	Zn (000 tons)
Proven	2	9.60	0.075	1.66	4.54	0	0.1	0.0	0.1
Probable	11,074	11.31	0.085	2.55	6.55	125,219	945.6	282.2	725.8
Total Proven + Probable	11,076	11.31	0.085	2.55	6.55	**125,219**	945.7	282.3	725.9

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Mineral Reserves were estimated by Hecla and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla
4. Mineral Reserves are estimated at a NSR cut-off of $215 NSR/ton for all zones except the Gallagher Zone, which used a $220 NSR/ton cut-off $215 NSR/ton.
5. Mineral Reserves are estimated using an average long term price of $1,600/oz Au, $17.00/oz Ag, $0.90/lb Pb, and $1.15/lb Zn.
6. A minimum mining width of 4.6 m (15 ft) was used.
7. A density of 0.075 t/ft^3 was used for waste material.
8. Totals may not add due to rounding.

The SLR QP is not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

Current practice at Greens Creek is to classify all in situ underground Reserves as Probable Mineral Reserves. The only material included in the "Proven" Mineral Reserve category is the relatively small amount of ore tonnage present in the surface stockpile. Inferred Mineral Resources were not converted to Mineral Reserves and are not included in the LOM plan.

The Mineral Reserves are estimated for nine different zones each constituting between 3% and 27% of total Mineral Reserve tons. The four most significant zones in terms of Mineral Reserves are 200S (27% of total tons, 29% of total Ag ounces), South-West (16% of total tons, 15% of total Ag ounces), West (14% of total tons, 13% of total Ag ounces), and East (13% of total tons, 13% of silver ounces). Grade varies across the nine zones with the highest grade zones approximately twice the grade of the lowest grade zones for each of the four metals.

1.3.8 Mining Methods

Greens Creek is a portal accessed mine that utilizes conventional rubber-tired mining equipment, and drill and blast techniques. Production mining is primarily executed using cut and fill and drift and fill methods, supplemented by longhole stoping where orebody geometry permits.

The orebody is complex which has resulted in each of the nine mining zones being unique in size and shape. Each requires differing levels of mine development infrastructure which is included in the mine plan. Ore handling is performed with a fleet of underground haulage trucks and scooptrams or load-haul-dump units (LHDs). Waste is either trucked out of the mine to the waste disposal area or is placed in previously mined-out stopes when available. All LHDs are equipped with remote operating capability and can be operated from an operations room on surface. Production areas are backfilled with either paste fill, created from concentrator tailings, or cemented or uncemented rock depending on future strength requirements.

Fresh air is fed into the mine via the 920 level access portal and distributed through a series of internal ramps and raises, and exhausts through the 1350 level portal and the 2853 surface raise. A ventilation on demand (VOD) system is currently in place in a limited number of headings and is planned to be extended to the remainder of the mine.

The LOM plan is based on a 2,300 stpd production rate continuing through to the end of mine life in 2035. Ore grades remain relatively stable through the mine life with silver grade ranging from a 10.6 oz/ton Ag to 11.9 oz/ton Ag.

1.3.9 Processing and Recovery Methods

Greens Creek mineralization is a typical example of a polymetallic mineral deposit. The metals that contribute to revenue are silver, lead, zinc, and gold. Copper, while present in the Greens Creek deposits, is not recovered as a marketable product. Hecla has elected to apply a conventional NSR approach for use in discriminating between ore and waste material but has applied a slight modification to this approach by including the price of each of the individual metals as a discrete input variable, as compared to including the price of the metal within the NSR factor.

Metallurgical testing programs are continually conducted to evaluate possible changes in feed types from new mining areas, proposed changes in processing to improve recoveries and/or concentrate grades and to investigate factors causing lower than desired recoveries and concentrate grades. Industry standard studies were performed as part of process development and initial Greens Creek mill design. Subsequent production experience and focused investigations, as well as marketing requirements, have guided mill expansions and process changes. The ‘filter cake balance’, based on the assays and weights of final mill products, is the official production balance and is the most accurate in the long term. There is good long term assay agreement between measured mill feed at the flotation feed sampler and the plant feed calculated from filter cake assays, wet filter cake production tonnages from the filter press load cells and the moisture contents of filter cake samples. Full-stream samplers are installed to sample flotation circuit products at the feed to each of the four thickeners. These assays are used, together with the SAG mill feed dry tonnage and the thickener feed mass flow loop measurements, as initial estimates in mass-balancing.

Greens Creek metallurgists annually update a concentrator recovery model to estimate the metallurgical distribution of mill products as a function of ore feed grades and concentrate product quality constraints. The model is developed through extensive process simulation work and monitoring of actual plant performance over the prior 16 month period.

The plant produces three saleable flotation concentrates and a gravity concentrate. Concentrates are separately hauled and stored to a storage–loadout facility at Hawk Inlet, which is approximately eight miles (10 km) from the mine. At the Hawk Inlet facility concentrates are stored indoors in piles until being loaded periodically into ocean-going ships for transport to a variety of smelters. The Greens Creek LOM plan for the plant assumes similar throughputs, recoveries, and concentrate grades to those achieved in recent years, based on projected mill feed grades provided by geology and mine staff for the LOM.

The plant is a conventional SAG mill-ball mill grinding, gravity and flotation concentrator producing the following concentrates.

- Carbon is removed from the circuit using column flotation prior to base metal flotation producing a carbon concentrate that is discarded to tailings.
- A gravity circuit comprising spiral concentrators treats a bleed stream from the grinding circuit cyclone underflow to produce a gravity concentrate containing precious metals that is further processed off site.
- Silver concentrate is produced in a rougher-cleaner flotation circuit including re-grinding of the cleaner circuit feed. The silver-lead concentrate is relatively low grade, at approximately 35% Pb, but carries a large proportion of the silver in mill feed.
- Zinc concentrate is produced in a rougher-cleaner flotation circuit including re-grinding, using lead rougher tailings as feed. The zinc concentrate typically contains 46% Zn to 50% Zn, which is a normal grade, and considerably less silver than the silver concentrate.
- PM concentrate is produced in a complex circuit treating cleaner tailings from both the lead and zinc circuits. It is a relatively low grade zinc concentrate, at 30% Zn, with a smaller amount of lead and some silver. PM concentrate has a relatively limited market so PM and zinc concentrates production is preferred over that of PM.

Mined ore is delivered to the plant stockpile near the portal by underground haulage trucks. Ore is stockpiled on a coarse ore pad with two active stockpiles. One stockpile is constructed by back dumping run of mine ore on a ramp and dozing to produce even layers, while the other stockpile is reclaimed by dozing slots down through the steep face of the ramp into day piles with a Caterpillar D8 dozer. Stockpiles range in volume from two to ten day's capacity (4,000 tons to 20,000 tons).

The unit operations in the concentrator include:

- Stockpiling and blending of underground ore
- Primary SAG mill grinding
- Primary screening
- Secondary screening
- Ball mill grinding
- Hydrocyclone classification
- Spiral concentration for gravity recovery of precious metals from cyclone underflow
- Column flotation of graphitic carbon and carbonaceous materials
- Lead rougher flotation column – concentrate to final concentrate thickener
- Lead rougher flotation in conventional cells
    - Lead rougher concentrate regrinding in a tower mill

  - Lead unit flotation cell in regrind mill cyclone underflow – concentrate to final silver concentrate thickener
  - Lead rougher concentrate cleaning in three stages
  - Lead cleaner concentrate to silver concentrate thickening and filtration
- Lead PM rougher flotation of lead cleaner tailings
  - Lead PM cleaner flotation with concentrate to lead regrinding
- PM conditioning of lead PM rougher tailings
  - PM flotation in Woodgrove SFR cells
  - Woodgrove concentrates to zinc regrinding
  - Woodgrove tailings to PM flotation column
  - PM column flotation followed by three stages of conventional rougher cells
  - PM cleaner flotation
  - PM concentrate thickening and filtration
- Zinc rougher flotation of lead rougher tailings
  - Zinc rougher concentrate regrinding in a tower mill
  - Zinc unit flotation cell in regrind mill cyclone underflow – concentrate to final zinc concentrate thickener
  - Zinc concentrate cleaning in three stages or two stage cleaning plus scavenger
  - Zinc cleaner concentrate to concentrate thickening and filtration
  - Zinc cleaner tailings to zinc tank cell
  - Zinc tank cell concentrate to zinc regrinding
  - Zinc tank cell tailing combined in PM flotation column
- Tailings thickening and filtration, carbon column concentrate, zinc rougher tailings and PM rougher tailings

The plant is highly instrumented, with operators accessing information directly from local instrument readouts, Allen Bradley Panelview programmable logic controller (PLC) terminals in the control room, or from the supervisory control and data acquisition (SCADA) system. Monitoring of trends in measured variables, setpoints, and control outputs takes place in the SCADA system. The process control scope is generally restricted to automatic control around manual setpoints, although substantial PLC programming has allowed the development of some integrated SAG mill, thickener, pressure filter, and mill water balance control integration.

1.3.10 Infrastructure

The Greens Creek mining operation includes a significant amount of existing infrastructure primarily at two locations: the 920/860 mine area and the Hawk Inlet camp, which are connected by an 8.5 mi long road. Key existing infrastructure includes the following:

- 920/860 Mine Area:
  - Underground mine portals
  - Administration and support buildings
  - Mill building and associated processing facilities
  - Mobile equipment repair shop
  - Warehouse facilities
  - Water collection and treatment facilities
  - Development waste rock storage (“Site 23”)
- Hawk Inlet Area:
  - Personnel housing and dining buildings
  - Concentrate storage and shipping facilities
  - Materials receiving dock and warehouse
  - Dry stack TDF
  - Water collection and treatment facilities (Pond 7/10 Dam System)
  - Fully-permitted discharge facilities for treated water (APDES 002)
- Other Areas:
  - High voltage electrical intertie to the Juneau power grid via undersea cable
  - Young Bay crew ferry terminal
  - Over 13.5 mi of mine roads

The current dry stack TDF has sufficient capacity to accommodate tailings to the end of the current mine life in 2030. Early-stage engineering studies are underway to determine modifications to the plan of operations in order to accommodate additional material beyond the current Greens Creek Mineral Reserve life.

1.3.11 Market Studies

The mine has now been operational for a 30 year period, and continuously operational for the last 23 years, and has current contracts in place for silver, zinc, and precious metals flotation concentrate sales, doré refining, concentrate transportation, metals hedging, and other goods and services required to operate an underground mine.

1.3.12 Environmental Studies, Permitting and Plans, Negotiations, or Agreements with Local Individuals or Groups

Greens Creek has obtained the requisite construction and operating permits needed to operate the existing operations. In addition, they have begun permitting for expansion of the dry stack tailings to account for additional tailings storage to accommodate current long range reserves. Environmental monitoring during operations includes surface water, groundwater, air quality, meteorology, aquatics, and biological resources for regulatory compliance. These activities will continue after closure to assess reclamation success and release of financial assurance (bonding). Reclamation and closure plans have been submitted to the appropriate agencies and are updated regularly. ARO legal obligations are updated regularly and based upon existing site conditions, current laws, regulations, and costs to perform the permitted activities. The ARO is to be conducted in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 410.

1.3.13 Capital and Operating Cost Estimates

Greens Creek has been in operation for decades hence there are no preproduction capital costs to consider. Capital costs over the LOM total $294.2 million and are summarized in Table 1-5.

Table 1-5: Capital Cost Summary
Hecla Mining Company – Greens Creek Mine

Item	Cost (US$ 000)
Capitalized Mine Development	100,929
Capitalized Definition Drilling	36,411
Other Capital Expenditures	173,430
Capital Lease Financing	(16,553)
Total	**294,216**

Note:
1. Totals may not agree due to rounding.

Operating costs over the LOM total $194.70/t milled and are summarized in Table 1-6.

Table 1-6: Operating Cost Summary
Hecla Mining Company – Greens Creek Mine

Item	Cost (US$ 000)	Unit Cost ($/t milled)
Mine	1,035,118	93.47
Mill	402,327	36.33
Surface Operations	297,838	26.90
Environmental	44,297	4.00
Administration	376,456	34.00
Total	**2,156,037**	**194.70**

Note:

1. Totals may not agree due to rounding.

Hecla's forecasted capital and operating costs estimates are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would be classified as Class 1 with an accuracy range of -3% to -10% to +3% to +15%.

2.0 INTRODUCTION

SLR International Corporation (SLR) was retained by Hecla Mining Company (Hecla) to prepare an independent Technical Report Summary (TRS) for the Greens Creek Mine (Greens Creek or the Property), located in southeastern Alaska, USA The purpose of this TRS is to support the disclosure of the Greens Creek Mineral Resource and Mineral Reserve estimates as of December 31, 2021. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary.

Hecla was established in 1891 and has its headquarters in Coeur d'Alene, Idaho, USA. Hecla owns and operates 100% of the Property via ownership through several Hecla corporate entities. Hecla is listed on the New York Stock Exchange (NYSE) and currently reports Mineral Reserves of lead, zinc, silver, and gold in SEC filings.

The Property includes the Greens Creek mine and a processing plant (or mill). The mine primarily produces silver, with accompanying zinc, gold, and lead extracted from sediment and volcanic hosted, stratiform massive sulfide deposits using underground mining methods. The plant is a conventional gravity and flotation plant that produces a gravity gold concentrate, a silver concentrate, a zinc concentrate, and a precious metal concentrate consisting of precious and base metals.

Greens Creek commenced operations in 1989 with Rio Tinto Zinc as the operator. In 2008, Hecla acquired Kennecott Minerals' (Kennecott) interest and became the sole owner of the Property. Except for a three year hiatus between 1993 to 1996, the mine has been in continuous operation since 1989 and as of December 31, 2020 the mine has produced a total of approximately 1.95 million tons (Mst) Zn, approximately 0.76 tons Pb, approximately 322 million ounces (Moz) Ag, and approximately 2.66 Moz Au in the plant feed.

For 2021, mine production occurred at a rate of approximately 2,100 tons per day (stpd) to 2,300 stpd using cut and fill and longhole stoping as the primary mining methods. Greens Creek has produced 9.2 Moz Ag in 2021.

2.1 Site Visits

SLR most recently visited the site on September 21 and September 22, 2021. During the most recent site visit, the SLR QPs received a project overview by site management followed by a visit to the mine stockpile area and a tour of the plant, control room, and on site metallurgical laboratory facilities (the Greens Creek Laboratory).

The SLR geology QP visited the core shack where examples of the mineralization were examined, the logging and sampling procedures were reviewed, and visits carried out to the sample sawing and density measurement facilities. Visits were also made to several locations in the underground mine where the style and structural complexity of the host rocks, alteration signatures, and sulfide mineralization were observed. Discussions were carried out regarding the grade control and sampling procedures. A visit had been made previously during Roscoe Postle Associates Inc.'s (RPA), which is now part of SLR, 2017 site visit to the Greens Creek Laboratory and associated sample preparation facility.

The SLR mining QP visited production, development, exploration drilling, and critical infrastructure areas in the underground mine. Both cut and fill and longhole stoping production areas were visited where discussions were carried out on the mining cycle, productivities, dilution, and recovery. The SLR mining QP visited the concentrator including the communication, flotation, ore loadout, and water handling facilities. The SLR mining QP discussed mining methods, mine economics, planning and scheduling activities, ventilation, and geotechnical procedures with relevant subject matter experts.

The SLR processing QP toured the plant and maintenance areas in Area 920 with the Manager of Mill Operations and toured the underground mine with the geologists on the first day. The plant flowsheet and process control systems were reviewed, including the ore blending, grinding, gravity separation, flotation, concentrate and tailings filtration and storage, water treatment, control room, reagent area, and Greens Creek Laboratory. The second day was spent at Hawk Inlet reviewing tailings management, and infrastructure including the camp, concentrate storage and ship loading systems, fuel storage, emergency power, and potable water systems, followed by a tour of the dry stacked tailings disposal facility (TDF) area, water treatment plant, and ponds.

The SLR environmental, social, and governance QP interviewed Hecla environmental and applicable staff manager(s) regarding the Greens Creek environmental/social management system(s), permitting and compliance program, reclamation and closure plan, and associated budget(s).

2.2 Sources of Information

During the preparation of this TRS, discussions were held with the following Hecla personnel:

- Mr. Keith Blair, Chief Geologist, Hecla
- Mr. Robert Davidson, Chief Geologist, Hecla Greens Creek
- Mr. Joshua Pritts, Resource Geologist, Hecla Greens Creek
- Mr. Jacob Miller, Senior Production Geologist, Hecla Greens Creek
- Mr. Martin Stearns, Environmental/Surface Operations Manager, Hecla Greens Creek
- Mr. Ben Beard, Senior Mine Engineer, Hecla Greens Creek
- Mr. Sam Wiley, Senior Mine Engineer, Hecla Greens creek
- Mr. Tim Brueggeman, Chief Mine Engineer, Hecla Greens Creek
- Mr. Russell Lawlar, Chief Financial Officer, Hecla

No previous Technical Report Summaries have been filed regarding the Property.

This TRS was prepared by SLR QPs. The documentation reviewed, and other sources of information, are listed at the end of this TRS in Section 24.0, References.

2.3 List of Abbreviations

Units of measurement used in this TRS conform to the imperial system. All currency in this TRS is US dollars (US$) unless otherwise noted.

µ	micron	kVA	kilovolt-amperes
µg	microgram	kW	kilowatt
a	annum	kWh	kilowatt-hour
A	ampere	L	litre
bbl	barrels	lb	pound
Btu	British thermal units	L/s	litres per second
°C	degree Celsius	m	meter
C$	Canadian dollars	M	mega (million); molar
cal	calorie	m^2	square meter
cfm	cubic feet per minute	m^3	cubic meter
cm	centimeter	MASL	meters above sea level
cm^2	square centimeter	m^3/h	cubic meters per hour
d	day	mi	mile
dia	diameter	min	minute
dmt	dry metric tonne	mm	micrometer
dwt	dead-weight ton	mm	millimeter
°F	degree Fahrenheit	mph	miles per hour
ft	foot	Mst	million short tons
ft^2	square foot	MVA	megavolt-amperes
ft^3	cubic foot	MW	megawatt
ft/s	foot per second	MWh	megawatt-hour
g	gram	oz	Troy ounce (31.1035 g)
G	giga (billion)	oz/ton	ounce per short ton
Gal	Imperial gallon	ppb	part per billion
g/L	gram per litre	ppm	part per million
Gpm	Imperial gallons per minute	psia	pound per square inch absolute
g/t	gram per tonne	psig	pound per square inch gauge
gr/ft^3	grain per cubic foot	RL	relative elevation
gr/m^3	grain per cubic meter	s	second
ha	hectare	ton	short ton
hp	horsepower	stpa	short ton per annum
hr	hour	stpd	short ton per day
Hz	hertz	t	metric tonne
in.	inch	tpa	metric tonne per annum
in^2	square inch	tpd	metric tonne per day
J	joule	US$	United States dollar
k	kilo (thousand)	Usg	United States gallon
kcal	kilocalorie	USgpm	US gallon per minute
kg	kilogram	V	volt
km	kilometer	W	watt
km^2	square kilometer	wmt	wet metric tonne
km/h	kilometer per hour	wt%	weight percent
kPa	kilopascal	yd^3	cubic yard
		yr	year

3.0 PROPERTY DESCRIPTION

Greens Creek is located on Admiralty Island, approximately 18 mi (29 km) to the southwest of Juneau, Alaska. The Property is 100% owned and operated by Hecla subsidiaries (refer to Section 3.2). The total land package encompasses 16,140 acres (ac) (6,530 ha). The Property location is displayed in Figure 3-1. The Property layout is presented in Figure 3-2.

The Property coordinates in UTM North American Datum of 1983 (NAD 83) Zone 8V are:

- US Survey Feet
  - Northing: 21121755.473
  - Easting: 1710158.573
- Meters
  - Northing: 6437923.944
  - Easting: 521257.376

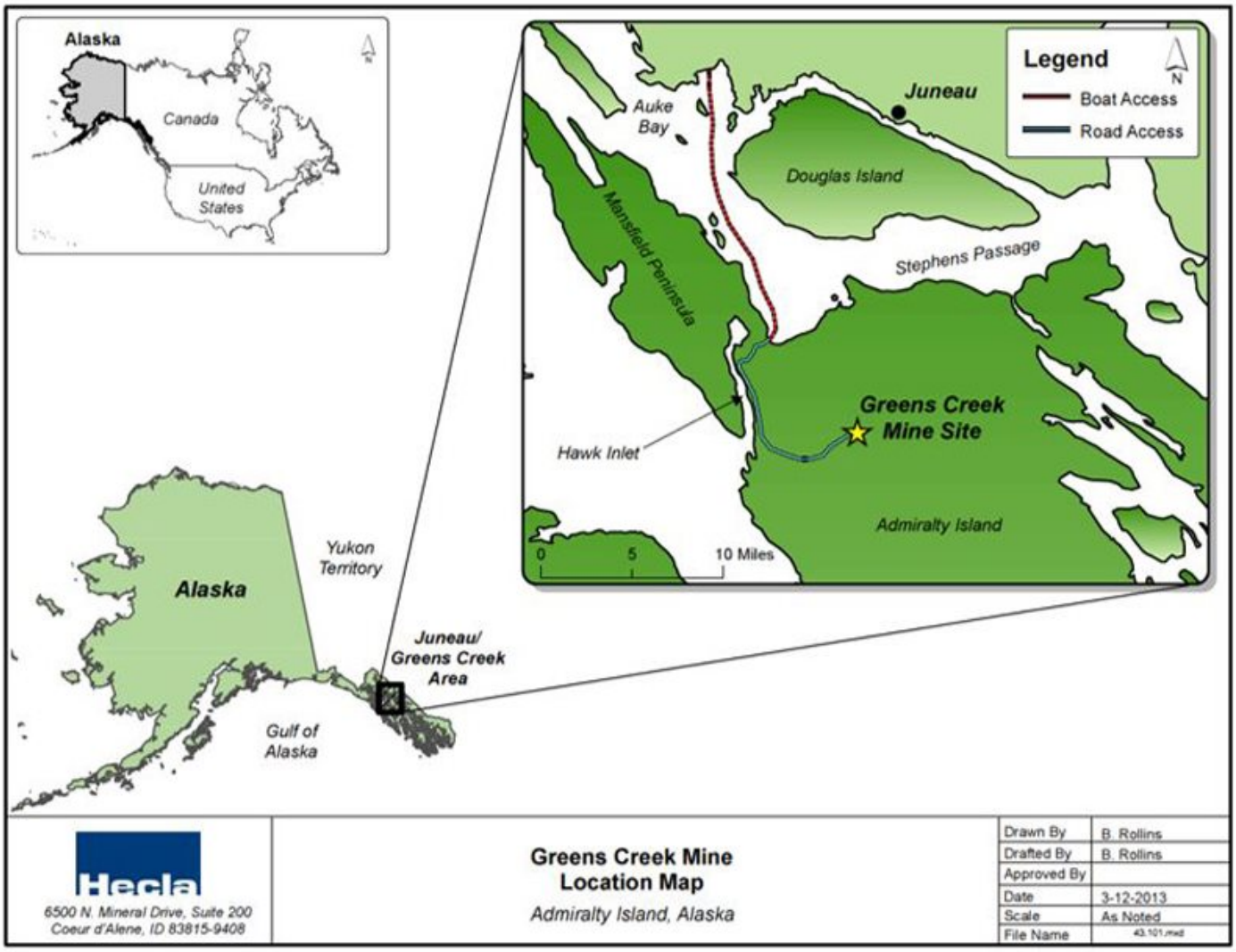


Figure 3-1: Project Location

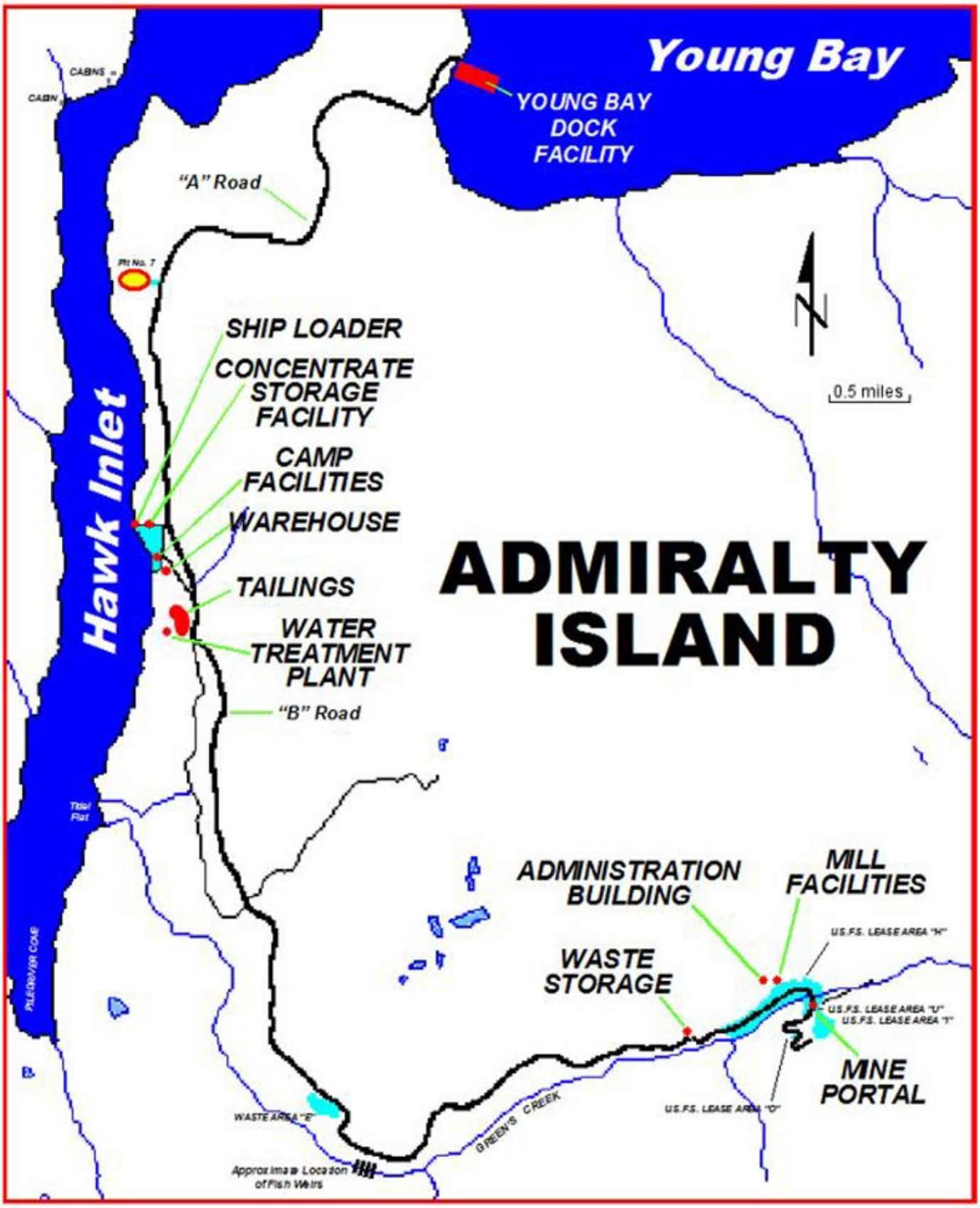


Figure 3-2: Mine Layout Plan

3.1 Property and Title in Alaska

Information included in the following subsections is summarized from Alaska Department of Natural Resources (ADNR) (2009), Alaska Division of Mining, Land and Water (2012), Bureau of Land Management (BLM) (2011a, 2011b, 2012), and the Alaska Department of Revenue (2012).

3.1.1 Mineral Tenure

Mineral tenure can be held either under Alaskan State law, or under Federal permits.

3.1.1.1 Federal Mineral Titles

Alaska is one of the 19 US states where there are federally administered lands that allow for staking of mining claims.

There are three basic types of minerals on Federal lands:

- Locatable (subject to the General Mining Law of 1872, as amended)
- Leasable (subject to the various Mineral Leasing Acts)
- Saleable (subject to mineral materials disposed of under the Materials Act of 1947, as amended)

The General Mining Law of May 10, 1872, as amended (30 U.S.C. §§ 22-54 and §§ 611-615) is the major Federal law governing locatable minerals. The General Mining Law allows for the enactment of State laws governing location and recording of mining claims and sites that are consistent with Federal law.

The BLM manages the surface of public lands and the United States Forest Service (USFS) manages the surface of National Forest System lands. The BLM is responsible for the subsurface on both public lands and National Forest System lands.

Mining claims may not be located on lands that have been:

- Designated by Congress as part of the National Wilderness Preservation System.
- Designated as a wild portion of a Wild and Scenic River.
- Withdrawn by Congress for study as a Wild and Scenic River.

Areas also excluded from the location of mining claims include National Parks, National Monuments, Native American reservations, most reclamation projects, military reservations, scientific testing areas, most wildlife protection areas (such as Federal wildlife refuges), and lands withdrawn from mineral entry for other reasons.

3.1.1.2 Claim and Entry Types

Two main claim types can be granted, lode mining and placer mining claims.

- Federal lode mining claims are defined by the BLM as:
    - Deposits subject to lode claims include classic veins or lodes having well-defined boundaries. They also include other in place rocks bearing valuable minerals and may be broad zones of mineralized rock. Examples include quartz or other veins bearing gold or other metallic minerals and large volume, but low grade disseminated gold deposits. Descriptions are by metes and bounds surveys beginning at the discovery point on the claim and including a reference to natural objects or permanent monuments. A Federal statute limits their size to a maximum of 1,500 ft in length, and a maximum width of 600 ft (300 ft on either side of the vein). The end lines of the lode claim must be parallel to qualify for underground extralateral rights. Extralateral rights involve the rights to minerals that extend at depth beyond the vertical boundaries of the claim.

- The boundaries of a claim based on staking and located after January 1, 1985, shall run in the four cardinal directions unless the claim is a fractional claim or the commissioner determines that staking in compliance with this paragraph is impractical because of local topography or because of the location of other claims; a claim established in this manner may be known as a non- meridian, township, range, section, and claim (MTRSC) location.

- Federal placer mining claims are defined by the BLM as:

  - Including all forms of deposit, excepting veins of quartz, or other in place rock. Therefore, every deposit, not located with a lode claim, should be appropriated by a placer location. Placer claims, where practicable, are located by legal subdivision (aliquot part and complete lots). The maximum size is 20 ac/locator, and the maximum for an association placer is 160 ac for eight or more locators. The maximum size in Alaska is 40 ac. The maximum size for a corporation is 20 ac/claim. Corporations may not locate association placers unless they are in association with other locators or corporations as co-locators.

Federal lode and placer mining claims are administered by the BLM under the General Mining Law. After physically staking the boundaries with six posts a minimum of one meter tall, new claims are filed with the local county and with the BLM.

Maintenance requirements are based on the assessment year which begins September 1, at noon, and ends the following September 1, at noon. An annual $165/claim maintenance fee is required to be filed or postmarked (if mailed) on or before September 1 of the year preceding an assessment year. These BLM fees are increased from time to time.

Claimants who perform assessment work must spend a minimum of $100/claim in labor or improvements, and record evidence of such with the BLM by December 30 of the calendar year in which the assessment year ended. Assessment work includes, but is not limited to, drilling, excavations, driving shafts and tunnels, sampling (geochemical or bulk), road construction on or for the benefit of the mining claim, and geological, geochemical, and geophysical surveys.

In addition to these claim types, there are two kinds of mineral entry claim.

- Mill site entries are defined by the BLM as:

  - A mill site must be located on non-mineral land. Its purpose is to either (1) support a lode or placer mining claim operation or (2) support itself independent of any particular claim. A mill site must include the erection of a mill or reduction works and/or may include other uses reasonably incident to the support of a mining operation. Descriptions of mill sites are by metes and bounds surveys or legal subdivision. The maximum size of a mill site is five acres.

- Tunnel sites are defined by the BLM as:

  - A tunnel site is where a tunnel is run to develop a vein or lode. It may also be used for the discovery of unknown veins or lodes. To stake a tunnel site, two stakes are placed up to 3,000 ft apart on the line of the proposed tunnel. Recordation is the same as a lode claim. An individual may locate lode claims to cover any or all blind (not known to exist) veins or lodes intersected by the tunnel. The maximum distance these lode claims may exist is 1,500 ft on either side of the centerline of the tunnel. This, in essence, gives the mining claimant the right to prospect an area 3,000 ft wide and 3,000 ft long. Any mining claim located for a blind lode discovered while driving a tunnel relates back in time to the date of the location of the tunnel site.

3.1.1.2.1 Federal Lode and Placer Patented Mining Claims

A patented claim is one for which the federal government has passed title to the claimant, making it private land. While a person may mine and remove minerals from a mining claim without a patent, mineral patent gives the owner title to the minerals, surface, and other resources (timber, vegetative). Mineral patents can be issued for lode claims and placer claims.

Patenting requires the claimant to demonstrate the existence of a valuable mineral deposit. In addition, the applicant needs to:

- Survey, if required, subsequent to location:
  - Survey application requires initial fee of $750 plus $300 for each additional claim.
  - Approved survey plan and notice of intent to patent posted on claim.
- File patent application in BLM State Office accompanied by fees - $250 service charge (one claim) and $50 for each additional claim.
- Provide evidence of title and citizenship.
- Provide statement of expenditures and improvements.
- Have BLM approval notice published in newspaper.
- Provide proofs of posting and publications, and corroborated statements.

Under the current law, if all requirements have been satisfied, the applicant can purchase a patent for a lode claim at $5.00/ac ($12/ha) and placer claims for $2.50/ac ($6.18/ha).

3.1.1.2.2 Federal Conditions of Use

Activities that ordinarily result in no or negligible disturbance of the public lands or resources are termed “casual use.” In general, the operator may engage in casual use activities without consulting, notifying, or seeking approval from the BLM.

For exploration activity greater than casual use and which causes surface disturbance of five acres (two hectares) or less of public lands; the operator must file a complete notice with the responsible BLM field office. Notice is for exploration only and only 1,000 tons (907 t) may be removed for testing.

A Plan of Operations is required for surface disturbance greater than casual use, unless the activity qualifies for a Notice filing. Surface disturbance greater than casual use on certain special category lands always requires the operator to file a Plan of Operations and receive approval from the federal agency that administers the land (i.e., BLM, the USFS). An applicant for a plan of operations must pay a processing fee, and/or for a mineral examination on a case-by-case basis.

Anyone proposing to prospect for or mine locatable minerals that might cause disturbance of surface resources is required to file a “Notice of Intention to Operate” with the local USFS office or BLM. If the Federal Agency determines that such operations will cause a significant disturbance to the environment, the operator must submit a proposed Plan of Operations, from which the impacts of the operations will be assessed. The Plan of Operations must describe such things as the type of operation proposed and how it will be conducted; proposed roads or access routes and means of transportation; and the time period during which the proposed activities will take place. The Plan of Operations must also indicate the measures to be taken to rehabilitate areas where mining activities have been completed. An operator shall also be required to furnish a bond commensurate with the expected cost of rehabilitation.

There are no fees associated with processing notices of intent or plans of operations needed for locatable minerals. A bond is required for a plan of operations, in an amount that would be adequate to reclaim the surface resources. In addition, the USFS may require an applicant to submit environmental information and may authorize an applicant to prepare an environmental assessment.

3.1.1.3 State Mineral Titles

State-owned lands cover an area larger than the entire State of California, and most of these lands are open to mining under a location system which is a modern version of the Federal mining law.

Legislation relating to mining claims was enacted in 2000 as Senate Bill 175. State mining claims in Alaska use the meridian, township, range, section, and claim (MTRSC) format. Two sizes of claim can be staked, quarter section (approximately 160 ac or 65 ha), and quarter–quarter section (approximately 40 ac or 16 ha). Claims require posting of corners, as the corner posts define the actual claim location and mineral rights acquired. Typically, such locators are defined using global positioning system (GPS) instruments.

Annual rental payments for a mining claim, leasehold location, or mining lease are based on the number of years since the concession was first located. Claims that were located before 31 August 1989 have that date as their commencement date for fee payment purposes.

Rental payments are required as follows:

- For all traditional mining claims and quarter–quarter section MTRSC locations, the annual rental amount is $35/year for the first five years, $70/year for the second five years and $170/year thereafter.
- For all quarter section MTRSC locations, the annual rental amount is $140/year for the first five years, $280/year for the second five years and $680/year thereafter.
- For all leases, the annual rent is $0.88/ac ($2.17/ha) per year for the first five years, $1.75/ac ($4.32/ha) for the second five years, and $4.25/ac ($10.50/ha) per year thereafter.

There is also a minimum labor requirement for each mining claim. Under Alaska legislation, “labor” includes geological, geochemical, geophysical, and airborne surveys conducted by qualified experts and verified by a detailed report lodged with the appropriate Alaskan authorities. Work such as drilling, excavations, driving shafts and tunnels, sampling (geochemical or bulk), and road construction on or for the benefit of the mining claim is considered “labor” under this requirement. In addition to the minimum labor requirement, the following commitments are required for maintenance of the claims:

- $100/claim, leasehold location, or lease if the claim, leasehold location, or lease is a quarter–quarter section MTRSC claim, leasehold location, or lease.
- $400 for each quarter section.
- $100 for each partial or whole 40 ac (16 ha) of each mining claim, leasehold location, or lease not established using the MTRSC system.

If more work is performed than required to meet minimum commitments, then an application can be made to have the excess applied against the following year, or for as many as four years. There is provision for a cash payment to be made in lieu of work expenditure.

At any time in the exploration or production process, a claimholder may convert the mining claim to a mining lease. Mining leases have the same rental and production royalty rates do mineral claims and require annual claim filing and recordation. Each lease title defines specific rights of control and tenure for that lease that may otherwise be open to conflict with third party claimants or other multiple use users of the State land. A mining lease shall be for any period up to 55 years and is renewable if requirements for the lease remain satisfied. Minerals on State lands cannot be patented.

3.1.2 Surface Rights

3.1.2.1 Federal Lands

Of the total area of Alaska, 60% (222 million acres (Mac) or 89.8 million ha (Mha)) is classed as Federal lands. The USFS and BLM manage approximately 20 Mac and 78 Mac (8.1 Mha and 31.6 Mha) respectively, for a total of 98 Mac (39.7 Mha), for multiple use purposes including timber production, fish and wildlife, recreation, water, and mining.

Mineral tenure holders do not have surface rights but do have the rights to concurrent use of land to the extent necessary for the prospecting for, extraction of, or basic processing of mineral deposits once necessary permits have been obtained. Requirements for BLM land varies from those for USFS administered lands.

3.1.2.2 State Lands

When Alaska became a state in 1959, the federal government granted the new state 28% ownership of its total area. Approximately 103.35 Mac (41.8 Mha) were selected under three types of grants:

- Community (400,000 ac or 162,000 ha)
- National Forest Community (400,000 ac or 162,000 ha)
- General (102.55 Mac or 41.5 Mha)

Additional territorial grants, for schools, university, and mental health trust lands; totaling 1.2 Mac (486,000 ha) were confirmed with statehood.

Mineral tenure holders do not have surface rights but do have the rights to concurrent use of land to the extent necessary for the prospecting for, extraction of, or basic processing of mineral deposits.

Where surface rights are held by a third-party other than the State, appropriate compensation must be negotiated with the owner.

3.1.2.3 Alaska Native Claims Settlement Acts Lands

In 1971 Congress passed the Alaska Native Claims Settlement Act (ANSCA). This law granted 44 Mac (17.8 Mha) and $1.0 billion to village and native corporations created under the act. Generally, ANSCA gave Natives selection priority over state land selections. Native lands are private lands. Thirteen regional corporations were created for the distribution of ANSCA land and money. Twelve of those shared in selection of 16 Mac (6.5 Mha) and the 13th corporation, based in Seattle, received a cash settlement only. A total of 224 village corporations, of 25 or more residents, shared 26 Mac (10.5 Mha). The remaining acres, which include historical sites and existing native-owned lands, were allocated to a land pool to provide land to small villages of less than 25 people.

Agreements and compensation for land access and infrastructure construction must be separately negotiated with ANSCA holders.

3.1.3 Water Rights

The Alaska Water Use Act defines water rights as:

- A water right is a legal right to use surface or groundwater under the Alaska Water Use Act (AS 46.15). A water right allows a specific amount of water from a specific water source to be diverted, impounded, or withdrawn for a specific use. When a water right is granted, it becomes appurtenant to the land where the water is being used for as long as the water is used. If the land is sold, the water right transfers with the land to the new owner, unless the Department of Natural Resources approves its separation from the land. In Alaska, because water wherever it naturally occurs is a common property resource, landowners do not have automatic rights to groundwater or surface water.

3.1.4 Permits and Environmental

Permits issued by federal agencies constitute “federal actions.” Any major federal action requires review under the National Environmental Protection Act (NEPA). A number of agencies can be involved in the review, at both the Federal and State levels. Other agencies are involved for specialist areas, such as transport of explosives, communication licenses, and landing strips for aircraft.

Typically, for larger metalliferous projects in Alaska, agencies involved in the permitting process can include:

- BLM
- Federal Aviation Administration (FAA)
- USFS
- National Marine Fisheries Service (NMFS)
- U.S. Coast Guard (USCG)
- U.S. Army Corps of Engineers (USACE)
- Environmental Protection Agency (EPA)
- Bureau of Alcohol, Tobacco, and Firearms (BATF)
- Federal Communications Commission (FCC)
- U.S. Department of Homeland Security (DHS)
- U.S. Department of Transportation (DoT)
- Mine Safety and Health Administration (MSHA)
- ADNR
- Alaska Department of Environmental Conservation (ADEC)
- Alaska Department of Fish and Game (ADFG)

The federal agency with the predominant federal permit is usually designated the lead for the NEPA process. During the permitting process, the agencies identified as requiring input into the process will review the proposed Project, evaluate impacts associated with each facet of the Project, consider alternatives, identify compliance conditions, and ultimately decide whether or not to issue the requested permits.

Upon completion of the NEPA process, a Record of Decision is prepared that supports issuance of the permit for the preferred alternative for the Project, describes the conditions of the decision to issue the permit, and explains the basis for the decision. The state permitting process typically is not finalized until the NEPA process is completed. Each federal and state permit has compliance stipulations requiring review and possibly negotiation by the applicant and appropriate agency.

3.1.4.1 Reclamation

The US Mining Laws, specifically 43 CFR 3809 on the federal level, define the reclamation standards for mines operated since 1981. An Alaskan State law regulates the reclamation procedures on private, state, and federal lands for mines operated since mid-October 1991. The Department of Natural Resources and Division of Water and Mining issued the reclamation requirements. Briefly, requirements are that all mined land be returned to a stable state, that post-mining erosion be minimized, and that the potential for natural re-vegetation be enhanced. Before a mining permit can be issued, the mining company must first submit a plan for reclamation.

An approved reclamation plan from the appropriate Alaskan regulatory authority Is required prior to mining operations commencement. An individual financial assurance is normally required, although for certain mining operations, the State will allow a bonding pool. However, a mining operation may not be allowed to participate in the bonding pool if the mining operation will chemically process material or has the potential to generate acid.

The Alaskan Commissioner determines the amount of the financial assurance needed after consideration of the reasonable and probable costs of reclamation for that operation. There are a number of methods of meeting the financial assurance requirements, including a surety bond, letter of credit, certificate of deposit, a corporate guarantee that meets the financial tests set in regulation by the commissioner, or payments and deposits into a specified trust fund. Typically, companies establish a fund under the Alaskan “Trust Fund for Reclamation, Closure & Post-Closure Obligations”, such that the amount in the fund is sufficient to generate adequate cash flow to cover all reclamation, closure, and post-closure costs.

3.1.5 Royalties

Applying to State lands only, there is a 3% production royalty that is calculated on the same net profits basis as the mining license tax. This production royalty is payable on all State land production and does not include the 3.5 year grace period. Failure to file and pay this royalty will result in loss of claims.

No Federal taxes are currently levied; however, royalties are payable by Hecla to the Federal Government in certain instances (see Section 3.3).

3.2 Mineral Tenure

The Project core claims at Big Sore are held in the name of Hecla Greens Creek Mining Company, a wholly-owned Hecla subsidiary.

Table 3-1 and Table 3-2 present a summary of the Hecla ground holdings. Details of the unpatented claims are included in Appendix 1. The holding obligations are summarized in Table 3-3. The annual maintenance fees of US$165/claim required to hold the unpatented mining claims have been paid annually to the BLM, and the required annual filing fees have been paid to Juneau Recording District, State of Alaska. The claims have been properly maintained and are in good standing. Hecla owns the patented mining and mill site claims and fee parcels, and pays the assessed property taxes, which payments are current as of the date of this TRS.

Figure 3-3 presents the ownership structure of the Greens Creek mining operations, while Figure 3-4 presents the project and regional land holdings layout.

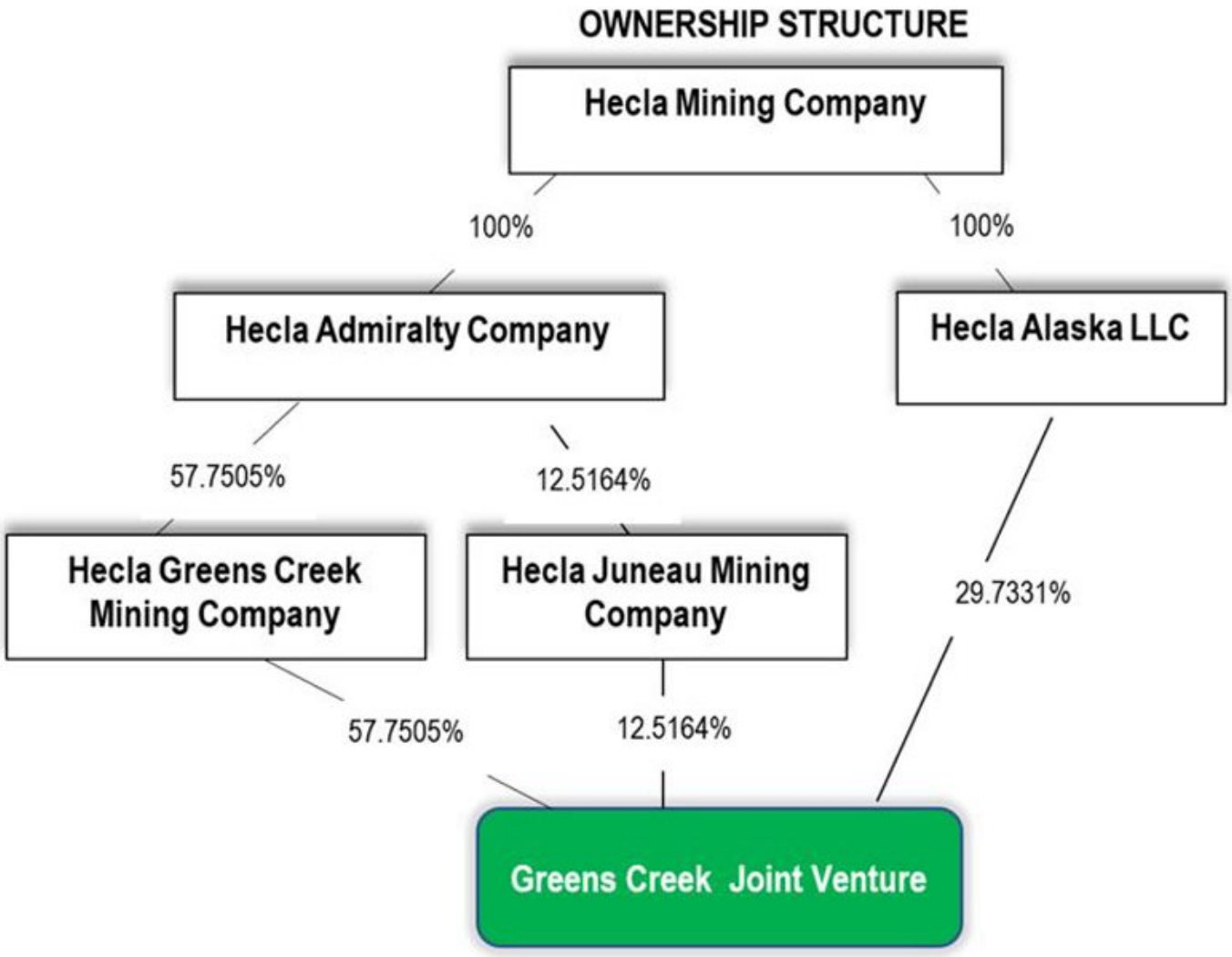


Figure 3-3: Ownership Structure of Greens Creek Mining Operations

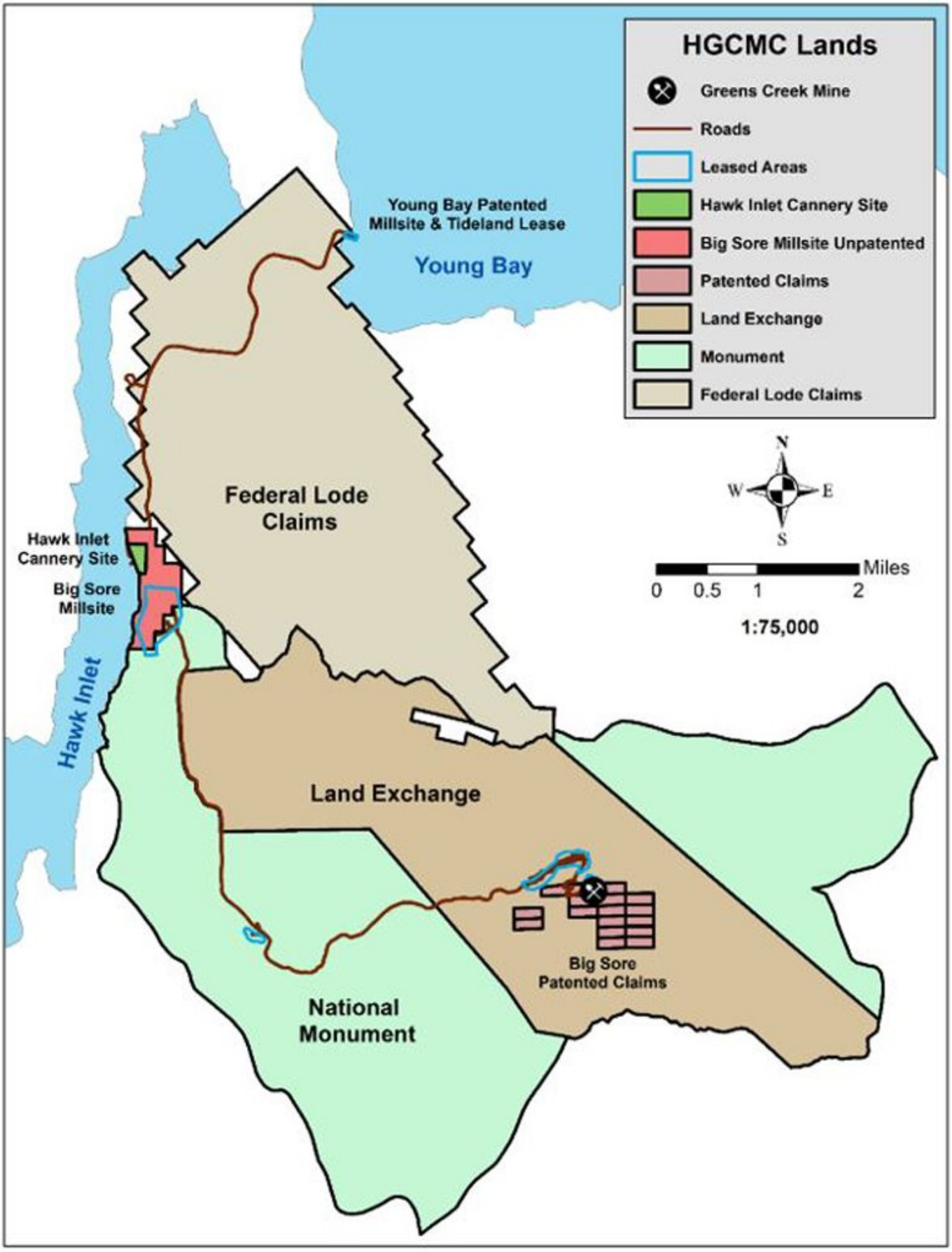

HGCMC Lands
Greens Creek Mine
Roads
Leased Areas
Hawk Inlet Cannery Site
Big Sore Millsite Unpatented
Patented Claims
Land Exchange
Monument
Federal Lode Claims
Young Bay Patented Millsite & Tideland Lease
Young Bay
Federal Lode Claims
Hawk Inlet Cannery Site
Big Sore Millsite
Hawk Inlet
Land Exchange
Big Sore Patented Claims
National Monument
N
W
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Miles
0 0.5 1 2
1:75,000

Figure 3-4: Project and Regional Land Holdings Layout Plan

Table 3-1: Summary- Patented Claims and Mill Sites
Hecla Mining Company – Greens Creek Mine

Claim Names	Number	BLM Serial No. or Survey No. or ADL No.	Type	Acreage
		Patented Claims		
Big Sore #s 902, 903, 904, 905, 906, 1006, 1007 and Big Sore #1305	8	Mineral patent Surveys: MS2402, MS2515	Patented surface and subsurface ("fee simple") lode mining claims	155.366 ac (62.874 ha)
Big Sore #s 1002, 1003, 1004, 1005, 1106, 1107; Big Sore #1105, 1207; and Big Sore #1304	9	Mineral Patent Surveys: MS2402, MS2515, MS2516	Patented lode	171.825 ac (69.535 ha)
		Patented Mill Site		
Young No. 1 mill site	1	Mineral Patent Survey: MS2514	Patented mill site, patented (surface) in Dec. 1992	0.6151 ac (0.2489 ha)

Table 3-2: Summary- Land Exchange and Other Fee Properties
Hecla Mining Company – Greens Creek Mine

Property Name	Number	BLM Serial No. or Survey No. or ADL No.	Type	Acreage
Exchange lands (Greens Creek Land Exchange Act of 1995)	N/A	Pat. No. 50-98-0434; U.S. Survey No. 11840, Alaska	Subsurface mineral estate, surface considered AINM non-wilderness for mining development purposes	7,301.48 ac (2,954.80 ha)
Hawk Inlet Cannery site	1	U.S. Survey No. 793	Fee Simple	16.83 ac (6.81 ha)
Hawk Inlet Cannery site tidelands	1	Alaska Tidelands Survey No. 57/ Serial No. 63-1523	Alaska State tidelands/shorelines	21.019 ac (8.5 ha)

Table 3-3: Summary- Claims Holding Obligations
Hecla Mining Company – Greens Creek Mine

Names	Number	Type	Acreage	Holding Costs	Royalties	Comments
Big Sore's 902, 903, 904, 905, 906, 1006, 1007 (MS 2402) and Big Sore # 1305 (MS 2515)	8	patented surface and subsurface 'fee simple') Federal lode mining claims	155.366 ac (62.874 ha)	property taxes	none	within Exchange Lands, represents so-called "perfected" claims in the immediate mine area (core claims with valid discoveries as of 12/1/78)
Big Sore 's 1002, 1003, 1004, 1005, 1106, 1107 (MS 2402); Big Sore # 1105, 1207 (MS 2516); and Big Sore # 1304 (MS 2515)	9	patented subsurface Federal lode mining claims	171.825 ac (69.535 ha)	property taxes	none	within Exchange Lands, represent so-called "unperfected" claims in the immediate mine area (core claims with valid discoveries made after 12/1/78)
Young No. 1 Mill Site	1	Federal mill site claim, fully patented (surface) in Dec. 1992	0.6151 ac (0.2489 ha)	property taxes	none	outside of AINM within standard Tongass National Forest lands; claim provides a site for Young Bay dock and parking facility
Big Sore 1321-1324, 1421-1424, 1521-1524, 1623-1627, 1723-1728, 1824-1827	27	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 540 ac (219 ha); valid acreage is much less	$165/year/claim BLM rental fees, plus filing/recording fees	none	Mariposite Ridge area (abutting the Mammoth claims) within Tongass National Forest lands but overlapping into AINM; a portion of this claim block is invalid

Names	Number	Type	Acreage	Holding Costs	Royalties	Comments
Mariposite 1-77, 79-87, 100-114	101	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 2,020 ac (817 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	multiple groups staked in the 1980s; on Tongass National Forest lands; portions may be invalid due to overlaps, especially with Lil Sore block
West Mariposite 115-123, 128-156, 159-165, 168-171	49	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 980 ac (397 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	staked in 1996; on Tongass National Forest land:
Lil Sore 41-48	8	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 160 ac (65 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	staked in 1996; on Tongass National Forest land; borders Lil'' Sore block to W, Fowler block to N, Young Bay Experimental Forest to E
Fowler 543-558, 643-658, 743-758, 843-858, 943-958, 1043-1047, 1143-1147	90	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 1,800 ac (728 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	staked in 1985; on Tongass National Forest land; bordered by West Fowler, North Fowler, & East Fowler; Lil Sore and Mariposite blocks to S
North Fowler 41, 141-144, 226-246, 250-251, 336-358, 363, 436-461	75	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 1,660 ac (672 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	93 claims staked in 1996; on Tongass National Forest land; 10 claims were declared Null and Void Ab Initio (and portions of 12 others) by BLM in February 1997 (State Selected Land)

Names	Number	Type	Acreage	Holding Costs	Royalties	Comments
West Fowler 559-561, 659-664, 759-767, 859-865, 959-966	33	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 660 ac (267 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	staked in 1996; on Tongass National Forest land; seven claims abandoned in April 1997 that overlapped new mill sites claims, one declared Null and Void Ab Initio (and portions of 10 others) by BLM in February 1997 (State Selected Land)
East Fowler 538-542, 641-642, 741-742, 841-842, 941-942, 1042	14	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 280 ac (113 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	41 claims staked in 1996; on Tongass National Forest land.
Big Sore Mill Site Nos. 798, 802-803, 899-902, 904-907, 996, 1001-1010, 1096-1097, 1103-1108, 1202-1205, 1505-1508, 1509-1511, 1514, 1516-1517, 1610-1614, 1710-1718	58	unpatented Federal mill site mining claims	claimed acreage, at 5.0 ac/claim, is 290 ac (117 ha)	$165/year/claim BLM rental fees, plus filing/recording fees	none	25 were re-staked in Fall 1993; on Tongass National Forest land; covers main tailings area; 33 sites to the north and east were re-staked in May 2002 (originally staked in Fall 1996)
HIP 010, 020, 030, 040, and 050	5	Alaska State Prospecting Sites	claimed acreage is 800 ac (324 ha) (1/4 section, 160 ac, per pros. Site), 'valid' acreage is approximately ½ that due to shoreline	no rentals, no fees, no filings required until land tentatively approved, costs thereafter would be same as the state tideland claims	3% net income production royalty	staked in Feb 1996; on State selected lands along E side of Hawk Inlet, status in limbo; no development allowed until state selections are tentatively approved (has not happened as of Sept, 2005)

Names	Number	Type	Acreage	Holding Costs	Royalties	Comments
Hawk Inlet Cannery site	1	fee simple land (US survey 783)	16.83 ac (6.81 ha)	property taxes	NA	acquired from Bristol Resources, Inc. (Bristol Resources)
Hawk Inlet Cannery site tidelands	1	Alaska Tidelands Survey No. 57	21.019 ac (8.50 ha)	property taxes	NA	acquired from Bristol Resources
Exchange Lands (Greens Creek Land Exchange Act of 1996)	NA	Subsurface mineral estate, surface remains AINM non-wilderness	7,301 ac (2,955 ha)	none	3% net island receipts (NIR) production royalty; 0.75% NIR when NIR value is less than $120/ton ore	Completed in 1998; no surface mining allowed; 100 year expiration of conveyance
East Ridge #'s 1011-1015, 1111-1115, 1210-1215, 1310-1315, 1408-1417, 1510-1515, 1611-1615,	43	unpatented Federal lode mining claims	claimed acreage, at 20 ac/claim, is 860 ac (348 ha); because of overlaps actual valid acreage will be less	$165/year/claim BLM rental fees, plus filing/recording fees	none	
The total unpatented and patented claims and mill sites, state prospecting sites and tideland claims; including Exch. Lands, approximately 16,410 ac (6,530 ha) encompassed			approximate total direct holding costs, excluding property taxes, are $87,750 plus approx. $1720 in recording costs			* excluding USFS leases and State tideland leases (approx. 113 ac (46 ha) total) ** AINM is Admiralty Island National Monument

The Property includes 440 unpatented lode mining claims, 58 unpatented mill site claims, 17 patented lode claims, one patented mill site and other fee lands, notably the Hawk Inlet historic cannery site. Hecla also holds title to mineral rights on 7,301 ac (2,955 ha) of Federal land acquired through a land exchange with the USFS.

3.2.1 Patented and Unpatented Claims

The patented lode claims, containing approximately 327 ac (132 ha), are located in Sections 4, 8, 9 and 10, Township 44 South, Range 66 East, Copper River Meridian, Juneau Recording District, Alaska. The 0.62 ac (0.25 ha) mill site claim is located in Section 1, Township 43 South, Range 65 East.

The unpatented lode and mill site mining claims are situated in Sections 1-3, 10-15, and 22-27, Township 43 South, Range 65 East, and Sections 7, 17 to 20, and 29 to 33, Township 43 South, Range 66 East, Copper River Meridian. The unpatented lode and mill site claims encompass approximately 8,072 ac (3,267 ha).

3.2.2 Leasehold Lands

Greens Creek leases parcels from the USFS on both the Monument and non-monument lands. It uses other public lands pursuant to special use permits issued by the USFS and leases issued by the State of Alaska. Some areas within the Monument required for the road right-of-way, mine portal and mill site access, campsite, mine waste area and a tailings impoundment are governed by USFS leases. Alaska National Interest Lands Conservation Act (ANILCA) is the legal basis for these leases and others which may be required.

3.2.3 Land Exchange Properties

Pursuant to "The Federal Greens Creek Land Exchange Act of 1995" (Pub. L. 104-123 April 1, 1996), 7,301 ac (2,955 ha) of mineral lands (subsurface estate and certain restricted surface use rights) surrounding the core group of 17 patented claims were conveyed to the Greens Creek Joint Venture in exchange for $1.0 million of private lands purchased by the Venture and a royalty on mineral production from the Land Exchange properties. Previously patented claims, including associated extralateral rights, are not subject to the royalty. The Property extents are approximately from Section 26, Township 43 South, Range 65 East, to Section 13, Township 44 South, Range 66 East, Copper River Meridian.

The Land Exchange properties conveyed are subject to:

- Restrictive covenants limiting surface use; and
- A future interest held by the United States which pertains to the Land Exchange properties, the core claims, and other Greens Creek properties.

The future interest vests with the United States upon the earlier of:

- Abandonment of the properties.
- January 1, 2045 (absent good faith mineral exploration, production, or reclamation); or
- January 1, 2095.

3.3 Surface Rights and Property Agreements

The land comprising the Property, inclusive of all Admiralty Island facilities, consists of both publicly- and privately-owned land. It owns land on Admiralty Island both as a result of patenting mining and mill site claims and through transfer of private lands in the historic cannery area from its predecessor.

As noted in Section 3.3.2, Hecla leases parcels from the UFSF on both the Monument and non-monument lands. Hecla uses other public lands pursuant to special use permits issued by the USFS and leases issued by the State of Alaska. Additionally, Hecla holds subsurface and restricted surface use rights under the Land Exchange.

3.3.1 USFS Agreement

Kennecott and the USFS began discussing the possibility of the existence of extralateral rights at Greens Creek in circa 1990. In 1994, Kennecott prepared a comprehensive geologic and legal analysis of extralateral rights at Greens Creek based upon the geologic information then available. Based upon that analysis, the USFS agreed that extralateral rights exist with respect to the Big Sore claims.

At Greens Creek, underground mining has progressed outside of the vertical boundaries of the mining claims under the extralateral rights. Hecla and predecessor companies have also conducted underground exploration beyond the mining claims' vertical boundaries.

In addition to the right to mine inherent in the Big Sore claims and the extralateral rights acknowledged by the USFS, Kennecott was granted mining rights pursuant to US Patent No. 50-98-0434 (AA-80626; the Patent) and the associated Agreement dated December 14, 1994 between Kennecott and the United States (the Patent Agreement). Hecla is also bound by these agreements and granted rights, and each of these rights carries with it somewhat different mining or possessory rights.

First, as it has done historically, Hecla can mine each and every mineral deposit found within the vertical boundaries of the Big Sore claims based upon the intraliminal rights that are inherent to every mining claim. Second, to the extent extralateral rights associated with the Big Sore claims can be demonstrated to exist, Hecla can mine "down dip" on a vein outside of the vertical boundaries of the claims. As long as Hecla stays within such vertical planes, there is no limit how far down dip Hecla can mine. And third, pursuant to the Patent and the Patent Agreement, Hecla is permitted to mine a specified area (the Agreement Area) outside of the vertical boundaries of the Big Sore claims even where no extralateral rights can be shown to exist.

To the extent Hecla mines pursuant to its intraliminal rights, i.e., the right inherent in the Big Sore claims, it is not obligated to make any royalty payment to the Federal Government. Likewise, to the extent Hecla mines pursuant to extralateral rights, i.e., down dip on a vein within vertical planes drawn through the end line of a claim that has extralateral rights, it is not obligated to make any royalty payment to the Federal Government.

When Hecla mines a mineral deposit located outside of the Big Sore claims where it cannot demonstrate extralateral rights, it must mine pursuant to the Patent and the Patent Agreement. The Patent and the Patent Agreement carry with them the obligation to pay a royalty to the Federal Government (the Federal Royalty, see Section 3.3). In addition, the area that can be mined is geographically limited to the Agreement Area.

From the statutory language of the General Mining Law, courts have established a number of requirements that must be met in order to obtain extralateral rights:

- The deposit involved must be a “lode” or a “vein”.
- The deposit must “apex” within the claim boundaries.
- The deposit must “dip”, and not be horizontal.
- The deposit must be “continuous”.
- The deposit can only be pursued beyond the vertical boundaries of the side lines of a claim within planes parallel to the end lines of the claim.

These definitions of what constitute the basis for extralateral rights are being reviewed in relation to known mineralization, in particular the Gallagher Zone, which is adjacent to and appears to extend into, the Land Exchange boundaries. Hecla is currently exploring the relationships of the Greens Creek mineral bodies to the Gallagher Zone, and evaluating the influence of a major structural boundary, the Gallagher Fault, on mineralization continuity. If extralateral rights across the Gallagher Fault are not established, then the Gallagher Zone would be subject to a royalty to the US Government.

3.4 Royalties and Encumbrances

Bristol Resources holds a 2.5% net smelter return (NSR) royalty based on 11.2142% of the Greens Creek Joint Venture. This royalty is the sole responsibility of the Hecla Juneau Mining Company ownership interest (12.5164%; refer to Figure 3-3 for the ownership interest breakdown).

The royalty was payable once a calculated “capital recovery amount” of $26.5 million was recouped. The capital recovery amount is based on a percent of the capital investment related to the original feasibility study, the original purchase price of Bristol’s ownership share, and interest accumulated for a four year period. Earnings applied to capital recovery were essentially calculated based on 11.2142% of net income before non-cash charges and income tax. The NSR value used in the Bristol Resources royalty is calculated as follows:

- Net proceeds from smelter.
- Less on-island concentrate transportation, storage, and ship loading costs.
- Less severance taxes.

Under the land exchange, production from new discoveries on the exchanged lands will be subject to Federal royalties included in the Land Exchange Agreement. The royalty is only due on production from Mineral Reserves that are not part of Greens Creek’s extralateral rights. Thus far, there has been no production, and no payments of the royalty have been triggered.

Per the Greens Creek Land Exchange Act of 1995, (Public Law 104-123), properties in the land exchange are subject to a royalty payable to the USFS that is calculated on the basis of NIR. NIR are equal to revenues from metals extracted from the land exchange properties less transportation and treatment charges (e.g., smelting, refining, penalties, assaying) incurred after loading at Admiralty Island.

The NIR royalty is 3% if the average value of the Mineral Reserve mined during a year is greater than $120/ton ($132/t) of ore, and 0.75% if the value is $120/ton ($132/t) or less. The benchmark of $120/ton ($132/t) was adjusted annually according to the US Gross Domestic Product (GDP) Implicit Price Deflator until the year 2016, after which time it became a fixed rate of $161/ton.

3.5 First Nations

Hecla complies with all state and federal employment laws, which identify Native Alaskans as a protected minority classification. Hecla has no First Nations agreements in regard to Greens Creek and there are no outstanding First Nations claims in the project area.

3.6 Other Significant Factors and Risks

SLR is not aware of any environmental liabilities on the Property. Hecla has all required permits to conduct the proposed work on the Property. SLR is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the Property.

4.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

4.1 Accessibility

The Property is situated partly within the Admiralty Island National Monument and completely within the municipal boundaries of the City and Borough of Juneau. The majority of the area of Admiralty Island is part of the Admiralty Island National Monument, which covers an area of more than 955,000 ac (3,860 km²). The mine and plant are located approximately five miles (eight kilometers) up the Greens Creek River valley with the mine camp located at Hawk Inlet (Figure 3-2).

Greens Creek employees are shuttled by ferry boat, which travels twice daily from Auke Bay, Juneau to Young Bay dock on Admiralty Island. Fixed wing air transport is also available on a charter basis originating at the Juneau airport and landing at the sea plane dock at Hawk Inlet camp. A number of helicopter services are also available on a charter basis and may, with proper clearance, land at two landing pads; one located at Hawk Inlet camp and the second located at the mine site in the Greens Creek valley.

Freight services operate via weekly scheduled barge with service originating in Seattle, Washington, and subsequent connections to Juneau. Once on Admiralty Island, buses are used to transport passengers along an improved dirt and gravel road from Young Bay dock to the Hawk Inlet camp or to the mine.

4.2 Climate

Admiralty Island is a temperate rainforest featuring a cool temperate climate milder than its latitude may suggest, due to the influence of the Pacific Ocean. Winters are moist, long but only slightly cold: temperatures drop to 20° F (−6.7° C) in January, and highs are frequently above freezing. Spring, summer, and fall are cool to mild, with average highs peaking in July at 65° F (18.3° C).

Annual snowfall on Admiralty Island averages 98 in. (213 cm) and occurs chiefly from November to March. Precipitation occurs year-round, ranging from 55 in. (1,400 mm) to 90 in. (2,290 mm) annually. The months of May and June are the driest while September and October are the wettest. Admiralty Island's monthly temperature, precipitation and snowfall are summarized in Table 4-1.

Surface exploration at Greens Creek operates at elevations ranging from sea level to 3,300 ft (1,005 m). Weather is highly variable, ranging from sunny to week-long periods of low clouds and fog and because of these weather conditions, exploration activities are conducted generally over a five month period; between May to October each year. Mining activity occurs year-round.

Table 4-1: Climate Summary Table
Hecla Mining Company – Greens Creek Mine

Month	Average Maximum Temp (°F)	Average Maximum Temp (°C)	Average Minimum Temp (°F)	Average Minimum Temp (°C)	Average Total Precipitation (in.)	Average Total Precipitation (mm)	Average Total Snowfall (in.)	Average Total Snowfall (mm)
January	29	-1.7	18.2	-7.7	4.26	108	26.8	681
February	34.2	1.2	23	-5	3.92	100	19.6	498
March	38.7	3.7	26.6	-3	3.48	88	14.4	366
April	47.5	8.6	32.4	0.2	2.93	74	2.8	71
May	55.3	12.9	39.2	4	3.53	90	—	—
June	61.6	16.4	45.3	7.4	3.13	80	—	—
July	64	17.8	48.4	9.1	4.29	109	—	—
August	62.7	17.1	47.6	8.7	5.34	136	—	—
September	56	13.3	43.2	6.2	7.21	183	—	—
October	47	8.3	36.9	2.7	7.86	200	1.1	28
November	37.7	3.2	28.5	-1.9	5.43	138	11.7	297
December	32.5	0.3	23.4	-4.8	5.09	129	21.8	554
Annual	47.2	8.4	34.4	1.3	56.47	1,434	98.4	2,499

4.3 Local Resources and Infrastructure

Juneau is the closest large city with a population of approximately 30,000. It is fully capable of providing all goods and services required by the mine and exploration teams. Operating supplies are shipped via weekly barge service from Juneau, AK, and Seattle, WA. The project infrastructure and the infrastructure layout at the mine site are discussed in Section 15 of this TRS. There is sufficient suitable land available within the mineral tenure held by Hecla for tailings disposal, mine waste disposal, and installations such as the plant and related mine infrastructure. All necessary infrastructure has been built and is sufficient for the projected long range plan (LRP).

4.4 Physiography

Mine facility elevations range from the concentrate shipping facility, which is at sea level, to the 1350-adit at an elevation of 1,350 ft (412 m) above sea level. The plant and main mine portal are located at an elevation of 920 ft (280 m).

The ecology of Admiralty Island is dominated by temperate rainforest that is primarily made up of Sitka spruce, and western hemlock interspersed with small areas of muskeg. The timberline is typically at an elevation of 2,000 ft to 2,500 ft (610 m to 762 m). Above the timberline the forest gradually changes to alpine-tundra with rock outcrops and permanent and semi-permanent snow fields.

5.0 HISTORY

5.1 Previous Ownership

The Pan Sound Joint Venture, formed in 1973, consisted of joint venture partners Noranda Exploration (29.73%), Marietta Resources International (29.73%), Exhalas Resources Corporation (29.73%), and Texas Gas Exploration (10.81%). Under the Pan Sound Joint Venture, the first mineral claims were staked over the Big Sore vegetation and geochemical anomaly.

Bristol Bay Resources (Bristol), a company held by the Bristol Bay Native Corporation, joined the original partners in 1976.

In 1978, the Pan Sound Joint Venture was dissolved, and the Greens Creek Joint Venture created, with the same partners holding the interests in the Greens Creek Joint Venture.

Bristol sold its 11.2% interest in 1988 to Noranda and Hawk Inlet Company, with a half interest sold to each party. Bristol retained a 2.5% NSR royalty on its 11.2% share as part of the sale.

In 1982, Anaconda Minerals bought Marietta's interest and, in 1986, Amselco (a unit of BP Minerals) purchased both Anaconda's and Noranda's interests, subsequently selling off a portion to Hecla in 1987.

Texas Gas changed its name to CSX Alaska Mining Company, Inc. (CSX) in 1987. Following the merger of British Petroleum and Sohio, Kennecott Minerals (Kennecott) acquired Amselco in 1987.

The three remaining joint venture partners, Kennecott, Hecla, and CSX bought out Exhalas Resources Corporation in 1993. Kennecott Minerals bought out CSX in 1994, and CSX changed its name to Kennecott Juneau Mining Company (KJMC). At that time, the ownership was Kennecott Greens Creek Mining Company (KGCMC) with a 57.75% interest, KJMC with a 12.52% interest and Hecla with an interest of 29.73%.

In 1994, the Greens Creek Joint Venture (GCJV) agreement was restated in order to resolve certain issues between the Joint Venture participants.

KGCMC operated the mine up to 2008 with Hecla maintaining its 29.73% interest. On April 6, 2008, Hecla Mining Company completed its transaction to acquire KGCMC's 57.75% and KJMC's 12.52% interests in the Joint Venture (the Kennecott subsidiaries which held the remaining 70.27% interest in Greens Creek). As a result, Hecla subsidiaries now hold 100% of the Greens Creek Joint Venture since 2008.

5.2 Exploration and Development

Information in this section is based on a summary prepared by West (2010) and by Hecla staff. A summary of the exploration and development work completed from 1973 to 2020 is presented in Table 5-1. The localities discussed in Table 5-1 are indicated in Figure 5-1. Mineralization was discovered at the Big Sore copper sub-crop in 1974. Mining operations commenced in 1989 but ceased in 1993 due to low metal prices. In 1996, the mine was re-opened, and production has continued uninterrupted to date.

Table 5-1: Exploration and Development History, 1973 to 2020
Hecla Mining Company – Greens Creek Mine

Year	Operator	Work Completed	Comment
1973	Pan Sound Joint Venture, a consortium vehicle of partners Noranda Exploration (29.73%), Marietta Resources (29.73%), Exhalas Resources (29.73%), and Texas Gas Exploration (10.81%)	Stream sediment sampling.	Identified a zinc and copper anomaly associated with Cliff Creek, but no claims were pegged.
1974		Air reconnaissance inspection.	Identified a large unperfected zone that was vegetation free, the “Big Sore”; claims staking.
1974–1975		Additional stream sediment sampling, soil and rock sampling, Crone shoot-back electromagnetic (CEM) geophysical survey, surface magnetometer survey, geological mapping, trenching, and blasting and drilling of three core holes.	PS0001 (first surface drill hole) intersects a wide zone of mineralization at Big Sore.
1976	Noranda assumed operatorship of the Pan Sound Joint Venture	Geochemical sampling, CEM and magnetic surveys, geological mapping at Big Sore, core (five holes) and Winkie (AQ size; eight holes) drilling.	First-time Mineral Resource estimate.
1977		22 holes totaling 8,810 ft (2,685 m) were completed at Big Sore, Killer Creek and Gallagher Creek. Additional soil sampling was undertaken over extensions to these areas, as was a CEM survey. Soil surveys, CEM and magnetic geophysical surveys, and geologic mapping were also carried out on the Zinc Creek and Mariposite Ridge prospects.	
1978	Pan Sound Joint Venture was dissolved		Greens Creek Joint Venture formed in its place to accommodate the involvement of the Bristol Bay Native Corporation.
1978	Greens Creek Joint Venture	Exploration drift was started; a total of 24 underground drill stations were established, from which 50 core holes were collared. Environmental baseline studies commenced.	By November 1979, 4,190 ft (1,277 m) of drift and a 219 ft (67 m) raise had been completed.

Year	Operator	Work Completed	Comment
1980		33 core holes were completed, and an Environmental Impact Assessment commissioned.	The Alaska National Interest Land Conservation Act was passed, under which the Admiralty Island National Monument was created. The Greens Creek deposit and mineral tenure, although within the national monument zone, were excluded from the wilderness classification of the remainder of the national monument area. Section 504 of ANILCA allowed for exploration on previously located, unpatented claims that fell within three-quarters of a mile of Greens Creek, providing that exploration ceased in five years and any claims not "perfected" reverted to national monument status.
1981–1982		Metallurgical bulk sample. Surface core drilling (12 holes totaling 11,210 ft or 3,417 m) was conducted, with nine holes completed in the Big Sore area, two in Gallagher Creek, and one in Bruin Creek, on the north side of Greens Creek. Detailed geological mapping at a scale of one inch = 500 ft was conducted in the Greens Creek area.	Development-support activities such as engineering and environmental studies. Mineral resource estimates updated.
1983	Anaconda purchased all of Martin-Marietta's interest in the Greens Creek Joint Venture in March 1983	17 holes drilled	Feasibility study completed.
1984	At the end of the year, Anaconda and Noranda equally bought out Bristol Bay Native Corporation's properties at Hawk Inlet for a cash payment and a 0.28% NSR royalty. The land would revert back to Bristol Bay Native Corporation upon termination of the Greens Creek Joint Venture.	Surface drilling, mapping, trenching. Two bulk samples were mined, one of which was tested by Noranda, the second by Anaconda.	
1985		10 holes totaling 12,266 ft (3,739 m) were completed from surface, and 47 holes and 34,749 ft (10,591 m) of drilling from underground.	A 10 year lease with a drill commitment and royalty payment obligation on production was signed with the owners of the nearby Mammoth claims.

Year	Operator	Work Completed	Comment
1986	Amselco (BP) become operator by buying out Anaconda and Noranda. Amselco sells portion to Hecla ; CSX acquires Texas Gas.	Three surface holes, totaling 4,694 ft (1,431 m), and one underground exploration hole was drilled to 1,271 ft (387 m). Surface mapping and exploration at the Mammoth and Mariposite claim groups. Four EM and magnetic survey lines were flown. Mill and surface road construction begins.	No magnetic anomalies were delineated but six electro-magnetic anomalies were co-incident with known soil geochemical anomalies in the Big Sore area. At the end of the year, the Greens Creek Joint Venture lost all rights to the Big Sore claims except for the eight core claims and the nine additional perfected claims.
1987		Structural mapping and interpretation.	
1988–1989		Engineering and technical studies in support of mine development.	
1989	Rio Tinto Zinc buys Kennecott from BP (Amselco) and becomes operator.	Two surface holes were drilled in 1989, and underground exploration drilling conducted.	Mill start-up occurred in February 1989. Surface holes tested for down-dip extensions of the North mineral zone. Underground drilling, also testing the North mineral zone, identified mineralization at a previously unrecognized horizon at a lower elevation than the North mineral zone.
1990		10 holes totaling 23,287 ft (7.098 m) completed to validate claims to the west of the core claim group at Big Sore.	Underground drilling program intersected three new mineral bodies: the Central West, the Northwest West, and the Southwest zones. No additional surface drilling subsequently took place until the passage of the Land Exchange Act in 1996.
1990–1993		Underground drilling was continued to define the West, Northwest-West and Southwest zones.	Negotiations began on a new land-exchange proposal whereby private land in-holdings on Admiralty Island and other areas of the Tongass National Forest would be conveyed to the USFS in return for the subsurface mineral rights to 6,875 ac (2,782 ha) surrounding the core claims. Greens Creek received title to the 17 core claims and one mill site claim in 1992 after the USFS and BLM approved the final validity test in December.
1993	Exhalas share bought out by Kennecott/Hecla	Underground drilling was continued to define the Southwest Ore Zone.	Mine closure due to low metal prices.

Year	Operator	Work Completed	Comment
1994	CSX bought out; Greens Creek Joint Venture now Kennecott (70.27%), Hecla (29.73%)		The land exchange agreement was with the USFS concluded.
1996		Updated feasibility study. Airborne EM, radiometric, and magnetometer surveys were completed during 1996–1997 to determine which might be more effective in surface exploration. Geological mapping. Underground definition drilling in the Northwest West and 5250 mineral zones. Underground and surface gravity surveys were completed. Two test lines over the West and Northwest West mineral zones were surveyed by the controlled source audio-magnetotelluric (CSAMT) method. A time-domain electromagnetic (TEM) survey was completed over eight lines and measured a strong response from the West Ore. Down-hole TEM surveys were completed on surface and underground holes.	The land exchange agreement approved by Congress. A total of 745-line mi (1,200-line km) of surveys covered the entire Greens Creek area, including the land exchange parcel. Distinct magnetic anomalies corresponded with already mapped ultramafic bodies. The EM survey proved useful in identifying graphitic rocks, such as the Hyd argillite. A completely revised one inch = 1,000 ft scale district map and numerous one inch = 200 ft scale mine geologic maps were compiled during 1996 to 1997, and the prospective mine stratigraphy was traced to the south and north. Milling operations re-commence in July.
1997		Nine holes (7,755.5 ft or 2,364 m) were completed, targeting extensions to known mineralization at the North Ore Zone, the Upper Plate Extension of the Northwest West Ore Zone, and a possible north extension of the West Ore. Four diamond drill holes (6,316 ft or 1,925 m) were completed in 1997 at Big Sore with limited results. Soil sampling, gravity, magnetic and TEM geophysical surveying, and geologic mapping on cut grids.	No high priority, near-surface coincident gravity and TEM anomalies (possible shallow massive-sulfide bodies) were identified. Soil sampling and geologic mapping outlined drill targets or areas for detailed follow up work in Bruin, Gallagher, and Lower Zinc Creek prospects. However, underground drilling identified the very high grade 200 South Zone.
1998		Four holes were drilled in Bruin Creek; grid extension and development, geochemical sampling, and geophysical surveys.	One new grid (Upper Big Sore) and extensions of three 1997 grids (Lower Zinc, Bruin, and “A” Road) were geochemically sampled and geophysically surveyed. The work outlined numerous multi-element anomalies with coincident TEM anomalies; however, none were considered immediate drill targets.

Year	Operator	Work Completed	Comment
1999		Grid expansion, geochemical sampling, and geophysical surveys. Ten diamond drill holes were completed (12,715 ft or 3,875 m), seven at Bruin Creek and three at Killer Creek.	Grid expansion continued at Killer Creek, Upper Zinc Creek and Cub prospects. Numerous high rank, multi-element soil anomalies were defined, and numerous sulfide-bearing outcrops and gossan zones were sampled and mapped. No mineralization was encountered in the Bruin Creek holes; the Killer Creek drilling intersected chalcopyrite and minor sphalerite mineralization.
2000		CSAMT geophysical survey; drilling	A CSAMT geophysical survey was completed along three lines in Bruin and Cub Creek prospects in 2000. Three lines were also surveyed in Killer Creek area. In conjunction with soil survey results, the identified Bruin and Cub Creek anomalies were tested by six core holes, with limited results. Five holes were drilled in Killer Creek. Four moderately southwest-dipping zones with silver and zinc enrichment were outlined.
2004		Completed 41 surface holes from 17 sites totaling 47,034 ft (14,335 m). Detailed geological mapping by John Proffett continued in the Gallagher Creek area. Down-hole electro-magnetic (DH-UTEM) and natural source audio-magnetotelluric geophysical surveys were completed.	Underground drilling identifies the Gallagher deposit. Four holes in Lower Gallagher Zone intersect sub-economic to economic grade mineralization. Upper Gallagher Zone drilling identified mineralization on west side of Gallagher Fault. Lower Zinc Creek drilling identified silica and massive pyrite at contact.
2005		Completed 35 surface drill holes from seven sites totaling 36,100 ft (11,003 m). Soil geochemistry grids completed at Cliff Creek, and grid extensions to Killer Creek, Cub Creek and Upper Gallagher prospects. Geological mapping along Killer Creek, Cliff Creek and Cub Creek prospects. Larger scale Magneto-Telluric (MT) survey in the Upper Gallagher Zone that targeted the West Gallagher contact.	Intersection of mineralized intervals underground in Southwest West Bench (Middle Gallagher) and within East Ore. MT survey refines local geology and may extend West Gallagher horizons to the north, west, and south. Surface-based drilling identified mineralization at Lower Zinc Creek and Lil' Sore.
2006		Completed 25 surface-based drill holes from six sites totaling 30,201 ft (9,205 m). Prospecting, geochemistry, and mapping grids extended at Cliff Creek, High Sore and Killer Creek. Mobile metal-ion (MMI) sampling tested at Killer Creek, West Bruin, and Lil' Sore prospects. Detailed mapping at High Sore and Cliff Creek.	Northern projection of West Bench mineralization intersected by underground excavations. Minor mineralized intersections at West Gallagher and Lower Zinc prospects located. Mine contact intersected at Bruin and Cub Creek prospects. Discovery of the 5250 North extension underground.

Year	Operator	Work Completed	Comment
2007		Surface drilling from seven sites totaling 28,920 ft (8,815 m) on Lower Zinc Creek, Cub Creek, West Gallagher and Lil' Sore prospects. Mapping and geochemical sampling at Killer Creek and West Bruin prospects. CSAMT and AMT/MT geophysical surveys completed West Gallagher prospect.	Definition of the Deep 200 South Zone at depth and the identification of the Northeast contact below the current mine infrastructure. Weak mineralization defined at Lower Zinc and Cub Creek prospects along mine contact. Claims near Young Bay staked.
2008	Hecla buys out the Kennecott interest in the Greens Creek Joint Venture, becomes 100% owner-operator	Surface drilling from 7 sites totaling 20,649 ft (6,293 m) on North Big Sore, East Ridge, Cub (northwest contact) prospects, and East Ore Zone. LiDAR surveys, geological mapping and geochemical sampling initiated on newly staked Young Bay ground.	Deep 200 South Zone drilling defines two distinct zone or fold limbs and 5250 Zone extended to the south. Southern extension to East Ore Zone mineralization intersected from surface. Detailed mapping defined mine contact at Lower Zinc and Killer Creek prospects.
2009		20 drill holes from surface totaled 18,064 ft (5,506 m) on East Ore Zone and West Gallagher, Bruin, and Northeast contact (Cub) prospects. Detailed mapping Bruin along projected northeast contact. Reconnaissance mapping and geochemical sampling at Young Bay claims.	Intersections of mineralization at south extent of East Ore Zone. Disseminated sulfides defined with drilling at Bruin and Cub prospects along projection of Northeast contact.
2010		Surface drilling of 17 holes totaling 21,217 ft (6,467 m) at Northeast contact (Cub and Bruin), East Ridge and Killer Creek prospects. Geochemical and MMI survey in the North Young Bay area. Compilation of historic geophysical data.	Expansion of the Deep 200 South, Northwest West and 5250 zone Mineral Resources. Mapping and drilling extend the Northeast contact to the northeast of the mine infrastructure. Weak mineralization along mine contact identified by drilling at East Ridge and Killer Gossan prospects.
2011		Completed 14 surface holes totaling 27,384 ft (8,346 m) at Northeast contact, West Bruin, and East Ore. 3D inversion analysis on portion of historic Aerodat airborne geophysical data. Surface and borehole Pulse EM surveys used to define targets. Reconnaissance mapping and geochemical sampling in North Young Bay area. Detailed mapping in Keller Creek area.	Continued expansion of the Deep 200 South, East Ore and 5250 Mineral Resources. Surface drilling continues to define the Northeast contact beyond Bruin and Cub prospects. Pulse EM identified conductor in sufficient detail to conduct drilling at Killer Creek and West Gallagher prospects.

Year	Operator	Work Completed	Comment
2012		Completed eight surface holes totaling 17,710 ft (5,398 m) at Killer Creek, West Gallagher, West Bruin prospects and East Ore Zone. Reconnaissance and detailed mapping and geochemical sampling in North Young Bay area. Detailed mapping of Killer Creek area.	Strong mineralization intersected underground at Deep 200 South, Southwest Bench, and Northwest West zones. Surface drilling at Killer Creek identified a broad copper-rich vein zone which may represent a new mineralizing vent area. Drilling to the southeast identified zinc-rich zones near the mine contact.
2013		Ten surface drill holes totaling 28,746 ft (8,762 m) at the Killer Creek target. Reconnaissance mapping of the anomalous Zinc Creek area and detailed structural mapping of Mariposite ridge.	Two silicified copper and zinc-rich zones were encountered near surface in the Killer Creek area. These broad zones likely represent a shallow feeder zone.
2014		Six surface drill holes totaling 23,214 ft (7,076 m) in the Killer Creek target area. Reconnaissance mapping of the Killer-Lakes district area and detailed structural mapping of the Killer Creek – Mammoth areas. One downhole EM survey was conducted in Killer Creek to define mineralization and 'mine contact' in the area.	A deep mine argillite contact was encountered with weak mineralization. The upper portions of drill holes in Killer Creek target continued to define shallow copper and zinc-rich zones.
2015		Four surface drill holes totaling 8,085 ft (2,464 m) were completed in the Lower Killer Creek and High Sore target areas. Mapping of the High Sore and Big Sore areas with a focus on local s2.5 shears. Physical property data (density), Magnetic Susceptibility and conductivity measurements were taken in every.	The Big Sore syncline was tested in Lower Killer Creek by a single drill hole between the Gallagher and Maki Faults. Though weak mineralization was encountered at the High Sore target, several s2.5 shears were encountered east of known locations.
2016		Two surface drill holes totaling 3,074 ft (937 m) were completed in Big Sore Creek targeting potential offset mineralization. Reconnaissance mapping of the Big Sore Creek and East of the Mammoth claims was completed.	Anomalous zinc mineralization in hanging wall argillite indicated that the 'mine contact' hosting Greens Creek mineralization was likely eroded away above Big Sore Creek. A barren Northeast contact was also encountered in each drill hole.
2017		Nine drill holes totaling 20,419 ft (6,224 m) were completed in the West Gallagher, Upper Gallagher, and Big Sore prospects. Mapping was completed in the Lower Zinc Creek area with a focus on mapping shear zones.	Five drill holes west of the Gallagher Fault encountered bench mineralization in shear zones. Broad zinc mineralization was encountered at the 'Bench' Contact west of known Mineral Resources and east of the Gallagher Fault. Drilling south of the mine in Upper Gallagher encountered a weakly mineralized mine contact.

Year	Operator	Work Completed	Comment
2018		Fifteen drill holes totaling 20,941 ft (6,383 m) were completed in the West Gallagher and Lower Gallagher Areas targeting Southwest Bench – 200S Bench and the Upper Plate Zone respectively. Detailed mapping was completed in the Upper Gallagher and Mammoth ridge areas.	Upper Plate ore grade mineralization was extended 150 ft west of known Mineral Resource. Four drill holes further defined western extensions of 'Bench' mineralization east of the Gallagher Fault and west of known Mineral Resources.
2019		Ten drill holes totaling 11,578 ft (3,529 m) were completed in the 200S, Southwest, and East Zones.	Ten drill holes targeting the 200s deposit extended the upper and lower benches by approximately 400 ft (122 m) and 800 ft (244 m) down plunge, respectively.
2020		Nine drill holes totaling 5,603 ft (2,927 m) were completed in the 200S zone.	Nine drill holes targeting the 200S deposit infilled a gap in exploration drilling and established continuity within the upper and lower benches.
2021		Seven surface exploration drill holes targeted the Lil'Sore Trend, and three targeted the 5250 Trend for a total of 22,484 ft of surface exploration drilling. Three underground exploration drill holes targeted the Gallagher Trend, four targeted the Gallagher Fault Block, five targeted the 200S zone, and two targeted the West zone, for a total of 16,324 ft of underground exploration drilling.	Surface exploration intersected Zn rich base metal rich mineralization within the Lil'Sore Trend. Underground exploration continued to extend the 200S mineralization down plunge.

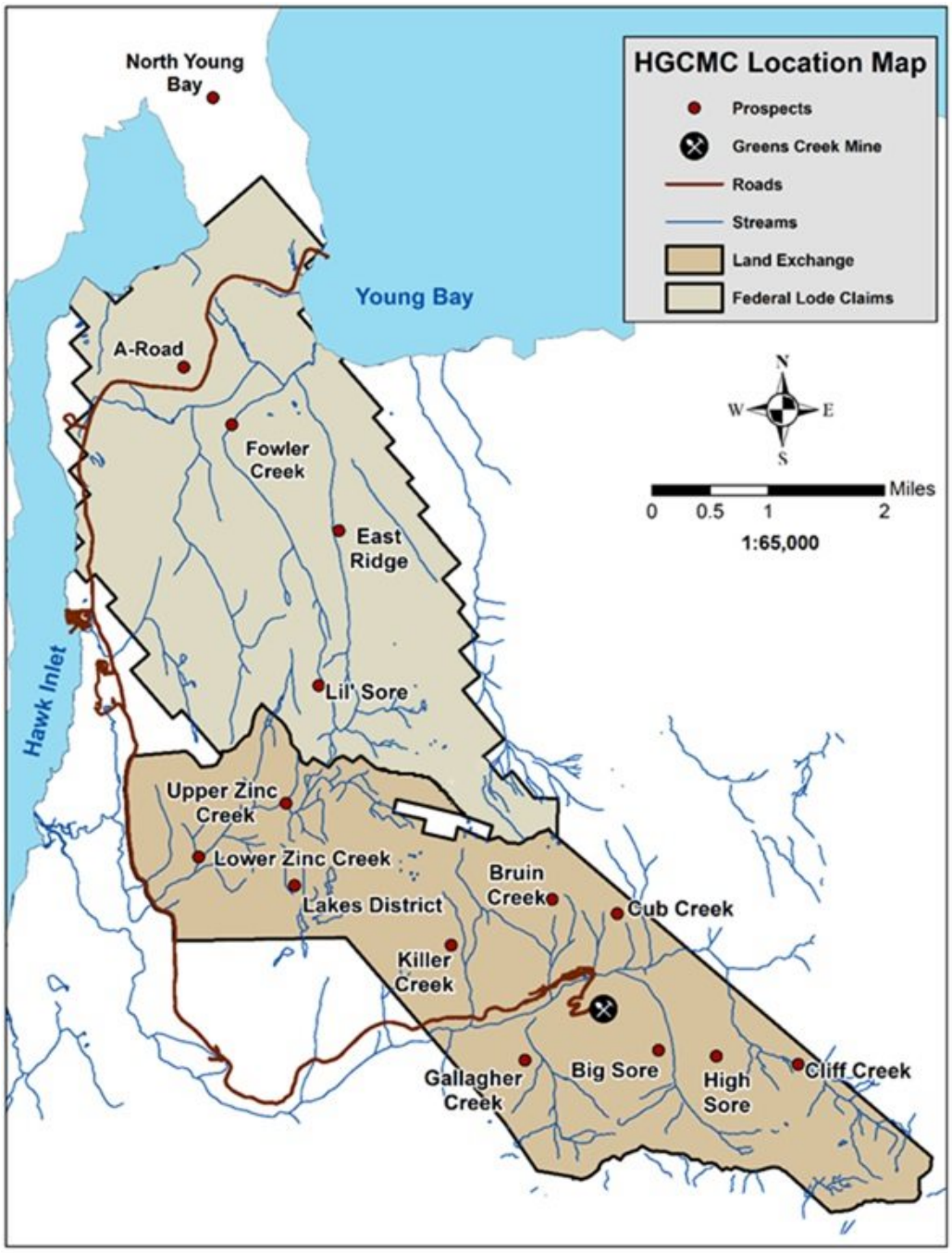


Figure 5-1: Plan Map of Exploration Target Areas, with Land Exchange and Claims

5.3 Mineral Reserve History

Greens Creek replaced or added Mineral Reserves from 1997 until 2001, both by new discoveries and by upgrading Mineral Resource models. In 1998, discovery and development of the 200S Zone and a change in classification of the 5250 Zone accounted for a significant increase in Mineral Reserves.

In 1999, there were more positive changes in these zones and in the Southwest Zone. In 2000, the West Zone Mineral Reserve increased substantially, but in 2001 and 2002, re-evaluation of the model and decreasing metal prices more than erased the 2000 gain.

After a notable decrease in 2001 due to metal prices, the Greens Creek Mineral Reserve tonnage was maintained at a consistent level of 7.0 Mst to 8.5 Mst between 2001 to 2017, until experiencing a large increase with the 2018 end of year update due to the addition of the Gallagher and Upper Plate zones and improved Mineral Resource models which enabled the addition of significant remnant material that was left behind by previous mining.

Mineral Reserve grades for precious metals have remained stable over the past ten years while grades for base metals have decreased steadily. Table 5-2 shows the Greens Creek Mineral Reserve history from 1997 to 2021.

Table 5-2: Greens Creek Mineral Reserve History - 1997 to 2021
Hecla Mining Company – Greens Creek Mine

Year	Ore (Mst)	Grade				Contained Metal			
		(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	(000 oz Au)	(Moz Ag)	(000 ton Pb)	(000 ton Zn)
1997	8.39	0.15	18.6	4.5	12.7	1,242	156	377	1,068
1998	9.76	0.14	15.4	4.5	12.3	1,385	150	440	1,202
1999	10.02	0.14	16.2	4.5	11.9	1,357	163	448	1,193
2000	10.01	0.13	15.7	4.4	11.9	1,335	157	442	1,190
2001	7.59	0.13	16.7	4.6	11.6	1,007	127	347	883
2002	7.05	0.13	14.9	4.2	11.4	903	105	298	801
2003	7.49	0.12	14.1	4.0	10.7	863	106	301	798
2004	7.93	0.11	14.1	3.9	10.2	880	112	313	809
2005	7.48	0.12	14.5	3.9	10.2	864	108	291	766
2006	7.68	0.11	14.4	4.0	10.4	865	111	306	798
2007	8.45	0.11	13.7	3.8	10.2	908	116	321	861
2008	8.07	0.11	13.7	3.8	10.5	870	111	309	851
2009	8.32	0.10	12.1	3.6	10.3	847	101	303	853
2010	8.24	0.09	12.1	3.5	9.3	757	100	291	767
2011	7.99	0.09	12.3	3.5	9.2	742	98	282	733
2012	7.86	0.09	12.0	3.4	9.0	721	95	267	704
2013	7.80	0.09	11.9	3.3	8.7	713	93	256	678

Year	Ore (Mst)	Grade				Contained Metal			
		(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	(000 oz Au)	(Moz Ag)	(000 ton Pb)	(000 ton Zn)
2014	7.70	0.10	12.2	3.1	8.3	739	94	241	640
2015	7.21	0.09	12.3	3.0	8.1	677	89	218	583
2016	7.59	0.09	11.7	2.9	7.6	673	89	217	576
2017	7.55	0.10	11.9	3.0	8.1	725	90	225	615
2018	9.28	0.09	11.5	2.8	7.6	840	107	263	706
2019	10.72	0.09	12.2	2.8	7.3	932	131	305	778
2020	8.98	0.09	12.4	2.8	7.3	828	11	255	652
2021	11.08	0.09	11.3	2.6	6.6	946	125	282	726

5.4 Past Production

A detailed summary of mine production from 1989 to 2020 is summarized in Table 5-3. An overall life of mine (LOM) production summary is included in Table 5-4.

Table 5-3: Production History, 1989 to 2020
Hecla Mining Company – Greens Creek Mine

Year	Tons Milled	Head Grade				Recovery				Contained Metal in Feed			
	(ton)	(% Zn)	(% Pb)	(oz/ton Ag)	(oz/ton Au)	(% Zn)	(% Pb)	(% Ag)	(% Au)	(000 ton Zn)	(000 ton Pb)	(Moz Ag)	(000 oz Au)
1989	264,672	8.71	4.39	24.22	0.139	84	77.6	80.6	63.9	23.1	11.6	6.4	36.8
1990	382,574	10.43	4.89	23.04	0.12	89.1	82.9	86.6	83.3	39.9	18.7	8.8	45.7
1991	427,942	11.05	4.65	22	0.116	85.3	76.3	80.6	73.9	47.3	19.9	9.4	49.5
1992	439,828	10.82	4.66	20.78	0.113	80.2	71.4	76.3	65.1	47.6	20.5	9.1	49.8
1993	119,772	11.3	4.58	20.7	0.131	86.1	75.2	79.1	64.1	13.5	5.5	2.5	15.7
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	143,737	9.98	4.85	23.81	0.108	80.1	72.9	80.8	66.4	14.3	7	3.4	15.5
1997	489,854	10.47	4.79	25.68	0.177	80	74.8	77.3	64.3	51.3	23.5	12.6	86.8
1998	540,028	11.93	5.13	22.74	0.17	84.1	75.8	77.3	65.9	64.5	27.7	12.3	91.9
1999	578,298	13.47	5.66	23.64	0.212	80.6	70.3	75.9	65.7	77.9	32.7	13.7	122.7
2000	619,438	13.57	5.28	20.06	0.208	79.6	68.1	74.3	64.8	84.1	32.7	12.4	128.7
2001	658,008	12.12	4.75	21.76	0.194	80.1	71.7	76.6	68.6	79.7	31.2	14.3	127.7
2002	733,431	12.52	4.73	19.73	0.203	79.9	70.9	75.4	68.9	91.9	34.7	14.5	149
2003	781,275	12.29	4.6	19.69	0.187	79.3	69.1	76.1	68	96	35.9	15.4	146.2
2004	805,353	11.14	4.05	16.65	0.163	77.1	67.1	72.4	65.5	89.7	32.6	13.4	131.6
2005	717,564	10.34	3.98	18.17	0.149	78.6	65.1	74.1	67.9	74.2	28.6	13	107.1
2006	732,100	9.36	3.66	15.78	0.13	76.5	69.5	76.8	66.2	68.5	26.8	11.6	95
2007	732,150	9.67	3.66	15.45	0.137	79.1	70	76.4	68	70.8	26.8	11.3	100.1

Year	Tons Milled	Head Grade				Recovery				Contained Metal in Feed			
	(ton)	(% Zn)	(% Pb)	(oz/ton Ag)	(oz/ton Au)	(% Zn)	(% Pb)	(% Ag)	(% Au)	(000 ton Zn)	(000 ton Pb)	(Moz Ag)	(000 oz Au)
2008	734,907	10.09	3.58	13.38	0.142	78.5	70.5	72.7	64.5	74.2	26.3	9.8	104.7
2009	790,871	10.13	3.64	13.01	0.133	79.1	68.5	72.5	63.8	80.1	28.8	10.3	105.5
2010	800,397	10.66	4.09	12.3	0.134	78.1	68	73.2	64.3	85.3	32.8	9.8	107.1
2011	772,068	9.81	3.52	11.49	0.118	78.8	68.1	73.2	62.3	75.7	27.2	8.9	91.2
2012	789,569	9.35	3.49	11.13	0.115	77.7	67.8	72.8	61	73.8	27.5	8.8	91
2013	805,322	8.47	3.33	13.04	0.118	74.1	67.6	70.9	60.6	68.2	26.8	10.5	94.9
2014	816,213	8.38	3.22	13.24	0.115	75.9	69.3	72.4	62.5	68.4	26.3	10.8	93.9
2015	814,398	8.74	3.3	13.5	0.111	75.1	73.3	76.9	67	71.2	26.9	11	90.5
2016	815,639	8.08	3.11	14.55	0.097	75	74.7	78	68.2	65.9	25.4	11.9	79.1
2017	839,589	7.25	2.72	12.88	0.093	74.6	72.7	77.2	65	60.9	22.9	10.8	78.2
2018	845,398	7.47	2.8	12.16	0.094	87.7	80.1	77.4	65.1	63.1	23.7	10.3	79.1
2019	846,076	7.43	2.92	14.64	0.096	90.3	81.5	79.8	69.5	62.9	24.7	12.4	81.5
2020	818,408	7.58	3.13	15.65	0.082	91.6	83.5	81.9	72.6	62	25.6	12.8	66.8

Notes:

1. Zinc recovery: to Zn concentrate, precious metals (PM) concentrate (Pb concentrate in 2018 only)
2. Lead recovery: to Pb concentrate, PM concentrate (Zn concentrate in 2018 only)
3. Silver recovery: to doré, Pb concentrate, Zn concentrate, PM concentrate
4. Gold recovery: to doré, Pb concentrate, Zn concentrate, PM concentrate
5. In 2018, zinc in the lead concentrate and lead in the zinc concentrate became payable, so they are included in the 2018 recovery percentages

Table 5-4: Life of Mine Production 1989 to 2020
Hecla Mining Company – Greens Creek Mine

Items	Units	Production
Tons milled	ton	19,654,879
	Head Grade	
Zinc	% Zn	9.90
Lead	% Pb	3.87
Silver	oz/ton Ag	16.39
Gold	oz/ton Au	0.140
	Metal in Feed	
Zinc	000 ton Zn	1,946
Lead	000 ton Pb	761
Silver	Moz Ag	322
Gold	000 oz Au	2,663
	Metal Recovered	
Zinc	000 ton Zn	1,556
Lead	000 ton Pb	547
Silver	Moz Ag	246
Gold	000 oz Au	1,765

6.0 GEOLOGICAL SETTING, MINERALIZATION, AND DEPOSIT

6.1 Regional Geology

Regional geological interpretations are largely based on work completed by the United States Geological Survey (USGS). USGS Professional Paper 1763 (Taylor and Johnson, 2010) and subsequent work by the USGS (Wilson et.al, 2015 and Karl and Wilson, 2016) best summarize the regional geology surrounding the Greens Creek deposit.

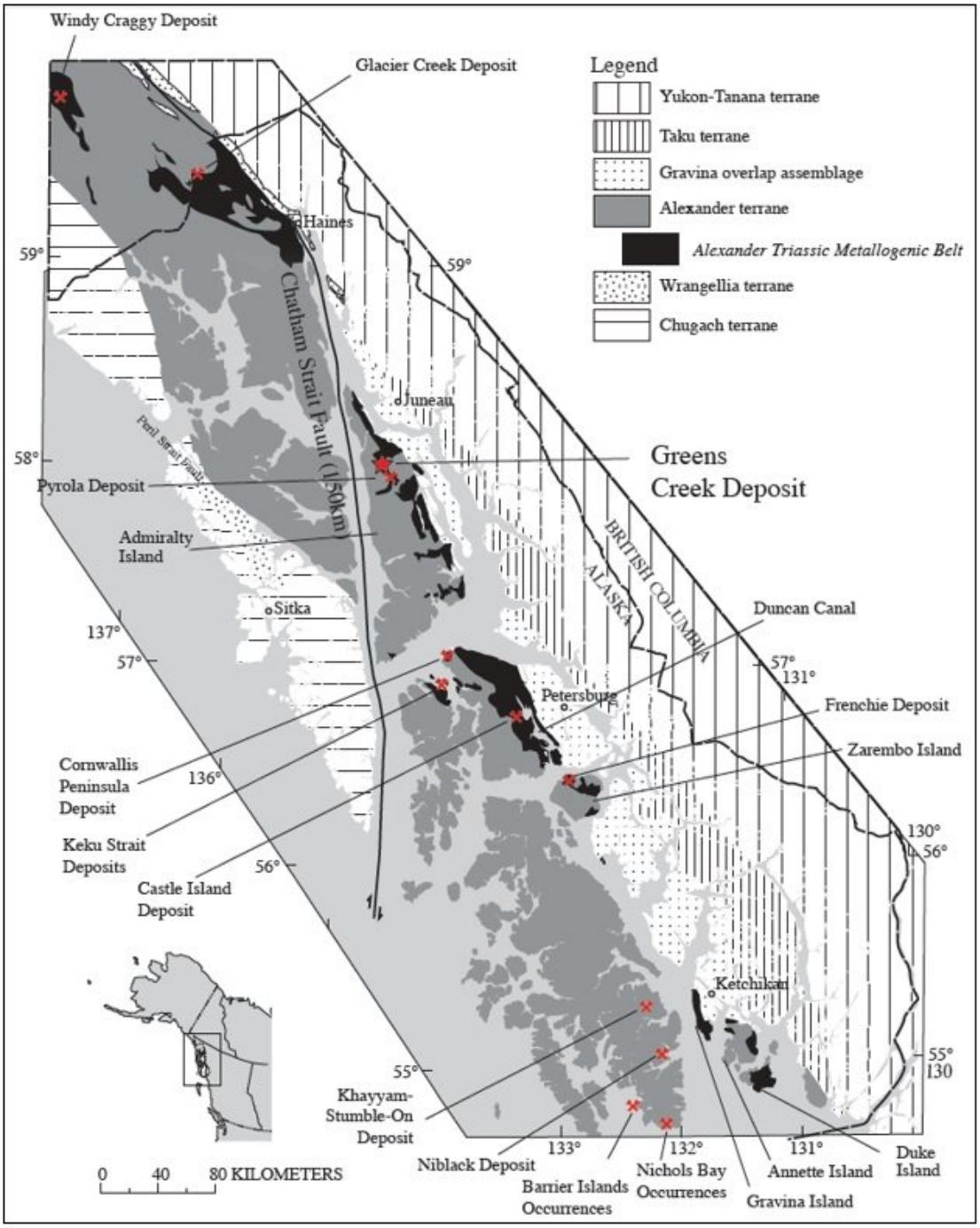
Greens Creek lies within the Alexander Triassic Metallogenic Belt which lies unconformably on Late Proterozoic to Permian aged strata of the Alexander Terrane. The tectono-stratigraphic map of Figure 6-1 shows these units as they now exist against the North American continent and where other deposits similar in type to Greens Creek have been discovered.

Amalgamation of the Alexander and Wrangellia terranes by Permian time resulted in sub-aerial exposure of the region and the formation of an erosional unconformity. The unconformity appears to have variably removed Devonian to Permian units from the Alexander terrane in the vicinity of the Greens Creek claim block.

Post-amalgamation of the Alexander and Wrangellia terranes, late Triassic rifting developed a restricted basin on the east side of the composite terrane as evidenced by the Hyd Group marine sediments and flood basalts of Carnian and Norian ages. The Greens Creek deposit is hosted within the Hyde marine sediments (Tr hgs) of Carnian to Norian age immediately below the Hyd basalts (Tr hgv) as shown in Figure 6-2 (Karl and Wilson, 2016).

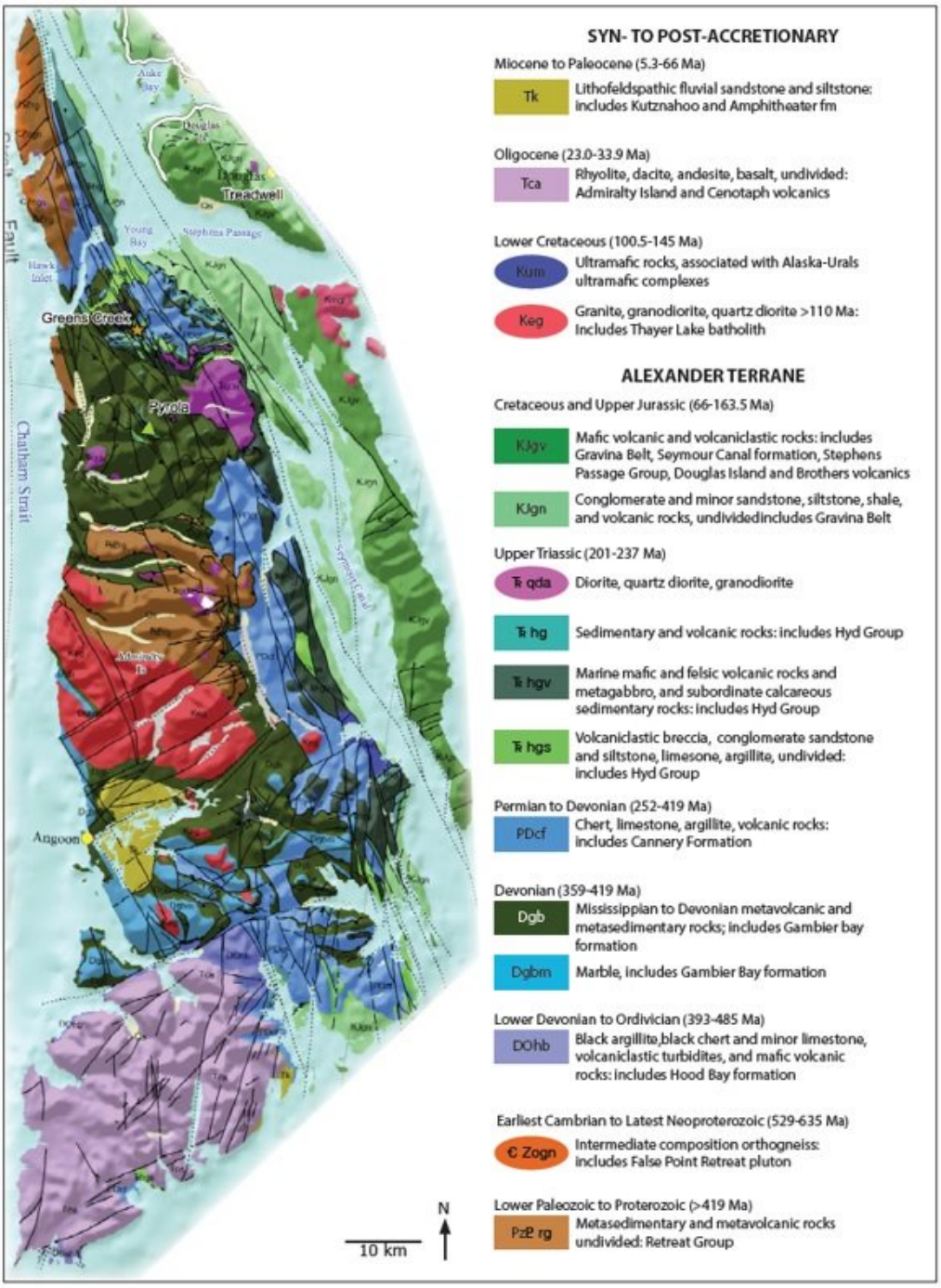
Beginning in the middle Jurassic and continuing through the Mid-Cretaceous, compressional tectonism attended the suturing of the Alexander/Wrangellia superterrane to continental North America. Crustal thickening during the Mid-Cretaceous collision resulted in intense fold and thrust style structural deformation. Toward the end of the Cretaceous compressional tectonism waned as tectonic plates along the coast of North America began to move in a dextral fashion which motion continues to the present.

Brittle dextral movement in the Tertiary affected the entire accreted coast of North America. The Chatham Strait Fault is one of many north-northwest striking faults of this brittle faulting which has caused significant strike-slip dislocation across the superterrane (Figure 6-1 and Figure 6-2). Two such Tertiary faults run through the Greens Creek deposit. The Maki Fault and Gallagher Fault have dextral offsets of approximately 1,800 ft (549 m) and 2,750 ft (838 m), respectively. The faults generally dip steeply to the west and have reverse movement (west side up) of approximately 110 ft (33 m) and 650 ft (198 m), respectively. Taylor and Johnson (2010) place Greens Creek into a series of deposits and prospects that they term the Alexander Triassic Metallogenic Belt (Figure 6-1). The belt is located along the eastern margin of the Alexander terrane throughout southeastern Alaska and northwestern British Columbia and exhibits a range of characteristics consistent with a single rift basin deepening to the north. Occurrences included in this group include Windy Craggy, Mt. Henry Clay, Greens Creek, Glacier Creek, Pyrola, and Yellow Bear Mountain among others.



Source: Steeves (2018), modified from Taylor (2008) and Campbell and Dodds (1983)

Figure 6-1: Regional Tectono-Stratigraphic Map



Source: Karl and Wilson (2016)

Figure 6-2: Geologic Map of Admiralty Island

6.2 Project Geology

6.2.1 Geologic Mapping

Extensive surface mapping on the Greens Creek claim block has allowed a detailed bedrock map to be produced for the project area. USGS units were not typically used in mapping lithologies, but Figure 6-3 provides mapped lithologies according to USGS defined units. Table 6-1 equates the surface mapping geologic units of Figure 6-3 to lithologies utilized in underground mapping and core drilling. A stratigraphic column showing the position of the Greens Creek mineralization relative to the regional geological setting is provided in Figure 6-4.

Table 6-1: Correlation of USGS Units to Greens Creek Mine Lithologic Units
Hecla Mining Company – Greens Creek Mine

USGS Unit/ GC Surface Mapping Unit	Explanation	GC Underground Mine Geology Units
Dg-gr	Gambier Bay Formation graphitic schist	not present
Dg-gst	Gambier Bay Formation greenstone	not present
Dg-sp	Gambier Bay Formation altered greenstone	not present
Dgf	Gambier Bay Formation felsic intrusive	not present
Dgm	Gambier Bay Formation marble	not present
Dsc	Hawk Inlet cherts	not present
KHsc	Seymour Canal Formation	not present
PDc	Cannery Formation	not present
Pzcs-gr	Lake Kathleen Unit graphitic schist	SPgr
PZcs-gst	Lake Kathleen Unit greenstone	GST
Pzcs-sp	Lake Kathleen Unit altered greenstone	SP, SPc
Pzgs-gst	Piledriver Unit greenstone	GST
Pzgs-um	Piledriver Unit ultramafic	SC
Tr_h-gn	Hyde Group gabbro gneiss	GB
Tr_hgs-ls	Hyde Group limestone	MB
Tr_hgs-x	Hyde Group basal conglomerate	SPcx
Tr_hs-arg	Hyde Group argillite	SA, MA, CHT
Tr_hs-exh	Hyde Group mineralized horizon exhalites	MFB, MFP, WBA, WCA, WSI
Tr_hs-xu	Hyde Group undifferentiated conglomerate	SPcx
Tr_hv-gst	Hyde Group basaltic greenstone	CR, GST
Tr_hv-rhy	Hyde Group rhyolite/dacite	RHY
Tr_hv-sp	Hyde Group basaltic greenstone – altered	SP, SPs

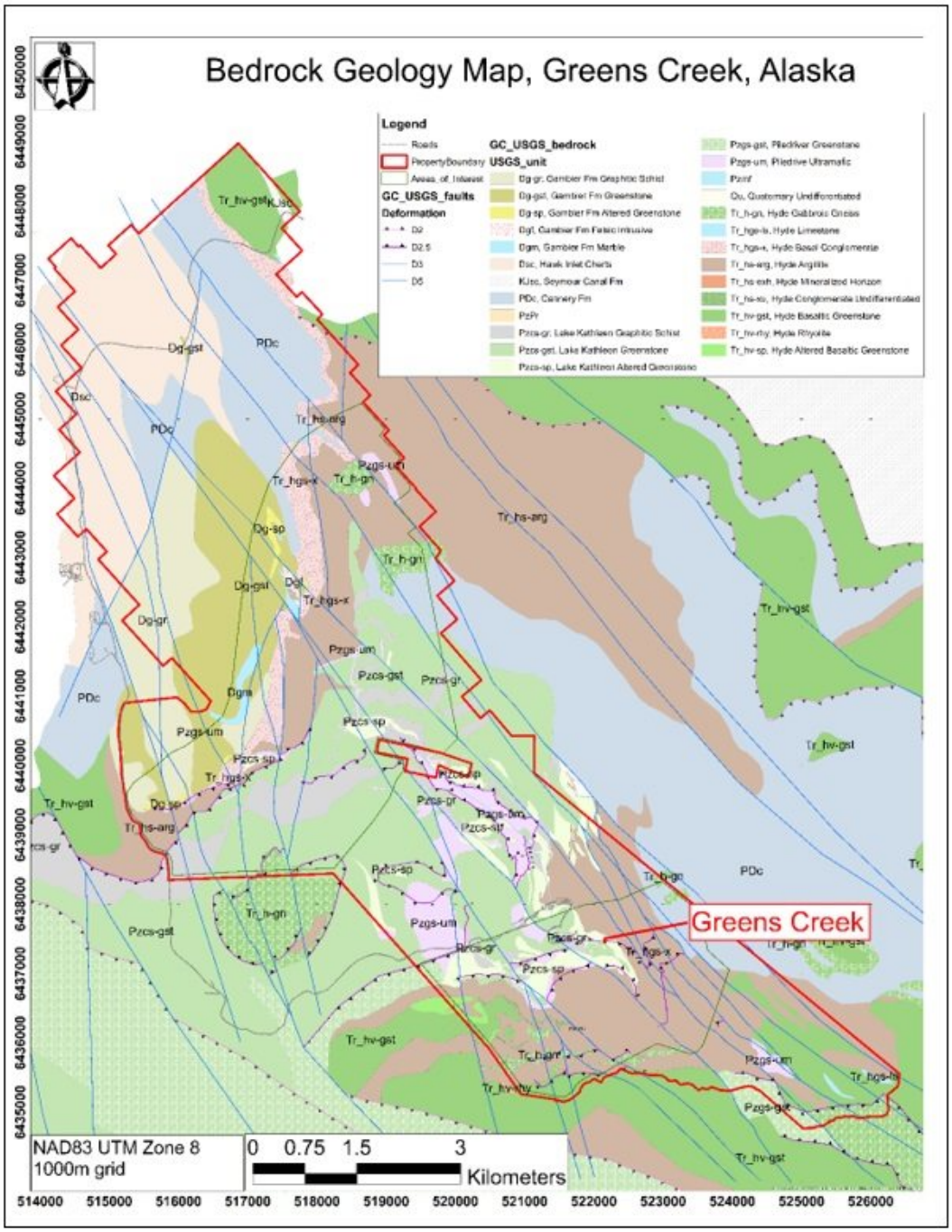


Figure 6-3: Geologic Map of the Greens Creek Claim Area

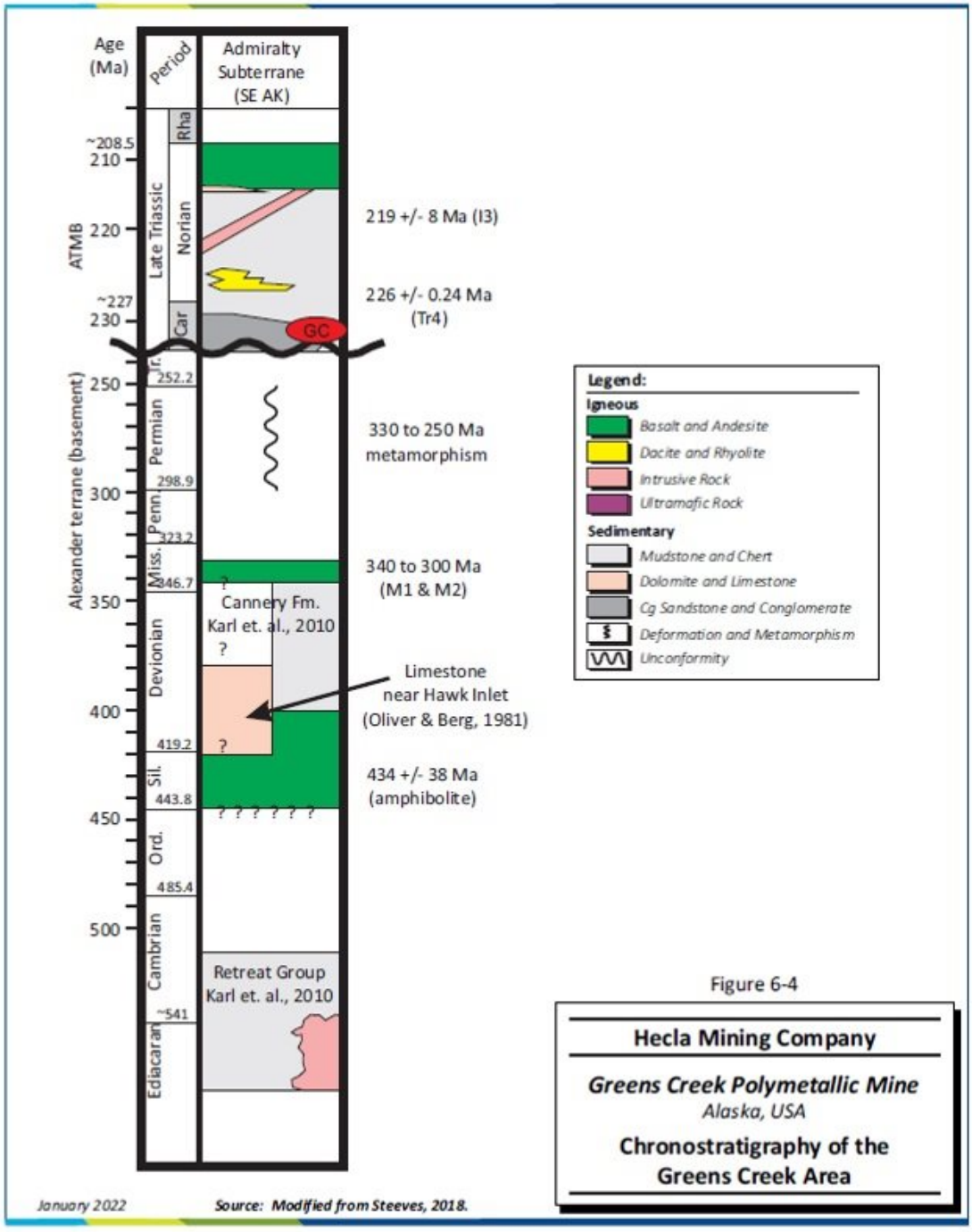


Figure 6-4: Chronostratigraphy of the Greens Creek Area

6.2.2 Lithology

While the regionally mapped units are mostly present at Greens Creek, some are absent, and others have been subdivided according to mine scale mapping and logging of drill holes. The Greens Creek mineralization is conformable to the contact between the Alexander Terrane Paleozoic-aged rocks and the late Triassic-aged Hyd Group. As the mineral zones are located at this unconformable contact the local lithologies are discussed according to footwall, mineralized horizon and hanging wall groups. Some dikes and sills cross-cut the Paleozoic units, Triassic units, and in rare situations cut the mineralized bodies.

6.2.2.1 Footwall Lithologies

The Admiralty subterrane makes up the stratigraphic footwall to the Greens Creek mineral deposit. The subterrane is variable in composition and spans Ediacarian through Permian time. North of the mine, but still on the claim block, Devonian aged metavolcanics, cherts and graphitic sediments have been mapped. East and south of the mine, younger Permian marine sediments have been mapped. This apparent younging of the Admiralty subterrane from the northwest to the southeast may be explained by some combination of the erosional unconformity immediately above the Permian boundary, which may be an angular unconformity and tectonic exhumation of deeper units on the northern end of the subterrane.

The erosional unconformity is marked by a polymictic conglomerate composed entirely of footwall lithologies. This conglomerate is found extensively within the Alexander terrane and is common below the Hyd Group metasediments. It is variably present in the mine area with thickness varying up to tens of feet. The conglomerate is hypothesized to have formed as debris flows over the basin bounding faults which formed the Triassic basin.

In the immediate mine area and directly below the polymictic conglomerate, the footwall is composed of Mississippian aged metavolcanics (Sack, 2016). These metavolcanics dominate footwall lithologies within a couple miles of the mineral deposit though some gabbroic intrusions and graphitic sedimentary units are present. The metavolcanics are further distinguished into the following mine units by mine geologists:

- Greenstone (GST) – a massive greenstone with pervasive foliation formed by chlorite and weak segregation of quartz into banding.
- Marble (MB) – though very rare in the immediate mine area this gray, coarse-grained dolomitic marble is present in the claim block.
- Graphitic phyllite (SPgr) – a well foliated carbonaceous quartz mica schist.
- Chloritic phyllite (SPc) – a well foliated and banded quartz chlorite muscovite schist.
- Sericitic phyllite (SPsr) – a well foliated and sericitically altered unit likely derived from the greenstone, graphitic phyllite and chloritic phyllite units.

Siliceous phyllite (SPs) – a dark grey quartz rich phyllite found proximal to the mineral bodies. This unit is likely derived from the other phyllite units by hydrothermal alteration related to mineral deposit formation.

- Altered ultramafic (AUM) – a fuchsite bearing quartz carbonate chlorite muscovite schist.
- Serpentinite (SC) – massive to talc altered serpentinite likely cross-cutting the mafic metavolcanics but clearly metamorphosed during the Cretaceous collision. This unit has not been radiometrically dated and is debated by some to cut the Triassic Hyd Group. Mapping and logging of core at the mine indicates the unit is pre-Hyd Group.

- Polymictic conglomerate (SPcx) – a highly strained sub-rounded to angular breccia/conglomerate that is found at the erosional unconformity between the footwall Mississippian age metavolcanics units and the overlying Hyd Group. Other polymictic conglomerates appear within the Hyde Group above the erosional unconformity but these have zircons dominated by Triassic ages, not Mississippian as in the basal conglomerate.

The relative age relationships are, from youngest to oldest, polymictic conglomerate, serpentinite, and all other units undifferentiated.

6.2.2.2 Hanging Wall Lithologies

The hanging wall of the mineral deposit, which is located immediately above the basal polymictic conglomerate, is entirely composed of the Hyd Group. In the immediate mine area, the mine geologists break the unit into the following lithologies:

- Massive Argillite (MA) – dolomitic argillite typically found close to the base of the Hyd Group. Beds tend to be one inch to 10 in. (2.5 cm to 25 cm) thick and have quartz-carbonate ladder veining normal to bedding due to post-depositional folding. Conodont samples have provided a Carnian-Norian age of 220 Ma.

- Slatey Argillite (SA) – finely laminated siliciclastic carbonaceous argillite, often with thin sulfide banding. Often grades into a phyllite where post-depositional deformation has strained the unit.

- Gabbroic sills (GB), basalts (BSLT) and a thin rhyolite (RHY) occur up in the Hyd Group section, structurally and/or stratigraphically over the mineral deposits. These volcanic bodies also cross the Paleozoic footwall units but are not generally recognized in the immediate mine area due to intense alteration and deformation.

- Relative ages of the hanging wall units from youngest to oldest are basalt, then argillite, rhyolite and gabbroic sills intermixed and finally massive argillite at the base. Some researchers put the polymictic conglomerate at the base of the Hyd group, but the conglomerate appears to be devoid of any Hyd group lithologies, at least in the immediate mine area.

6.2.3 Structural Setting

An early and poorly preserved S1 metamorphic segregation foliation is present in the footwall lithologies. As such it is likely pre-Triassic and may have developed as a result of the amalgamation of Alexandria and Wrangellia in the Permian.

Intense mountain building throughout the Cretaceous resulted in D_2 thrusting and penetrative S_2 foliation in muscovite-rich lithologies. In the hanging wall argillite, the S_2 foliation is less apparent though F_2 folding is well preserved. The F_2 folds in the argillite are generally non-cylindrical, isoclinal and often recumbent. The shallow dipping “benches” of mineralization developed across the mineral deposit are pronounced recumbent F_2 folds with amplitudes up to 1,000 ft.

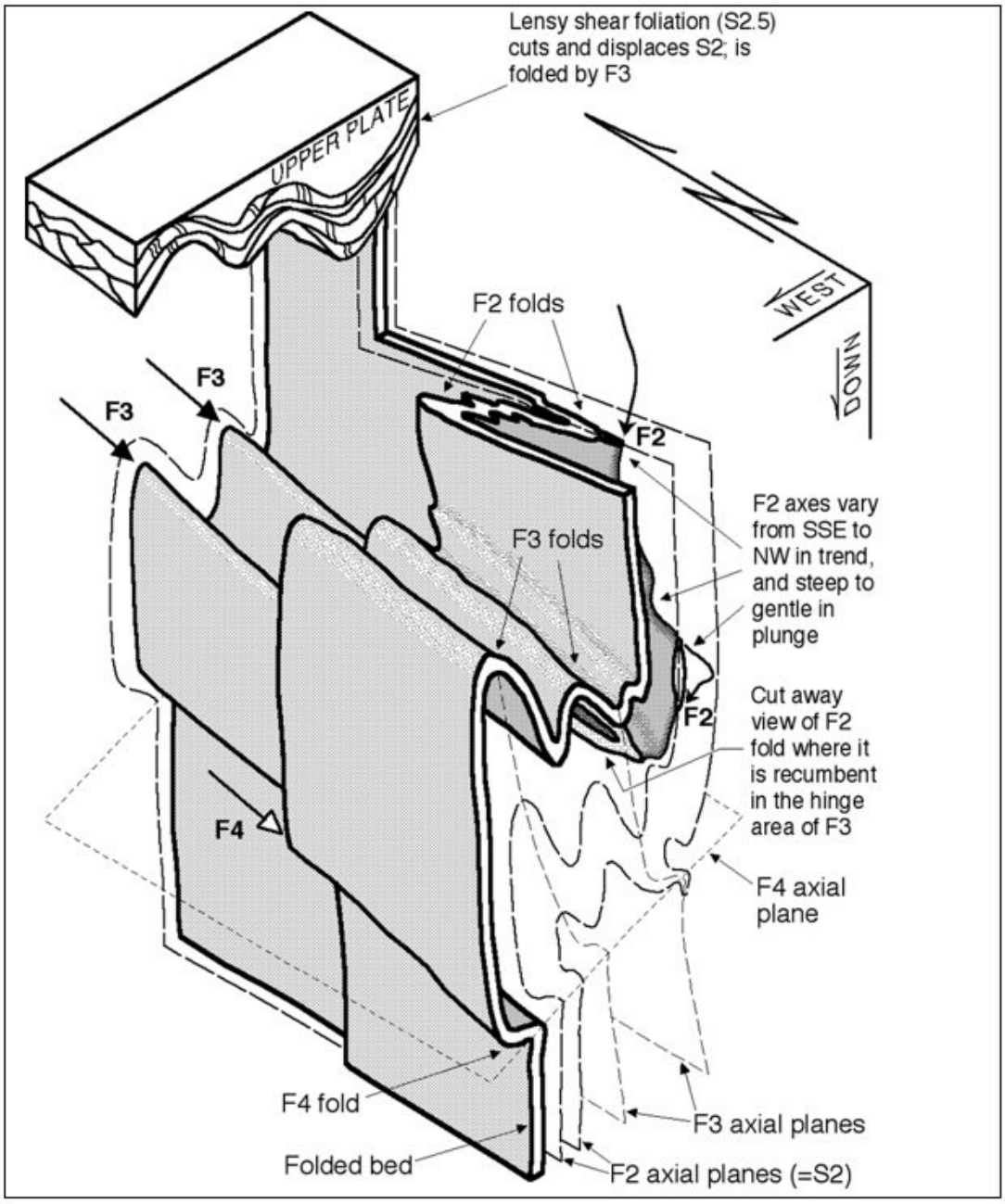
Following D_2, the mine area was subjected to protracted D_3 transpression which created open to isoclinal upright folding and north-northwest striking shear zones.

Several post-D_2 ductile shears have been mapped across the claim block which are nearly age equivalent to the upright D_3 shears and have been assigned to a $D_{2.5}$ event in the literature. These $D_{2.5}$ shears have C-S fabrics indicating top to the west-northwest movement. The two prominent $D_{2.5}$ shears mapped in the mine area are the Upper Shear and the Klaus Shear. The cross-cutting relationship between D_3 and $D_{2.5}$ shears have not been observed directly though regional mapping of a $D_{2.5}$ shear appeared to fold up into a D_3 shear.

A pronounced S_3 crenulation cleavage is present as thin 0.05 in. to 0.125 in. bands cutting S_2 foliation. The cleavage bands are spaced one inch to 10 in. apart where present and are nearly axial planar to the F_3 folds they helped create. These cylindrical folds are generally of low amplitude, typically less than 20 ft, but can be more than 100 ft in amplitude, significantly deforming the deposit.

A weak D_4 folding event affected the mine area. The folds are open and of very low amplitude to wavelength ratio with amplitudes rarely exceeding several feet. These folds do not appreciably deform the mineralization. Figure 6-5 illustrates the superposition of folding present within the mine area.

Mid- to late-Tertiary dextral transform faulting caused brittle D5 faults such as the Maki Fault system, which cuts through the immediate Greens Creek area. The similar orientations of D3-ductile and D5-brittle structures indicate that the D3 structural grain was utilized in D5. The Maki Fault zone has approximately 1,800 ft (550 m) of right-lateral and 110 ft (33 m) of reverse, west side up, offset. The Maki Fault zone is a zone of parallel fault splays with particularly intense faulting concentrated along the bounding structures, the Maki fault on the east and the Kahuna Fault on the west. The zone is 350 ft wide at the southern end of the deposit but narrows to less than 25 ft wide at the northern end of the deposit. Significantly, the Maki Fault zone truncates mineralization and hosts the 9a ore zone, which is composed of entrained blocks of mineralization. The other significant D_5 fault in the mine area is the Gallagher Fault with 2,750 ft (840 m) of right-lateral and 650 ft (200 m) of reverse, west side up, offset.



Source: Proffett, 2010

Figure 6-5: Fold and Shear Relationships at Greens Creek

6.3 Geology of Mineralization

6.3.1 Locations and Relationships

The Greens Creek sulfide mineralization is localized on the Mississippian/Late Triassic contact marked by the Hyd basal conglomerate. This erosional unconformity is referred to as the "mine contact" by the mine geologists. Though mineralization and significant alteration extend into the footwall mafic rocks and though some lenses of mineralization occur in the overlying argillites, the bulk of mineable material is located immediate to the mine contact.

The mine contact is variably mineralized over the claim block and nearly continuously mineralized in the mine area. Three main trends of mineralization have been traced along the mine contact with multiple centers of mineralization along those trends. Though the trends are folded with the mine contact the general mineralization trends strike 160° and plunge 20° to the south. Figure 6-6 displays the mineralized wireframes of each mineral zone of the Greens Creek Mineral Resource and Mineral Reserve with the faults that displace them. Figure 6-7 shows a section through the mineralized zones with major fault offsets.

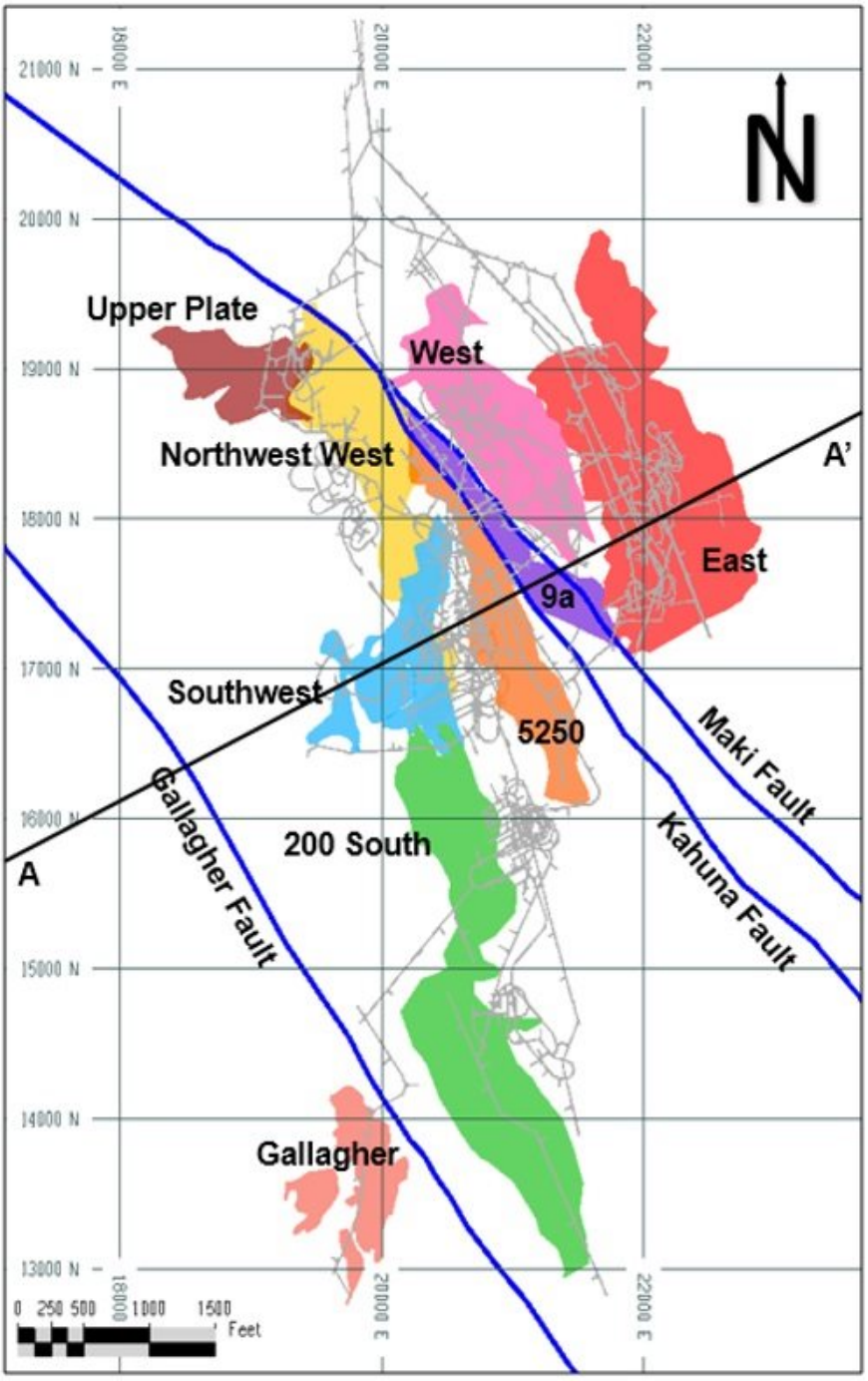
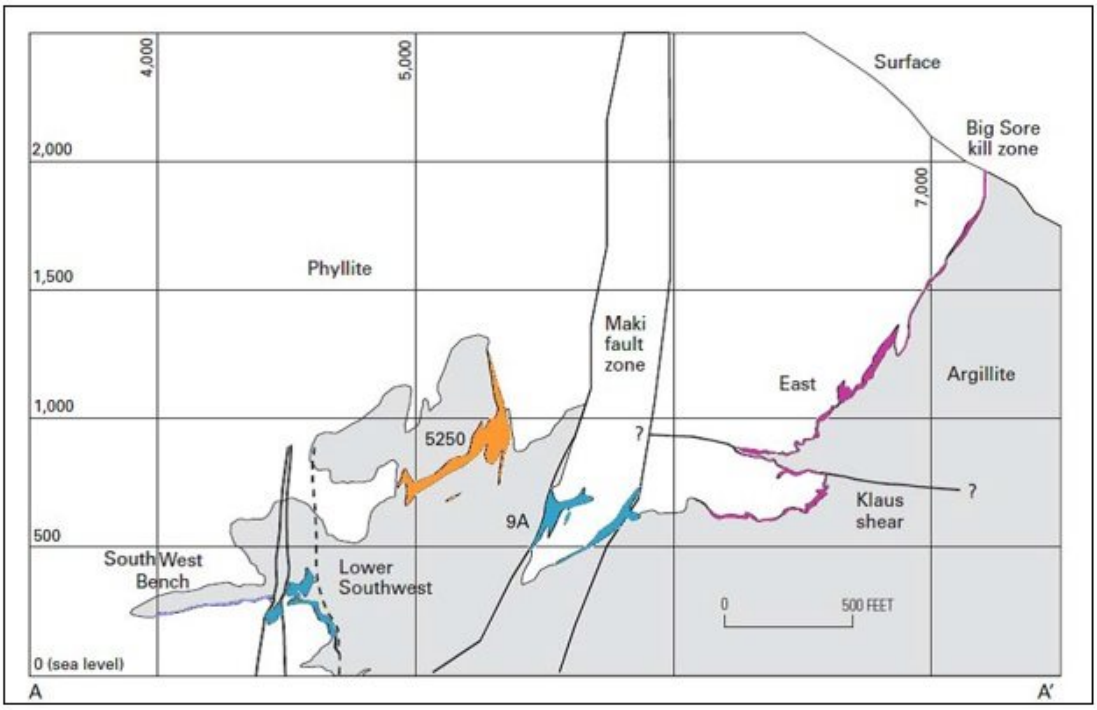


Figure 6-6: Plan View of the Mineral Resource and Mineral Reserve Mineralization Shells of the Greens Creek Mineralized Zones

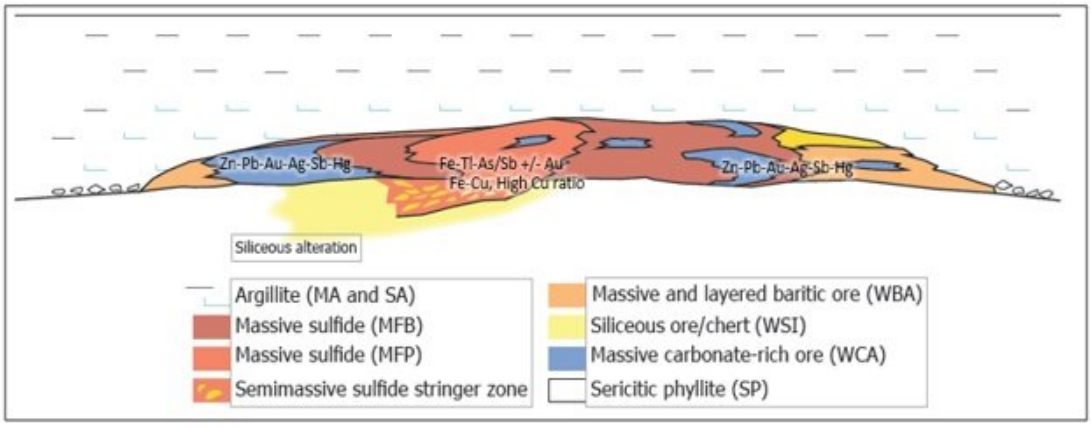


Note:

1. Line of section A-A' is shown in Figure 6-6, Looking Northwest

Figure 6-7: Section through the East, 9A, 5250 and Southwest Zones

In general, the mineralized bodies are zoned over a silica flooded, pyrite-rich footwall phyllite (SPs). Semi-massive stringer mineralization is often present in the footwall below significant massive sulfide centers. The central mineralization immediately above the stringers is rich in copper, iron, arsenic, and gold and called massive pyritic ore lithology (MFP) due to the high pyrite content. Grading immediately outward from the MFP zones are the base metal (Zn-Pb) and silver rich mineral zones (MFB). Massive carbonate-rich material (WCA) is present within the MFB and towards the MFB's outer margins. More distal mineralization is characterized by quartz and barite-rich white mineral styles, WSI and WBA respectively (Figure 6-8).



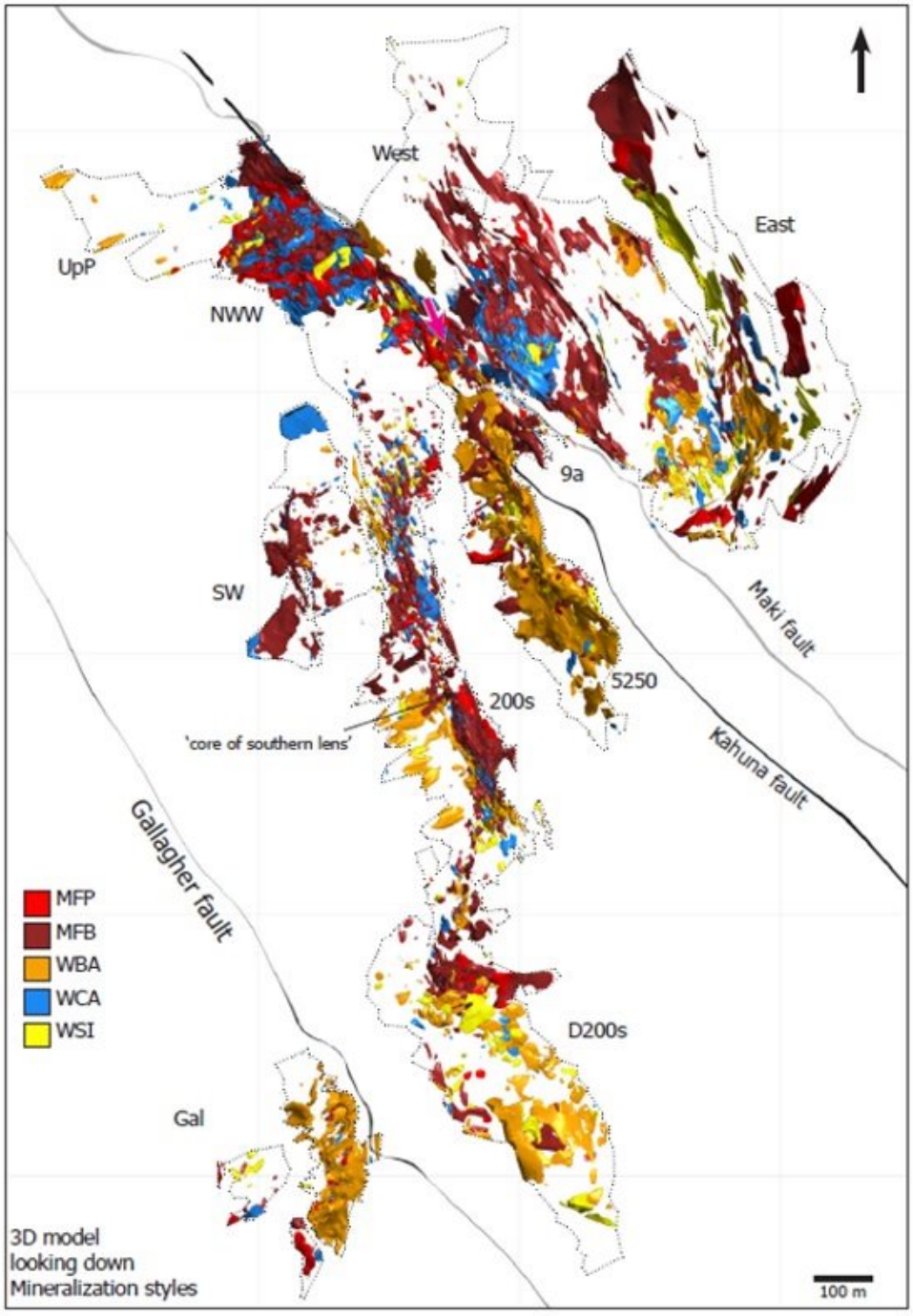
Source: Steeves, 2018

Figure 6-8: Simplified Mineralization Cross –Section

Figure 6-9 provides a plan view of the entire mineral deposit separated according to the mineral types. Clear centers of mineralization are seen with at least four major MFP/MFB cores along the linear mineralization trends. The largest MFP/MFB core is centered on the West and Northwest-West (NWW) zones. Two more centers are present in the SW and upper 200S zones. Another core is present in the deeper, more southern, 200S Zone. Finally, there appears to be two more centers of mineralization at the farthest southern end of the current Mineral Resource; one on the deep vertical limb below the southern 200S Zone and the other possibly emerging at the southern end of the Gallagher Zone.

While minable grades exist within all the mineral types, the MFB, MFP, and WBA types typically have the highest overall grades. Base metals typically are lower in the white mineral type though some baritic material can have high sphalerite contents. Baritic material (WBA) is observed to be particularly silver rich while the white siliceous mineral style (WSI) is typically of the lowest grade.

Ore minerals are dominantly comprised of sphalerite, galena, tetrahedrite, electrum, and proustite-pyrargyrite. A weak, epigenetic, high sulfidation event overprinted portions of the mineral deposit producing bornite, covellite, chalcocite and stromeyerite. Figure 6-10 provides relative mineral abundances for each of the mineral types.



Source: Steeves, 2018

Figure 6-9: Plan View of Mineral Types across the Greens Creek Mineral Deposit

Mineral	Formula	WCA	WBA	WSI	MFP	MFB
Pyrite	FeS_2	●●●	●●●	●●●	●●●	●●●
Sphalerite	(Zn,Fe,Mn)S	●●●	●●●	●●	●●●	●●●
Galena	PbS	●●	●	●	●	●●●
Tetrahedrite (Ag)	$(Cu,Fe,Zn,Ag)_{12}Sb_4S_{13}$	●	●	○	●	●
Chalcopyrite	$CuFeS_2$	●	○	○	●	●
Colusite	$Cu_{12-13}V(As,Sb,Sn,Ge)_3S_{16}$	+	●	○	○	○
Arsenopyrite	FeAsS	+	-	-	●	○
Proustite-Pyrargyrite	Ag_3AsS_3–Ag_3SbS_3	-	●	+	-	-
Electrum, Ag°, Au°	AuAg	○	○	+	○	+
Pearceite-Polybasite	$(Ag,Cu)_6(As,Sb)_2S_7$	-	+	-	-	-
Furutobeite	$(Cu,Ag)_6PbS_4$	-	+	-	-	-
Bornite	Cu_5FeS_4	+	●	○	-	-
Enargite/Luzonite-Famatinite	Cu_3AsS_4–Cu_3SbS_4	-	●	○	+	+
Tennantite	$(Cu,Fe,Zn)_{12}As_4S_{13}$	+	●	+	-	-
Chalcocite Group	Cu_2S	-	●	○	-	-
Covellite	CuS	-	●	+	-	-
Stromeyerite	AgCuS	+	●	+	-	-

Mineral abundance: ●●● Major mineral phase >10 vol.% present in most samples; ●● Moderate mineral phase 5–10 vol.% present in most samples; ● Minor mineral phase 1–5 vol.%; ○ Trace mineral phase <1 vol.% present in some samples; + Rare mineral phase; - not found.

Source: Steeves, 2018

Figure 6-10: Mineral Zonation at Greens Creek by Mineral Type

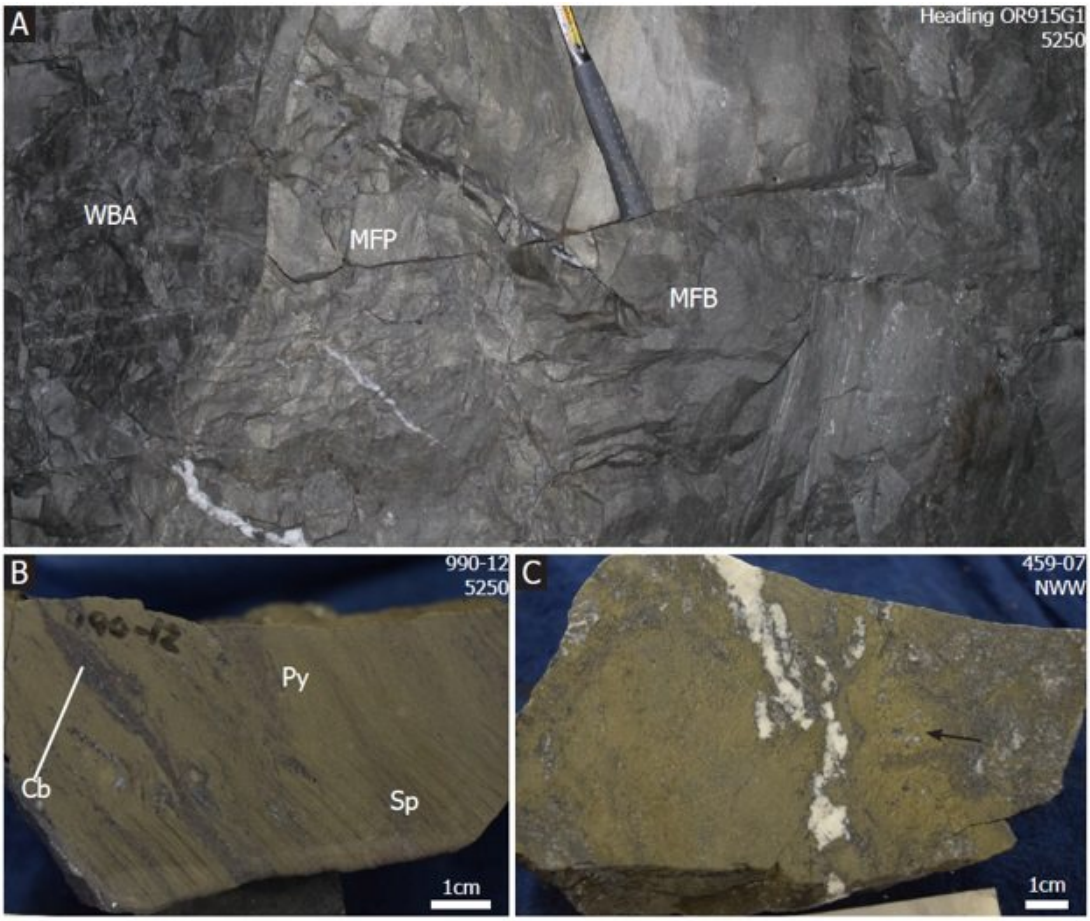
6.3.2 Mineral Type Descriptions

6.3.2.1 Massive Fine Pyritic Mineral Type (MFP)

The massive fine pyritic mineral type contains at least 50% overall sulfide with pyrite being more abundant than the other sulfides combined. Sphalerite and galena dominate the base metal sulfides though chalcopyrite, arsenopyrite and tetrahedrite are common. Gangue consists of quartz, carbonate, barite, and muscovite.

The MFP material is finely bedded generally with the pyrite often framboidal and colloform. Sometimes the MFP unit displays coarser textures suggesting annealing during metamorphism. Near faults the pyritic material becomes brecciated and has late carbonate gangue.

Figure 6-11 provides photographs of MFP as it appears at the stope and hand sample scales. Photo A taken from a mine heading shows the stratification between MFB and MFP mineral styles. Photo B displays the massive sulfide texture and fine segregation of minerals present in the MFP in a cut hand sample. Photo C shows intense deformation and late carbonate gangue in veinlets in a cut hand sample.

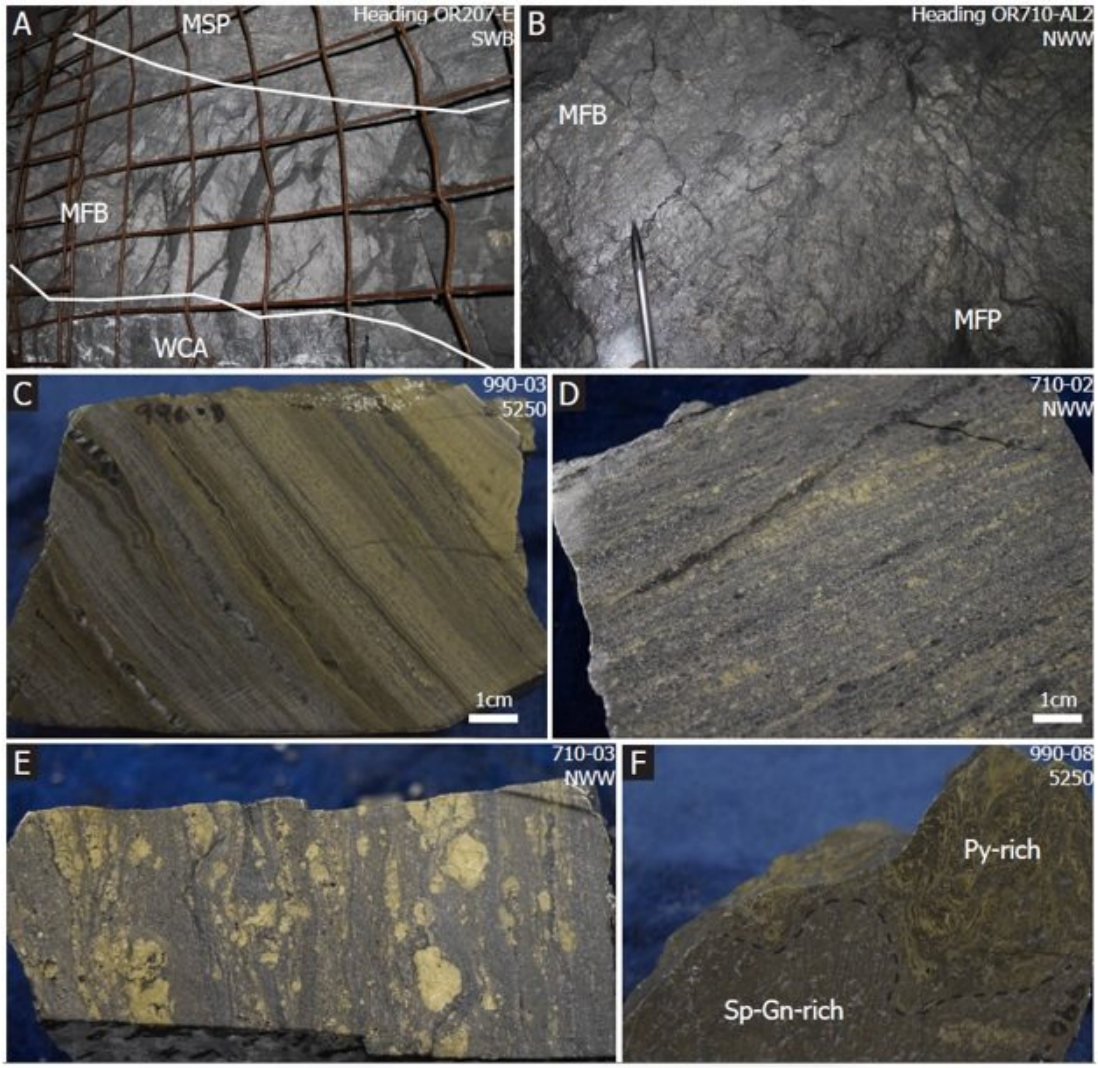


Source: Steeves, 2018

Figure 6-11: Massive Pyritic Material (MFP) at Greens Creek

6.3.2.2 Massive Fine Base Metal Mineral Type (MFB)

The MFB has >50% sulfide with sphalerite, and galena dominating over pyrite. The textures are similar to MFP material but with more sphalerite and galena. Figure 6-12 displays the MFB at heading and hand sample scales. Photos A through D show the stratification, massive and finely bedded natures of the MFB material at outcrop and hand specimen scales. Photos E and F show boudinaged, rolled clasts and intense folding within the material at hand specimen scale.

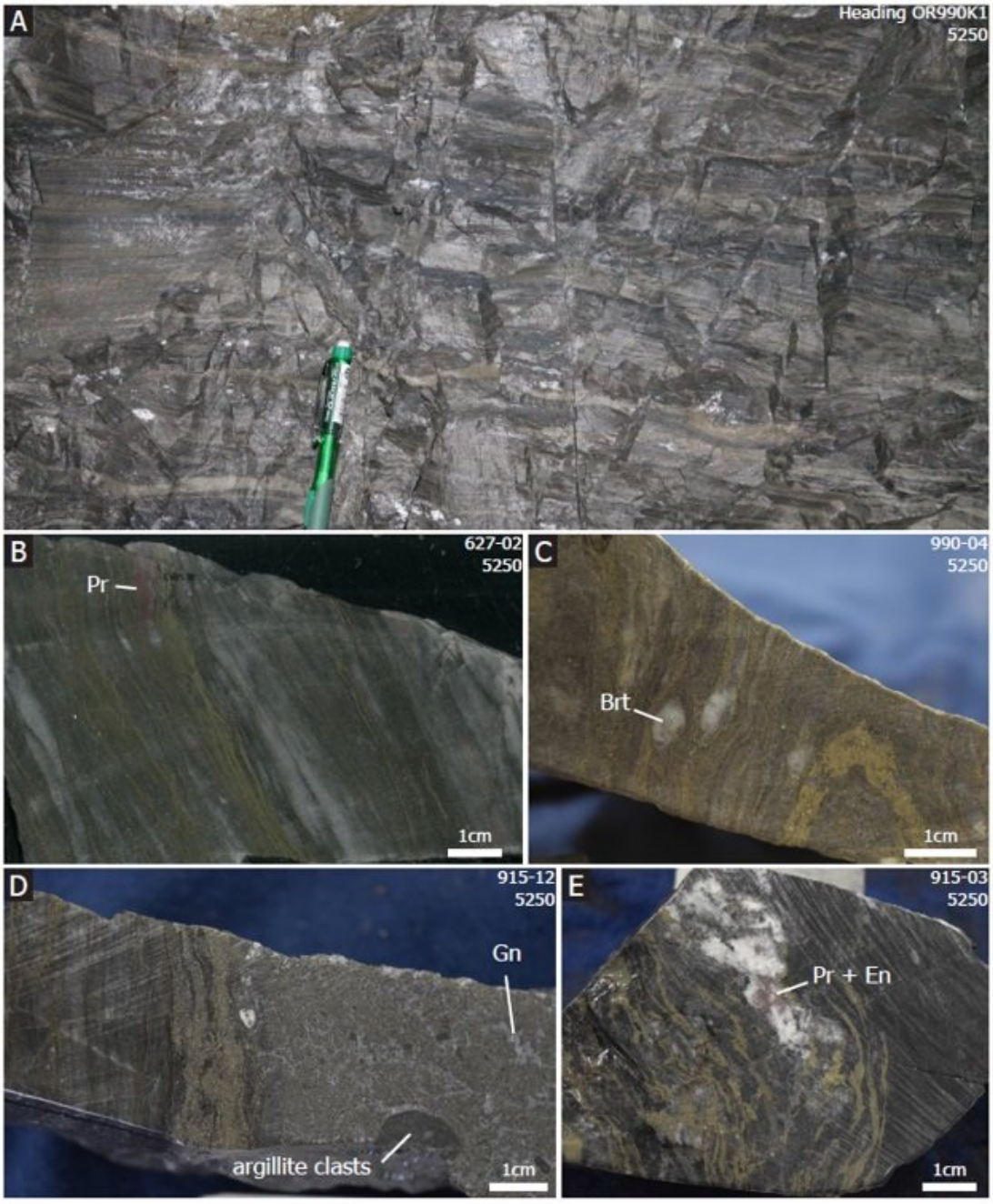


Source: Steeves, 2018

Figure 6-12: Massive Base Metal-Rich Mineral Type (MFB) at Greens Creek

6.3.2.3 Baritic Mineral Type (WBA)

The WBA contains less than 50% total sulfide and a lower pyrite to zinc and lead base metal sulfide ratio than the MFP material. Pyrite, sphalerite, galena, tetrahedrite, proustite-pyrargyrite and stromeyerite are common minerals of WBA material. The gangue is dominated by barite, carbonate, quartz, and muscovite. Figure 6-13 shows the baritic mineral type at outcrop and hand sample scales. Photo A shows a heading in the 5250 Zone where massive baritic material is common. The material is well layered and dark brown with fine banding. The hand samples of photos B through E show the fine banding of sulfide and gangue and the presence of proustite.



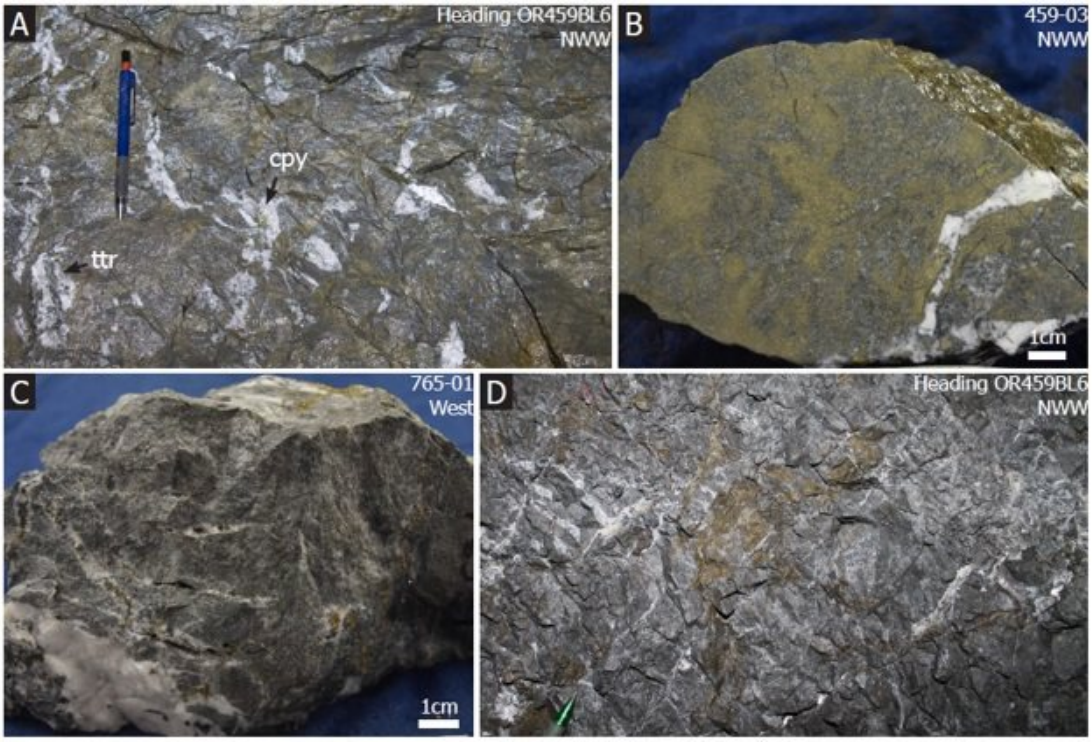
Source: Steeves, 2018

Figure 6-13: Massive Base Metal-rich Mineral Type (MFB) at Greens Creek

6.3.2.4 Carbonate Mineral Type (WCA)

The WCA at Greens Creek contain less than 50% sulfide by volume and are dominated by carbonate gangue minerals. Pyrite, sphalerite, galena, tetrahedrite and chalcopyrite are the dominant sulfides while dolomite, calcite, Ba-carbonate, biotite, barite, quartz, muscovite, and graphite make up the gangue minerals. The carbonate material tends to be massive and recrystallized due to metamorphism. Carbonate veining is common to the unit.

Figure 6-14 displays the textures common to the carbonate mineral type. The photos show a typically massive gray rock with disrupted sulfide and carbonate lenses. Possibly due to repeated carbonation and brecciation the original host lithology is largely destroyed; only small fragments of argillite remain intact. Possibly this unit was originally a carbonate-rich sediment mostly replaced by dolomitization, void creation, breccia collapse and re-dolomitization during the original mineralization event.



Source: Steeves, 2018

Figure 6-14: White Carbonate-Rich Mineral Type (WCA) at Greens Creek

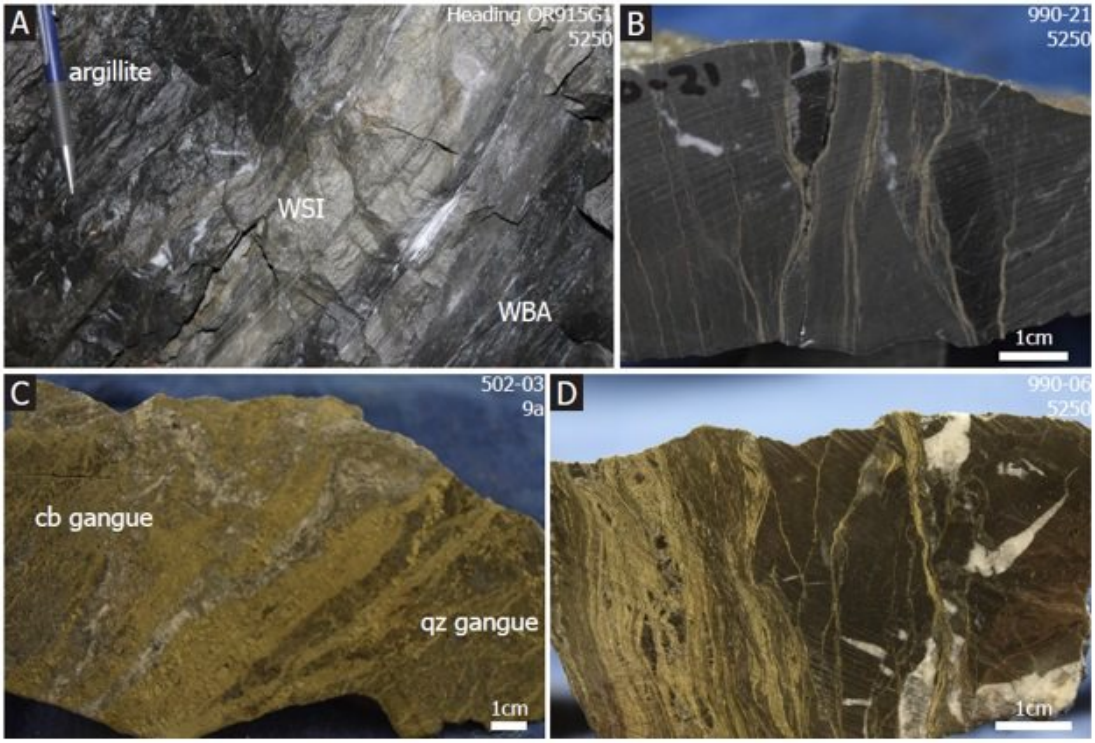
6.3.2.5 Siliceous Mineral Types (WSI)

Siliceous mineral types contain less than 50% sulfide and pervasive quartz flooding. As with the previous mineral styles, pyrite, sphalerite, galena, tetrahedrite, chalcopyrite are dominant sulfides. Muscovite, albite, and carbonate are accessory gangue minerals accompanying the dominant quartz.

Steeves (2018) makes the important observation that the WSI material occupies three different stratigraphic locations and represent differing processes during mineralization at Greens Creek. At the lowest stratigraphy within the fossil hydrothermal system there is widespread silica flooding of the footwall host rock. Due to the sulfide and quartz replacement of the footwall and the brecciation of the unit during mineralization and later metamorphism, the original host lithology is undiscernible except through trace element lithogeochemistry.

The second stratigraphic level and occurrence of the WSI material is within the MFP mineral style as separate layers indicating episodes or growth of the early hydrothermal system. The last stratigraphic, and highest level, occurrence of the WSI mineral type is at the mineral-argillite contact, likely representing the cap and coolest portion of the observable VMS system.

Figure 6-15 illustrates the common forms of WSI material at Greens Creek. Photo A shows the WSI altered contact between baritic material toward the footwall and argillite in the hanging wall (uppermost stratigraphic level). Photo B shows the massive quartz flooding typical in the WSI sometimes mistaken for chert. The lower right corner of photo C shows stringer sulfide material with quartz only gangue would be from the second stratigraphic episode discussed above. Photo D shows finely banded sulfide mineral in a quartz flooded rock; late, white quartz veining in this photo is from tensional cracking of the primary siliceous material during metamorphism.



Source: Steeves, 2018

Figure 6-15: White Siliceous Mineral Type (WSI) at Greens Creek

6.4 Mineralized Zones

6.4.1 Overview

Due to variations in mineralization, structural complexity, and spatial location, the Greens Creek mineralization is segregated into nine separate mineralized zones. In order from easternmost and highest elevations to westernmost, the zones are:

- East
- West
- 9A
- Northwest West
- Upper Plate
- 5250
- Southwest
- 200 South
- Gallagher

The mineralization is stratigraphically controlled and typically found at the contact between the phyllites (stratigraphic footwall) and the argillites (stratigraphic hanging wall). Due to the intense structural deformation, mineralization may be tightly folded into the phyllite or argillite packages such that the original stratigraphic relationships are unclear.

At the deposit scale the mineralization trends N 30° W and plunges to the south at approximately -20°. The East Zone outcrops at the eastern edge of the mineral deposit, dips to the west, and transitions into the West Zone near a tight F_2 fold where the mineral horizon transitions from a nearly flat orientation to a nearly vertical wall dipping steeply to the west. The East and West zones are bounded on the west by the Maki Fault system which offset the mineral horizon to the north in a dextral sense. The western deformation boundary of the Maki Fault zone is a continuous fault splay which is called the Kahuna Fault. The mineralization hosted inside the fault zone are called the 9A Zone.

West of the Kahuna Fault, the Northwest West Zone represents the offset portion of the West Zone. Above and to the south of the Northwest West Zone is the main trend of mineralization which includes the Southwest Zone followed by the 200S Zone further down plunge. The 5250 Zone is offset of the East zone across the Maki Fault zone (Figure 6-9).

The Gallagher Zone lies to the west of the 200 South Zone and is located west of a second major dextral fault zone known as the Gallagher Fault. Offset of a post-mineralized dike swarm, the trend of the 200S Zone into the Gallagher Fault and the similar structural and chemical styles between the southern 200S and Gallagher mineral zones all indicate that the Gallagher Zone is the fault offset of the 200S Zone.

6.4.2 East Zone

The East Zone outcrops at the discovery "Big Sore" gossan and extends down-dip to the west until it is deformed and offset by the $D_{2.5}$ Klaus Shear at depth or by the Maki Fault at its southern extent. The mineralization occurs along the phyllite/argillite contact and varies from one foot to 30 ft (0.3 m to nine meters) in thickness.

At the surface the mineralization dips at 60° to 80° to the west with the argillite on the bottom or eastern side. The dip shallows with depth to near-horizontal as a result of F_2 folding. Where the mineral body terminates into the Maki Fault drag folding has rotated the mineralization nearly 900 ft to 850 ft along strike. This geometry indicates that the entire Greens Creek deposit is on an overturned major antiform such that the stratigraphic younging direction is now oriented to depth.

Figure 6-16 shows a $140 NSR/ton mineralized envelope for the East Zone as created in Leapfrog 3D software. Figure 6-17 shows a level plan of drilling and the Mineral Resource block model at the 1,110 ft elevation, which is located in the approximate centre of the zone's vertical extent of 750 ft to1,980 ft elevation. Figure 6-18 shows the XS2600 cross section (located on the plan map) with drilling and block interpolation displayed by $NSR/ton.

The Klaus Shear and related F_2 fold deforms the lower portion of the East Zone and into a sub-horizontal, argillite-cored fold extending 600 ft to the northwest over the top of the West Zone. One high angle, ductile shear striking northwest and dipping to the west has drag folded the East Zone at approximately the 1,200 ft elevation, causing the zone to have an apparent repeat of mineralization (Figure 6-18).

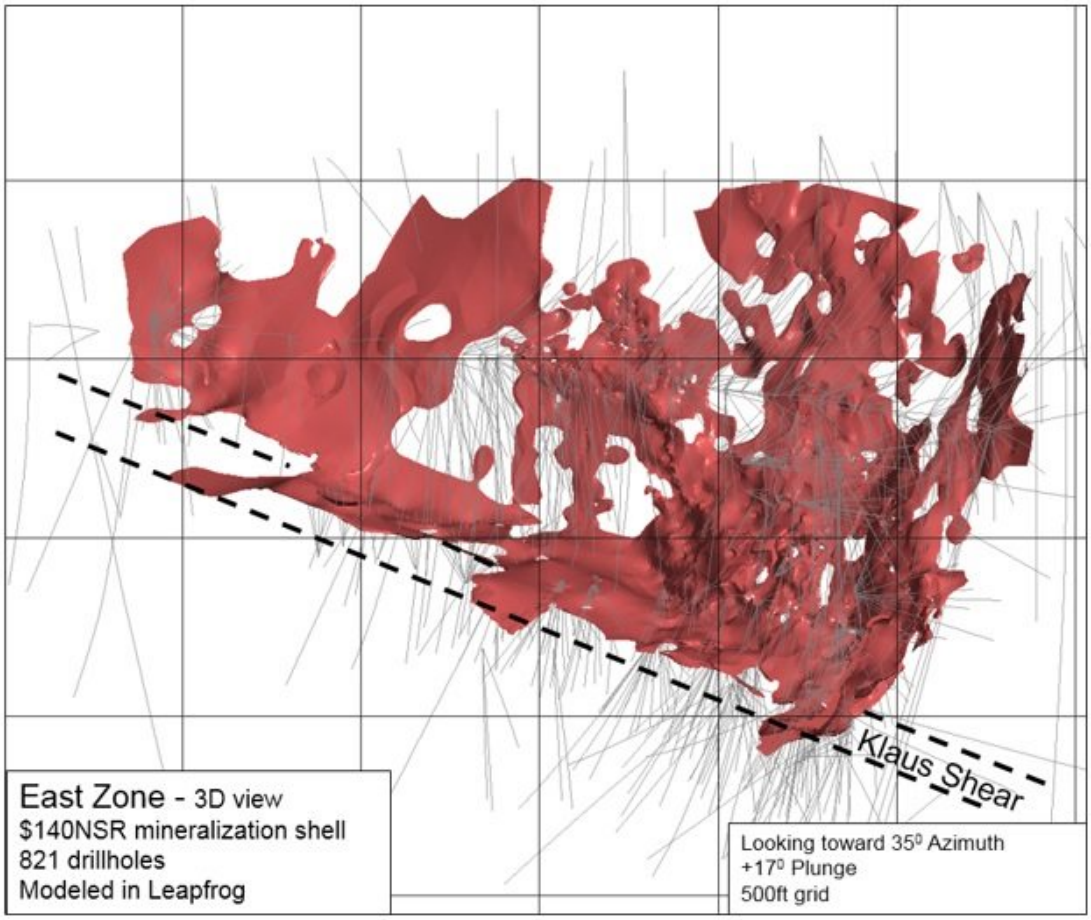


Figure 6-16: East Zone – 3D Model

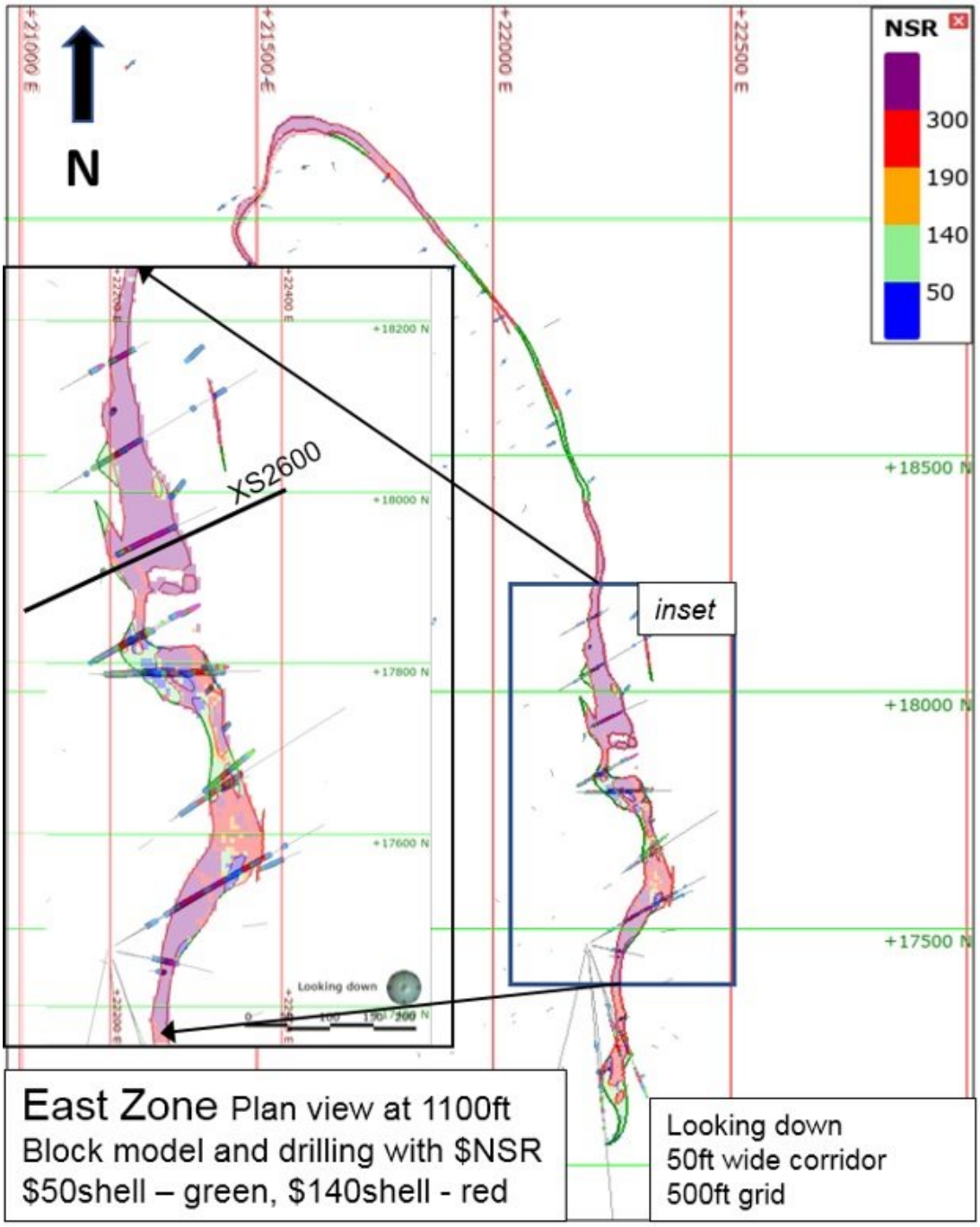


Figure 6-17: East Zone – Level Plan 1100

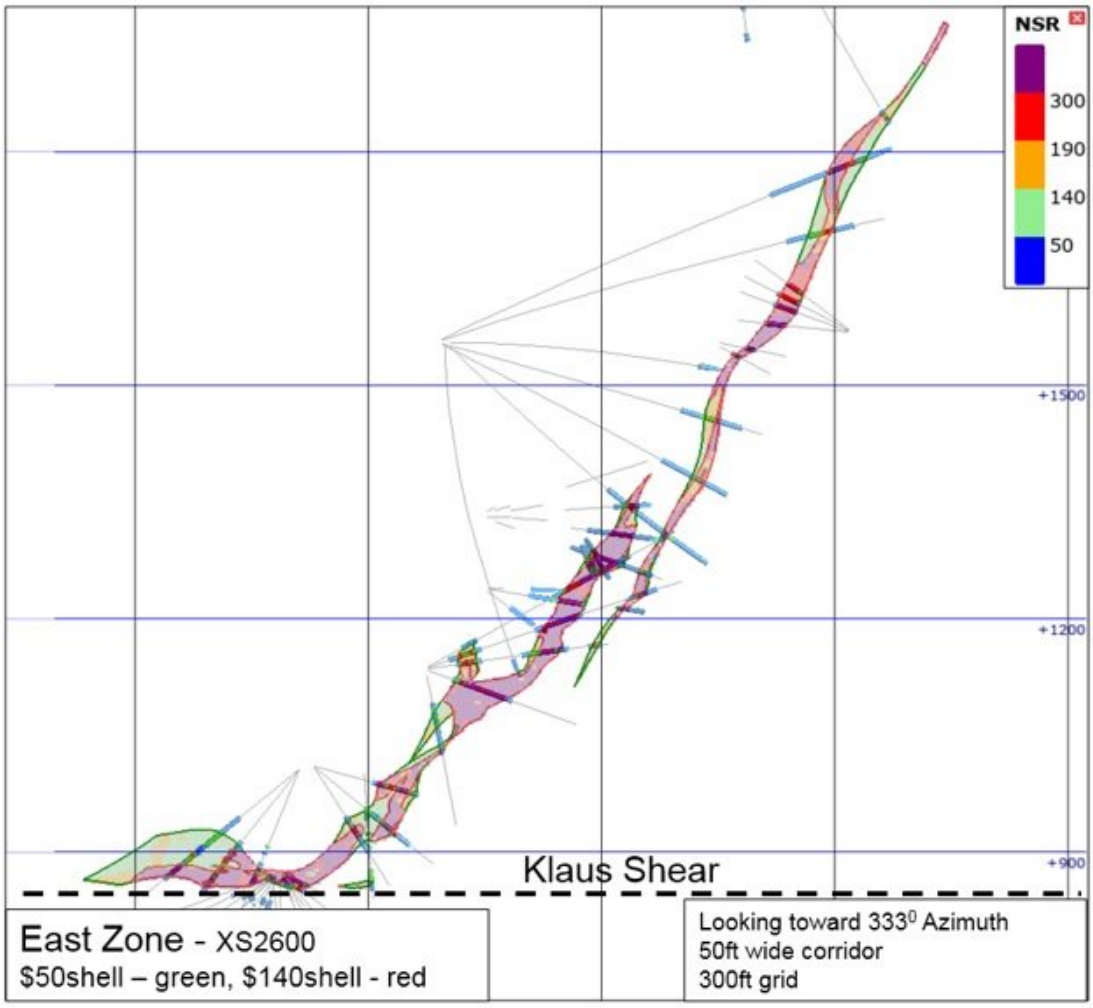


Figure 6-18: East Zone – Cross Section 2600

6.4.3 West Zone

The West Zone is the down-dip extension of the East Zone located below the Klaus Shear, and present from 75 ft to 1,100 ft in elevation. While quite variable, the overall trend of the deposit strikes N 30°W for over 2,500 ft (762 m) of strike length and 1,025 ft of vertical extent (75 ft to 1,110 ft). The thickness is also highly variable from less than 10 ft (three meters) to over 300 ft (91 m) in its central portions.

The West Zone shows well developed metal zoning patterns with silver rich fringes around a central high iron, copper core of MFP with a high zinc to lead ratio. Baritic material tends to form more commonly surrounding the core of MFP.

Figure 6-19 is an illustration of the 3D model for the West Zone. Figure 6-20 is a level plan at the 700 ft elevation showing drilling and the Mineral Resource block model by $NSR/ton values. Figure 6-21 is a cross- section through the West Zone as located on the level plan map.

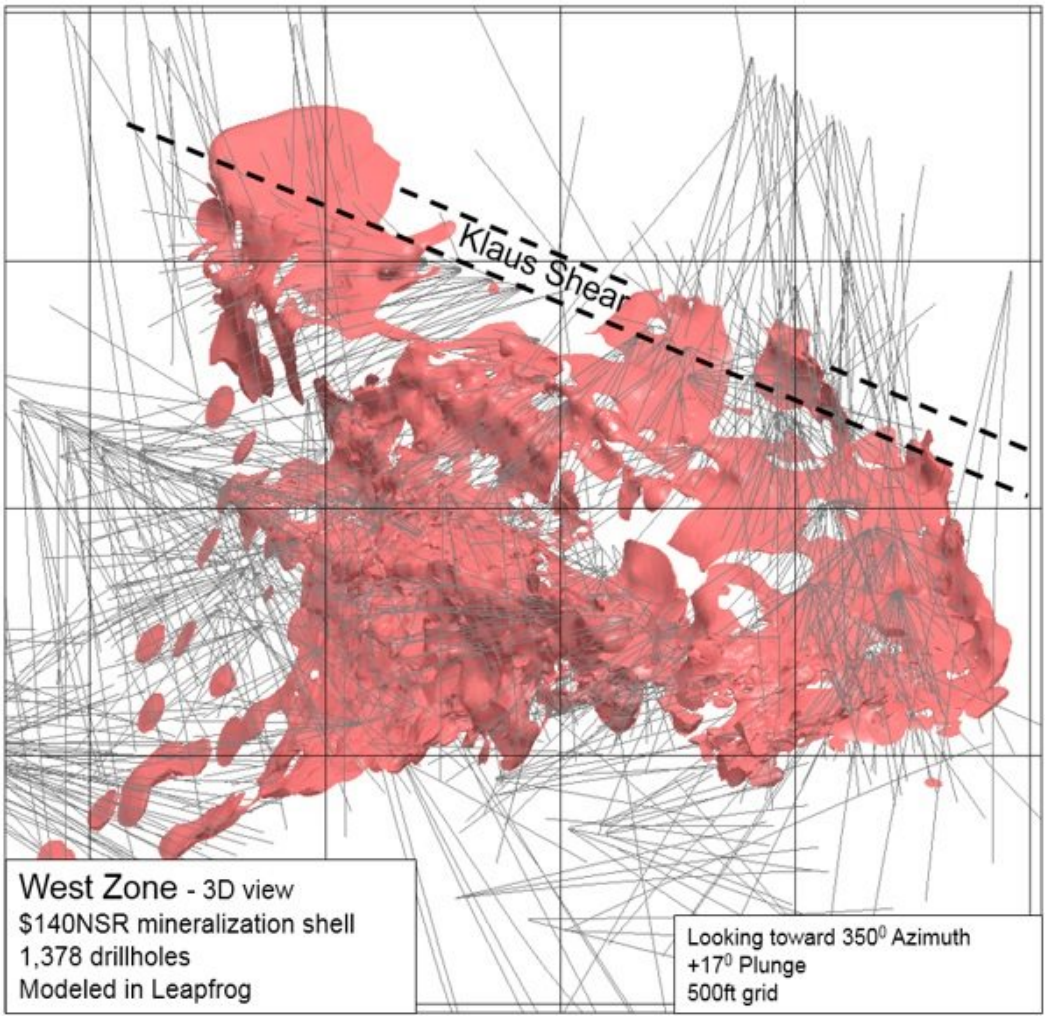


Figure 6-19: West Zone – 3D Model

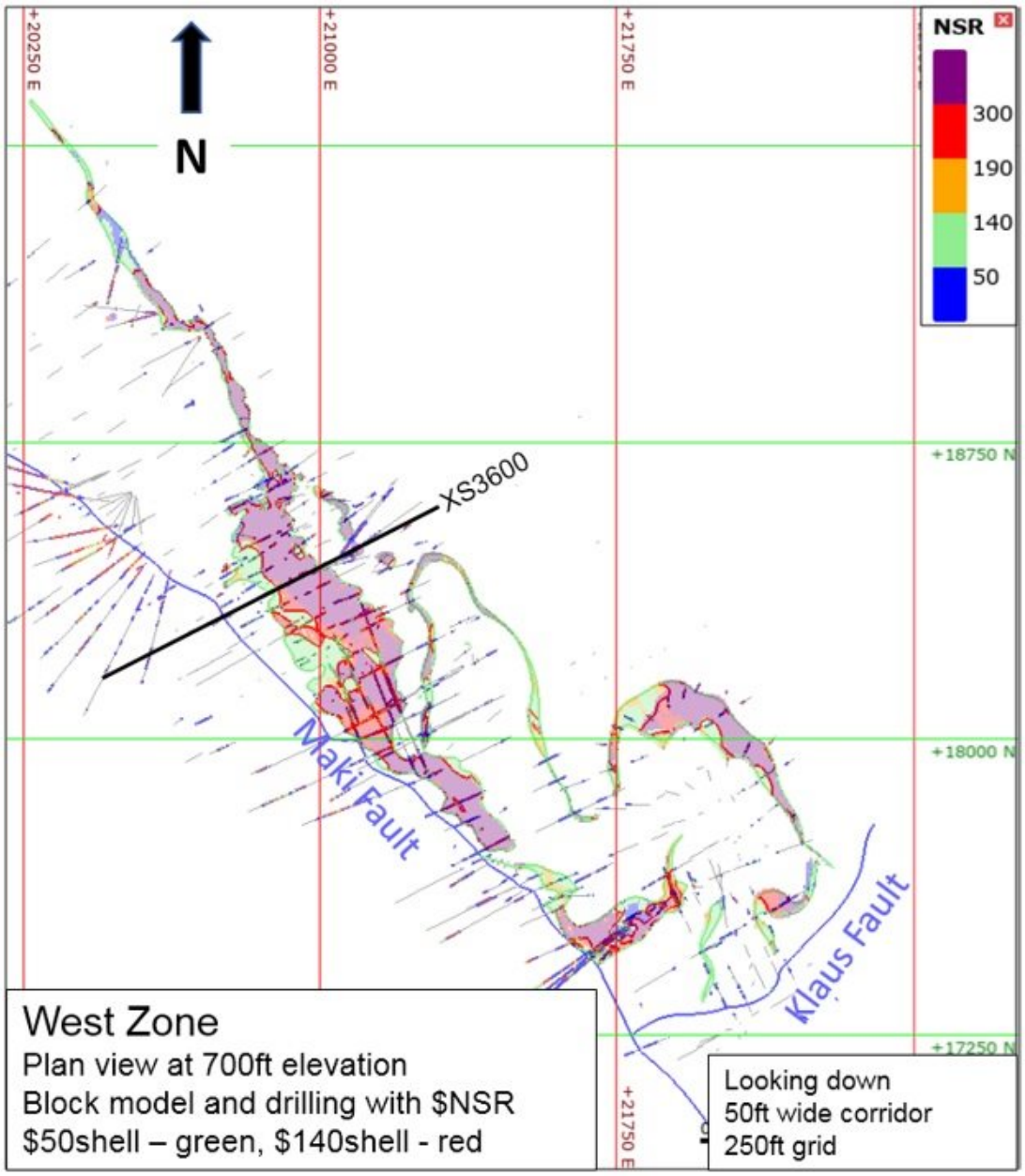


Figure 6-20: West Zone – Level Plan 700

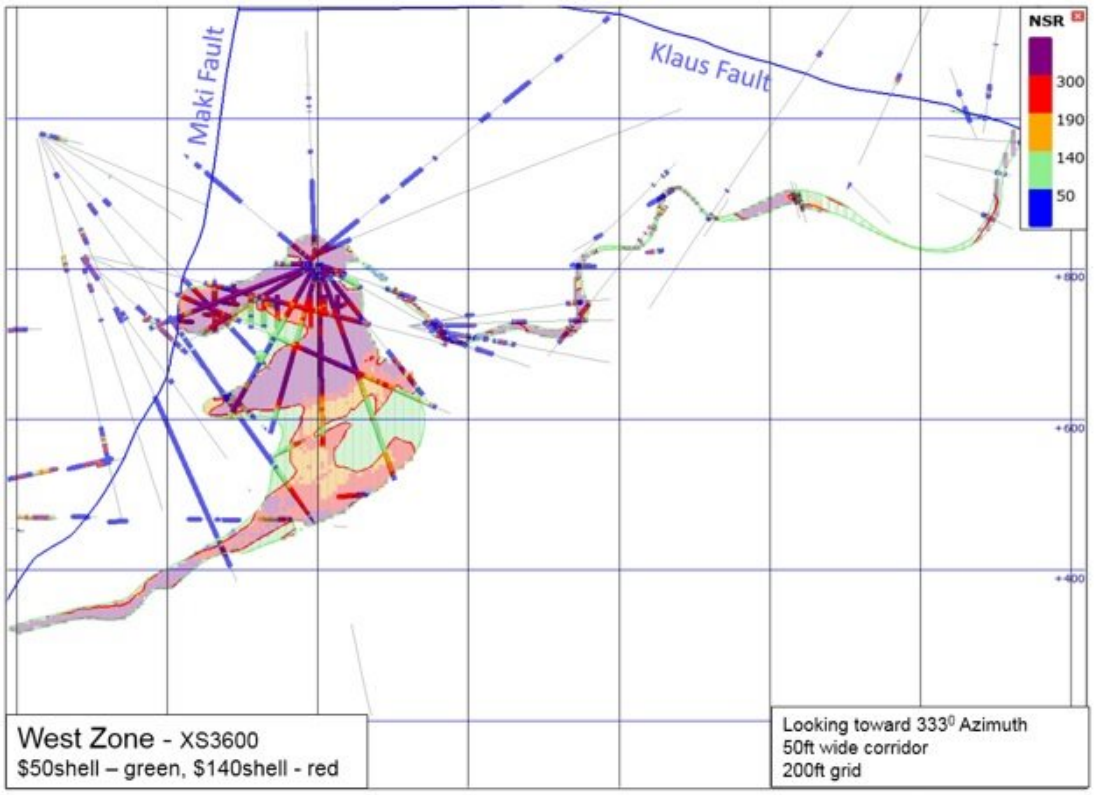


Figure 6-21: West Zone – Cross Section 3600

6.4.4 9A Zone

The 9A Zone is the most structurally dismembered zone at Greens Creek as it lies within the Maki Fault Zone. The general orientation of the mineral body is striking to the northwest and dipping steeply to the west but many internal fault splays cut mineralization at differing orientations. In plan view, mineralized widths range between less than five meters (1.5 m) up to 100 ft (30 m).

Restoration of the movement along the Maki Fault suggests that the 9A Zone represents the fault-bounded connection between the East and West zones (east of the fault zone) and the 5250, Northwest West Zone and Southwest Zone (east of the fault). As such, the mineral types within the 9A Zone tends to be similar to the East, West, and Northwest-West zones. MFB and MFP materials dominate with less carbonate, siliceous and baritic material intermixed. The intense deformation within this fault zone, which appears to have early ductile deformation prior to the brittle faulting, has remobilized precious metals so that exceptionally high silver grades can be found in brittle fractures cutting S_2 foliation.

Figure 6-22 is an illustration of the block model extents. Figure 6-23 is a cross-section through the 9A Zone. Figure 6-24 is a level plan that shows the orientation of the mineralization in relation to the Maki Fault, and the trace of the mine contact.

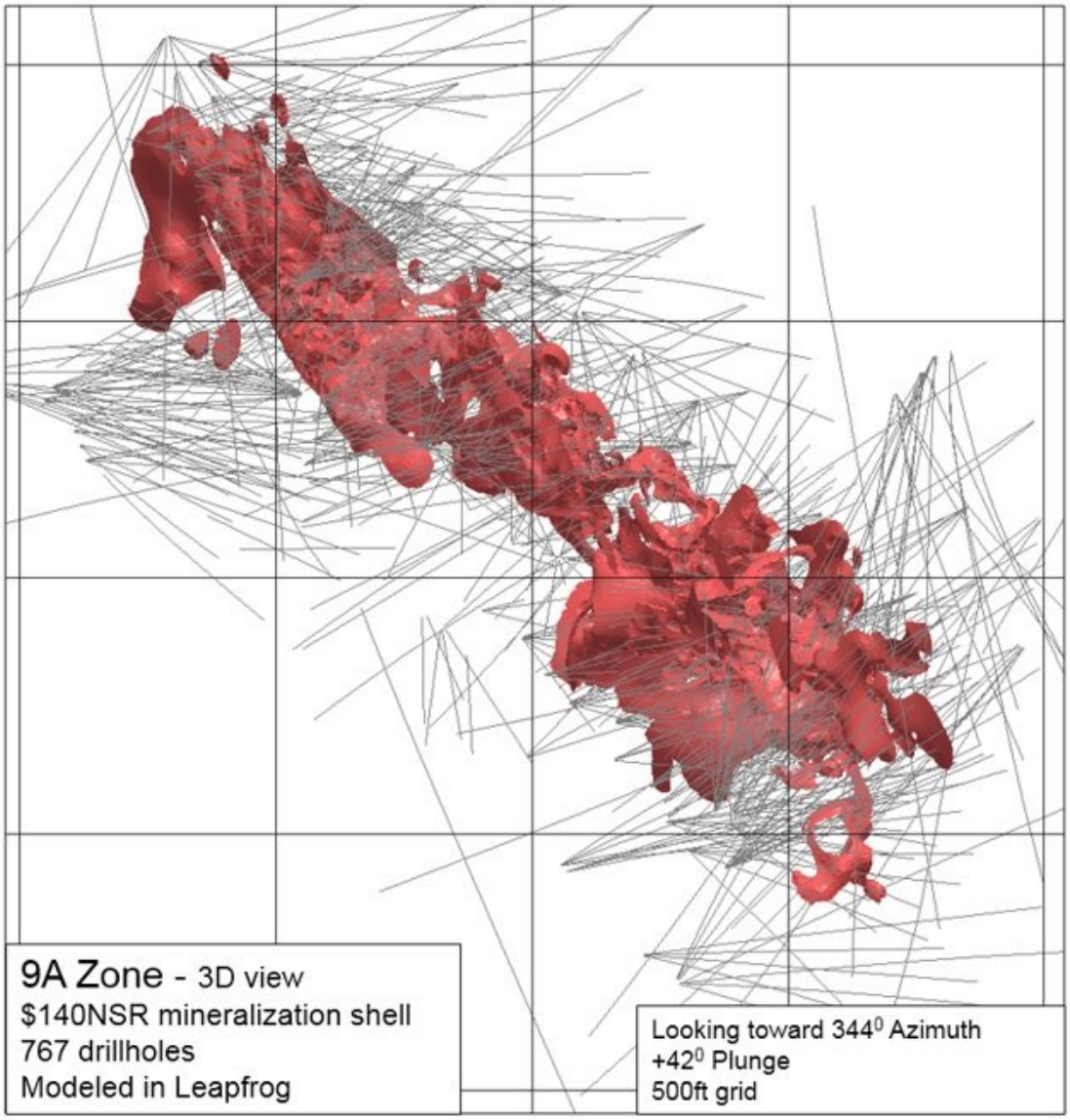


Figure 6-22: 9A Zone – 3D Model

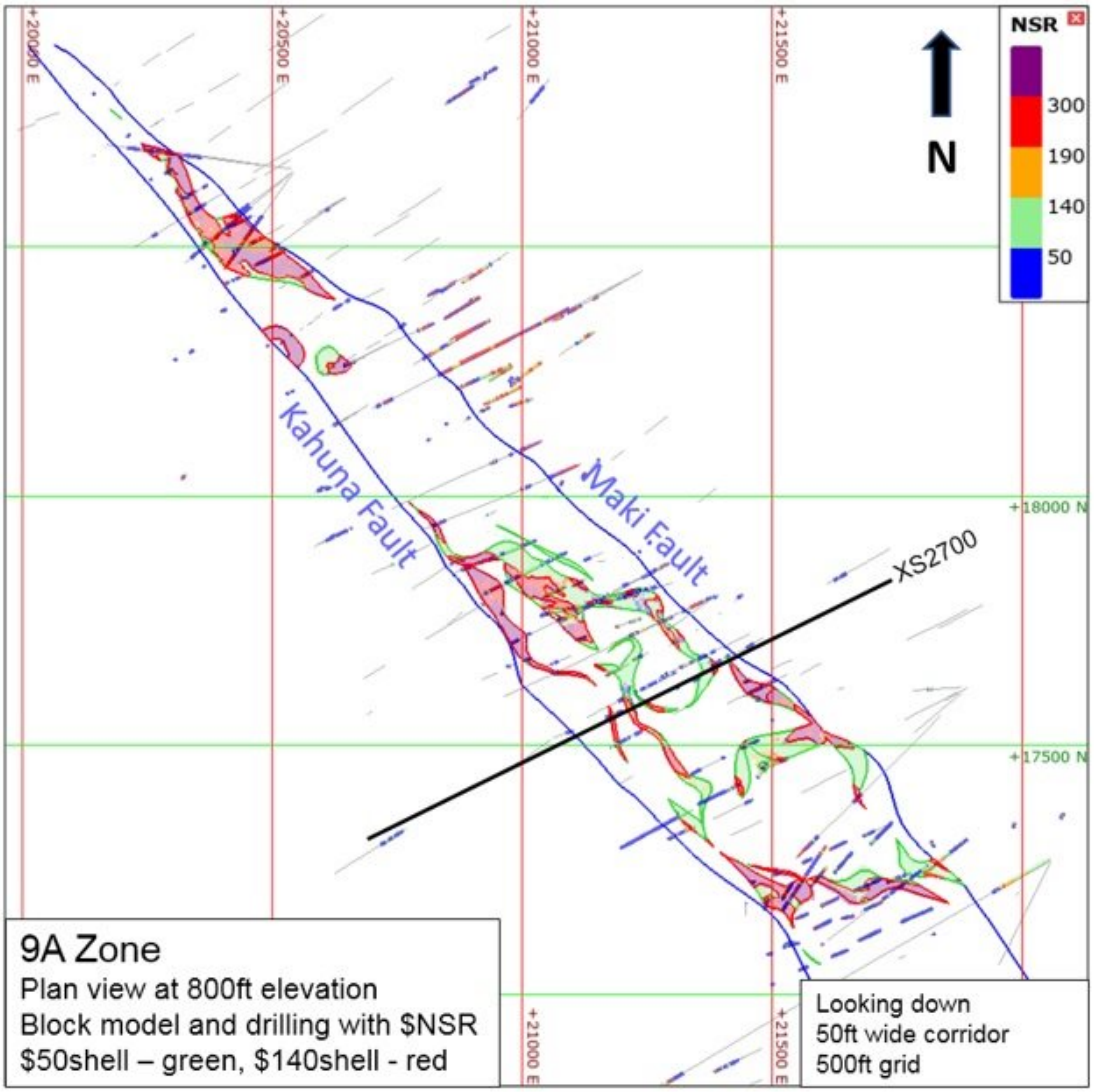


Figure 6-23: 9A Zone – Level 800

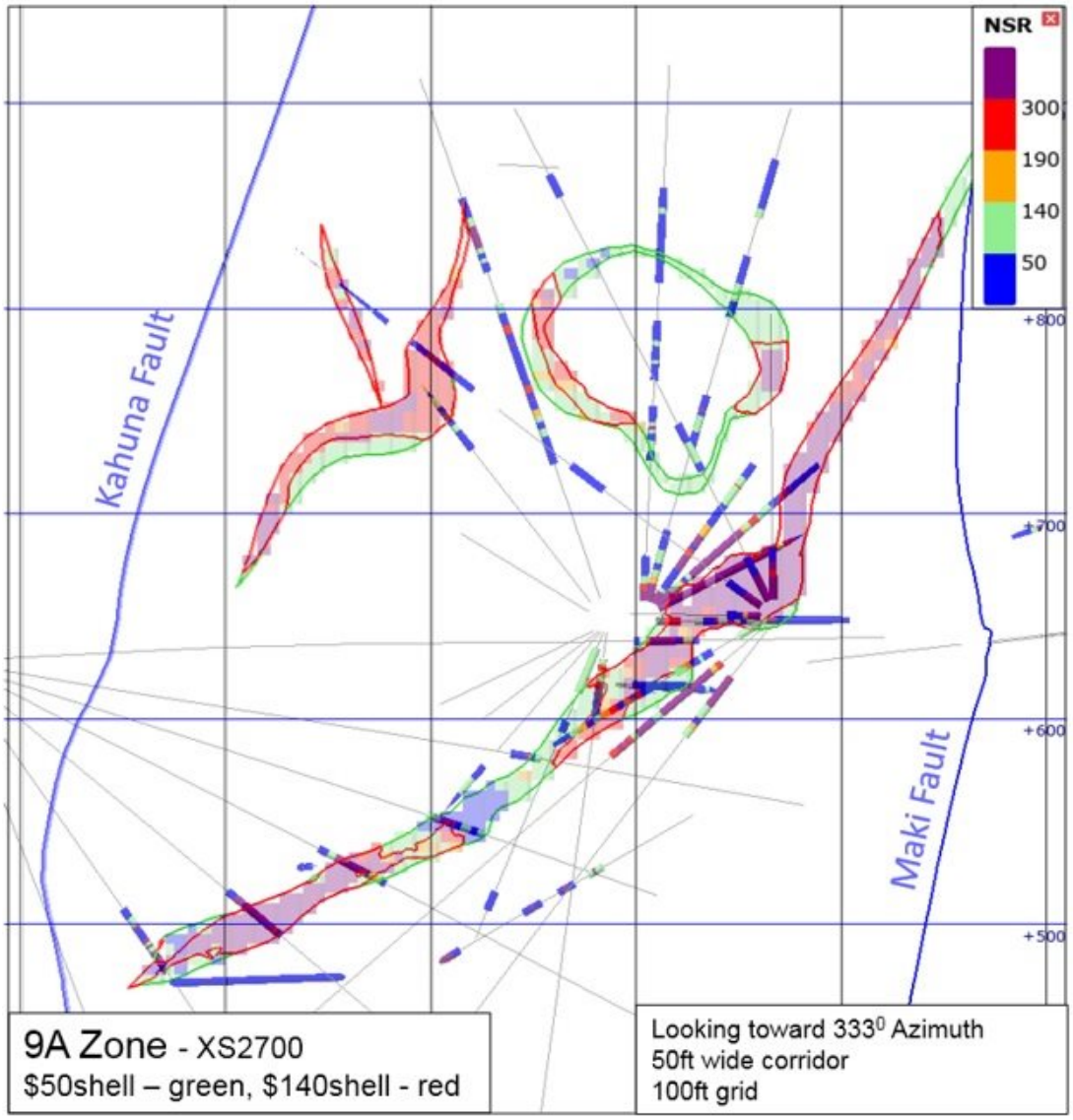


Figure 6-24: 9A Zone – Cross Section 2700

6.4.5 Northwest West Zone

The Northwest West Zone the fault offset of the West Zone, with the 9A Zone tying the two together through the Maki Fault zone. The structural setting is dominated by a pair of recumbent F_2 folds. The upper fold is an argillite-cored syncline while the lower fold is a phyllite-cored anticline. Mineral types and mineralization are similar to what has previously been described for the West Zone, with MFB and MFP dominate with some WSI and WCA intermixed.

In the Northwest Zone some mineralization is located up to 100 ft off the mine contact into the hanging wall argillite as a result of high amplitude F_2 folding. Mineral types are a mixture of mostly massive and white-siliceous material types with lesser carbonate, baritic material and mineralized argillites. This zone is particularly rich in zinc, iron, and copper with lower silver relative to most of the Greens Creek deposit.

Figure 6-25 illustrates the Northwest West Zone mineralization envelope in 3D with definition drilling completed within the area. Figure 6-26 provides a plan view of the drilling and Mineral Resource block model at the 450 ft elevation. Figure 6-27 displays a cross section through the middle of the Zone at XS2700. In the cross section the two large F_2 folds are apparent.

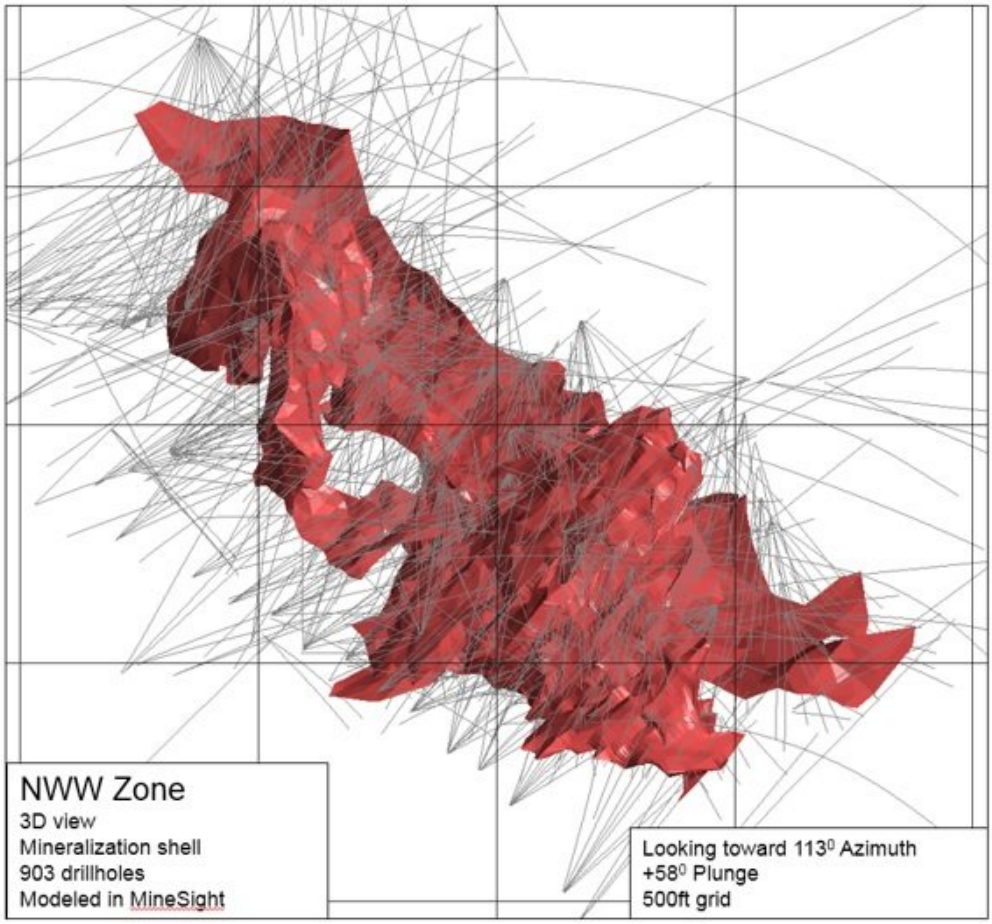


Figure 6-25: Northwest West Zone – 3D Model

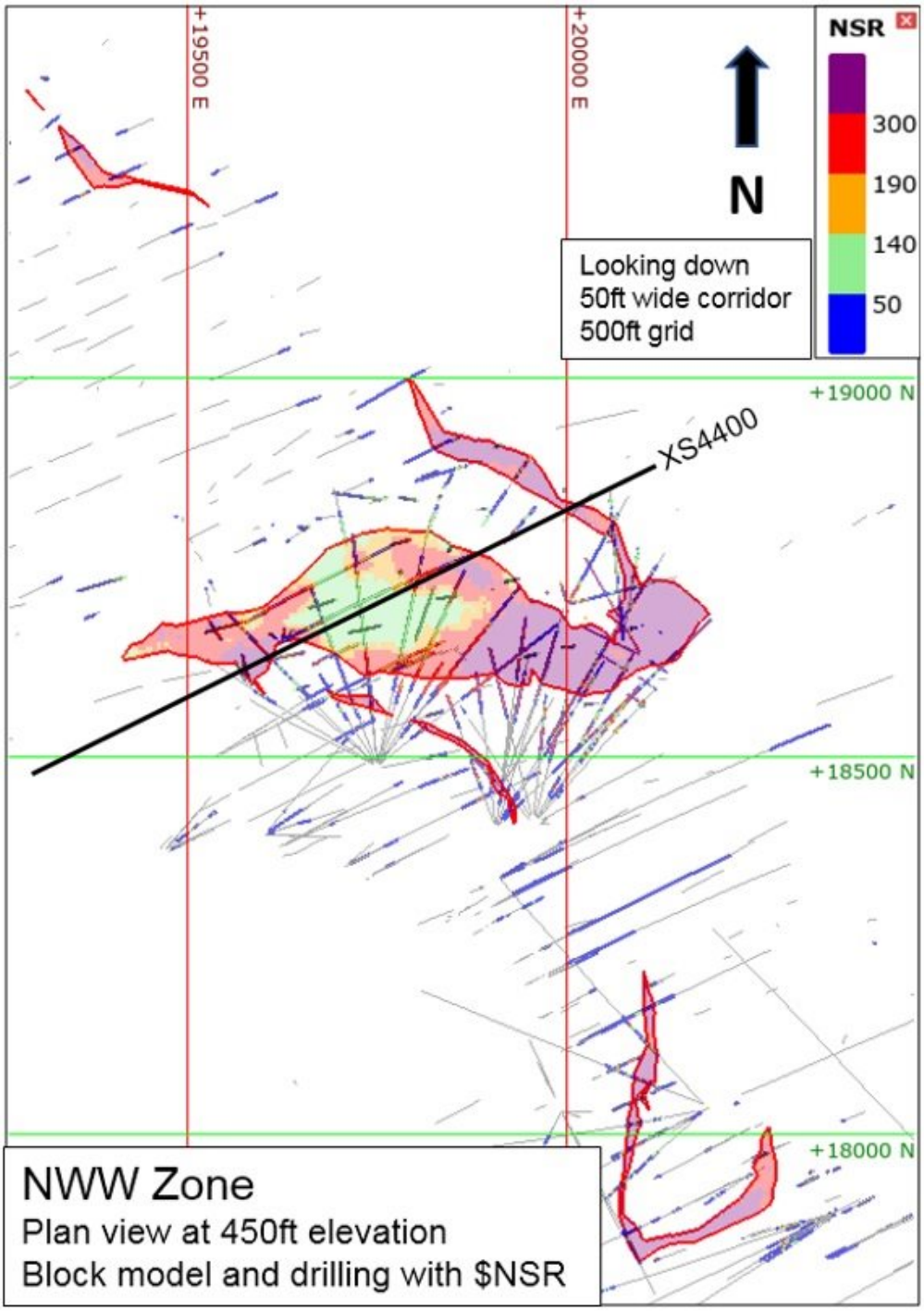


Figure 6-26: Northwest West Zone – Level Plan 450

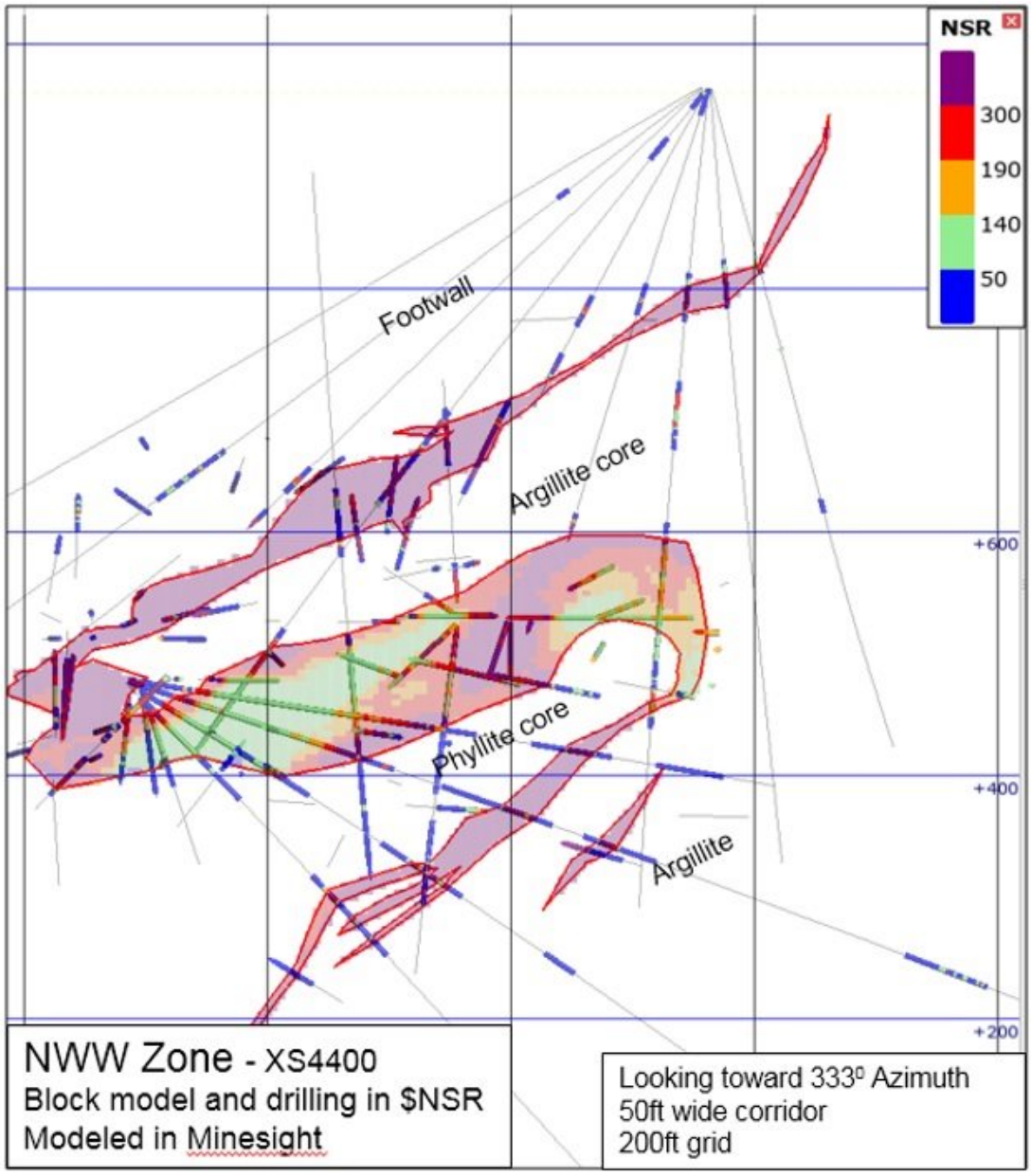


Figure 6-27: Northwest West Zone – Cross Section 4400

6.4.6 Upper Plate Zone

The Upper Plate Zone is located at the far northern end of the Greens Creek deposit and above the Northwest West Zone. It is a smaller body representing the fault offset (across the Maki Fault zone) of the western extension of the flat-lying portion of the East zone. Upper Plate mineralization occurs along the margins of an argillite cored recumbent fold. The recumbent fold has an amplitude of over 3,000 ft with an argillite core no more than 200 ft thick. Mineralization is found mostly on the upper and lower contacts of the fold but does in places cross into the argillite core.

Ore types for this relatively thin zone are generally MFB or mineralized argillite. Figure 6-28, Figure 6-29, and Figure 6-30 provide a 3D view of the $140 NSR/ton mineralization shell, a level plan through the 1,100 ft elevation and a cross section through the southeastern end of the mineral zone, respectively.

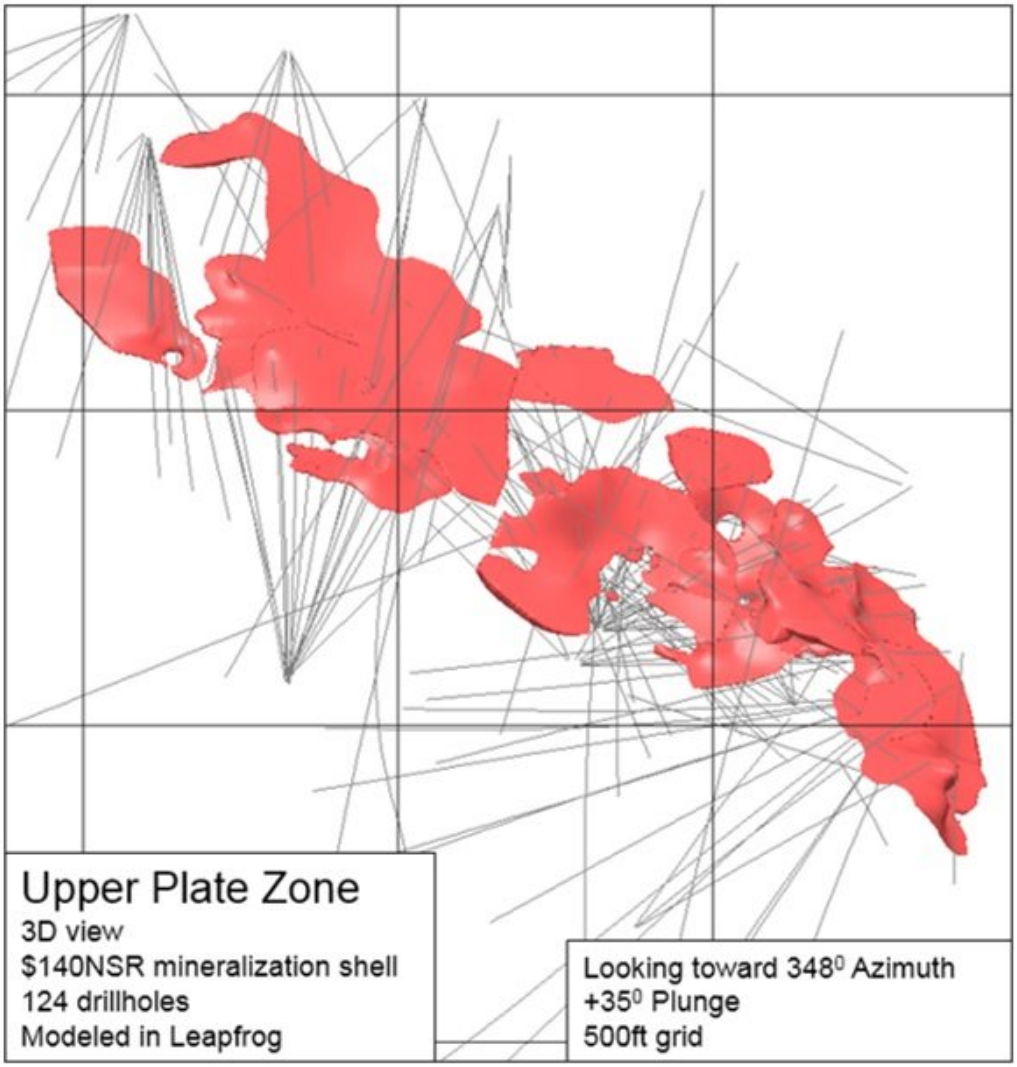


Figure 6-28: Upper Plate Zone – 3D Model

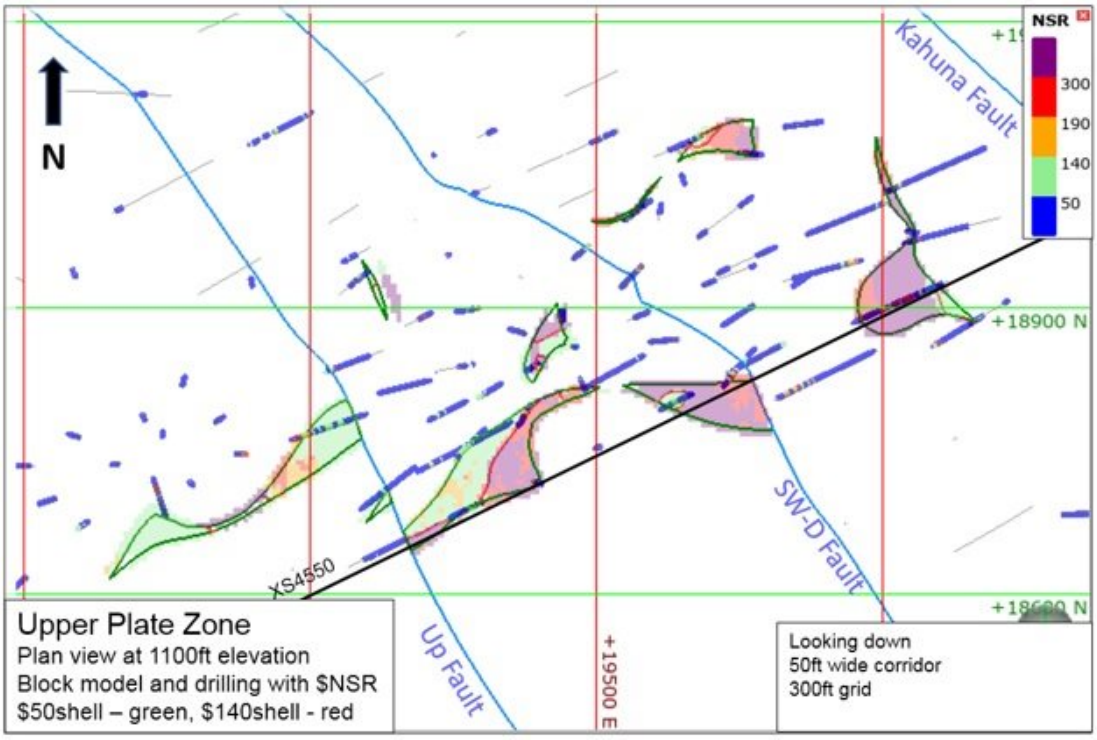


Figure 6-29: Upper Plate Zone – Level Plan 1100

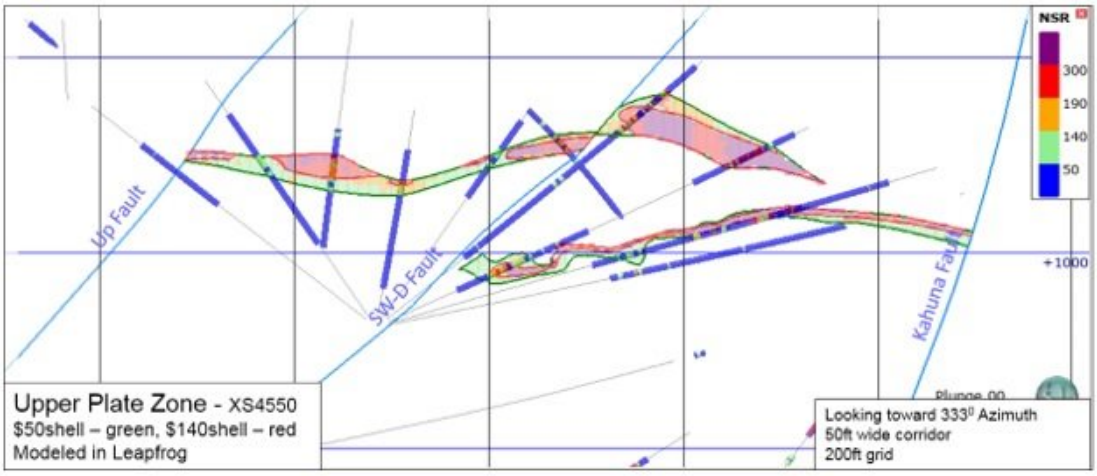


Figure 6-30: Upper Plate Zone – Cross Section 4550

6.4.7 5250 Zone

Immediately west of the Maki Fault zone is a lower temperature lens of barite-rich mineralization. This lens, known as the 5250 Zone, is continuous for up to 1,200 ft (366 m) along a N300W trend and represents the uppermost mineralization trend at Greens Creek. It represents the fault offset of the upper portion of the East zone.

The mineral types are dominated by white baritic material (WBA) with lesser massive mineral and minor amounts of carbonate and siliceous mineral types. The silver grades are typically higher than average for the Greens Creek mineral bodies while zinc, lead and gold are below average. The mineralized material occurs along the phyllite/argillite mine contact and trends approximately N 35° W. The interpretation shows two limbs of a fold: the western limb dips generally 30° to the west/southwest and the eastern limb dips more steeply at approximately -80°.

Figure 6-31 is an illustration of the mineralized wireframe with definition drilling shown. Figure 6-32 is a level plan map of the drilling and Mineral Resource block model for the 5250 Zone. Figure 6-33 shows cross-section XS2200 through the 5250 Zone showing the block model and drill traces.

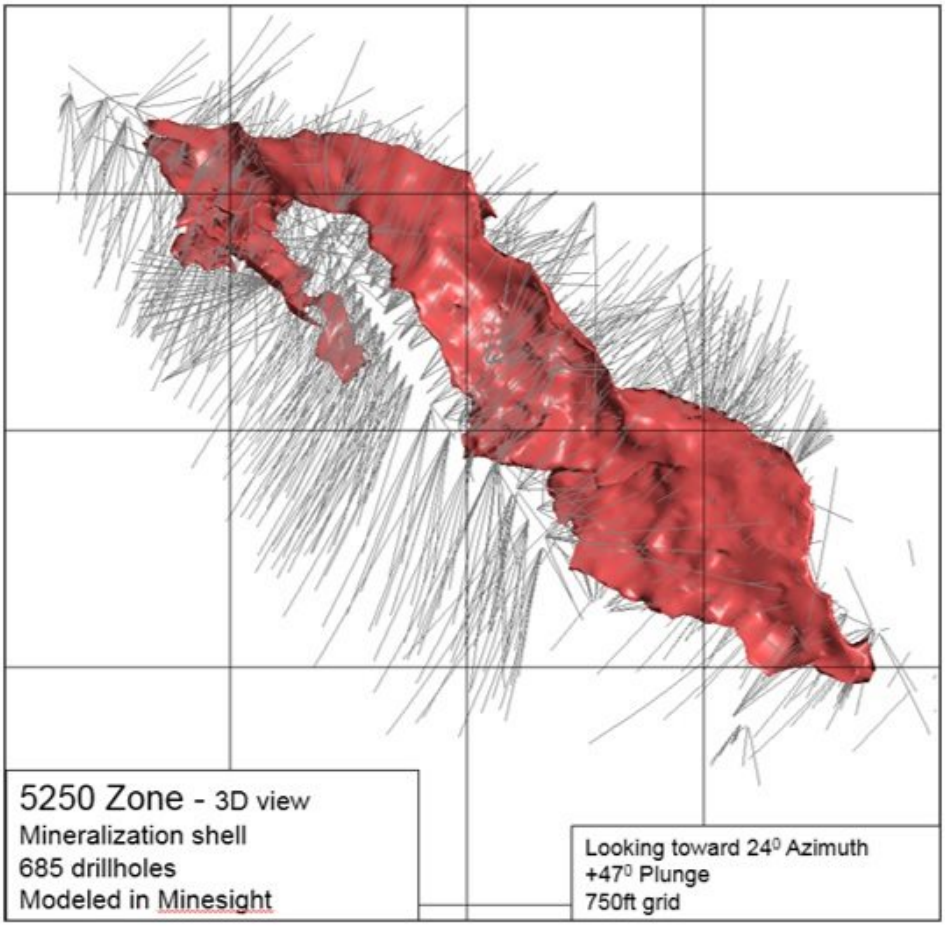


Figure 6-31: 5250 Zone – 3D Model

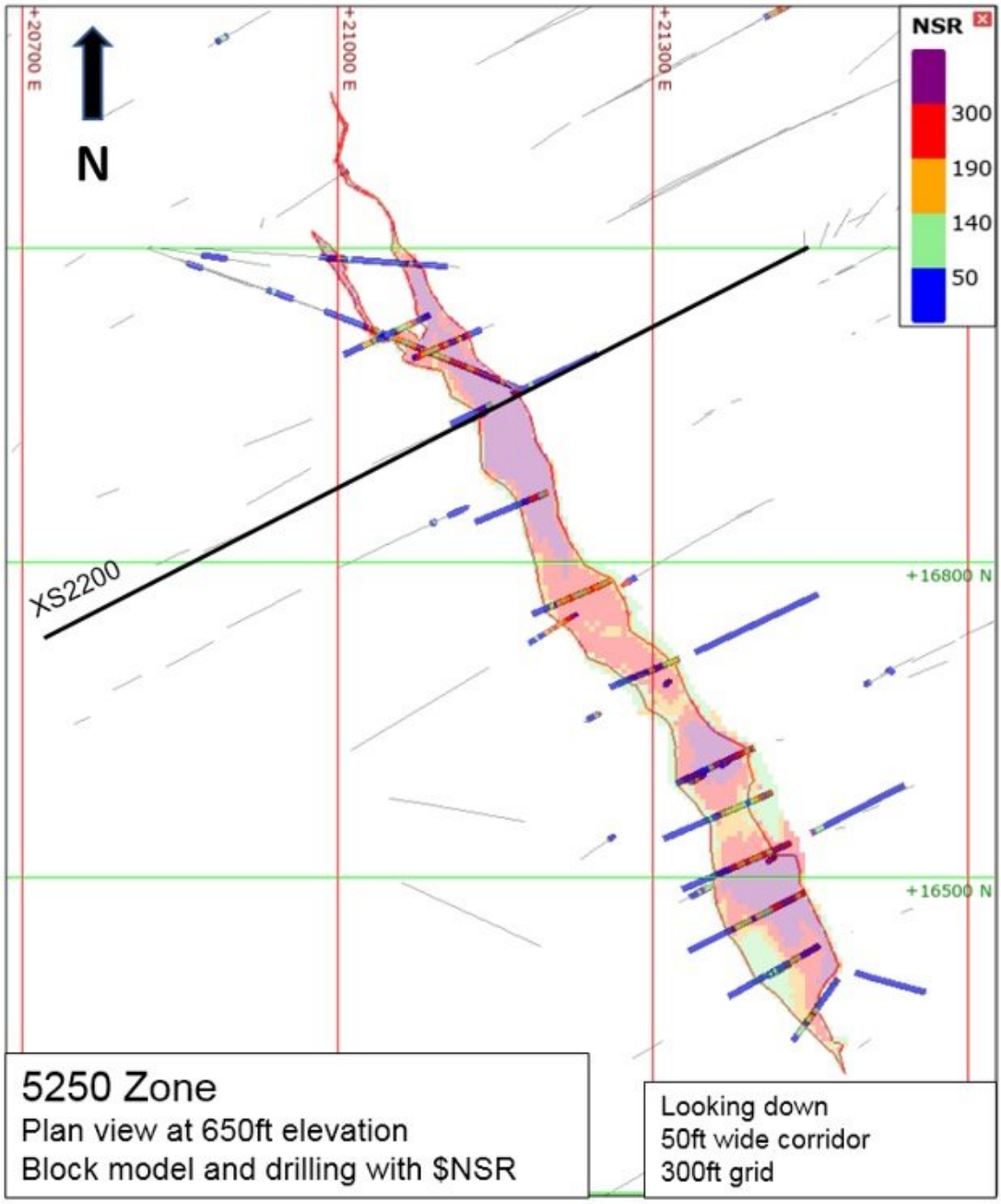


Figure 6-32: 5250 Zone – Level 65

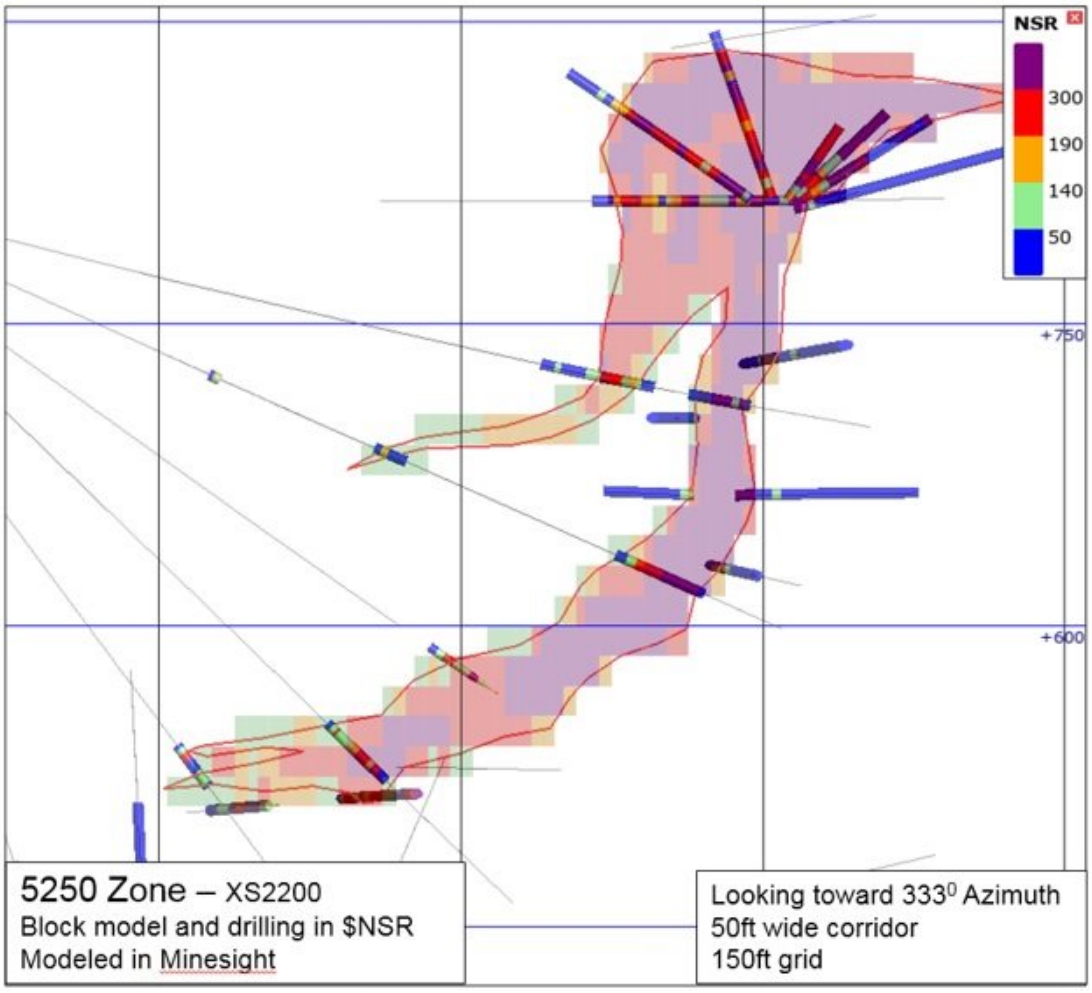


Figure 6-33: 5250 Zone – Cross Section 2200

6.4.8 Southwest Zone

The Southwest Zone is comprised of a large phyllite cored F_2 anticline with a nearly horizontal argillite syncline (also F_2) on its upper limb. The lower limb of the anticline is steeply east dipping to moderately westerly dipping with increasing depth. Mineralization wraps around the anticline's mine contact, staying on the contact except at the hinge of the fold where multiple lenses of mineralization have folded up into the argillite above the hinge along steep parasitic folds as is commonly seen over large intensely folded structures. Late F_3 folding has significantly deformed the mine contact and F_2 argillite cored syncline.

The Southwest Zone body continues down dip and trends directly into the 200S Zone, the boundary between the 200S and SW Zone being somewhat arbitrarily set to keep modeling calculations manageable.

The high amount of deformation in the Southwest Zone has remobilized and enriched precious metals, especially silver. As the zone sits atop a hydrothermal center and has secondary enrichment it has historically been one of the highest grade areas at Greens Creek. Even after being mostly mined out this zone still contains the highest silver Mineral Resource and Mineral Reserve numbers for the mine. Mineral types are a mixture of MFB, WSI, WCA, and MFP; indicating that the location is in a focused vent area.

Figure 6-34 provides a 3D view of the Southwest Zone mineralization envelope at a $140 NSR/ton cut-off. Figure 6-35 is a level plan view through the zone at the 300 ft elevation. Note the north-northwest striking F_3 folds on the plan map at the 19800E and 20200E gridlines. Figure 6-36 displays a cross section through the middle of the Southwest Zone as located on the plan map.

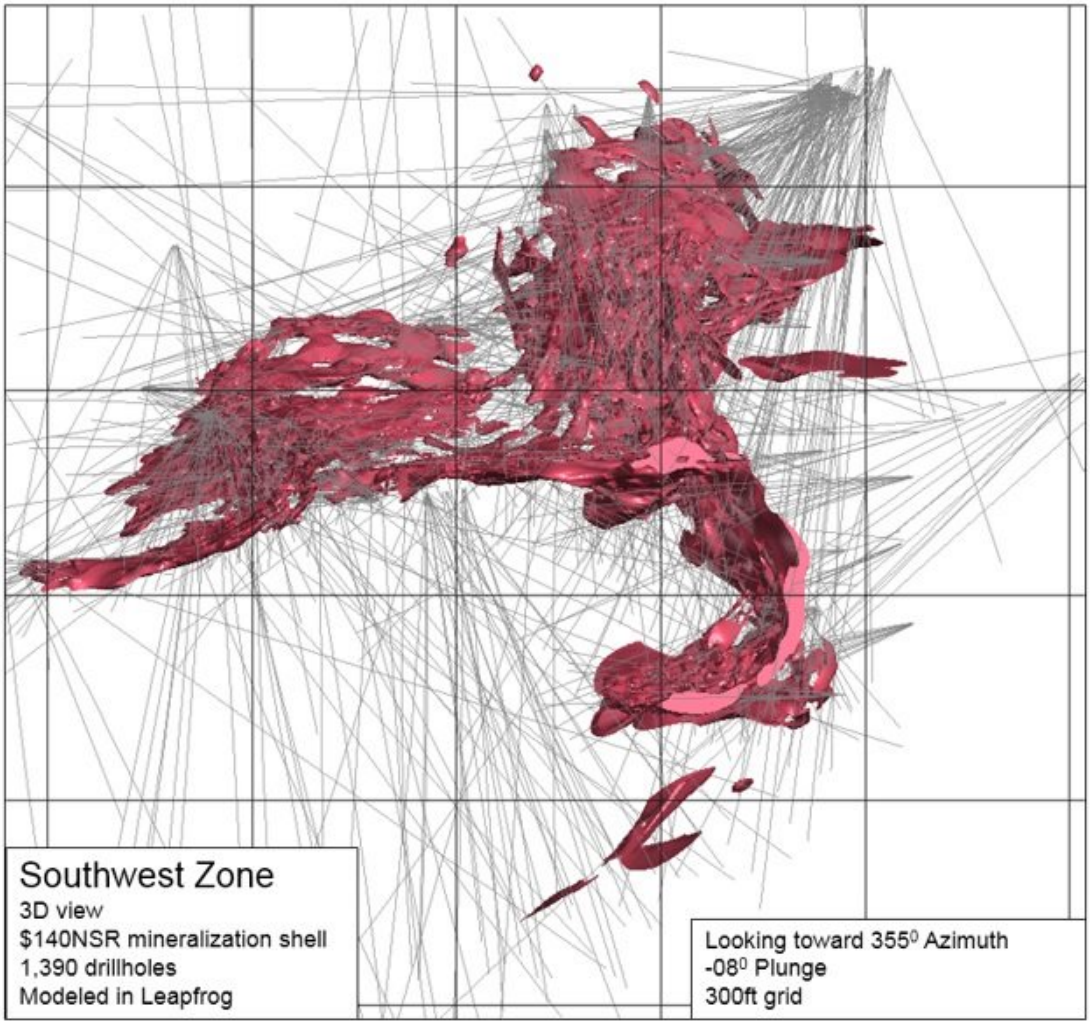


Figure 6-34: Southwest Zone – 3D Model

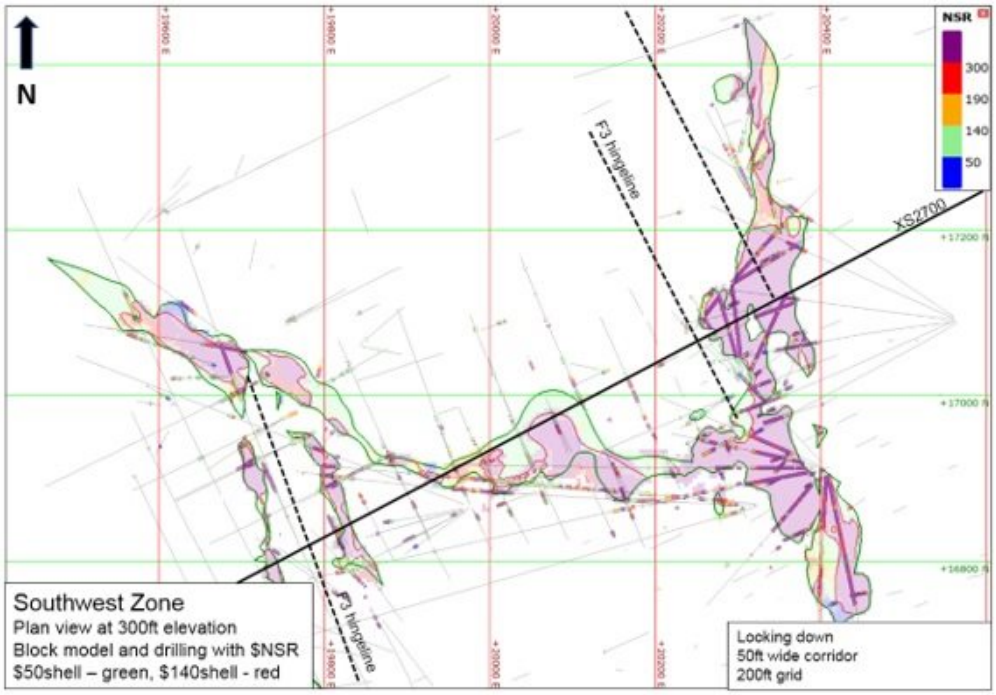


Figure 6-35: Southwest Zone – Level Plan 300

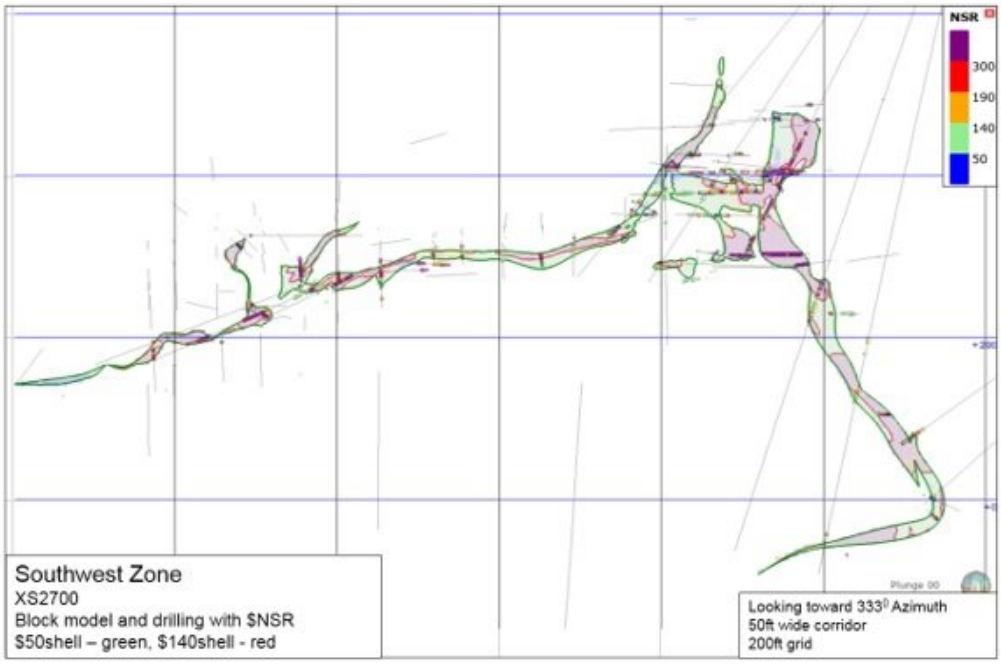


Figure 6-36: Southwest Zone – Cross Section 2700

6.4.9 200 South Zone

The 200 South (200S) Zone is a continuation of the Southwest Zone trend and has been historically subdivided into two major areas, the main 200 South and the Deep 200 South zones. As the division was due to limiting model sizes to practical levels, this differentiation is not recognized in this TRS, rather one continuous 200S Zone is described beginning at the arbitrary XS2200 boundary between the Southwest and 200S zones.

The main 200 South Zone displays the same general anticlinal geometry as the Southwest Zone, with a steeply dipping eastern limb and a flat-lying western limb. Mineralization continues for 1,200 ft (366 m) along a strike of N 15° W.

There appears to be at least one major F_2 anticline in the core of the deposit that has been affected by an F_3 fold with east-dipping axial plane. One major $D_{2.5}$ shear offsets the 200S Zone at approximately the 550 ft elevation, top to the northwest. Mineralization is bounded on the east by a steep, brittle fault zone that offsets the mineral horizon several hundred feet (75 m to 100 m) in a dextral sense.

Figure 6-37 is a 3D illustration of the mineralized wireframe and definition drilling. Figure 6-38 is a level plan at Level 100 that shows the outline of the block model in relation to the mine contact, and the major drill hole orientations. Figure 6-39 is a cross-section through the 200 South Zone that shows the relationship of the drilling to the block model.

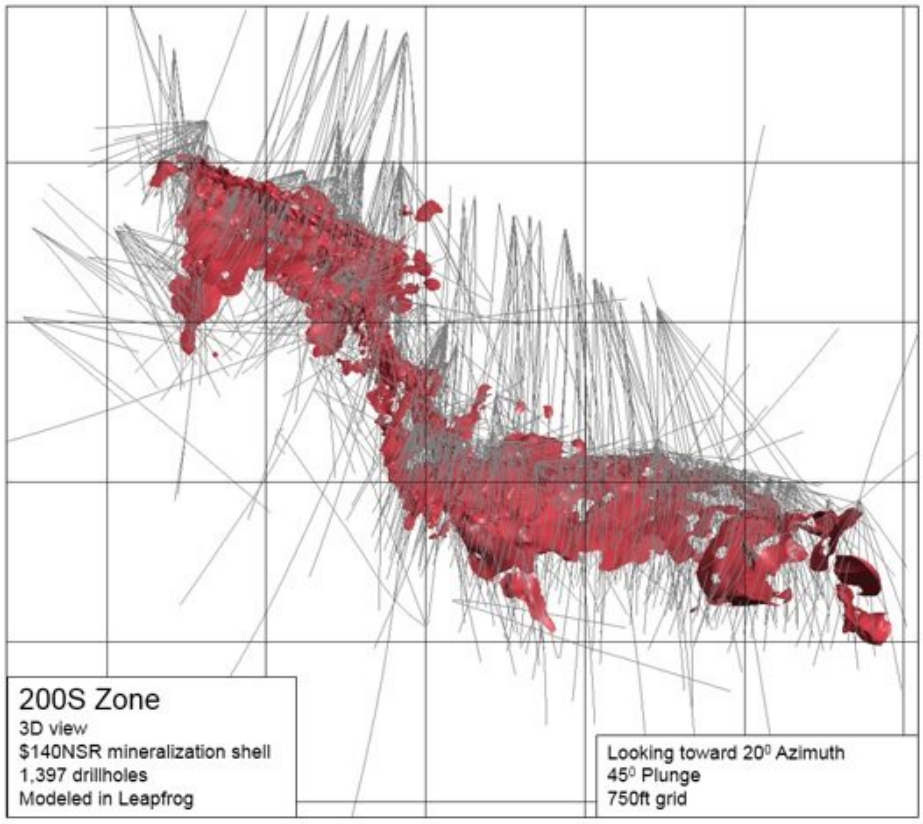


Figure 6-37: 200S Zone -3D Model

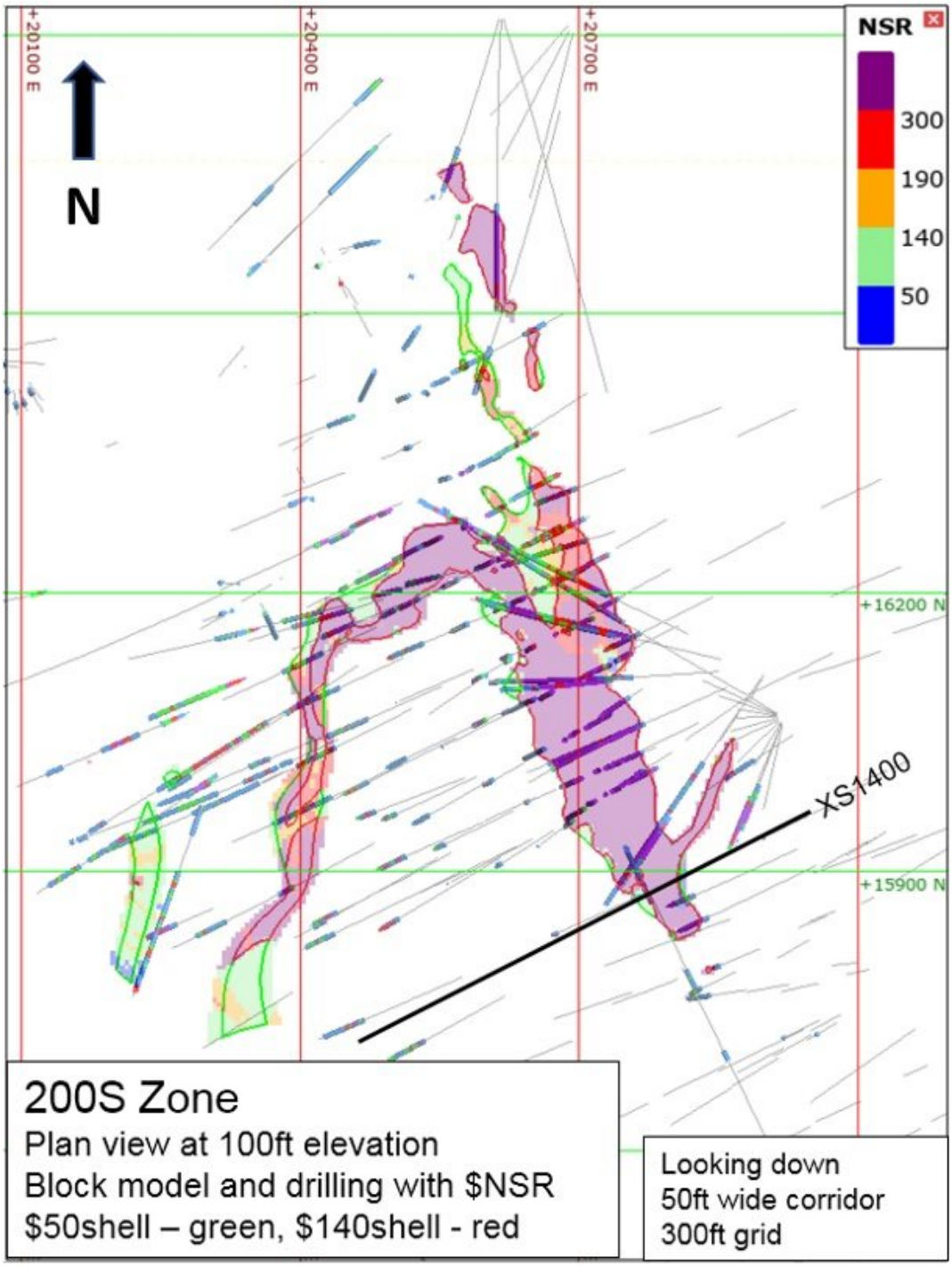


Figure 6-38: 200S Zone – Level Plan 100

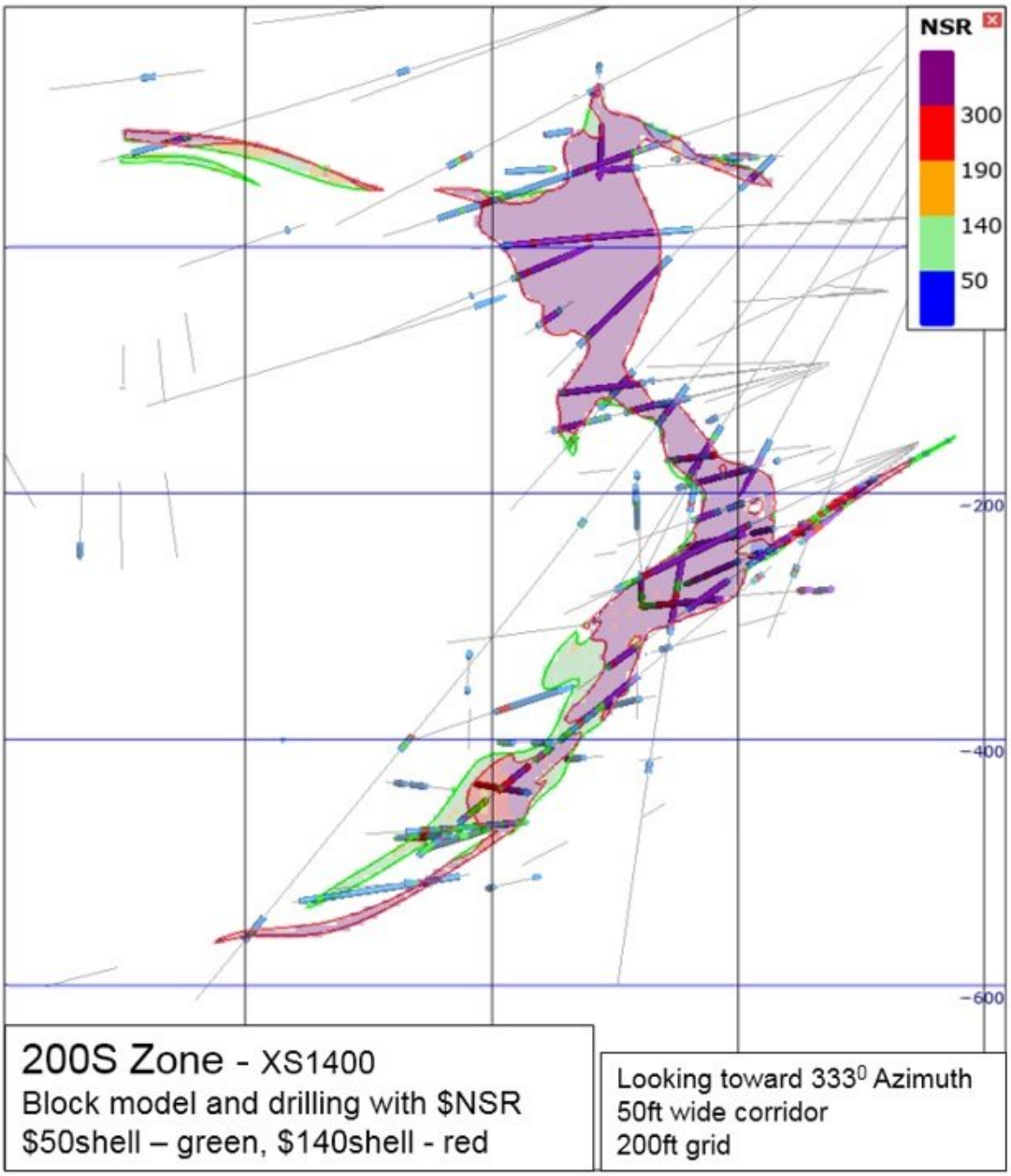


Figure 6-39: 200S Zone – Cross Section 1400

As the 100 Level of the 200S Zone is mostly mined out, Figure 6-40 is at the -600ft elevation, which is in the deepest area of active mining at Greens Creek. Figure 6-41 is a cross section XS000 through the Deep 200 South Zone showing the relationship of the drilling to the Mineral Resource block model. Figure 6-42 is a level plan at -800 ft elevation, which is below any historic or active stopes at Greens Creek. Figure 6-43 displays cross section XS-1300 which reaches near the maximum southern extent of definition drilling on the 200 South Zone (and for the entire mine).

At the northern end of the 200 South Zone a mixed group of mineral types are present such as MFB, MFP, WCA and WBA which are interpreted to be localized at an original hydrothermal seafloor vent. At the southern extents of the 200 South Zone baritic material (WBA) dominates with high silver grades. Two to three benches are present with a high angle mine contact on the western side of the deposit which is also mineralized.

A deeper mineralized trend is present below the benches shown in Figure 6-41 and Figure 6-43, at the -1,100 ft elevation. This deeper, poorly explored trend is thought to be the main Greens Creek mineralization trend, and displays hotter, or more proximal, MFP, WSI and MFB mineral types.

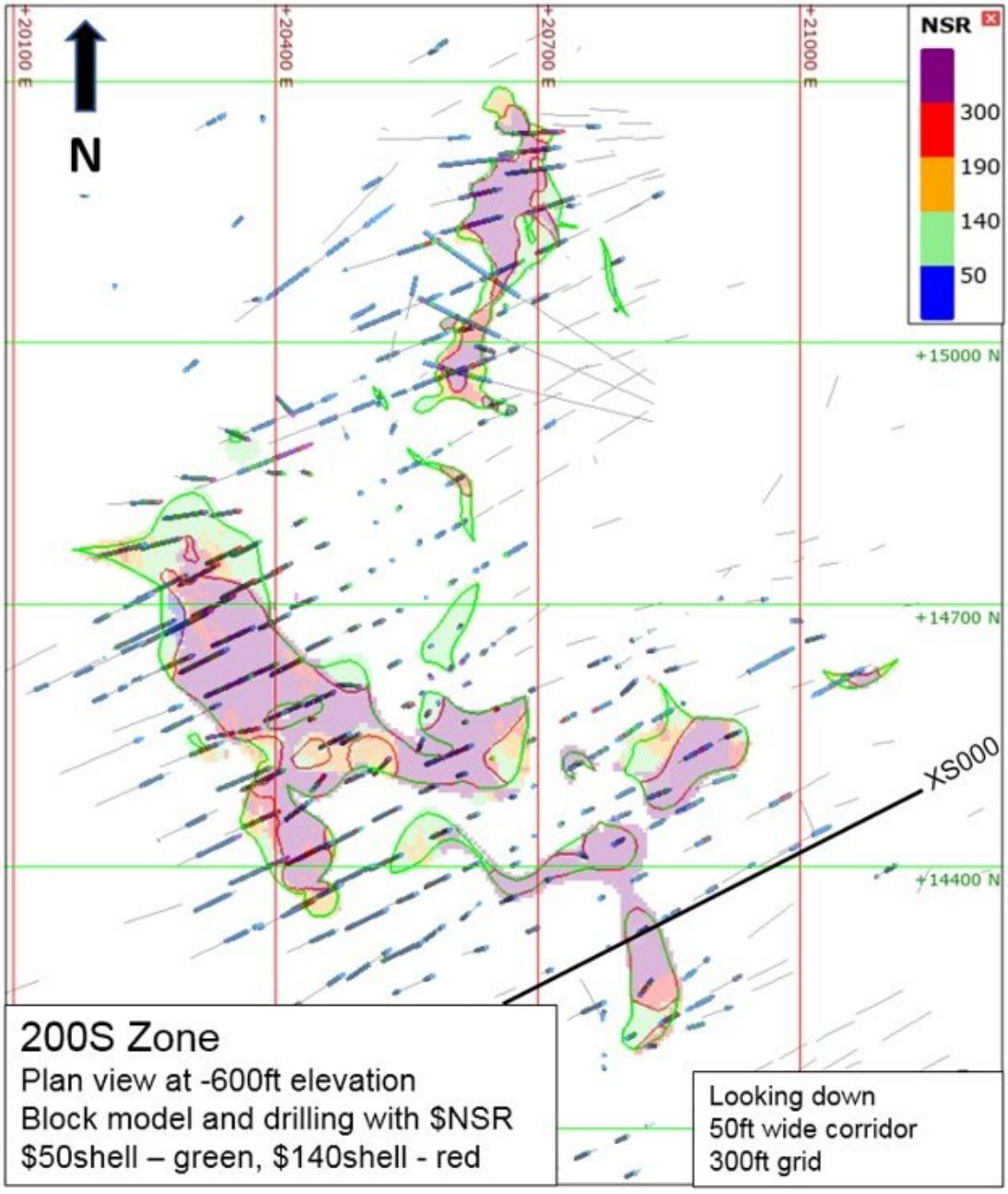


Figure 6-40: 200S Zone – Level Plan at -600 Elevation

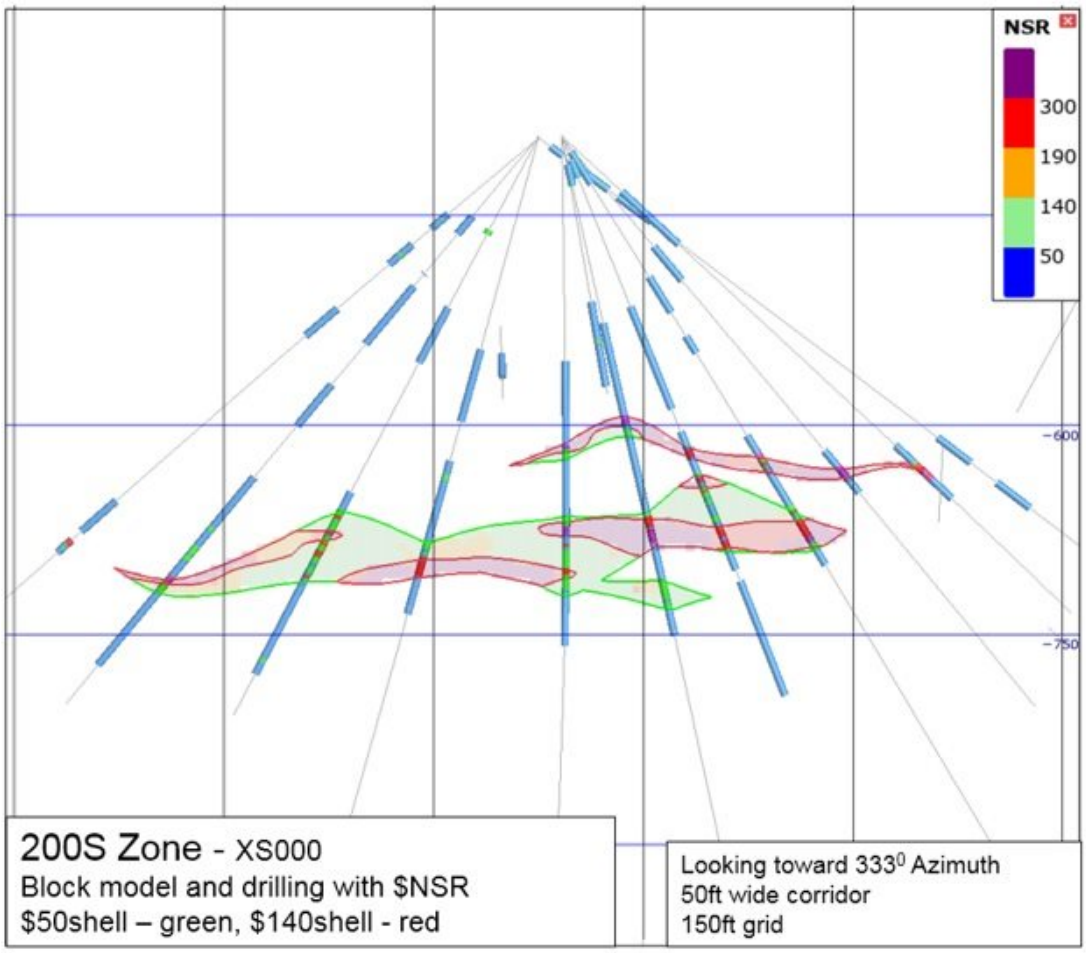


Figure 6-41: 200S Zone – Cross Section XS000

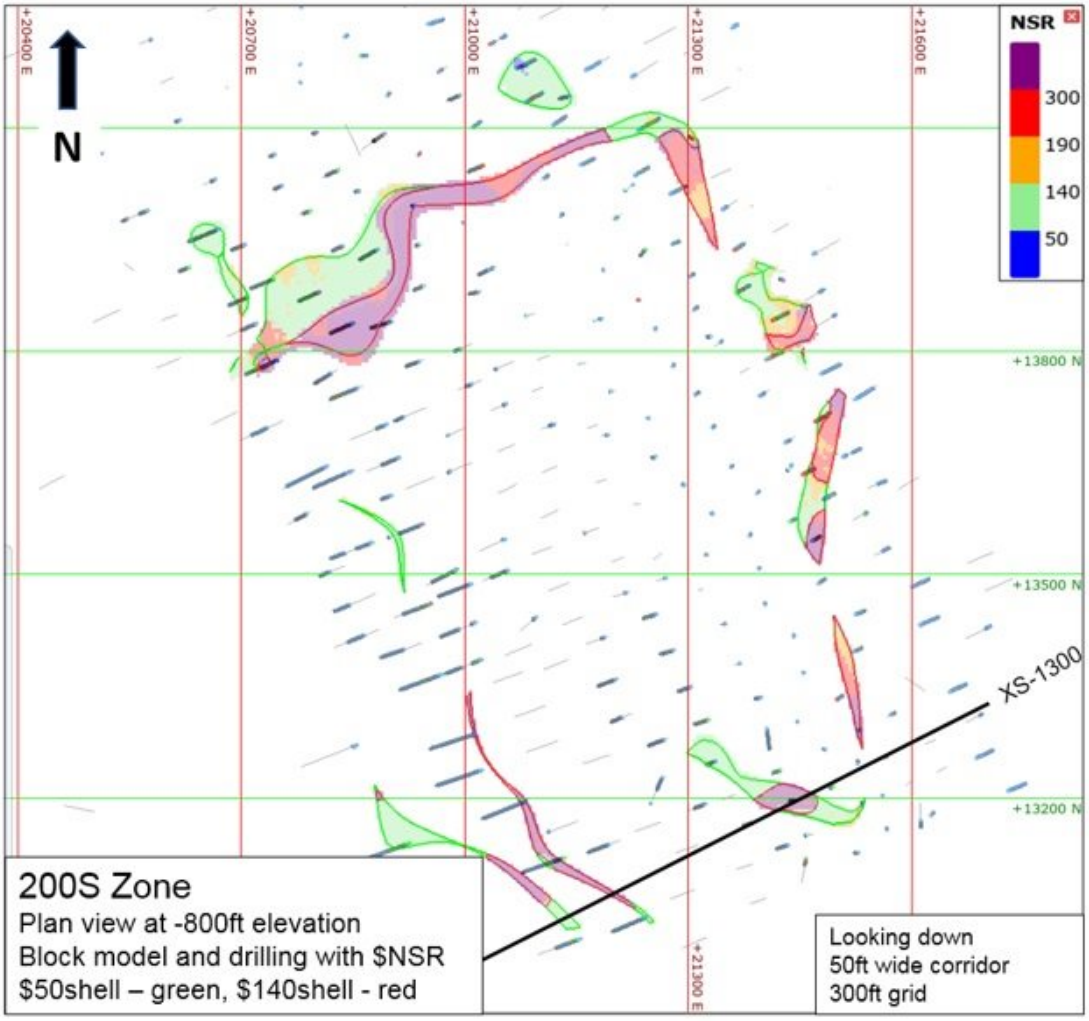


Figure 6-42: 200S Zone – Level Plan – 800 Elevation

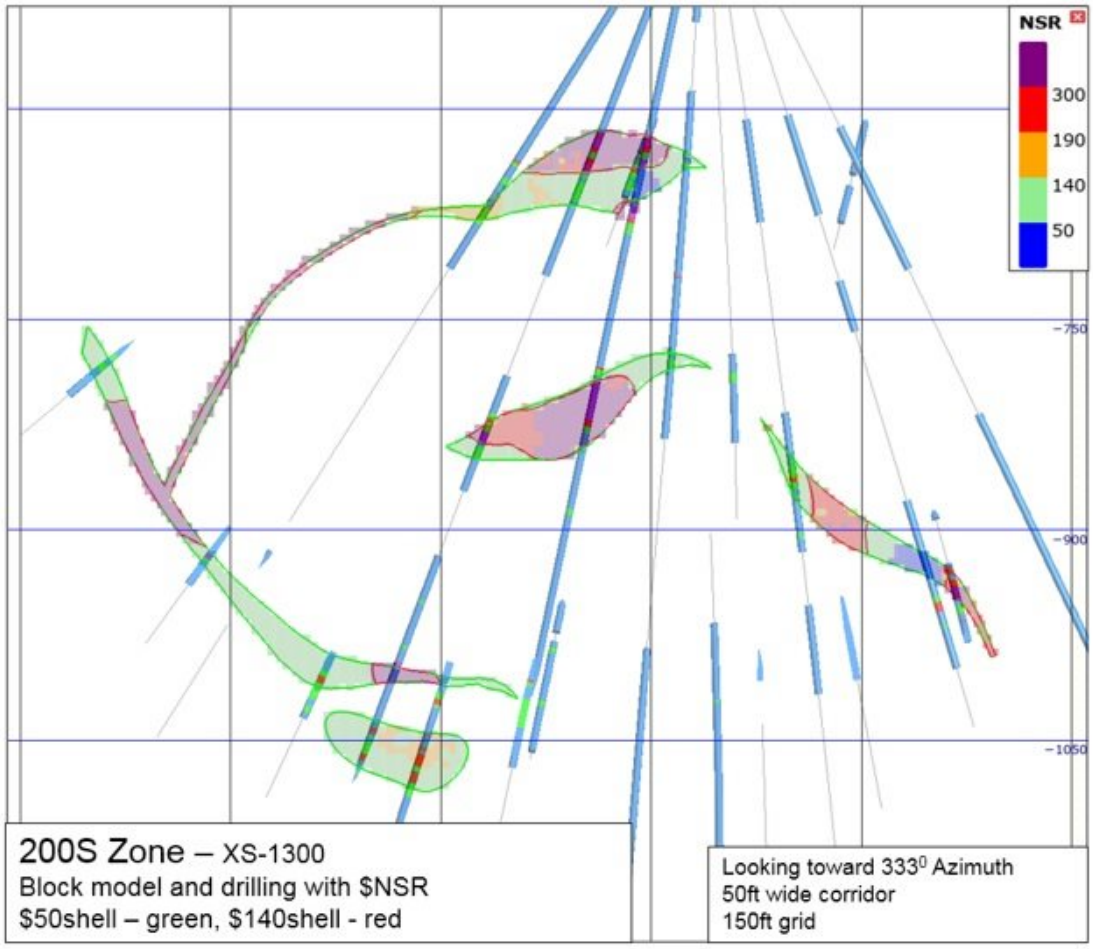


Figure 6-43: 200S Zone – Cross Section XS-1300

6.4.10 Gallagher Zone

The Gallagher Zone is located west of the Gallagher Fault and is the westernmost of the known zones of the Property (refer to Figure 6-6). The overall Gallagher Zone strikes N70°E and dips 25° SE.

The thickness of the mineralized horizon is highly variable. In the northwest portion of the zone where the horizon is sub-horizontal the true thickness ranges from less than five feet (1.5 m) up to a maximum of 15 ft (4.6 m). To the south, where the mineralized horizon becomes conformable to the phyllite/argillite contact the thicknesses typically range from 10 ft (three meters) to 20 ft (6.1 m).

The Gallagher Zone does show some broad-scale zonation patterns with Fe-rich massive mineralization dominate in the lower southern sections, a middle barite-rich relatively metal-poor central section, and a more typical mixture of white and massive mineralization types in the northern sections. The Gallagher Zone is the offset of the 200 South Zone across the Gallagher Fault as is evidenced by similarities in structural style and mineral types, and post-D_4/pre-D_5 late Cretaceous dike offset across the fault.

Figure 6-44 displays the mineralized $140 NSR/ton wireframe with definition drilling. Figure 6-45 is a level plan map at the zero feet elevation showing the Mineral Resource block model and drilling. Figure 6-46 shows cross section XS-250 through the mineral body.

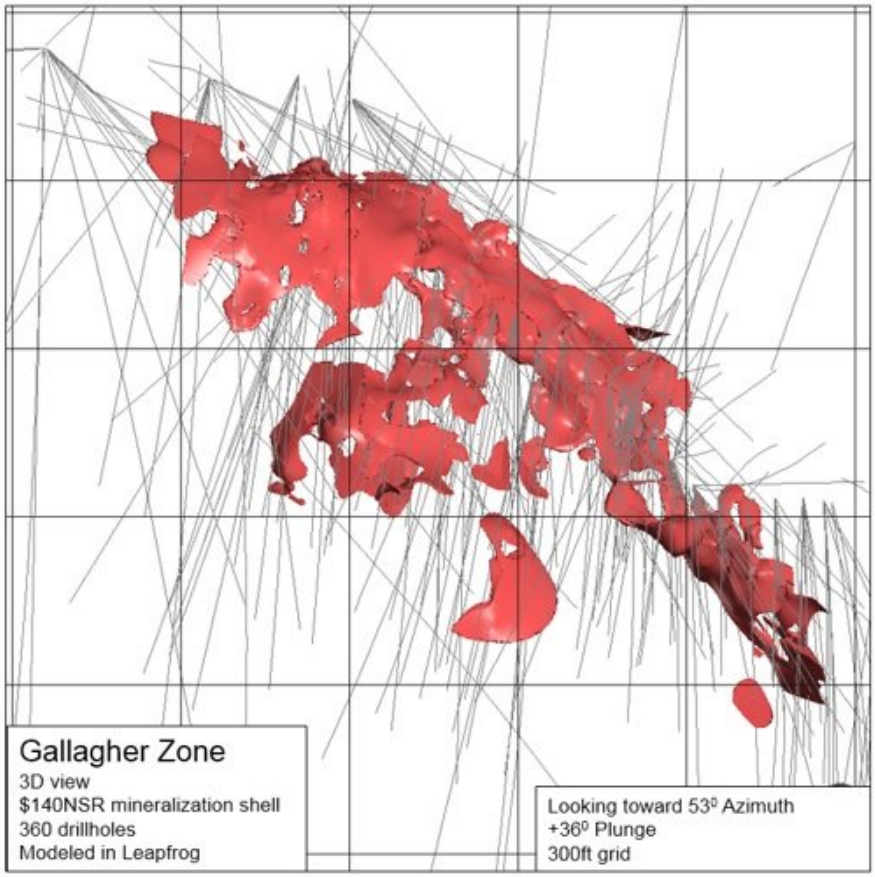


Figure 6-44: Gallagher Zone – 3D Model

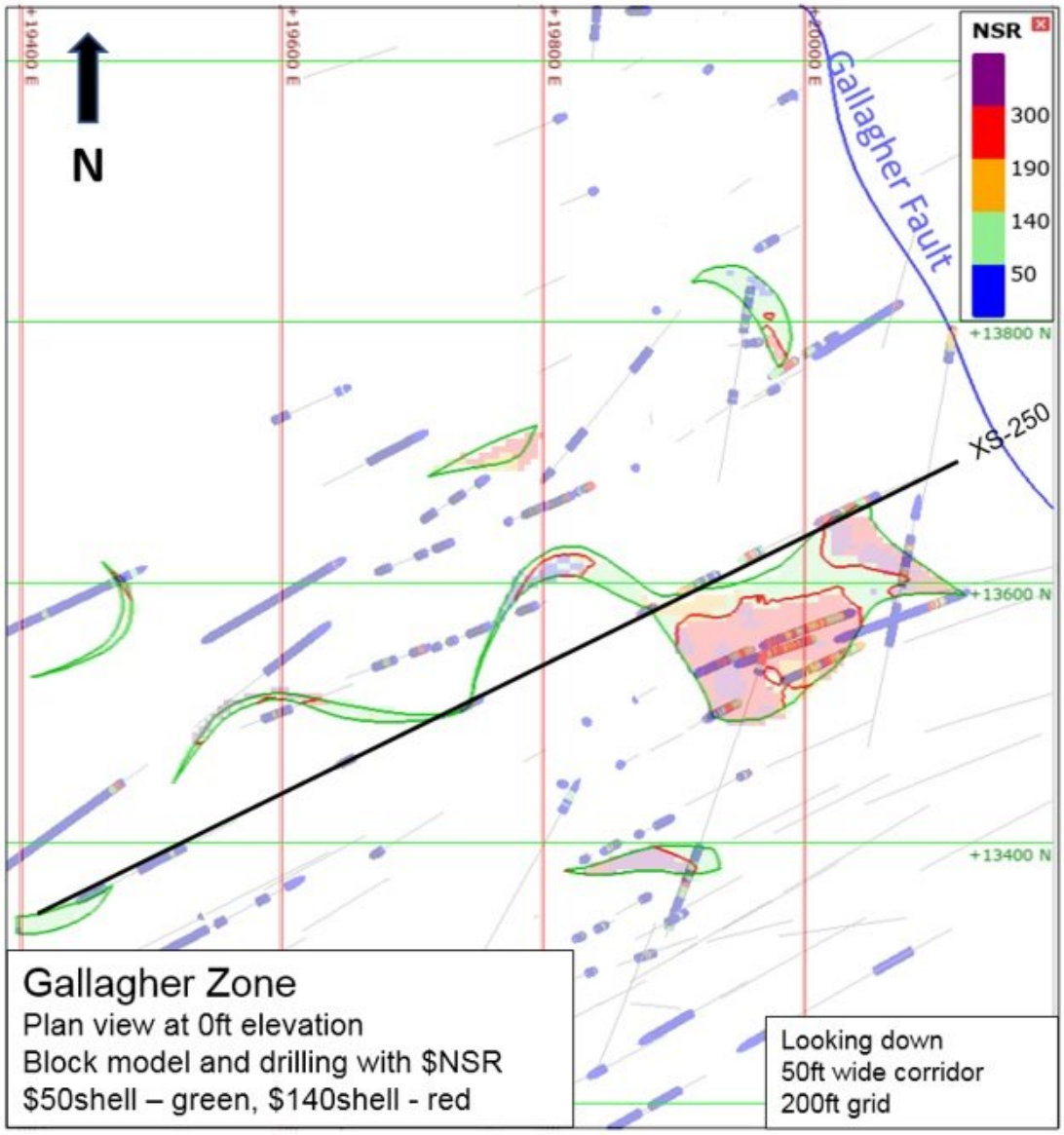


Figure 6-45: Gallagher Zone – Level Plan at 0 ft Elevation

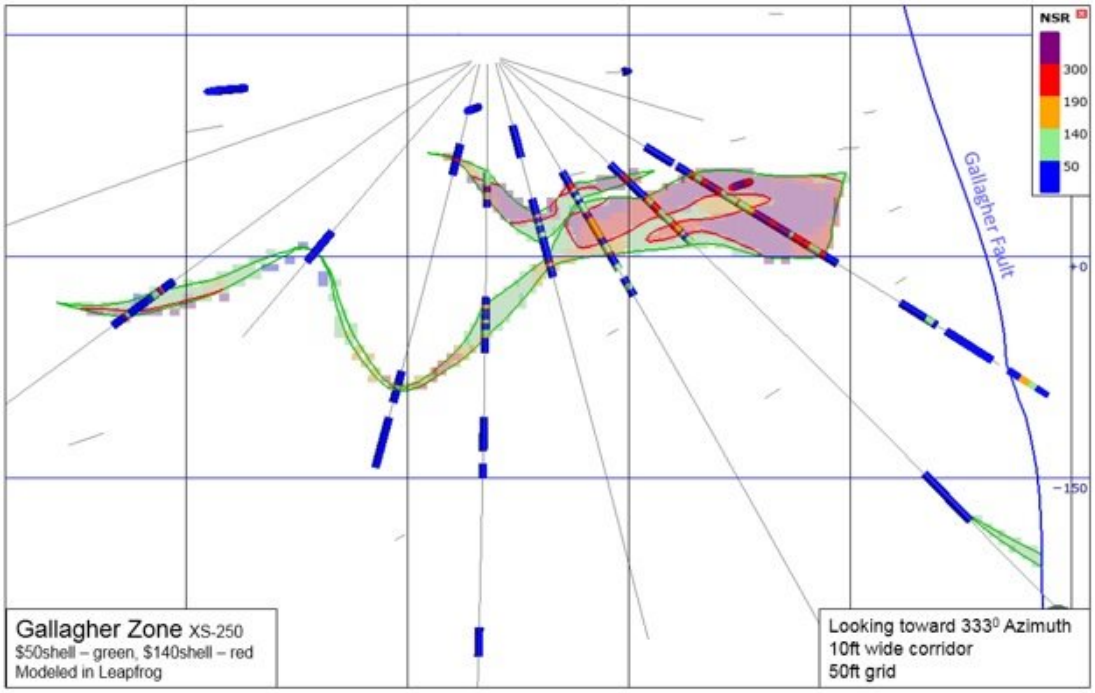


Figure 6-46: Gallagher Zone – Cross Section -250

6.5 Comments on Geological Setting and Mineralization

In the QP's opinion, the geological understanding of the settings, lithologies, structural and alteration controls on mineralization, and mineralization continuity and geometry in the defined mineral zones is sufficient to support estimation of Mineral Resources and Mineral Reserves. The geological knowledge of the area is also considered sufficiently acceptable to reliably inform mine planning. The mineralization style and setting are well understood and support the declaration of Mineral Resources and Mineral Reserves.

Other prospects identified within the Project area (see Section 7.1.6.7) are at an earlier stage of exploration, and the lithology, structural, and alteration controls on mineralization, as well as the continuity and geometry of the mineralization, are currently insufficiently understood to support estimation of Mineral Resources.

6.6 Deposit Types

6.6.1 Research on Greens Creek Deposit Type

Work by Taylor and Johnson (2010) indicated that the Greens Creek deposit displays a range of syngenetic, diagenetic, and epigenetic features that are typical of volcanic massive sulfide deposits (VMS), sedimentary exhalative (SEDEX), and Mississippi Valley-type (MVT) genetic models. Based on those observations the investigators indicated that the Greens Creek mineral deposit was a 'hybrid' type possessing elements of several deposit models.

Since that earlier work, two PhD thesis out of the Center for Ore Deposit and Earth Sciences at the University of Tasmania (Sack, 2009, 2016 and Steeves, 2018) have added significantly to the observations available for the deposit from which to evaluate previous interpretations. More mapping of the mineralization, structures and alteration across the claim block has also added to the data from which to classify the deposit.

6.6.2 Interpretation of the Greens Creek Depositional Setting

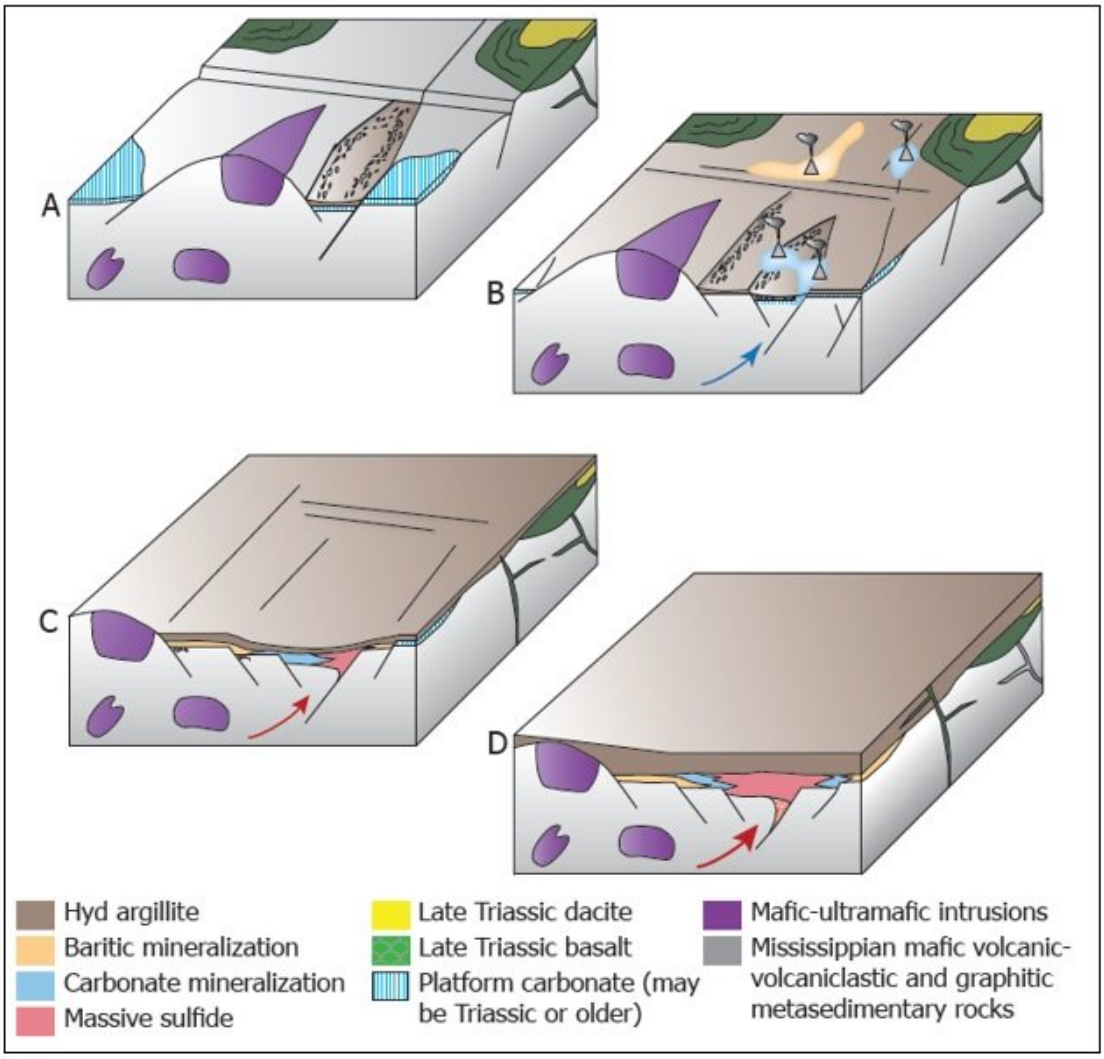
Based on the most recent data, the Greens Creek deposit most fully follows that of a volcanogenic massive sulfide (VMS) deposit (Steeves, 2018). This classification puts the Greens Creek deposit more in line with the other VMS deposits of the Alexander Triassic Metallogenic Belt.

6.6.2.1 Support for VMS Classification

Characteristics that are displayed at Greens Creek that fit the VMS model include:

- A zinc–lead–silver–gold–copper metal endowment similar to Kuroko-type VMS deposits,
- Bimodal volcanism is present in the Triassic, mineralization-age, host lithologies,
- A zoned alteration profile with a copper-iron-zinc core grading outward into baritic, precious metal rich fringes and silicified cap,
- Presence of quartz-sericite-sulfide stringers in the footwall directly below the massive sulfide accumulations; and massive chloritic alteration around the stringers,
- Mineralogy similar to that of white smoker systems of the southwestern Pacific Ocean. Baritic and carbonate mineral styles with framboidal and colloform pyrite indicate primary seafloor deposition, and
- The Greens Creek mineral deposits are within a well-established metallogenic belt where numerous other VMS deposits of Late Triassic age have been identified.

Figure 6-47 presents the schematic depositional setting for the Greens Creek deposit.



Source: Steeves, 2018

Figure 6-47: Schematic Depositional Setting for the Greens Creek Mineral Deposit

Earlier investigators accepted the Triassic rifting, deep circulation of seawater, and seafloor deposition but pointed to several observations out of line with 'typical' VMS deposits such as:

- An intra-arc setting,
- Apparent sub-seafloor replacement mineralization,
- Lack of felsic igneous rock and a preponderance of ultramafics,
- A lack of focused feeder systems,
- Chromium and barium rich silicates and carbonate alteration, and
- High zinc, lead, and silver grades without typical high (several percent) copper grades.

Steeves (2018) responds to these arguments using observations from other VMS deposits which have similar characteristics. VMS deposits have been identified in other intra-arc settings whereas SEDEX and MVT deposits tend to form on craton margins only. SEDEX deposits are limited to anoxic basins whereas the argillites of Greens Creek show pronounced negative Ce anomalies and high Y/Ho ratios indicative of oxic conditions in the basin. The abundant barite also argues for oxidizing conditions in the basin. Sub-seafloor replacement is common at other VMS deposits as well, a condition that only requires longevity of the hydrothermal system post-burial.

Further mapping, drilling and age dating of units has confirmed bimodal volcanism of similar age to the Greens Creek deposit, which is typical for VMS deposits and not SEDEX or MVT deposits. Continued mapping and drilling have located two major feeder systems in the footwall unknown to the earlier investigators, which is understandable as the feeders are sub-parallel to the footwall/hanging wall mine contact and immediately underlie most of the mined zones. As the mafic to ultramafic footwall units were enriched in chromium it is not surprising that high chromium is found in the alteration products as well as direct sedimentary input to the base of the Hyd Group.

The main feeder system responsible for Greens Creek has also been shown to be zoned over several miles of strike length with the more copper-rich core located north of the mine area. It is only the zinc-rich and copper-poor portion of the feeder system which underlies the mine. Rather than the Greens Creek hydrothermal system being low in copper, only the cooler zinc, lead and silver southern limb was preserved below current topography. Zonation of the preserved mineral deposit shows a hotter core on the northern end and cooler baritic Mineral styles on the southern end. The mineral styles do not zone back to cooler types north of the Greens Creek mineral body but were eroded off above the copper rich feeder zone north of Greens Creek.

Steeves (2018) also argues that the enrichment of gold, silver, zinc, and lead are incompatible in a typical low temperature SEDEX type deposit as the solubility of gold is inverse to the other metals given chloride and bi-sulfide complexing activities, and therefore could not explain the rich endowment of all the metals at Greens Creek. Steeves also explains the exceptional metal budget of high gold with high silver, zinc, and lead as being derived from Devonian – Mississippian mafic metavolcanics (CR, SP) and graphitic metasedimentary (SPgr) footwall rocks enriched in the metals.

In summary, data obtained since the original USGS (2010) publication explains the apparent incongruities of the Greens Creek deposit relative to other VMS deposits. The only remaining oddity is that the Greens Creek deposit formed directly on a 100Ma aged unconformity, a very unique stratigraphic location for a VMS deposit. There is no reason why the VMS system should not form at this stratigraphic location however, and some have proposed that the conglomerate at the unconformity may have been a permeable aquifer for the hydrothermal fluids creating the deposit.

The QP concurs with the interpretation that the Greens Creek mineral deposit is of the VMS type and consider the model and interpreted deposit genesis to be appropriate to support exploration activities.

7.0 EXPLORATION

7.1 Exploration

Historical exploration activities at the Greens Creek project prior to Hecla's acquisition of the land package in March 2008, are extensive. Exploration commenced on the Property in 1973. A complete overview of historical exploration activities at Greens Creek, including work completed by Hecla since its acquisition of Greens Creek in 2008, is included in Table 5-1.

This section focuses mainly on exploration activities completed since Hecla acquired sole possession of the Property. Hecla's exploration target selection criteria and exploration programs have been built using refinements in knowledge and understanding from historical exploration data combined with knowledge and experiences gained from more recent systematic exploration programs.

Since 2008, Hecla has completed a number of surface and underground core drilling programs (described in further detail in Section 7.2), auger and MMI soil geochemistry, ground and borehole pulse electromagnetic (EM) geophysical surveys, and compilation of historic geophysical survey information. Reconnaissance-scale and detail-scale geologic mapping have been completed by Dr. Norm Duke, Dr. John Proffett, and various Hecla geologists. These exploration programs are summarized in Table 7-1.

7.1.1 Grids and Surveys

The original regional identification of the Greens Creek deposit was likely done with USGS topographic maps. The USGS quadrangle maps from this period use the horizontal North American Datum (NAD) of 1927 (NAD27).

By 1977 an assumed or local plane grid was developed for the immediate area surrounding the Big Sore mineral occurrence. This grid, referred to as the "mine grid", is orthogonal to true north and is still in use for all current underground surveying.

A second assumed grid was also developed prior to commencement of the underground drill program in 1978. This grid was rotated 26° 33' 54'' W (counter-clockwise) of the mine grid so as to parallel the average strike of the East Zone. The origin of the grid was offset to the southwest of the East Zone. This grid, known as the "geo-grid", is still in use for planning drill hole layouts, sectional geologic interpretations, and Mineral Resource modeling. All grid coordinates are in U.S. Geological Survey Feet. The coordinate transform coefficients for conversion from/to mine grid to geo-grid are shown in Table 7-2.

Beginning in 1983 the horizontal datum was changed from NAD27 to North American Datum of 1983 (NAD83). All surface exploration mapping, geochemistry grids, drill collars and geophysical surveys exist in both NAD27 and the NAD83 datum. The affine transform parameters used for coordinate transformation of mine grid to Alaska State Plane Zone 1, NAD83 are shown in Table 7-3.

Table 7-1: Summary Table of Hecla Greens Creek Exploration Activities 2008 to 2020
Hecla Mining Company – Greens Creek Mine

Year	Exploration Activity	Contractor	Exploration Activity Completed	Purpose	Results
2008	Geologic Mapping	John Proffett, Norm Duke, Greens Creek Exploration Staff	Reconnaissance and detailed geologic mapping	Reconnaissance mapping for extensions of mine contact, originating from a known favorable target area into unknown areas. Detailed mapping for refining targets, identified from regional mapping and geochemical anomalies.	Reconnaissance mapping resulted in expansion of the known mine contact. Detailed mapping began to bring an understanding of the Killer Creek target area.
	Soil Geochemistry	Greens Creek Exploration Staff	658 auger soil geochemical samples and 658 MMI soil geochemical samples along 67,800 ft of gridlines in the Young Bay area.	Begin to identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
	Core Drilling	Connors Drilling	15 underground core holes totaling 9,935 ft (3,028 m). 18 surface core holes totaling 20,649 ft (6,294 m).	Surface drilling in North Big Sore, East Ridge, East Lil Sore, Cub, and Young Bay targets. Underground drilling to expand Mineral Resources.	Surface drilling advanced geologic and geochemical knowledge of the target areas. Underground drilling expanded Mineral Resources.
2009	Geologic Mapping	John Proffett, Norm Duke, Greens Creek Exploration Staff	Reconnaissance and detailed geologic mapping	Reconnaissance mapping for extensions of mine contact, originating from a known favorable target area into unknown areas. Detailed mapping for refining targets, identified from regional mapping and geochemical anomalies.	Reconnaissance mapping resulted in expansion of the known mine contact. Detailed mapping included interpretation of cross-section in the area of the Northeast Contact.
	Core Drilling	Connors Drilling	20 underground core holes totaling 18,064 ft (5,506 m). Four surface core holes totaling 8,292 ft (2,527 m).	Surface Drilling to test the Northeast Contact. Underground drilling to expand Mineral Resources.	Surface drilling intersected repeated folds of the Northeast Contact as expected. Underground drilling expanded Mineral Resources.
	Geologic Mapping	John Proffett, Norm Duke, Greens Creek Exploration Staff	Reconnaissance and detailed geologic mapping	Reconnaissance mapping for extensions of mine contact, originating from a known favorable target area into unknown areas. Detailed mapping for refining targets, identified from regional mapping and geochemical anomalies.	Reconnaissance mapping resulted in expansion of the known mine contact. Detailed mapping focused in the Killer Creek target area and assisted in definition of the geologic interpretation for drilling in 2011 and 2012.

Year	Exploration Activity	Contractor	Exploration Activity Completed	Purpose	Results
2010	Soil Geochemistry	Greens Creek Exploration Staff	580 auger soil geochemical samples and 580 MMI soil geochemical samples taken in the North Young Bay area.	To identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
	Core Drilling	Connors Drilling	25 underground core holes totaling 31,464 ft (9,590 m). 17 surface core holes totaling 21,217 ft (6,467 m).	Surface drilling continued testing the Northeast Contact, Killer Creek, and East Ridge targets. Underground drilling to expand Mineral Resource.	Surface drilling continued to define the Northeast Contact and the one hole in the Killer Creek target intersected anomalous silver and zinc mineralization. Underground drilling expanded Mineral Resources.
2010	Geophysics	Ken Robertson	Compilation of Historic Geophysical Data	To identify geophysical survey methods that could be effective in future work.	Results from this compilation re-defined the Killer Creek target area as a priority for exploration. This target had been drilled by Noranda Exploration in the late 1970s then abandoned when the Greens Creek deposit was discovered.
2011	Geologic Mapping	John Proffett, Norm Duke, Greens Creek Exploration Staff	Reconnaissance and detailed geologic mapping	Reconnaissance mapping for extensions of mine contact, originating from a known favorable target area into unknown areas. Detailed mapping for refining targets, identified from regional mapping and geochemical anomalies.	Reconnaissance mapping resulted in expansion of the known mine contact. Detailed mapping focused in the Killer Creek and upper Bruin Creek target area and assisted in definition of the geologic interpretation for drilling in 2011 and 2012.
	Soil Geochemistry	Greens Creek Exploration Staff	818 auger soil geochemical samples taken in the North Young Bay area.	To identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
	Core Drilling	Connors Drilling	28 underground core holes totaling 38,098 ft (11,612 m). 14 surface core holes totaling 27,384 ft (8,347 m).	Surface drilling continued testing the Northeast Contact, West Bruin Contact, and East Ore targets. Underground drilling to expand Mineral Resources.	Surface drilling continued to define the Northeast Contact and began to define the West Bruin Contact and the East Ore target. Underground drilling expanded Mineral Resources.
	Geophysics	Ken Robertson, Techno Imaging, and Crone Geophysics & Exploration Limited	3D Inversion of 340-line km subset of the 1,227 line-km from the 1996 Aerodat Ltd frequency domain EM survey. Borehole pulse EM surveys at Killer Creek target	3D Inversion analysis on a portion of the historic Aerodat data was completed to identify overlooked anomalies. Surface and Borehole Pulse EM surveys were used to define EM anomalies identified from the 3D Inversion.	3D Inversion re-identified the Killer Creek conductor. Pulse EM defined the re-identified conductor in sufficient detail for exploration drilling.

Year	Exploration Activity	Contractor	Exploration Activity Completed	Purpose	Results
	Geologic Mapping	John Proffett, Norm Duke, Greens Creek Exploration Staff	Reconnaissance and detailed geologic mapping	Reconnaissance mapping for extensions of mine contact, originating from a known favorable target area into unknown areas. Detailed mapping for refining targets, identified from regional mapping and geochemical anomalies.	Reconnaissance mapping resulted in expansion of the known mine contact. Detailed mapping focused in the Killer Creek target area and assisted in definition of the geologic interpretation for drilling in 2012.
	Soil Geochemistry	Greens Creek Exploration Staff	253 auger soil geochemical samples taken in the North Young Bay area.	To identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
2012	Core Drilling	Connors Drilling	24 underground core holes totaling 20,817 ft (6,345 m). Eight surface core holes totaling 17,710 ft (5,398 m).	Surface drilling to test the Killer Creek and West Gallagher target areas. Underground drilling to expand Mineral Resources.	Surface drilling in the Killer Creek target identified a broad copper-rich vein zone varying from 2.1 ft to seven feet and accompanying values up to 7.0% Cu and 5.0 oz/ton Ag. This area is interpreted to be the center of a mineralizing vent. Underground drilling expanded Mineral Resources.
	Geophysics	Ken Robertson	Review of 2011 geophysical survey results	To propose additional geophysical survey if needed.	Still in review.
	Core Drilling	Falcon Drilling	Ten surface drill holes totaling 28,746 ft (8,732 m) at the Killer Creek target	Continuation of 2012 program testing extent of shallow and broad copper and zinc-rich zones in the area.	Zoned Copper and Zinc-rich extents further defined as potential for higher grade mineralization in the area.
2013	Geologic Mapping	John Proffett, Norm Duke and Exploration Staff	Reconnaissance mapping of the anomalous Zinc Creek area and detailed structural mapping of Mariposite ridge	Continued mapping of major s2.5 shears north and west of known locations. Mapping mine contact and associated mineralization north of Zinc Creek and along Mariposite ridge (east and west of Mammoth claims).	Large and silicified shear zone mapped north and west along mariposite ridge. Mine contact was expanded from Lower Zinc Creek to Upper Zinc Creek-Lakes District.
	Core Drilling	Falcon Drilling	Six surface drill holes totaling 23,214 ft (7,076 m) in the Killer Creek target area	Continuation of 2013 program testing extent of shallow and broad copper and zinc-rich zones and exploring for mine contact at Killer Creek target.	A deep mine contact was intercepted in five drill holes likely corresponding to the ‘Deep mine syncline’ below the ‘Mine syncline’ and associated mineralization at the mine. This contact was weakly mineralized.

Year	Exploration Activity	Contractor	Exploration Activity Completed	Purpose	Results
2014	Geologic Mapping	John Proffett, Norm Duke and Exploration Staff	Reconnaissance mapping of the Killer-Lakes district area and detailed structural mapping of the Killer Creek – Mammoth areas	Reconnaissance mapping to determine extensions of mine contact and mineralization in the Lakes District and Killer Creek areas. Detailed mapping of s2.5 shears and mineralization in the Mammoth and Killer Creek areas.	Expanded known mine contact in the Zinc Creek area north and east into the Lakes District. Detailed mapping of mineralization in the Killer Creek target yielded a better understanding the habit and orientation of mineralization.
	Geophysics	SJ Geophysics	One downhole EM survey was conducted in Killer Creek to define mineralization and 'mine contact' in the area	Determine geometry of possible mine contact and mineralization in the Killer Creek area.	Recognized district deep mine contacts and alteration changes between lithologies though no sulfide horizons were outlined from the survey.
	Core Drilling	Falcon Drilling	Four surface drill holes totaling 8,085 ft were completed in the Lower Killer Creek and High Sore target areas	Exploring for offset mineralization east of known East Ore Mineral Resource and across Cub and High Sore Faults. Test the Big Sore syncline in Lower Killer Creek target between the Gallagher and Maki Faults.	Several bifurcating s2.5 shears were intercepted in the High Sore drill holes though no offset mineralization was found. A weakly mineralized Big Sore syncline was encountered at depth north of known mineralization.
2015	Geologic Mapping	John Proffett and Exploration Staff	Mapping of the High Sore and Big Sore areas with a focus on local s2.5 shears	Mapping s2.5 age shears east of known intercepts and mineralization/mine contact in Big Sore Creek.	Detailed orientation of local S2.5 shearing in High Sore prospect and down into the Big Sore drainage was captured.
	Geophysics	Exploration Staff	Physical property data (density), Magnetic Susceptibility and conductivity measurements were taken in every drill hole	Provide base-line data for future surveys.	Collected data for all units not just mineral lithologies which will further refine future geophysical surveys.
2016	Core Drilling	Falcon Drilling	Two surface drill holes totaling 3,074 ft (937 m) were completed in Big Sore Creek area	Testing offset East Ore mine contact and mineralization east of the Cub Fault and known Mineral Resource.	One drill hole intersected expected East Ore mineralization close to surface. Drilling east of known East Ore Zone mineralization and targeting displaced mineral across the Cub Fault intersected anomalous zinc mineralization in hanging wall argillite nearing a likely eroded mine contact. A barren Northeast contact was also encountered in each drill hole.

Year	Exploration Activity	Contractor	Exploration Activity Completed	Purpose	Results
2016	Geologic Mapping	Exploration Staff	Reconnaissance mapping of Big Sore Creek, and Lil Sore areas and east of the Mammoth claims was completed.	Verify historic mapping in the Big Sore Creek area and follow extents of shearing at East and West of the Mammoth claims. Map geochemical anomaly at Lil' Sore prospect and sample Rhyolite occurrence.	Mapping in the Big Sore Creek drainage confirmed no mine contact was present where historical mapping showed. Several s2.5 shears, known to offset mineral at the mine, were mapped north and west of Mammoth Ridge. Further defined mine contact at Lil' Sore Rhyolite and determined unit is Devonian.
2017	Core Drilling	Falcon Drilling	Nine drill holes totaling 20,419 ft (6,224 m) were completed in the West Gallagher, Upper Gallagher, and Big Sore prospects.	Testing potential western extents of Southwest bench mineralization east of the Gallagher Fault, offset 'Bench' mineralization west of the Gallagher Fault, and southern extents of the East Ore and 5250 zones of the mine.	Five drill holes targeted west of the Gallagher Fault for offset 'Bench' mineralization in the mine while one drill hole targeted western extensions of the Southwest Bench Zone east of the Gallagher Fault. Broad zinc mineralization was encountered at the 'Bench' Contact west of known Mineral Resource east of the Gallagher Fault and higher grade mineralization was encountered west of the Gallagher Fault within the interpreted Klaus Shear. Drilling south of the mine in Upper Gallagher targeting southern extensions of the 5250 Zone encountered a weakly mineralized mine contact. Drilling south of the Big Sore target area tested southern continuations of the East Ore Zone between the Kahuna and Maki Faults. No mine contact was encountered in this area. A single 5250 drill hole tested a mineralized anticline 2,000 ft south of known Mineral Resource and above the 200S zone. No significant mineralization was encountered.
	Geologic Mapping	Exploration Staff	Mapping was completed in the Lower Zinc Creek area with a focus on S2.5 shearing.	Determine location of 'Zinc Creek Thrust' and link with structures seen north and east in North Mammoth.	Location of 'Zinc Creek Thrust' changed.

Year	Exploration Activity	Contractor	Exploration Activity Completed	Purpose	Results
2018	Core Drilling	Timberline Drilling	Fifteen drill holes totaling 20,941 ft (6,383 m) were completed in the West Gallagher and Lower Gallagher Areas targeting Southwest Bench – 200S Bench and the Upper Plate Zone respectively.	A continuation of the 2017 program testing for western extensions of 'Bench' Mineralization east and west of the Gallagher Fault and western extensions of the Upper Plate Zone.	Upper Plate ore grade mineralization was extended 150 ft west of known Mineral Resource on either limb of a flat-lying F2 fold. Four drill holes further defined western extensions of 'Bench' mineralization east of the Gallagher Fault and west of known Mineral Resource. Mineralization is generally broad and zinc-rich at or near the 'Bench' mine contact. One drill hole was extended to test the 'Deep Mine Syncline' below known mine mineralization. This drill hole intersected a very silicified and pyrite-rich footwall immediate to the mine contact with trace base metal mineralization.
	Geologic Mapping	John Proffett and Exploration Staff	Detailed mapping was completed in the Upper Gallagher and Mariposite ridge west of Gunsight pass.	Map conglomerate units of Upper Gallagher and extend mapping south along the Gallagher Ridge. Link mapping of units and structures in Upper Zinc Creek and Northwest Mammoth.	Collected several conglomerate samples for detrital zircon analysis to determine if they are of similar age to the basal conglomerate of the mine. Extended mapping of mine contact west of Mammoth Ridge.
2019	Core Drilling	First Drilling	Ten underground diamond drill holes totaling 11,578 ft (3,529 m) were completed in the 200S, Southwest, and East Zones.	200S drilling tested the down plunge extent of the bench. Southwest drilling followed up to the north of an existing ore grade intercept. East drilling tested the eastern extent of flat-lying mineralization.	Ten drill holes targeting the 200S drilling extended the upper and lower benches approximately 400 ft (122 m) and 800 ft (244 m), down plunge, respectively.
2020	Core Drilling	Timberline Drilling	Nine underground diamond drill holes totalling 5,603 ft (1,708 m) were completed in the 200S Zone.	Infill drilling targeting the upper and lower portions of the 200S bench, between two widely spaced sections of existing exploration drilling.	Nine drill holes targeting the 200S infilled a gap in exploration drilling and established continuity within the upper and lower benches.
2021	Core Drilling	Timberline Drilling	Ten surface diamond drill holes totaling 22,484 ft (6,853 m) and 14 underground exploration drill holes totaling 16,324 ft (4,976 m) were completed in 2021.	Surface drilling followed up on existing intercepts within the Lil'Sore and 5250 trend prospects. Underground drilling followed up on existing intercepts within the Gallagher trend, Gallagher Fault Block, 200S and West Zones.	Surface exploration intersected Zn rich base metal rich mineralization within the Lil'Sore Trend. Underground exploration continued to extend the 200S mineralization down plunge.

Table 7-2: Coordinate Transform Coefficients to Convert from/to Mine Grid to Geo-Grid
Hecla Mining Company – Greens Creek Mine

	Origin Offset in US Survey Feet	
	Mine Grid	**Geo-Grid**
X (Easting)	0.00	17438.42
Y (Northing)	0.00	12635.93
Z (Elevation)	0.00	0.00
	Rotation Angle (°)	
ATAN(1/2)=	-26.56505	

Table 7-3: Affine Transform Parameters Used for Coordinate Transformation of Mine Grid to Alaska State Plane Zone 1, NAD83
Hecla Mining Company – Greens Creek Mine

Horizontal Conversions: State Plane to Mine Grid		
Formulas	**Coeff.**	**Value**
	a	1.000097656
X’ = ax + by + c	b	-0.010449167
Y’ = dx + ey + f	c	-2455614.471
x,y (state plane)	d	0.010566122
(X’,Y’) calc mine grid	e	1.000969256
	f	-2290833.4
Horizontal Conversions: Mine Grid to State Plane		
Formulas	**Coeff.**	**Value**
	a	0.999792212
X’ = ax + by + c	b	0.010435993
Y’ = dx + ey + f	c	2479013.084
x,y (mine grid)	d	-0.010553352
(X’,Y’) calc state plane	e	0.998919067
	f	2262447.0
Vertical Conversions		
Grid to MLLW	-61.11	
MLLW to Ortho	-3.742	

7.1.2 Geological Mapping

Geologic mapping at Greens Creek has been ongoing since 1976. A basic understanding of the lithologic units was first gathered from early drill holes in the Big Sore Creek area located immediately east of the current mine. In 1977, a Noranda geologist, John Dunbier, realized that the mineralized zone was at a lithologic contact between argillite and tuffites (the tuffites were later recognized as phyllites). This lithologic contact has been dubbed the "mine contact". To date, over 30 mi (48 km) of mine contact have been identified through mapping efforts, of which less than 10 mi (16 km) have been tested by diamond drilling for its potential of hosting base metal deposits.

Figure 6-3 displays a compilation of regional geological mapping programs undertaken from 1974 through to the present day. The map has been compiled from different sources and has changed over time as new data are available. The major contributors to this regional geology map are Paul A. Lindberg, Norman A. Duke, John M. Proffett, Andrew W. West, Paul W. Jensen, and Christopher D. Mack.

Dr. Paul Lindberg made mapping contributions from 1995–2000. His efforts are reflected in the current geological understanding of the deposit and through numerous cross-section interpretations. On the regional map, Dr. Lindberg's mapping is visible in the Mariposite Ridge prospect area, Upper Gallagher, East Lil' Sore and Upper Big Sore Basin prospects; his maps range from a very detailed 1:200 scale to 1:10,000 metric scale.

Dr. Norm Duke has been responsible for the regional (1:10,000) metric scale mapping of the geology at Greens Creek from 1995 through 2014. His regional mapping sheets are usually the first observations made in an unknown area and influence future decisions for follow up efforts. It is in part through Dr. Duke's efforts that the mine contact has been extended for the distance it has. Dr. Duke has covered most of the land package north of Greens Creek with his activities.

Dr. John Proffett conducted detailed mapping at 1:24,000 scale. His contributions have been in both underground and surface mapping with structural interpretations. Dr. Proffett's efforts started with a month of mapping in 1987, with mapping of the 1350 drift in the underground mine. After 1987, Dr. Proffett did not return to the Property until 1996. Since then, he has mapped at Greens Creek continually every year to the present. His areas of focus have been Big Sore Basin, Upper Big Sore Ridge, Upper Big Sore, Lakes District, High Sore, Cliff Creek, Big Boil, Killer Creek, and the underground mine.

Andrew West, Greens Creek's exploration superintendent from 1998 to January 2011, contributed to the map shown in Figure 6-3 in portions of the Upper and Lower Zinc Creek areas as well as in the Cub Creek, Bruin Creek, Little Sore, and Gallagher prospects. His mapping was also performed at 1:24,000 scale.

7.1.3 Soil Sampling

Table 7-4 summarizes the soil sampling programs since 1974. The auger and MMI soil geochemistry results shown in Figure 7-1 and Figure 7-2 present contours of the silver concentrations in auger drilling and silver concentrations in MMI data, respectively. Similar maps reflecting contoured values for gold, lead, zinc, and copper have also been developed by Hecla's exploration team.

The auger soil sampling grids cover every known prospect from the southern to the northern boundaries within the Greens Creek's land package. Within each prospect, the grid spacing of samples is 100 ft (30 m) apart along grid lines spaced 300 ft (90 m) apart, which originate from an established baseline. Standard auger soil samples are taken at each station. All soil campaigns were successful in delineating geochemical anomalies within many of the prospects.

Since 2008, Hecla has continued investigating the land package for economic mineral potential by compiling historical rock and soil geochemistry results onto comprehensive maps.

Most recent efforts focus on developing soil geochemistry from within the North Young claim group. Prior to 2008, mine contact lithologies were identified by regional scale mapping within this area. This mapping successfully extended the contact 9,500 ft (2,896 m) in the district, warranting further follow up exploration. This included establishing a soil-sampling grid over the contacts' location and flanks. So far, the sampling has revealed some small anomalies which will be followed-up by infill sampling in order to develop targets. Hecla has mostly employed the use of inductively coupled plasma mass spectrometry (ICP-MS) analyses for 53 elements within this area. However, in 2010–2011 the use of MMI analysis was used on samples taken within the Greens Creek land boundary.

A total of 1,443 MMI and 2,309 auger soil samples have been collected since 2008. Results of the exercise suggested several single point anomalies within the soil data. Overall, the soil data points to the East Lil' Sore, Killer Creek, Gallagher Creek, and Bruin Creek target areas as the best surface geochemical targets. The soil geochemical data also appears to identify the two main structural trends dominated by the northwest-trending Maki and Gallagher Fault systems. The data also indicate that precious metals appear to favor the Maki Fault system and the base metals have a stronger relationship with the Gallagher Fault system.

Table 7-4: Summary Table of Greens Creek Soil Sampling Activities 1974-2020
Hecla Mining Company – Greens Creek Mine

Year	Contractor	Exploration Activity Completed	Purpose	Results
1974	Watts, Griffis and McOuat, Inc.	Initial soil geochemical sampling in Big Sore.	Define anomalies in the Big Sore target.	Defined numerous silver-zinc anomalies.
1975	Watts, Griffis and McOuat, Inc.	Expansion of the soil geochemical sampling grid at Big Sore.	Expansion of the previous Big Sore soil grid.	Expanded soil anomalies in the Big Sore area.
1976	Noranda	Soil geochemical sampling at Gallagher and Killer Creeks.	Expand soil sampling coverage in Gallaher and Killer Creek areas.	
1977	Noranda	Soil geochemical sampling at Big Sore, Gallagher, Killer Creek, Zinc Creek, and Mariposite Ridge.	Expand soil sampling coverage in all of the target areas at the time.	Local silver and zinc anomalies along the contact zone at Big Sore were identified. The expanded Killer Creek soil results identified 16 primary soil anomalies. Weak soil anomalies identified in Zinc Creek. The Mariposite soil results identified nine soil anomalies associated with mineralization located along the contacts of a mariposite-carbonate contact.
1988	Noranda	Soil geochemical sampling at Lil' Sore and Mariposite claims.	Define anomalies in the Lil Sore and Mariposite target areas.	Six anomalous soil geochemical zones were outlined.
1997	Kennecott	Soil sampling along seven new grids totaling 230,000 line-ft in the High Sore, Bruin, Lower Zinc, Upper Zinc, "A" Road, and Gallagher target areas.	Define anomalies in these target areas.	Soil sampling and geologic mapping outlined drill targets or areas for detailed follow up work in the Bruin, Gallagher, and Lower Zinc Creek target areas.
1988	Kennecott	One new soil grid in the Upper Big Sore target and extensions to three of the 1997 grids in Lower Zinc, Bruin, and the "A" Road target areas.	Define additional anomalies in these target areas.	Outlined numerous soil anomalies but none significant enough to warrant drill testing.
1999	Kennecott	Large Killer Creek soil survey and a new survey in the Cub Creek target areas.	Define additional anomalies in these target areas.	Numerous multi-element soil anomalies were defined.
2000	Kennecott	904 soil samples collected in the Bruin, High Sore, Killer Creek, Upper Gallagher, and Upper Zinc Creek target areas.	Define additional anomalies in these target areas.	Numerous multi-element soil anomalies were defined.

Year	Contractor	Exploration Activity Completed	Purpose	Results
2002	Kennecott	583 Soil samples collected in the Gallagher, Lil' Sore, and Lower Zinc Creek target areas.	Define additional anomalies in these target areas.	Identified numerous multi-element soil anomalies of which the most significant occurred at the southern end of the Zinc Creek target.
2003	Kennecott	757 soil samples collected in the Gallagher, Killer, and Lil' Sore target areas.	Expand and fill in previous soil sampling in these target areas to follow up on the anomalies identified in 2002.	Identified numerous multi-element soil anomalies of which the most significant occurring within the Lil Sore target area. The 2003 Gallagher soil results, when combined with the 2002 soil results, outlined two significant multi-element anomalies coincident with the mine contact zone.
2004	Kennecott	238 soil samples collected in the High Sore and Lil' Sore target areas.	Further define previous anomalies in these target areas.	In combination with the 1997 High Sore sampling, the 2004 results identified 11 multi-element soil anomalies.
2005	Kennecott	486 soil samples collected in the Cliff Creek, High Sore, and Killer Creek target areas.	Define additional anomalies in these target areas.	Eight multi-element soil anomalies identified in the Cliff Creek target area. Five multi-element anomalies identified in the Killer Creek target area.
2006	Kennecott	586 soil samples collected in the Cliff Creek, High Sore, Upper Zinc, and Young Bay target areas.	Define additional anomalies in these target areas.	Minor soil anomalies identified.
2008	Greens Creek Exploration Staff	658 auger soil geochemical samples and 658 MMI soil geochemical samples along 67,800 ft (20,665 m) of gridlines in the Young Bay area.	Begin to identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
2010	Greens Creek Exploration Staff	580 auger soil geochemical samples and 580 MMI soil geochemical samples taken in the North Young Bay area.	To identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
2011	Greens Creek Exploration Staff	818 auger soil geochemical samples taken in the North Young Bay area.	To identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
2012	Greens Creek Exploration Staff	253 auger soil geochemical samples taken in the North Young Bay area.	To identify geochemical anomalies in the Young Bay area.	Minor soil anomalies identified.
2013-2021				No soil sampling programs completed.

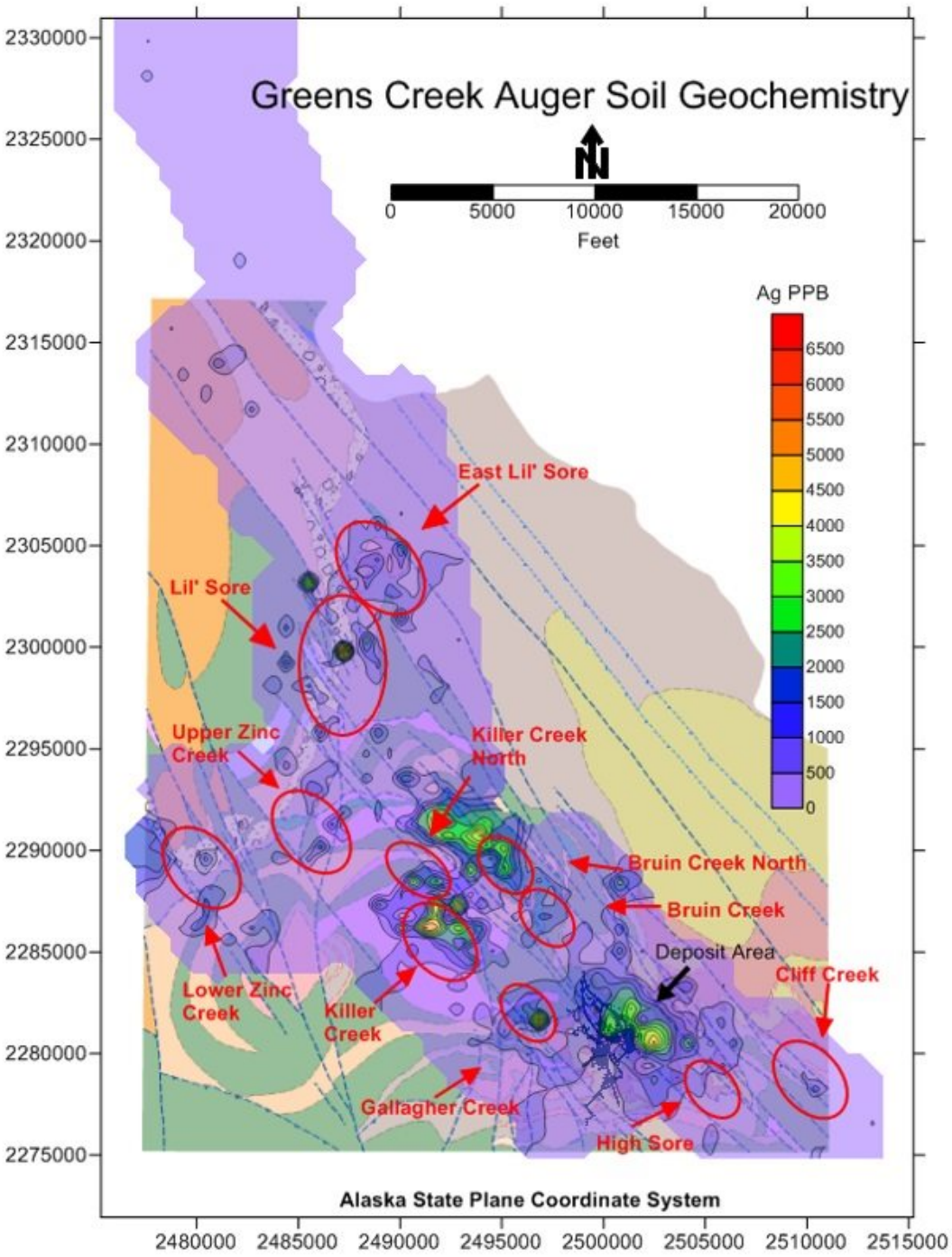


Figure 7-1: Greens Creek Soil Auger Geochemical Sample Location and Silver Contour Map

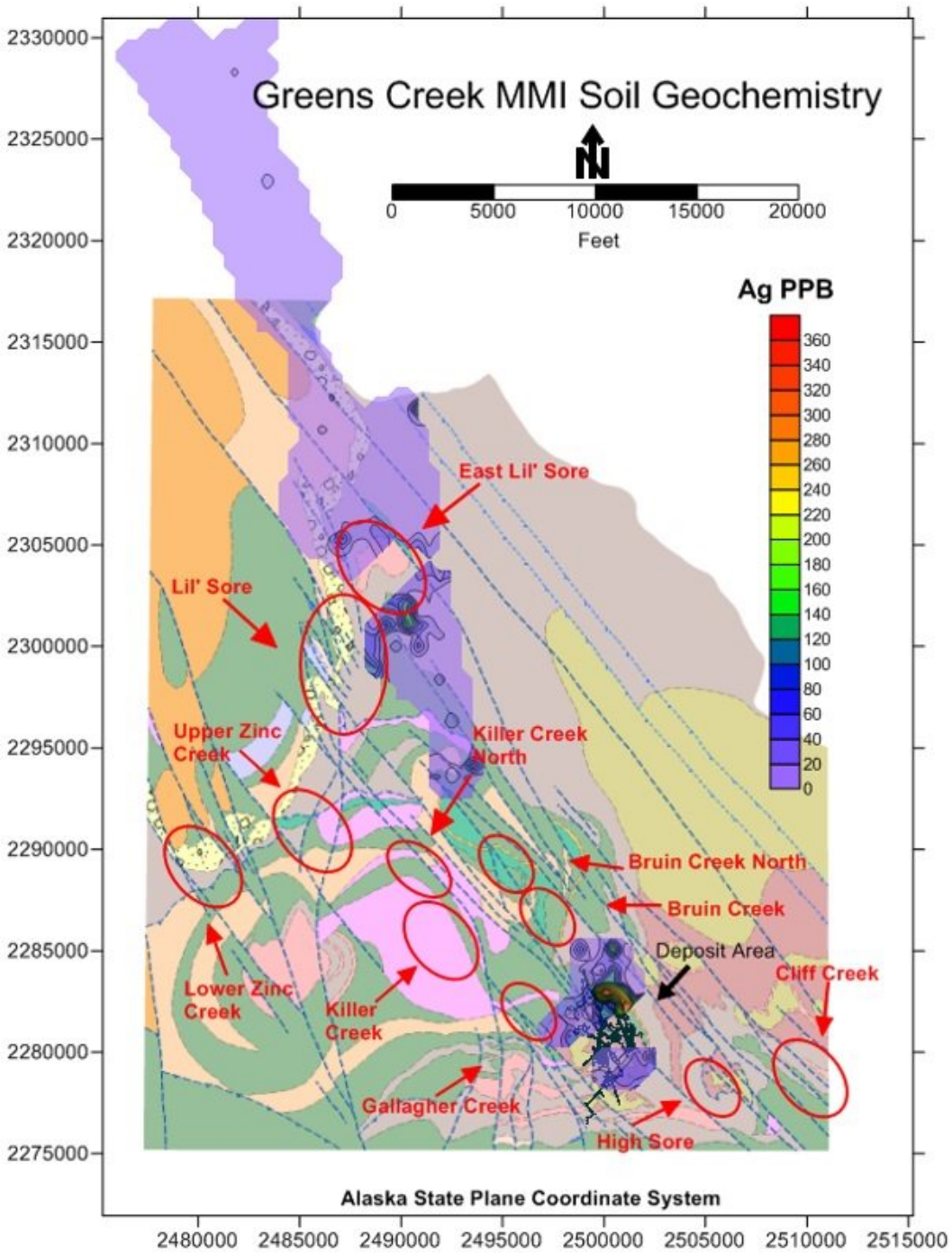


Figure 7-2: Greens Creek Soil MMI Geochemical Sample Location and Silver Contour Map

7.1.4 Geophysics

Various geophysical surveys have been conducted at Greens Creek since 1996 by several geophysical contractors and the previous Greens Creek owners.

Historic geophysical surveys prior to Hecla's acquisition of the Property in March 2008 include airborne, ground and bore-hole surveys. Details of these geophysical surveys are summarized in Table 7-5 and Section 5 of this TRS. Table 7-5 also summarizes the surveys undertaken between 1996 and 2007 including 1,227 line km of AeroDat airborne frequency-domain EM, magnetic, and radiometric surveys (1996), ground pulse EM (1998-99), gravity (1996–98), magnetic (1997–2003), controlled-source audio-frequency magneto-telluric (1996–2007), and audio-frequency magneto-telluric (2004–05) surveys, and bore hole TEM and UTEM3 surveys (1996–2004).

The results from the ground gravity surveys are summarized in Figure 7-3, those of the ground magnetic surveys in Figure 7-4, and the AeroDat geophysical survey results are included as Figure 7-5.

VOX Geoscience Ltd. based out of Vancouver BC, Canada, was contracted in 2010 to assist in the compilation of the historical geophysical surveys completed on the Property and to recommend geophysical survey methods that could be effective in future exploration work. Data from the 1996 AeroDat airborne survey was high quality but in the 15 years since the survey was flown; geophysical software and processing methods have steadily improved.

Beginning in late 2010 and early 2011, Hecla began a program of re-processing the airborne survey results. The first step involved micro-levelling the aeromagnetic data to remove the effects of line offsets and line corrugation. The survey was studied line by line and any spurious readings that could be attributed to man-made cultural interference were removed by hand. The resulting, cleaned, grid was then filtered. Figure 7-6 presents a close up of the Greens Creek and Big Sore areas with the re-processed tilt derivative contouring. A very good fit between the mapped northeastern mine contact and the western edge of the strong magnetic low (blue) can be observed.

Techno Imaging of Salt Lake City was contracted in late 2010 to use their 3D EM Inversion software on a 211 line-mi (340 line-km) subset of the 1996 AeroDat EM survey. The results from application of this inversion on the data subset provided little additional insights. Consequently, the remaining 551 line-mi (887 line-km) of data were not inverted.

Table 7-5: Greens Creek Geophysical Surveys 1996 through 2020
Hecla Mining Company – Greens Creek Mine

Survey Type	Year	Contractor	Survey Location(s)	Spacing	Purpose	Results
Fixed Loop TEM	1996	Zonge Engineering	Gallagher Gridlines 3800N to 5400N	50 ft	Orientation survey over the western-most extent of the GC mineral body to see what geophysical method may provide useful data and help optimize future surveys.	Able to detect the West Ore as a large 400 ft by 200 ft .1 ohm-m conductor at depth of 800 ft
Downhole TEM	1996	Zonge Engineering	PS-111, PS-112, GC1530	5 m	Test DH-TEM.	GC1350 detected the West Ore body and the PS-holes had an anomalous response coincident with a narrow sulfide band.
CSAMT	1996	Zonge Engineering	Gallagher Gridlines 5000N and 4600N	100 ft spacings, all scalar measurements	Underground Orientation survey over the NW-W mineral zone to determine if gravity could detect a GC mineral zone.	Subsurface conductors coincide with the west projection of the Upper plate NW-W Zone, suggests taking E-filed measurements parallel to strike.
Gravity (UG)	1996	Greens Creek personnel, data processed by James Fueg, KEX geophysicists	59 Drift,36 Decline,33 X-Cut and 52 X-Cut over the West Ore Zone	95 stations over 6,400 line-ft (50 ft to 100 ft spacings)	Orientation survey over the western-most extent of the GC mineral body.	Detected a 1.5 mgal high over the West Ore Zone.
Surface Gravity	1996	Greens Creek personnel, data processed by James Fueg, KEX geophysicists	Gallagher Gridlines 5000N and 4600N	50 ft	Test surface gravity over the West Ore Zone and Maki Fault.	Only a minor to non-existent response over the West Ore, mineral body may be too deep to detect.
Aerial Magnetics, EM, and radiometrics (K, Th, U)	1996	AeroDAT	Over entire Land Package and much of Mansfield Peninsula	200 m line spacings, 100 m spacings near mine	Provide property wide geophysical maps for regional geologic mapping and 1st order targeting.	EM survey outlined the mine contact very well through-out the Property, mag data shows the ultramafic bodies also very well. Was very useful to the regional geologic map. Selected EM anomalies not rigorously evaluated.

Survey Type	Year	Contractor	Survey Location(s)	Spacing	Purpose	Results
Pulse EM Grid Surveys	1997	Crone Geophysics	Gallagher, Bruin, Lower Zn, Upper Zn (East), 'A' Road, and High Sore grids	100 ft station spacings with 400 ft line spacings (800 ft spacings in the 'A' Road grid)	Provide ground EM data on recently cut and sampled gridlines to map geology and outline possible conductive anomalies.	Agrees well within existing known trend of lithologic units and aerial EM.
3D Downhole Pulse EM	1997	Crone Geophysics	PS-120, PS-121, and PS-122	uncertain	Test for any off hole conductive horizons that may represent mineralization, also map project intersected sulfide bands away from the hole.	Conductor 200 ft below the TD of PS-120 was identified, hole was re-entered in 1998 and intersected 24 ft of graphic phyllite at the conductor target.
Ground Gravity	1997	Tony Newman (operator) Clarke Jorgenson (processor)	Gallagher, Bruin, Lower Zn, Upper Zn (East), 'A' Road, and High Sore grids	100 ft station spacings with 400 ft line spacings (800 ft spacings in the 'A' Road grid)	Detect possible massive sulfide or baritic bodies at depth.	No significant anomalies found that do not correlate with topography
Pulse EM Grid Surveys	1998	Crone Geophysics	New extensions of the Gallagher, Bruin (north-end), Lower Zn, 'A' Road Grids, Upper Big Sore grid and other KEX grids.	100 ft station spacings with 400 ft line spacings (800 ft spacings in the 'A' Road grid)	Provide ground EM data on recently cut and sampled gridlines and extensions to map geology and outline possible conductive anomalies.	Agrees well within existing known trend of lithologic units and aerial EM.
Downhole Pulse EM	1998	Crone Geophysics	PS-123, PS-124, PS-125, PS-126, and PS-127	uncertain	Test for any off hole conductive horizons that may represent mineralization, also map project intersected sulfide bands away from the hole.	All significant responses are due to lithologic changes at footwall-argillite contacts, West Bruin contact could be seen off hole with increasing conductivity to the south and/or west in PS-126 and Zn-Pb mineralization 400M down in PS-123 correlates with conductive body centered to the south of hole.

Survey Type	Year	Contractor	Survey Location(s)	Spacing	Purpose	Results
Ground Magnetometer	1998	KGCMC Personnel	Bruin (north-end), Upper Big Sore, Lower Zn, and 'A' Road grids.	Approximately every 10 ft, was run in walking mag mode (must verify) along lines, 400 ft line spacings (800 ft in 'A' Road grid)	Aid in geologic mapping of the newly emplaced grids.	Ground mag data generally replicates the trends seen in the aeromagnetic data. Highlights exposed and suspected ultramafic bodies
Ground Gravity	1998	Clarke Jorgenson	Bruin (north-end), Upper Big Sore, Lower Zn, and 'A' Road grids.	100 ft station spacings with 400 ft line spacings (800 ft spacings in the 'A' Road grid)	Detect possible massive sulfide or baritic bodies at depth.	Generally, correlates well with topography. High along Bruin line 2400N and another within the 'A' Road grid that is coincident with a PEM anomaly are features of interest.
Downhole 3-Component TEM	1999	Zonge Engineering	PS-130 through PS-137	10 ft	Detect possible off-hole conductive anomalies.	All but PS-135 had indicated conductive anomalies that correlated with conductive lithologic units.
Ground Magnetometer	2000	KGCMC Personnel	Killer Creek, Cub Creek, and Lakes District grids	20 ft	Aid in geologic mapping of the newly emplaced grids.	Ground mag data generally replicates the trends seen in the aeromagnetic data. Highlights exposed and suspected ultramafic bodies
CSAMT	2000	Zonge Engineering	Bruin and Cub Creek lines 2400N, 2800N, and 3200N, and Killer Creek lines 800N, 1200N, and 2000N	100 ft	Map out the various exposed contacts in the Bruin and Cub Creeks to a greater depth, explore for buried argillite contact in Killer Creek where no argillite is exposed.	Detected the buried East Bruin contact (argillite syncline), defined the geometry of the exposed Bruin contact. Steep conductors on the west side of Killer Creek remain unexplained.

Survey Type	Year	Contractor	Survey Location(s)	Spacing	Purpose	Results
CSAMT	2002	Zonge Engineering	Killer line 2800N, Bruin lines 800N and 4400N, Lower Zn lines CSAMT1, CSAMT2, and CSAMT3	100 ft spacing along selected lines. Mostly vector measurements	Provide subsurface resistivity mapping for determining contact (target) geometry for drill hole orientation.	The three lines in Lower Zn defined the geometry of the argillite and graphitic phyllite units. Bruin line 4400N shows a deep conductor that may be the northern extensions of the East Bruin Contact. Deep conductor along Killer 2800N was attributed as the West Bruin Contact, however drilling did not intersect any conductive units.
CSAMT	2003	Zonge Engineering	Killer line 2000S, Bruin lines 2000N and 3200N, Upper Zn lines line 2000N, and Gallagher Line 4400N and 5200N	100 ft spacings, mostly vector measurements	Provide subsurface resistivity mapping for determining contact (target) geometry for drill hole orientation. Killer line (2000S) was exploring for the north projection of the West Gallagher argillite.	All lines surveyed showed conductive units that conform with surface mapping and adding greatly in understanding the subsurface geology.
Ground Magnetometer	2003	KGCMC Personnel	West Gallagher, East Lower Zn extension, South Lil' Sore, NW Mammoth	50 ft	Aid in geologic mapping of the newly emplaced grids.	Maps out geology, especially the ultramafics that outcrop in the South Lil Sore and NW Mammoth grids
AMT	2004	Phoenix Geophysics	Upper Gallagher Lines XS200b and LS2000	150 ft	Test the AMT technique at Greens Creek and explore for the Gallagher Mineral Resource Zone and conductive argillite on west side of Gallagher Fault at a depth of >2,000 ft from surface.	Two conductive bodies were mapped the correlates with the Gallagher argillite and an upper argillite unit intersected in PS-223
Complex Resistivity Bench Tests	2004	Zonge Engineering	Selected UG and surface drill core	N.A.	Provide resistivity data for modeling the MT/AMT survey in upper Gallagher. Most core samples were from Gallagher drill holes.	CR results from representative lithology shows a wide range of resistivities.

Survey Type	Year	Contractor	Survey Location(s)	Spacing	Purpose	Results
Downhole UTEM3	2004	SJ Geophysics	GC2459, GC2463, GC2551, PS0153, PS0161, PS0166, PS0169, PS0203, PS0210, PS0219, and PS0223	uncertain	Original aim was to downhole survey GC2551 and PS0223 which intersect or comes close to the new Gallagher Mineralized zone to determine its possible extent and structural orientation.	GC2551 could not be surveyed and only half of PS0223, thus other holes were surveyed. The survey of PS-210
MT/AMT	2005	Phoenix Geophysics	Upper Gallagher, 12 XS and 11 LS lines spaced 100 ft to 200 ft apart.	150 ft	Expand on the 2004 AMT survey in Upper Gallagher to determine the possible extend of the Gallagher Mineral Resource and use MT frequencies to model deeper.	Four anomalies were identified, most related to known and drilled argillite horizon near surface.
Gravity re-modeling	2005	Big Sky Geophysics	Gallagher, Bruin, Upper Zn (East), Upper Big Sore, Lower Zn, and 'A' Road and High Sore grids	100 ft	Remodel the gravity data from the 1997 and 1998 surveys using the greatly improved LiDAR terrain data for the terrain corrections.	Forward modeling shows much better resolution with Lidar data as opposed to inclinometer measurements at stations. Gravity highs in High Sore and 'A' Road grids need further investigation.
MT 3D Model	2007	GeoSystems	Upper Gallagher grid	used data from MT/AMT survey	Use the closed spaced grid data from the 2004 and 2005 MT/AMT to create a 3D model below Upper Gallagher.	Upper argillite is well modeled across the entire survey area, lowest conductor that can be modeled is at 700 m depth (Above the Gallagher Zone). Modeled only down to sea-level.
CSAMT	2007	Zonge Engineering	East Lil Sore lines 2000N, 4400N, 4800N, and 5600N, Young Bay lines 5600S, 6400S, and 8000S, and NW Mammoth 6000N.	100 ft spacings, mostly vector	Survey above the East Ridge prospect and its projection of the north to determine the geometry of the contact.	East Ridge contact well mapped out by conductive units. Young Bay gridlines define graphitic phyllite over conglomerate contact much better than the conglomerate over argillite (Mine) contact.
PEM	2011	Crone	Killer Creek	10 m	Determine location and geometry of argillite contact in Killer Creek.	No contact encountered
PEM	2011	Crone	Killer Creek	25 m	Determine location and geometry of argillite contact in Killer Creek.	No contact encountered
Volterra Borehole EM	2014	SJ Geophysics	Killer Creek		Determine location and geometry of argillite contact in Killer Creek.	Frequencies employed were too high. The U and V components of the magnetometer were too noisy, so no 3D orientation of conductors available.
	2015-2021					No geophysical surveys completed.

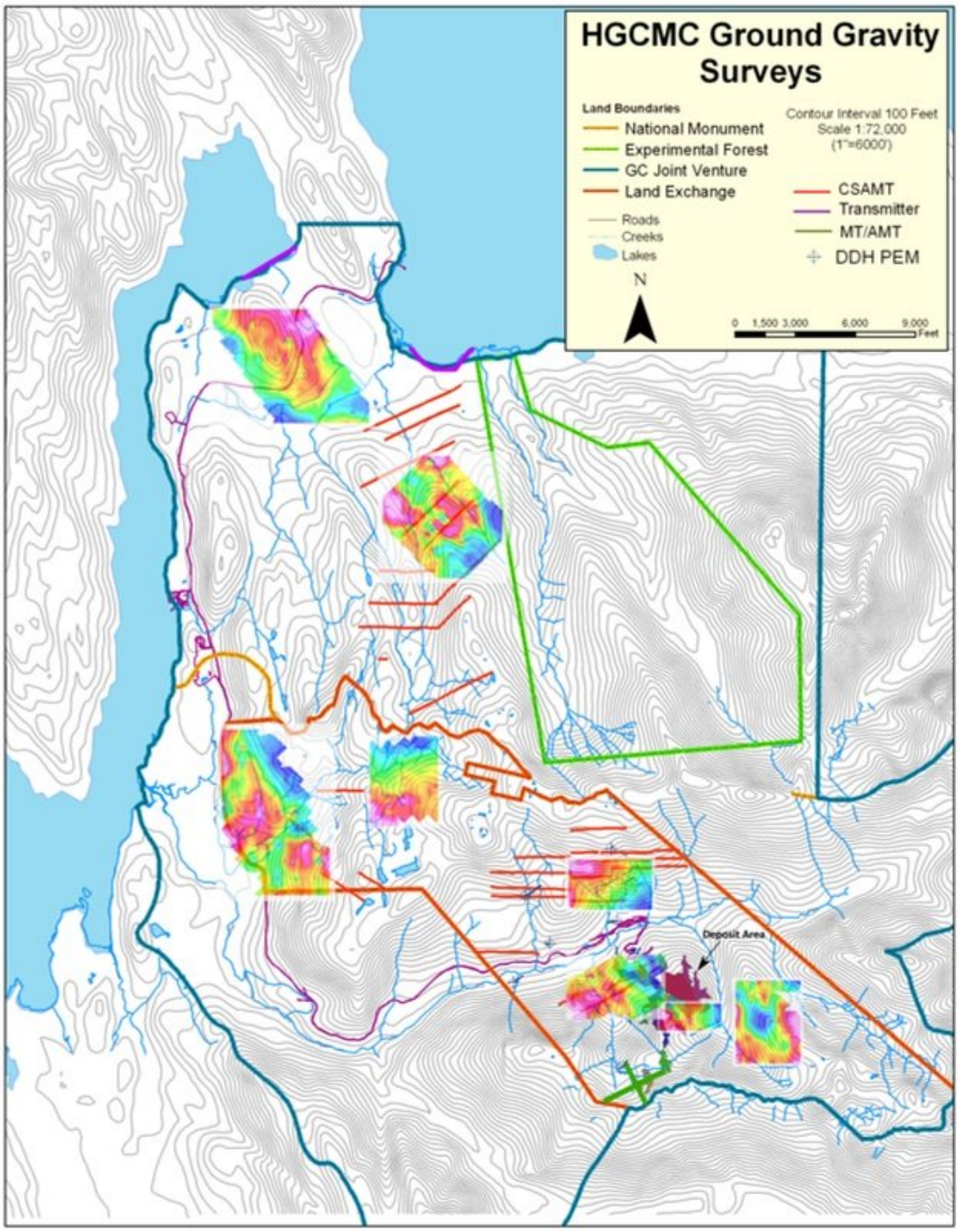


Figure 7-3: Greens Creek Ground Gravity Surveys

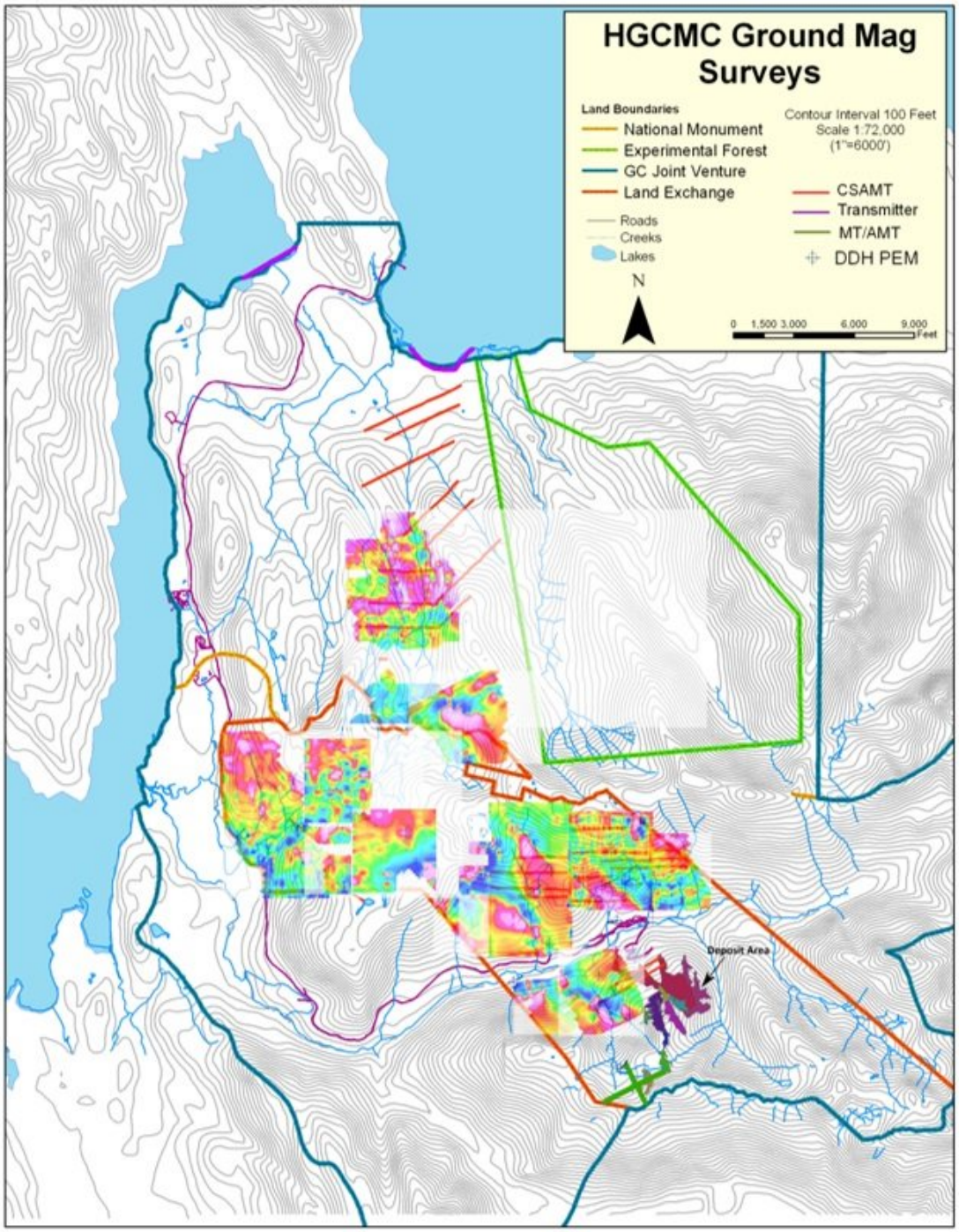


Figure 7-4: Greens Creek Ground Magnetic Surveys

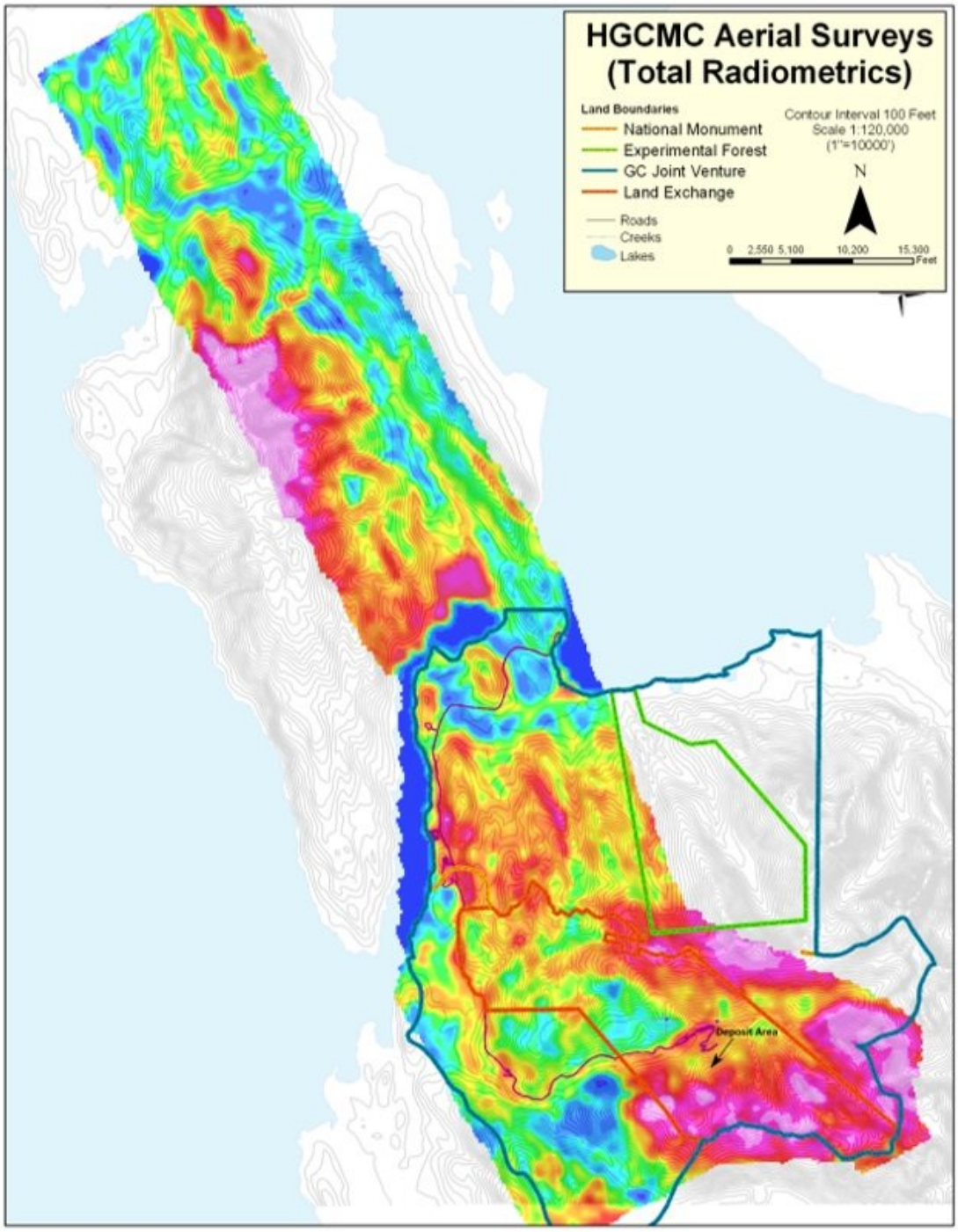


Figure 7-5: Greens Creek AeroDat Surveys Total Radiometrics

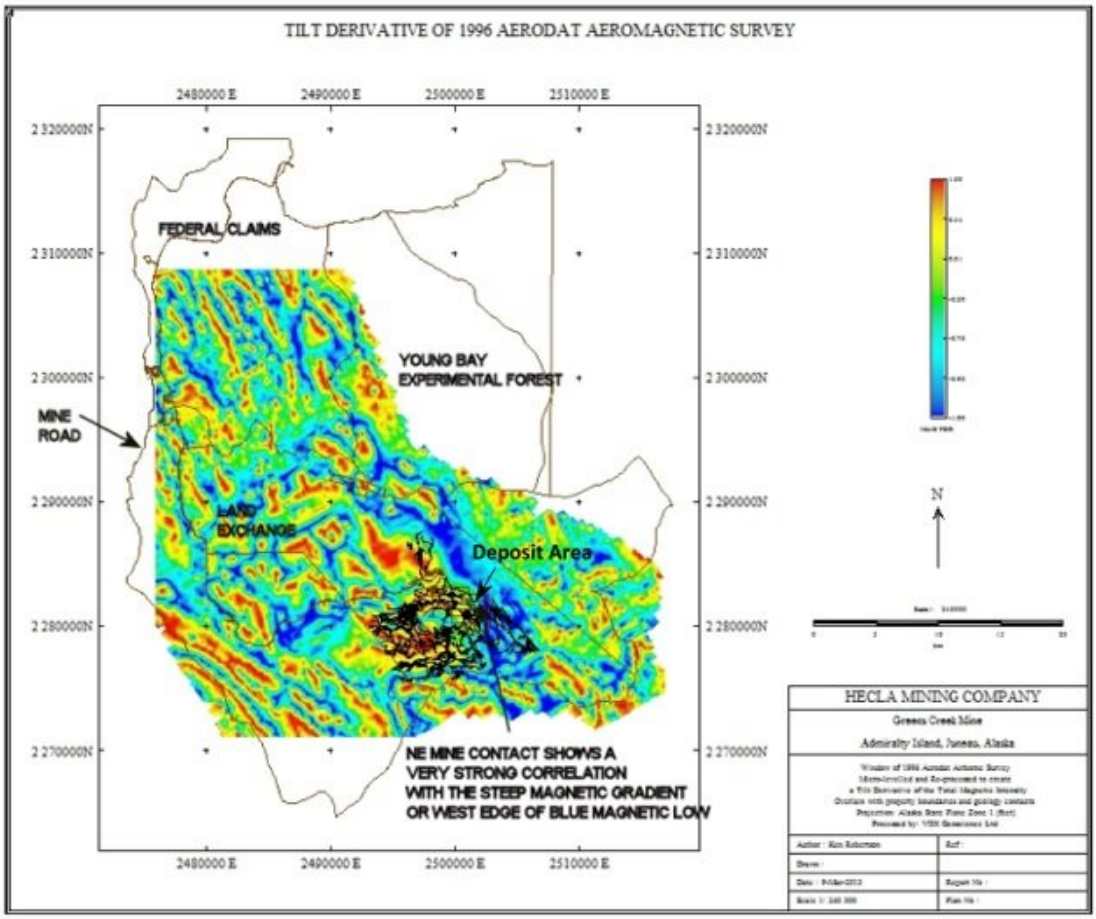


Figure 7-6: Greens Creek 2010-2011 Tilt Derivative Reprocessing of the AeroDat Survey Magnetics Data

In 2011, Crone Geophysics & Exploration Limited based in Mississauga, Ontario, Canada, was contracted by Hecla to conduct surface and borehole pulse EM surveys on the Killer Creek target area. Twelve surface lines utilizing two surface loops and two boreholes were surveyed form one transmitter loop. The surface surveys were carried out using a time base of 100.00 milliseconds (2.5 Hz) with a 1.5 m/s shut-off ramp time. Vertical and in-line data were collected at a nominal station spacing of 82 ft (25 m).

Some interesting but confusing data were acquired as the host lithologies in the area can be very conductive. In particular, discriminating graphitic sediments from sulfides is problematic for EM surveys. However, the Crone Pulse Electro Magnetic data was modelled with Electromagnetic Imaging Technology Maxwell software, which resulted in the isolation of a small conductor from the background conductivity. This small conductor was drill tested in 2012 and copper-rich sulfide mineralization was intersected in a vein zone varying from 2.1 ft to seven feet (0.6 m to 2.1 m) with anomalous copper and silver values.

7.1.5 Petrology, Mineralogy, and Research Studies

Hecla and its predecessor companies have commissioned specialist petrographic and mineralogic reports in support of elucidation of mineral species and lithological determinations. A number of professional papers and research studies have been completed on the Greens Creek deposit and surrounding area, including:

- USGS Professional Paper 1763: Geology, Geochemistry, and Genesis of the Greens Creek Massive Sulfide Deposit, Admiralty Island, Southeastern Alaska.
- Anderson, V.M., and Taylor, C.D., 2000: Alteration Mineralogy and Zonation in Host Rocks to the Greens Creek Deposit, Southeastern Alaska: Geological Society of American Cordilleran Section Meeting, Abstracts with Programs, v. 32. No. 6, p. A-2.
- Dressler, J.S., and Dunbire, J.C., 1981: The Greens Creek ore deposit, Admiralty Island, Alaska: Canadian Institute of Mining and Metallurgy Bulletin, v. 74, no. 833, p. 57.
- Franklin, J.M., and McRoberts, S., 2009: Report on Analytical Reliability and Method Selection for Hecla Greens Creek Mining Company.
- Freitag, K., 2000: Geology and Structure of the Lower Southwest Orebody, Greens Creek Mine, Alaska: Colorado School of Mines Thesis.
- Freitag, K., 2010, Structure of the Lower Southwest Orebody, Structural Com-parison to Neighboring Orebodies, and Tectonic Model for the Greens Creek Deposit, in Taylor, C.D. and Johnson, C.A., eds., Geology, Geochemistry, and Genesis of the Greens Creek Massive Sulfide Deposit, Admiralty Island, Southeastern Alaska: U.S. Geological Survey Professional Paper 1763, p. 367–401.
- Fulton, R.L., Gemmell, J.B., West, A., Lear, K., Erickson, B., and Duke, N., 2003: Geology of the Hanging Wall Argillite Sequence, Greens Creek VHMS Deposit, Admiralty Island, Alaska, GAC-MAC Abstract, v. 28, p. 299.
- Newberry, R.J. and Brew, D.A., 1997, The Upper Triassic Greens Creek VMS (volcanogenic massive sulfide) deposit and Woewodski Island VMS pros-pects, Southeastern Alaska; chemical and isotopic data for rocks and ores demonstrate similarity of these deposits and their host rocks: U.S. Geo-logical Survey Open File Report 97-539, p. 49.
- Sack, P., 2009: Characterization of Footwall Lithologies to the Greens Creek Volcanic-Hosted Massive Sulfide (VHMS) deposit, Alaska, USA: PhD thesis, Univ. of Tasmania.
- Steeves, N., 2018. Mineralization and Genesis of the Greens Creek Volcanogenic Massive Sulfide (VMS) Deposit, Alaska, USA. Unpublished PhD, University of Tasmania, Hobart, Australia, 416p.
- Taylor, D.D., Newkirk, S.R., Hall, T.E., Lear, K.G., Premo, W.R., Leventhal, J.S., Meier, A.L., Johnson, C.A., and Harris, A.G., 1999: The Greens Creek Deposit Southeastern Alaska – A VMS-SEDEX Hybrid: in Stanley, D.J., and others, eds., Mineral Deposits – Processes to Processing, Rotterdam, Balkema, v. 1, p. 597– 600.
- Taylor, D.D., Premo, B.R., and Lear, K.G., 2000: The Greens Creek Massive Sulfide Deposit – Premier Example of the Late Triassic Metallogeny of the Alexander Terrane, Southeastern Alaska and British Columbia [abs.]: Geological Society of America Abstracts with Programs, v. 32, no. 6, p. A-71.

7.1.6 Exploration Potential

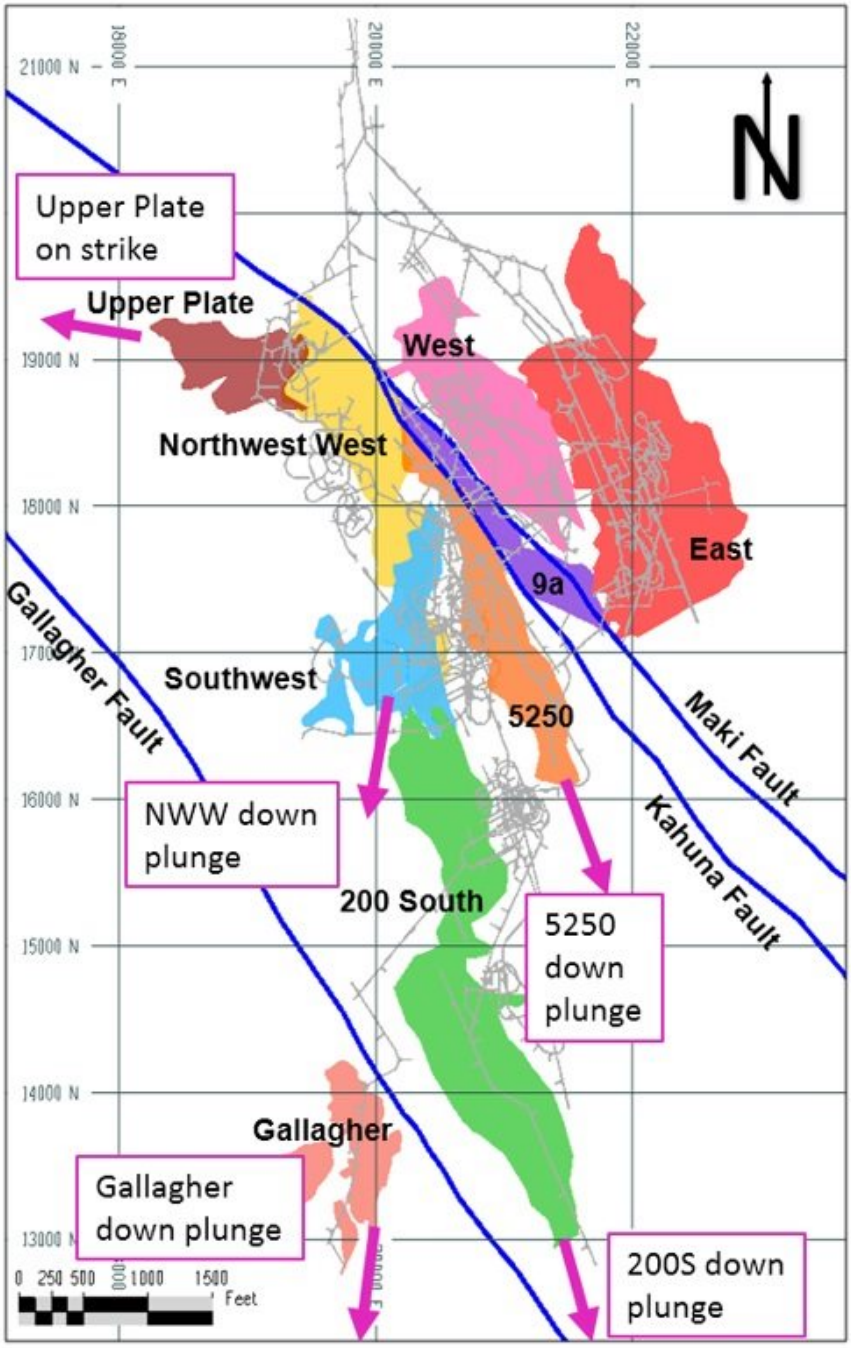
Greens Creek exploration programs are designed to continually develop prospective target areas, evaluate emerging prospects, and test potential economic targets. Development of favorable areas includes regional mapping, followed by geochemical sampling and/or geophysical surveys. Evaluation activities include detailed geologic mapping and the incorporation of refined historical data with new exploration data to establish target potential. Testing involves diamond core drilling with the assessment of new information. Since Hecla assumed 100% ownership of Greens Creek in 2008, surface exploration programs have tested several prospects per season.

In 1977, it was recognized that the mineralization at Greens Creek is associated with the lithologic contact between argillite and phyllite. This was dubbed the “mine contact”. To date, much of the mine contact on the Greens Creek claim block has not been tested, even at coarse spacing on the order of 1,000 ft (approximately 300 m).

The main feeder system under the Greens Creek deposit is still being targeted where it meets the mine contact in the mine area. A separate, lower feeder system was found to mineralize the mine contact on a major anticline below the mine workings. This lower system has not been tested over most of the northern claim area.

Underground exploration at Greens Creek has historically followed the mine contact down dip and down plunge. When the contact is interrupted by major structural boundaries such as the Klaus Shear or the Maki and Gallagher Fault systems, the exploration strategy concentrates on locating the mine contact across the structure, then continuing to follow it down plunge. After the initial discovery of the East Zone, the implementation of this strategy has led to the discovery of the West, Northwest West, 9A, 5250, Southwest, 200 South zones, and most recently the Deep 200 South and Gallagher zones.

Exploration targets underground are categorized as emerging or advanced based upon the amount of drill testing that has been applied to that target. Currently there are five major exploration targets being tested at Greens Creek, all on the main Greens Creek feeder system. They are: 1) down plunge on the 200 South Zone, 2) down plunge on the Gallagher Zone, 3) down plunge on the Northwest-West Zone, 4) down plunge on the 5250 Zone and 5) along strike on the Upper Plate Zone. These targets are shown in relationship to the current Mineral Resources in Figure 7-7.



Note:

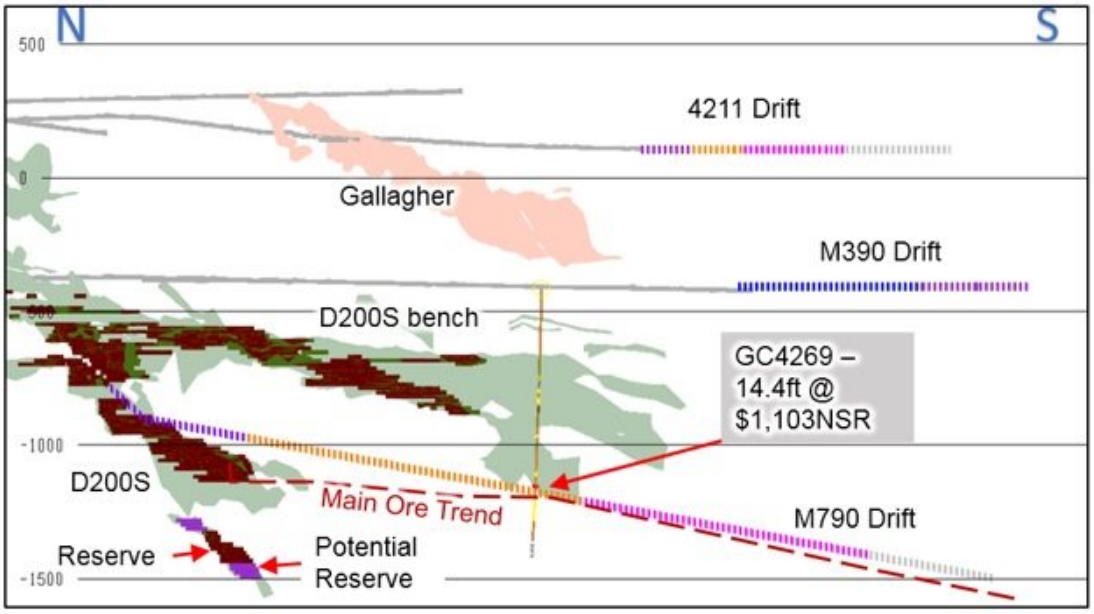
1. Magenta boxes and arrows show exploration targets.

Figure 7-7: Plan View of Underground Exploration Targets in Relation to the Mineral Zones

7.1.6.1 200 South Down Plunge

The Deep 200 South Zone projects to the south approximately 750 ft to 1,000 ft from current Mineral Resource limit to the Gallagher Fault where it is likely cut and offset to become the Gallagher Zone. As ore grade mineralization is present in drilling at the southern end of the known 200 South Zone, and as the Gallagher Zone also has mineable grades, it is expected that drilling down plunge on the 200 South Zone will intercept 750 ft to 1,000 ft of well mineralized rock before being cut off by the Gallagher Fault.

Exploration down plunge has typically been from an exploration drift at the -390 ft elevation, which will continue to work for defining the upper benches of mineralization described in Figure 6-43. This bench mineralization does not represent the main mineral trend of the 200S Zone at the southern end however as the hotter MFP and MFB mineralization diverged from the bench and are now located on an anticlinal hinge below the benches at approximately 1,100 ft elevation. To adequately test and convert this main trend of mineralization another exploration drift at the -790 ft elevation is planned. This exploration work will continue for several years into the future. Figure 7-8 shows the planned drifts for carrying out diamond drilling programs targeting the Deep 200 South Zone and the Gallagher Zone.



Note:

1. Long section, looking east .

Figure 7-8: Drifts Planned for Exploring Down Plunge on the Gallagher Zone (4211 Drift), Upper Bench of 200S Zone (M390 Drift), and Lower Trend of 200S Zone (M790 Drift)

7.1.6.2 Gallagher Zone Down Plunge

The Gallagher Zone is interpreted as the faulted offset of the 200 South Zone. Based on this interpretation, the zone represents the down plunge continuation of the upper bench of the 200 South as depicted in Figure 6-43. Below this bench the main trend of Greens Creek has been identified under the 200 South Zone, but drilling has not been carried out to follow this trend to the south. The M790 drift shown in Figure 7-8 will be necessary to follow this main trend to the south with diamond drill holes. The 4211-exploration drift will also continue to advance to the south to follow the upper level bench mineralization as shown in Figure 6-43.

7.1.6.3 Northwest West Zone Down Plunge

The Northwest West Zone represents the lowest of three mineralized trends identified at Greens Creek. Down plunge from the current Mineral Reserve significant Inferred Mineral Resource is present and is open to the south. Recent completion of the PD150 ramp has given access for drilling this down plunge extension which has begun in 2019. This mineralization will be followed to the south until it terminates or connects with the lower levels of the Southwest Zone.

7.1.6.4 5250 Zone Down Plunge

Underground exploration drilling in 2016 and surface drilling in 2017 identified mineralized mine contact approximately 2,000 ft south of, and on trend with, the current 5250 Zone Mineral Resource. This drilling indicates that the 5250 Zone trend may host significant mineralization between the Mineral Resource and the exploration drilling. Surface exploration drilling was planned to step closer to the 5250 Zone Mineral Resource but was canceled due to a focus of exploration work on Upper Plate Zone drilling in 2018. As this 2,000 ft of open ground is highly prospective it will be targeted in the future from both surface and underground drilling.

7.1.6.5 Upper Plate along strike

A reinterpretation of this zone suggests it is open down plunge to the south and to the north. Further drilling is planned to test this interpretation.

7.1.6.6 Lower Feeder System

Below the entire mine, but still on the mine contact, mineralization has been found on a major anticline which closes to the east. The mineralization, called the "Northeast Contact" target, was tested in the mine area and to the north across the Greens Creek drainage from 2008 to 2011. Though a hydrothermal system was clearly active in this area, and some high grade intercepts were encountered, no Mineral Resource or Mineral Reserve was discovered.

While better defining the main feeder system for the Greens Creek deposit in drilling and on surface, a second, lower feeder system was apparent. This feeder system coincides with the "Northeast Contact" target and appears be the source of mineralization at the Lil' Sore prospect (Figure 5-1) Between these two target areas, a distance of over 2.5 mi (four kilometers), significant mine contact is expected to be present at depth and remains to be tested. As VMS mineralization is typically located where feeder systems intersect the mine contact, this area is considered as highly prospective.

7.1.6.7 Other Prospects

Many other prospects are present across the claim block as the geochemical sampling maps indicate. Analysis of exploration results can be difficult as geochemical anomalies may be located in footwall host rocks and geophysical anomalies such as magnetic, gravity or conductive highs can just as easily be associated with greenstone, serpentinite or graphitic argillites and schists, respectively. Overturned F_2 folding also complicates interpretation of the exploration results, as the mine contact may be folded under footwall lithologies at any place on the claim block.

Mineralization at Zinc Creek is folded and likely associated with the main Greens Creek feeder system but has a large thrust complicating the geology (Figure 5-1 and Figure 6-3). The mineralization is present between the Zinc Creek and Lil' Sore prospects and is defined with very few drill holes. More drilling is needed to adequately assess the mineral potential of this area.

Southeast of the mine several square kilometers of the claim block is essentially unexplored. The USGS has indicated that the mine contact is present less than 1,500 ft below surface in this area (Karl, 2016). Furthermore, the Hyd Group which dominates the surface outcrop in this area may yet have VMS deposits within the section as others VMS deposits are in the Triassic Metallogenic Belt.

7.1.7 Comments on Exploration

In the QP's opinion:

- The exploration programs completed to date are appropriate to the style of the deposit and prospects.
- The research work supports Hecla's genetic and affinity interpretations for the deposits.
- Additional drilling has a likelihood of generating further exploration successes, particularly down-plunge of known zones.

7.2 Drilling

A total of 8,202 drill holes totaling to 4,024,918 ft (1,226,795 m) have been completed over the entire Project area from 1975 to 2020 (Figure 7-9; Table 7-6 and Table 7-7). Of these drill holes, 412 drill holes totaling 508,454 ft (154,977 m) are surface-based holes drilled for exploration or Mineral Resource development purposes. Underground exploration or Mineral Resource definition drill holes total 5,462 for 2,996,378 ft (913,296 m) and are typically drilled on 50 ft to 200 ft (15 m to 60 m) spaced vertical sections. The remaining 2,328 drill holes, totaling 520,088 ft (158,523 m), are underground pre-production drill holes that are drilled on cross-sections and plan-views spaced from 20 ft to 50 ft (15 m to 60 m).

All bedrock drilling has been completed using conventional wireline coring methods. Surface-based drill holes collared in unconsolidated sediments utilize RC methods until bedrock is encountered (typically less than 100 ft or 30 m) and are then completed using conventional wireline coring methods.

7.2.1 Pre-2008 Legacy Drilling

Prior to 2008, a total of 4,792 drill holes (2,196,694 ft or 669,553 m) had been completed (Table 7-6). Of these drill holes, 307 (305,887 ft or 93,234 m) are surface holes drilled for exploration or Mineral Resource development, 2,963 (1,590,079 ft or 484,656 m) are underground Mineral Resource definition drill holes, and 1,522 (300,728 ft or 91,662 m) are underground pre-production drill holes.

7.2.2 Hecla Drilling

Since 2008, a total of 3,410 drill holes (1,828,223 ft or 557,242 m) have been completed (Table 7-7). Of these drill holes, 105 (202,567 ft or 61,742 m) are surface holes drilled for exploration or Mineral Resource development, 2,499 (1,406,299 ft or 428,640 m) are underground Mineral Resource definition drill holes, and 806 (219,360 ft or 66,861 m) are underground pre-production drill holes.

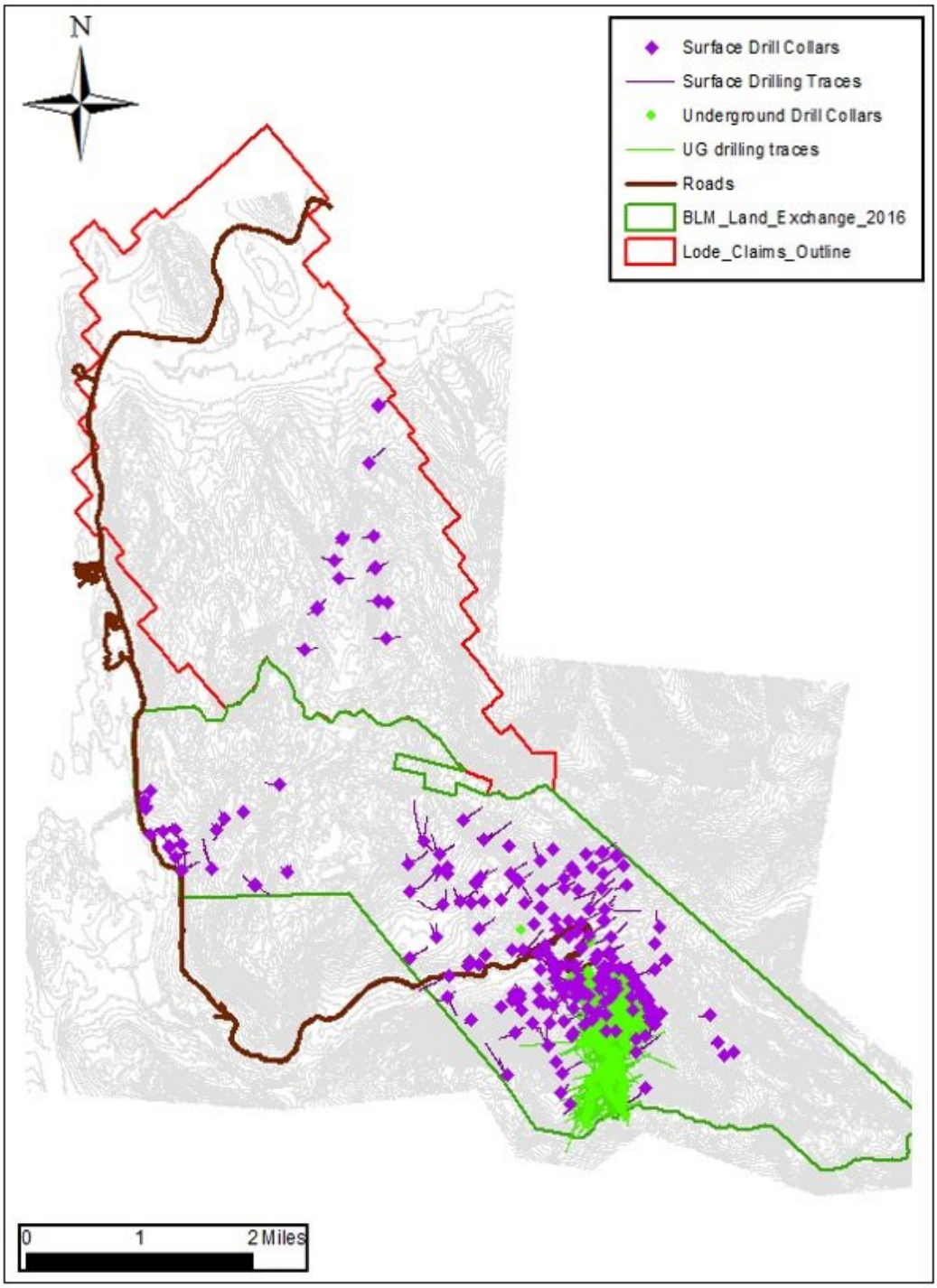


Figure 7-9: Plan View Map with Drill Hole Locations

Table 7-6: Summary of Legacy Drilling- 1975 to 2007
Hecla Mining Company – Greens Creek Mine

Year	Surface Exploration (PS Series)		Underground Definition & Exploration (GC-series)		Pre-production / Stope Planning (PP+ST-series)		Annual Totals		Drill Contractor
	Holes	Feet	Holes	Feet	Holes	Feet	Holes	Feet	
1975	3	997	-	-	-	-	3	997	Wink Brothers
1976	16	5,350	-	-	-	-	16	5,350	
1977	19	7,901	-	-	-	-	19	7,901	
1978	-	-	4	1,427	-	-	4	1,427	Unknown
1979	-	-	40	17,094	-	-	40	17,094	
1980	-	-	34	13,528	-	-	34	13,528	
1981	-	-	-	-	-	-	0	0	
1982	13	12,220	-	-	-	-	13	12,220	Diamond Drill Contracting Co
1983	17	7,438	-	-	-	-	17	7,438	
1984	15	12,424	10	8,970	-	-	25	21,393	
1985	10	11,721	44	33,760	-	-	54	45,482	
1986	3	4,692	7	2,068	-	-	10	6,760	
1987	-	-	12	3,426	-	-	12	3,426	
1988	-	-	164	47,011	-	-	164	47,011	Greens Creek (Underground) Surface (Unknown)
1989	2	2,562	98	27,676	-	-	100	30,238	
1990	9	21,053	139	68,488	-	-	148	89,541	
1991	-	-	247	138,613	-	-	247	138,613	
1992	-	-	226	74,899	-	-	226	74,899	
1993	-	-	17	17,856	-	-	17	17,856	
1994	-	-	200	132,998	-	-	200	132,998	NANA Dyantech
1995	-	-	184	96,787	103	21,118	287	117,905	Connors Drilling, LLC
1996	8	7,420	127	83,694	101	30,880	236	121,994	
1997	4	7,071	166	111,381	242	39,474	412	157,926	
1998	5	8,484	157	92,651	224	30,567	386	131,702	
1999	11	12,148	127	78,285	144	28,425	282	118,858	
2000	15	15,812	206	90,333	83	22,430	304	128,575	
2001	-	-	98	87,278	43	8,991	141	96,269	
2002	20	17,258	109	73,212	73	14,109	202	104,579	
2003	25	27,743	85	60,598	87	13,830	197	102,171	

Year	Surface Exploration (PS Series)		Underground Definition & Exploration (GC-series)		Pre-production / Stope Planning (PP+ST-series)		Annual Totals		Drill Contractor
	Holes	Feet	Holes	Feet	Holes	Feet	Holes	Feet	
2004	45	52,174	95	54,923	89	18,957	229	126,054	
2005	34	35,920	158	82,807	108	18,552	300	137,279	
2006	19	16,555	78	40,893	106	17,744	203	75,192	
2007	14	18,946	131	49,425	119	35,652	264	104,023	
Total	**307**	**305,887**	**2,963**	**1,590,079**	**1,522**	**300,728**	**4,792**	**2,196,694**	

Table 7-7: Summary of Hecla Drilling 2008 to 2020
Hecla Mining Company – Greens Creek Mine

Year	Surface Exploration (PS series)		Underground Definition & Exploration (GC- series)		Pre-production / Stope Planning (PP+ST-series)		Annual Total		Surface Drill Contractor	Underground Drill Contractor
	Holes	Feet	Holes	Feet	Holes	Feet	Holes	Feet		
2008	16	20,041	132	54,530	23	2,822	171	77,392	Connors Drilling, LLC	
2009	4	8,292	51	39,556	55	12,830	110	60,678		
2010	17	21,805	67	89,373	29	9,677	113	120,854		
2011	14	27,397	88	88,345	25	6,210	127	121,952		
2012	7	19,858	186	105,929	35	19,593	228	145,380		
2013	11	29,873	220	140,199	60	17,168	291	187,240	Falcon Drilling, Inc.	Connors Drilling, LLC
2014	6	23,316	145	84,886	67	20,454	218	128,656		
2015	4	7,587	317	173,177	125	19,960	446	200,723	Falcon Drilling, Inc.	First Drilling, LLC
2016	2	3,074	229	140,949	110	37,282	341	181,305		
2017	9	20,419	309	156,358	66	16,397	384	193,174		
2018	15	20,906	322	157,141	97	29,167	434	207,213	Timberline Drilling, Inc.	First Drilling, LLC
2019	0	0	329	129,447	81	18,974	410	148,421	N/A	First Drilling, LLC
2020	0	0	104	46,409	33	8,826	137	55,235	N/A	Timberline Drilling
2021	**11**	**22,991**	**153**	**78,863**	**28**	**5,782**	**192**	**107,636**	Timberline Drilling	Timberline Drilling
Total	**116**	**225,558**	**2,652**	**1,485,162**	**834**	**225,142**	**3,602**	**1,935,859**		

7.2.3 Drill Methods

7.2.3.1 Pre-2008 or Legacy Drilling

The drilling methods of prior operators were similar to the practices employed by Hecla. Underground core was mostly NQ or NQTK diameter, and minor footage of BQ and BQTK diameter core was used for longer holes. In some drill holes, the drill core diameter was reduced from NQ/NQTK to BQ/BQTK (telescoping) due to problematic ground conditions, typically as a result of faulting.

Surface legacy exploration drilling also utilized methods similar to current Hecla practices. Drilling in the overburden (unconsolidated sediments) utilized HQ as casing and drill core was typically reduced to NQ or NQTK once bedrock was encountered. In some drill holes, the drill core diameter was reduced from NQ to BQ due to problematic ground conditions.

Legacy drilling methods, where known, are summarized in Table 7-8. Information concerning the number and types of drill rigs utilized for the legacy underground and surface drill programs are not available.

Table 7-8: Summary of Legacy Drill Methods- 1975 to 2007
Hecla Mining Company – Greens Creek Mine

Core Type	Diameter (in.)	Diameter (mm)	Typical Use
BQ	1.44	36.5	Legacy (pre-2000) – used to extend drilling in difficult ground conditions
BQTK	1.61	40.9	Legacy – when required to extend holes in difficult ground conditions and some legacy ST holes.
NQ	1.87	47.6	Legacy (pre-2000) – standard surface and underground core size
NQTK (NQ2)	2.00	50.8	Standard surface and underground core size
HQ	2.50	63.5	Typically used on surface for overburden drilling and underground for longholes

7.2.3.2 Hecla Drilling

Hecla has explored Greens Creek deposits since 2008 with core holes spaced at various intervals depending on the stage of exploration and development.

Surface-based exploration holes (PS-prefix series drill holes) are drilled primarily with HQ and NQTK tools. To drill through the unconsolidated overburden HQ-diameter tri-cone methods are utilized so as to enable the insertion of drill casings. Typically, one to six holes are drilled from remote, helicopter-accessible sites, and holes are more rarely completed from setups located adjacent to the existing mine road system. All drilling sites require USFS approval prior to construction of a wooden drill platform. A typical remote site requires a 60 ft x 60 ft (18 x 18 m) clearing to ensure safe access by helicopter.

All remote drilling is supported by one Greens Creek dedicated helicopter (Hughes 500D) based at Hawk Inlet. Drill rigs are moved using an A-Star B2 or B3, which is mobilized from Juneau as needed. During the active drill season one to two drills are active on a 24 hour basis, seven days per week. Drill plans are laid out parallel to geo-grid sections (refer to Section 7.1 for an explanation of the Project grids).

Definition holes (GC-prefix series drill holes) are completed with NQTK or HQ tools. Holes are drilled in fans principally from underground drill stations spaced from 50 ft to 100 ft (15.2 m to 30 m) along strike of mineralization. Depending on the availability of drill stations, the vertical spacing of holes within mineralization in individual sections may range from 12 ft to 100 ft (3.6 m to 30 m).

Pre-production holes (PP-prefix series) and stope holes (ST-prefix series) are drilled with NQTK tools. Pre-production drill fans are drilled at 50 ft (15.2 m) intervals along strike of mineralization and on 30 ft to 60 ft (nine meters to 18 m) vertical intervals. Most pre-production drill holes are planned to produce a final drill hole spacing of 50 ft (15.2 m) or less in mineralized zones. Stope delineation (ST-prefix series) drill holes are completed in areas of complex mineralized shapes to aid mine design and planning.

Drill core for exploration, infill and definition purposes is generally NQ in diameter. In some drill holes, the drill core diameter is reduced from HQ to NQ to BQ (telescoping) due to ground conditions problems, typically as a result of faulting. Longer holes or holes in areas with anticipated bad ground are generally collared using HQ tooling. Table 7-9 summarizes the size of coring at Greens Creek post-2008. Table 7-10 summarizes the makes and models of drilling equipment utilized by Hecla post-2008.

Once retrieved from the core barrel, the core is placed in sequential order in core boxes labeled with the drill hole number. Each successive section of core drilled, usually 10 ft (three meters) long, is identified by a wood block marked with the depth of the interval. At the end of each shift, core boxes are transported by the drillers to the logging area which is located at the 860 Area on surface.

Table 7-9: Summary of Current Drill Methods- Post-2008
Hecla Mining Company – Greens Creek Mine

Core Type	Diameter (in)	Diameter (mm)	Typical Use
BQTK	1.61	40.9	ST-series holes; when required for difficult ground conditions.
NQTK (NQ2)	2.00	50.8	Standard surface and underground core size.
HQ	2.50	63.5	Typically used on surface for overburden drilling and underground for longholes.

Table 7-10: Drill Equipment Utilized for Core Drilling- Post-2008
Hecla Mining Company – Greens Creek Mine

Make	Model	Description
Christensen	CS14	Surface Drilling, 2009 & 2011
Atlas Copco	CS1000	Surface Drilling 2008,2010-2012
Atlas Copco	U6	Underground Drilling 2008-2009
Atlas Copco	U8	Underground Drilling 2009-2018
Connors Drilling	20HH	Underground Drilling 2009-2018
Falcon Drilling	F-3500	Surface Drilling 2013-2017
Sandvik	DE-140	Surface Drilling 2018

7.2.4 Geological Logging

7.2.4.1 Legacy Drilling

The current system of logging employed by Hecla has been used with minor modifications since 1987 (starting with drill hole GC0150). Prior to 1987, lithological nomenclature differed in the names applied to various units. All of the pre-1987 logging has been translated into the current system based on the descriptive details from the original logs. Over 95% of the logged intervals contained adequate details to unequivocally place intervals into the current lithological system. Where insufficient descriptions did occur, assays and or adjacent holes were utilized to ensure continuity. Other differences found in the pre-1987 logging include the use of longer maximum sample lengths (up to 10 ft or three meters) that may span multiple lithologies. Finally, not all of the legacy logs prior to 2000 have consistently recorded Rock Quality Data (RQD) and fracture counts. The majority of the legacy core was photographed wet with either 35 mm slides or digitally.

7.2.4.2 Hecla Drilling

Underground drill core is logged for recovery, RQD, lithology, alteration, mineralization, structure, and fabric according to a standardized system of logging and sampling procedures. Lithologies can be subdivided into non-mineralized/non-ore (generally not mineralized but may contain erratic high grade values that can be mined) and mineralized/ore categories. Underground logging information is entered directly into the acQuire database.

Surface core is logged for recovery, lithology, alteration, mineralization, structure, and fabric. The surface lithologies use the same classification system as is used in the underground mine. Typically, surface core logs contain a higher level of descriptive details than underground logs. Surface logs are recorded on paper at a one inch = 10 ft scale before entry of the collected data in the acQuire database.

All core is photographed wet. Graphical logs are recorded on paper at scales ranging from one inch = 20 ft to one inch = five feet, depending on observed complexity.

7.2.5 Recovery

Core recovery is generally high because of the compact nature of the greenschist metamorphic rocks. Approximately 80% of drilled intervals have core recovery greater than 95%. Poor recovery, defined as less than 50% core recovery, occurs in approximately 2% of intervals. Poor recovery is generally localized to heavily-faulted areas in the argillite.

7.2.6 Collar Surveys

7.2.6.1 Legacy Drilling

The majority of the legacy underground drill collars were surveyed with conventional mine survey equipment by the mine staff. In rare cases (approximately 2%), collar locations were mapped by Brunton compass and tape methods from known survey points. All collar points were recorded in the database utilizing the mine grid coordinate system.

7.2.6.2 Hecla Drilling

Drill holes are planned (azimuth, dip, length) by geologists on vertical cross-sections and on vertical longitudinal sections orthogonal to the geo-grid.

For surface drill holes a 2 in. x 4 in. (5 cm x 10 cm) tack board is aligned with the geo-grid sectional line (333° azimuth) during pad construction. When the rig is slung into place the skid frame is aligned with the tack board. If drill holes are planned that are not parallel with the geo-grid section line, an arrow pointing in the planned direction is painted onto the deck. After drill hole completion, surface drill collars are located using a Trimble Geo XH 600 handheld GPS instrument. The collar coordinates are recorded using the UTM-NAD83 datum. Accuracy is generally ±10 ft (three meters) for northing and easting coordinates. Elevations are adjusted to match the local light detection and ranging (LiDAR) topographic survey.

Underground drill lines are marked (front sight and back sight) by the mine surveyors. After completion, underground drill hole collars are surveyed with conventional mine surveying equipment by Hecla staff.

All collar locations are recorded in the database utilizing the mine grid coordinate system.

7.2.7 Down-Hole Surveys

7.2.7.1 Legacy Drilling

Prior to 1996, down-hole surveys were done by magnetic single-shot cameras. The majority used a Sperry-Sun single-shot camera with a few using a Well-Nav single-shot. Usually, a shot was taken at the collar, at 50 ft (15 m), and approximately every 100 ft to 200 ft (30 m to 60 m) thereafter. If the azimuth and inclination at the collar were more than a few degrees different from that of the shot at 50 ft (15 m), the collar azimuth and inclination were regarded as suspect (affected by steel in the equipment) and replaced by the azimuth and inclination at 50 ft (15 m). Magnetic azimuths were corrected for magnetic declination and, for the Sperry-Sun, had a high latitude correction applied.

Between 1996 and 2000 a combination of Sperry-Sun and MAXIBOR instruments were used. The MAXIBOR system determines drill hole deviation optically relative to a survey measurement of the drill hole collar. The Sperry-Sun was replaced with a Reflex© EZ-shot survey tool in 2000. The EZ-Shot is a solid-state electronic, single-shot instrument with stated accuracy of ±0.5° azimuth and ±0.2° dip. Between 2000 and 2004, the EZ-Shot and MAXIBOR system were used in tandem. Since 2005 the EZ-Shot has been the only system used for down-hole surveys at Greens Creek.

7.2.7.2 Hecla Drilling

Hecla continued the use of the EZ-Shot system implemented in 2005; from 2008 through 2021 all surface and underground drill holes have been surveyed using an EZ-Shot system. From 2022 through present all surface and underground drill holes have been surveyed using an EZ-Trac system.

For underground drill holes an initial shot at 50 ft (15 m) depth is taken and compared to the planned drill hole azimuth and dip. If the hole alignment is off by more than ±3° in azimuth or ±1° in dip the hole is typically stopped and re-collared. After the initial 50 ft (15 m) shot, surveys are typically taken every 200 ft (60 m) and at the end of the drill hole. Surveys are taken as the drill hole advances. Readings that show anomalous magnetic field strength are flagged as suspect during database entry.

For surface drill holes, an initial survey is first shot below the casing and then every 100 ft (30 m) down hole thereafter as the drill hole progress. A final shot is taken at the end of the drill hole upon completion.

7.2.8 Geotechnical and Hydrological Drilling

7.2.8.1 Legacy Drilling

Surface-based drilling methods of prior operators were similar to the practices employed by Hecla. Prior to 2008, a significant number of geotechnical and hydrological drill holes were completed in support of construction and operations of the Greens Creek surface facilities. Areas covered by these holes include the 920 Area, Site 23-D, Site E, and the TDF. An accurate tally of the number of holes and footage for this period is not currently available.

Underground geologic core drilling methods of prior operators were similar to the practices employed by Hecla. However, the portion of the legacy Ingres database that contained core recoveries and RQD data was not successfully recovered with the transfer to acQuire in 2008 (see Section 9.2 for details). These data are still available on the paper logs.

7.2.8.2 Hecla Drilling

Since 2008, a total of 136 geotechnical and hydrological holes for a total of 7,619.1 ft (2,322.3 m) have been completed (Table 7-11). The drill campaign in 2009 was focused on investigating existing pile conditions at the TDF. A uniaxial hydraulic jab was used to push a three inch (7.6 cm) diameter Shelby sample tube into the TDF for collection. Sample depths ranged from 20 ft to 45 ft (six meters to 13.7 m).

Drilling investigations in 2010 and 2011 were in support of a proposed TDF expansion. Additionally, in 2010, Site 23, the mill back slope area, and 1350 Area were drill tested to support stability and groundwater monitoring programs. The 2010 program utilized a CME-75 track-mounted rig operated by Cascade Drilling of Woodinville, Washington; the 2011 program utilized a heli-portable CME-45C drill rig operated by Denali Drilling Inc. of Alaska.

The typical methodology for foundation and hydrogeological investigations in 2010 and 2011 included using hollow stem auger drilling for peat, tri-cone mud rotary (water/bentonite-based) for sand/gravel/till, and HQ3 coring for bedrock lithology. Data collection included standard penetration testing (SPT), typically at five feet (1.5 m) intervals and sample collection using a SPT split spoon for index testing. Core samples were also taken where bedrock was encountered. Where clays were encountered, Shelby tube samples were typically collected.

For drill rigs with auto-hammer capability (2010), energy transfer efficiency measurements were taken utilizing a pile driving analyzer at initiation of the drill program to verify correlation. For drill rigs without auto-hammer capability (2011), energy transfer efficiency measurements were taken throughout the duration of the field program for blow count correction.

During the 2011 drill program, a vane borer was also utilized for in situ shear strength data collection. Since 2012, the geotechnical drilling has focused on the TDF.

Hecla logs geotechnical data on all standard underground drill core, and data are stored in the acQuire® database. The dataset includes core recovery (all core), RQD data, and fracture count (sampled intervals and all ST holes). The data set is used in conjunction with the lithologic rock type to classify the mining areas based on the Greens Creek Ground Support Management Plan (GCMP). The GCMP is audited and validated by outside consultants.

Table 7-11: Summary of Surface Geotechnical and Hydrological Drilling- 2008 to 2020
Hecla Mining Company – Greens Creek Mine

Year	Area	Driller	Holes	Footage
2008		No drilling	0	0
2009	Tailings	Unknown	5	152.6
	1350 Area	Cascade Drilling	4	381.5
2010	Tailings	Cascade Drilling	8	595.7
	Tailings	Cascade Drilling	11	780.8
	A-Road	Denali Drilling	3	345.5
2011	Tailings	Cascade Drilling	11	568.3
	Tailings	Denali Drilling	18	848
2012		No drilling	0	0
2013		No drilling	0	0
2014	Tailings	Denali Drilling	4	315
	Tailings	ConeTec	6	77.1
	Site E	Denali Drilling	2	49.5
	Ore Pad Backslope	Denali Drilling	2	88
2015	Tailings	ConeTec	5	271.9
	Tailings	Mud Bay	5	323.5
2016		No drilling	0	0
2017	B Road	Mud Bay	7	304.3
	Tailings	Mud Bay/ConeTec	10	793.4
2018	Tailings	Mud Bay/ConeTec	35	1724
2019	B Road	Mud Bay/ConeTec	2	160
	Tailings	Mud Bay/ConeTec	18	2074.4
2020	Hawk Inlet	Mud Bay/ConeTec	15	890.4
	Site 23	Mud Bay/ConeTec	2	375
2021	B Road	Discovery	2	71.5
	Tailings	Discovery	6	249.5
	920 Area	Discovery	5	143

7.2.9 Metallurgical Drilling

Current metallurgical testing is primarily based on actual mill feed or composite samples collected from underground faces. See Section 8.2 for a description of metallurgical drill sampling.

7.2.10 Sample Length/True Thickness

Drill holes are designed to intersect the mineralization as perpendicular as possible; reported mineralized intercepts using core lengths are typically longer than the true thickness of the mineralization.

A series of section and plan maps for each mineralized zone are included in Section 7.4. These maps include drill hole traces, block model outlines, and an interpretation of major geologic contacts and faults. These plans and figures show that drill orientations are generally appropriate for the mineralization style and have been drilled at orientations that are optimal for the orientation of mineralization for the bulk of the deposit areas.

7.2.11 Comments on Drilling

In the opinion of the QP, the quantity and quality of the logging, geotechnical, collar and down-hole survey data collected in the exploration and infill drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation as follows:

- Core logging performed by Hecla staff meets industry standards for exploration on polymetallic deposits.
- Core logging performed prior to Hecla acquiring 100% Project ownership met industry standards at the time of logging.
- Collar surveys for Hecla core holes have been performed using industry standard instrumentation.
- Collar surveys for legacy drill holes were performed using methods that were industry standard for the time.
- Down-hole surveys performed after 2008 were performed using industry standard instrumentation.
- Prior to 1996, magnetic single-shot cameras were used for down-hole surveys. Although standard for the time, these readings can be affected by magnetic rocks and drill casings. From 1996 to 2006, industry standard instrumentation was used.
- Drilling practices, logging, collar surveys and down-hole surveys have been periodically reviewed by independent auditors (refer to Section 9).
- Recovery data from core drill programs are acceptable.
- Geotechnical logging of drill core meets industry standards for planned open pit and underground operations.
- Drilling is normally perpendicular to the strike of the mineralization.
- Drill orientations are shown in the example cross-sections in Section 7 and are considered to appropriately test the mineralization.
- No factors were identified with the data collection from the drill programs that could affect Mineral Resource or Mineral Reserve estimation.

8.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

8.1 Sampling Methods

8.1.1 Face Samples

Nearly every mining face is marked with paint to delineate the mineral subtypes, plus argillite and phyllite wall rocks, low grade mineralized material, and occasional high grade precious metals zones. Usually, a single face sample is taken from each mineral type; where the area represented by a mineral type is greater than 50 ft^2 (4.6 m^2), multiple face samples are taken. These samples are taken by chipping the face on an irregular grid.

The locations of stope-face samples are initially recorded in the grade control geologist's field book, wherein the geologist records the distance to the face, typically the center, from a spad, rib or other reference object/feature. On the surface, the geologist utilizes an AutoLISP program within the AutoCAD software program to insert a "stope-face" block at the appropriate measured distance from the reference object into an as-built drawing for the appropriate bench elevation. The orientation of the stope-face (relative to the drift/drive) is determined by the geologist. The geologist adjusts the stope-face block positions manually based upon detailed stope surveys.

The area of each sampled face is calculated using two different methods. The first method is the traditional cross-sectional area (width by height). The second method relies upon digital photography of the face and then on-screen digitization of the distinct sample areas on the photo. The individual sample areas are electronically summed and then compared with the first method. Hecla tolerates up to a 20% difference between the two area methods; differences larger than this are not permitted by the data-entry procedure, which requires the data entry person to modify the input data.

A detailed survey is performed in active stopes at least every five days and preferably after every three rounds. The elevation is initially based on the mid-rib elevation and is more accurately "back determined" at the end of the month through the wire-framing of the back and floor survey points.

The survey crew consists of a single individual utilizing a special Geodimeter total station equipped with a visible red laser. The instrument calculates the distance to an object by reading the reflected laser beam. This makes for very efficient single-person surveying, although erroneous distance readings can and do occur. The distance that can be measured is limited/impacted by the reflectivity of the target object, the clarity of the air in the stope/drive, and the angle at which the laser hits the target. The erroneous distances for the detailed survey points are readily identified and removed after loading the survey data into AutoCAD.

8.1.2 Core Samples

Drill core is sampled using two methods based on the stage of drilling. Exploration and definition drilling are sampled on intervals ranging from one foot to five feet (0.3 m to 1.5 m) that do not cross lithological boundaries. Exploration drill holes are cut and sampled as half-core; definition drill holes are whole-core sampled.

Barren contacts are sampled through 15 ft (4.6 m) 'buffer' zones into the hanging wall and the footwall, whereas mineralized or ore-type contacts are sampled through 30 ft (9.2 m) 'buffers' into the hanging wall and footwall. If a mineral type lithology is encountered off the mine contact, it will also receive a 30 ft (9.2 m) buffer on both sides. If a mineralized, but non-ore type, lithology is encountered off the mine contact, the buffer length is at the discretion of the logging geologist, but not to be less than five feet (1.5 m).

For sampling the buffer zones, narrower intervals of two feet (0.6 m) followed by three feet (one meter) samples, are placed immediately adjacent to lithological contacts; five feet (1.5 m) intervals are sampled through the rest of the buffer zone.

Mineralization occurring within veins or as remobilized bands away from contacts are sampled in five feet (1.5 m) intervals or less, depending on the thickness of mineralization, and are enclosed by five feet (1.5 m) buffer samples.

Geologists are responsible for identifying samples in the core, labeling each sample extent with polyvinyl chloride (PVC) flagging, and documenting them with photographic logs. Sample intervals are also recorded on the paper log sheets and in the drill hole database. Core samples are dispatched to the underground cutting facility where technicians process the sample intervals into half-core samples. The half-core sample intervals are individually bagged and then delivered to either the Greens Creek Laboratory or the offsite commercial laboratory.

Pre-production and stope drill holes are typically sampled through the majority of the drill hole as whole-core, with sample intervals ranging from one foot to five feet (0.3 m to 1.5 m). Samples are documented in an identical method to exploration and definition core.

8.2 Metallurgical Sampling

Prior to 2000, composited quarter-cut definition drill core was used for metallurgical test work on a mineral zone basis in selective cases. The core was chosen from select definition drill hole intervals that had been previously sampled. Since 2000, metallurgical sampling is done using quarter-cut definition or exploration drill core on an as-needed basis when new zones or new mineral styles are encountered.

8.3 Density/Specific Gravity Determinations

The procedure for measuring specific gravity (SG) of core at Greens Creek is the weight in water versus weight in air method. The weighing takes place after the core has been logged, but before the core is cut, and occurs in the underground core cutting facility. Exploration and definition core holes are considered for density sampling.

Samples of whole core approximately one foot to five feet (0.3 m to 1.5 m) in length are weighed in air and the weight is recorded on the paper SG sheet. The sample and tray are then placed in water until fully submerged and the weight recorded. Completed sheets are returned to the 860-Core Shack for manual data entry. At the time of data entry, the weight of the basket, wet and dry, is subtracted from the recorded weights accordingly and the final values are manually entered into the acQuire® database.

SG measurements are required of all exploration or definition core that is a mineralized or ore-type lithology as well as the associated buffer samples. For exploration drilling, all mineralized lithologies are sampled for SG measurements. For definition drilling, all mineralized lithologies within a 15 ft buffer of the main mineralized zones are sampled for SG measurements.

Highly fractured or faulted core is measured for SG, though it is difficult. The holes in the tray used are several millimeters in diameter. Material deemed at risk for falling or flowing through those holes is generally not weighed in water or in air. This type of material makes up a relatively small percentage of the total samples and is generally related to heavily-faulted intervals.

8.4 Analytical and Test Laboratories

Table 8-1 summarizes the laboratories utilized throughout the Project history and covers legacy and current operations. All laboratories are independent of Hecla and previous operators, except for the Greens Creek Laboratory and Kennecott Utah Copper laboratory. Dates of legacy contracts are best estimates and noted as "unclear" where the information was not available.

Bondar Clegg Canada Ltd. (Bondar Clegg), now part of ALS Chemex Laboratories, obtained ISO 9001 certification in 1998; however, its accreditation through the period of use at Greens Creek is not known. SVL Laboratories' accreditation through the period of use at Greens Creek is also unknown. The accreditation of other metallurgical laboratories, Lakefield Research, company laboratories, Kennecott Utah Copper Labs and CESL, are not known.

McClelland Laboratories is a metallurgical laboratory with extensive experience in precious metals metallurgy and process and a good reputation within the mining industry; however, it is not a certified laboratory. SGS is an ISO 9001 certified laboratory.

Acme was ISO 9001 certified in 1997 and successfully maintained that certification until its acquisition by Bureau Veritas (BV) in 2015. Acme and Inspectorate Laboratories were acquired and successfully integrated by BV starting January 1, 2015. BV is also ISO 9001 certified. Acme/BV has been the primary laboratory used for exploration and definition drill core from 1987 to present. The Greens Creek Laboratory is used for pre-production and grade control samples and is the secondary laboratory used for exploration and definition drill core samples since 2002. The Greens Creek Laboratory has participated in round robin programs to compare its results to other laboratories intermittently throughout its history but is not a certified laboratory.

Table 8-1: Assay Laboratories used at Greens Creek
Hecla Mining Company – Greens Creek Mine

Laboratory	Location	Period of Use		Comments
Bondar Clegg Canada Ltd.	Vancouver, BC	1976	1982	Primary laboratory for early surface exploration and definition drill core
Acme Analytical Laboratories Ltd.	Vancouver, BC	1987	2015	Primary laboratory for all exploration and definition drill core
Bureau Veritas	Vancouver, BC	2015	2021	Primary laboratory for all exploration and definition drill core after acquisition of Acme Analytical
SVL Analytical	Kellogg, ID	1987	2002	Primary laboratory for all exploration and definition drill core until Acme, then secondary umpire laboratory until 2002
McClelland Laboratories, INC	Sparks, NV	1988	Unclear	Gravity concentrates
Greens Creek Laboratory	Admiralty Island, AK	1989	Present	Primary laboratory for some exploration and definition drill core in 1989-90 range. Primary laboratory for pre-production and stope drill core and grade control samples since 1994.Secondary laboratory for all exploration and definition drill core since 2002.
Lakefield Research		1992	1994	West Zone tests
Kennecott Utah Copper Laboratory	Salt Lake City, UT	1996	2000	Acid rock drainage (ARD) samples 1996–2000
CESL	Vancouver, BC	1998	2008	ARD samples 1996–2000
SGS Canada Inc.	Toronto, On	2006	2010	Surface soil MMI analysis

8.5 Sample Preparation and Analysis

8.5.1 Legacy Sampling

Sample preparation and analytical methods have been consistent with the current methods since 1998 (MRDI, 1998). Methods used prior to 1998 are not well documented and are not known in detail.

8.5.2 Hecla Sampling

From 2008 through late 2011, all drill core sample preparation was done at Acme laboratory locations in Whitehorse, Yukon or Vancouver, British Columbia. In late 2011, a sample preparation laboratory, purchased by Greens Creek but operated by Acme personnel, was established on the Greens Creek site. From late 2011 on, nearly all exploration and definition core samples were prepared for analysis at this facility on site and then shipped to the Acme/BV laboratory facility in Vancouver for analysis. Preparation procedures were the same, whether they occurred at the Whitehorse or Vancouver sites or were prepared at the Greens Creek facility. The on site preparation was discontinued in 2015 with the establishment of a new sample preparation facility in Juneau, AK by BV.

The current preparation procedure consists of crushing to 70% passing 10 mesh (two millimeters), riffle splitting approximately 250 g, then ring pulverizing to 95% passing (P_{95}) 150 mesh (106 µm). Additional cleaning of the preparation equipment is requested after high base metal content samples. Of the pulverized material 115 to 120 g is sent for analysis, and the remaining 115 to 120 g are stored as a master pulp.

Currently, all mineralized definition and exploration drill core is assayed at BV for Au, Ag, Pb, Zn, Cu, Fe, and Ba. All mineralized samples are also analyzed for a 33 element inductively coupled plasma emission spectroscopy (ICP-ES) assay suite.

Silver and base metal assays for Pb, Zn, Cu, and Fe are performed using ICP-ES on one gram samples digested in hot aqua regia. Automatic re-analysis is triggered on a smaller sample size if results return above detection limits. Silver is re-assayed by fire-assay with gravimetric finish if the initial ICP-ES results are greater than 300 ppm and by metallic-screen fire assay if the original over-limit assay is greater than 80 oz/ton.

The standard assay package employed consists of fire assay for Au on a 30 g sample with an AA finish. Gold is re-assayed by gravimetric finish if the initial fire assay results return values above 7 ppm. Where the gravimetric finish assays continue to determine grades greater than 7 ppm Au, a third assay is carried out using a metallic-screen fire assay.

Preparation for the 33-element suite involves a 0.5 g sample split digested in an aqua regia solution containing equal parts HCl, HNO_3, and de-ionized H_2O before analysis by ICP-ES.

Analysis for Ba is a lithium borate fusion of a 0.2 g subsample with analysis by ICP-ES.

Since 2008, the Greens Creek Laboratory has been used as the primary laboratory for pre-production and in-stope drill core as well as an umpire laboratory for definition and exploration drill core. The standard assay package employed consists of fire assay for Au and Ag, and ICP-ES analysis for Pb, Zn, Cu, and Fe.

8.6 Quality Assurance and Quality Control (QA/QC)

8.6.1 Legacy QA/QC

Previous (pre-2008) operators have used a similar system to the current QA/QC methodology. Legacy assaying protocols are typical of those employed in the mining industry and have been described in several reports (MRDI 1998 and 1999; AMEC, 2005, 2008 and 2013). The 1998 MRDI report is referenced as the source of pre-1998 legacy QA/QC procedures by all the subsequent audit reports, with QA/QC of drill holes added since 1998 covered by each subsequent report period (see Section 9 for a description of external reviews on Greens Creek data).

8.6.1.1 Standards

Different standard reference materials (SRMs) were created by the Greens Creek Joint Venture (GCJV) to reflect the different mineral types at Greens Creek, and successor SRMs were created as the stocks became exhausted. SRMs were prepared at Hazen Research by ball milling to exceed P_{95} 150 mesh. Ten packets of each SRM were submitted to independent commercial laboratories to determine the recommended values for controlling quality.

Standards B, D, F and G were made from Southwest Zone cores. Standards E and H were made from Northwest West and West Zone cores. Standard I was made from mineralized material from a stope in the 200S Zone. The material was submitted to six independent laboratories: Hazen Research, Denver; SVL, Acme, Cone Geochemical Laboratories, Lakefield, CO; Rocky Mountain Geochemical Laboratories (RMG), and Chemex, Mississauga, Ontario. Standard H was characterized by Acme, CAS, RMG and SVL. Standard I was submitted to Acme, Hazen, SVL, RMG, and two laboratories not previously used: Actlabs, Wheatridge, CO; and SGS, Vancouver, BC.

8.6.1.2 Duplicates

Duplicate assays were performed at the same laboratory as the original assays and were not “blind.” Acme performed assay (same pulp) duplicates and coarse reject (second split, second pulp) duplicates on every 10th sample and reported the results on the same assay certificate. Duplicate assay (same pulp) and coarse reject duplicates (second split and second pulp) were performed for one in every 20 samples by the Greens Creek Laboratory.

8.6.1.3 Check Assays

Most of the Greens Creek drill holes were included in a check assay program where SVL Analytical, formerly Silver Valley Laboratories, of Kellogg, Idaho was the umpire laboratory.

Approximately one in 15 samples were selected for a check assay on the pulp. The checks were selected from intervals logged as massive and white mineral styles in approximately equal amounts. Any interval showing visible gold was also selected for check assay. Selected samples were recorded on the sample submission form, directing Acme to send a split of the pulp to SVL. After receiving Acme assay results, geologists examined the results for a reasonable match to geologic observation and requested additional check assays on samples that reported unreasonably high or low values.

SVL performed a fire assay for Au and Ag using a half-assay ton sample. SVL determined Pb, Zn, and Cu by AA on one gram samples digested in aqua regia. SVL analyzed base metals by AA. If samples reported above 15 percent Zn or above 20 percent Pb (as determined by AA), those samples were re-assayed using titration methods.

Acme performed check assays on pulps selected from drill hole samples prepared and assayed by the Greens Creek Laboratory, using the protocols described above. The practice of submitting pulps for check assay was discontinued for pre-production drill holes on April 1, 1998.

8.6.2 Hecla QA/QC

Since 2008, Hecla has used two laboratories for drill core assays: the Greens Creek Laboratory; and Acme, followed by its successor laboratory, BV, in Vancouver, Canada. BV acquired Acme in 2015 and is currently the primary commercial laboratory for Greens Creek. Batches are controlled by a system of SRMs, pulp duplicate samples, coarse reject duplicate samples, and check assay submittals.

8.6.2.1 Standards

From 2008 to 2011, standards materials were sourced from underground bulk samples or drill core and then prepared and certified by Hazen Research, Inc. of Golden, Colorado. The Hazen Research standards used from 2008 are Standard K, Standard L, Standard N, and Standard P; these materials were used until exhausted during the period between 2012 and 2015.

Beginning in 2011, matrix-matched standards materials were prepared and certified by CDN Resource Laboratories Ltd (CDN) of Langley, BC, Canada using mineralized materials sourced from several locations in the mine. Additional matrix-matched standards have been prepared as needed when the previous supplies became depleted by CDN through 2021. A summary of the various matrix-matched standards used since 2008, and the material from which they were sourced are summarized in Table 8-2. All reference materials used have certified values for Au, Ag, Pb, Zn, Cu, and Fe. A more detailed summary of the source, preparing company, certificate dates and recommended values for the reference standards used are presented in Table 8-3.

From 2008 to March 2018, one standard was submitted as the 10th sample of each drill hole; an additional standard was inserted for every subsequent 20 samples and as the last sample for every drill hole. Beginning in March 2018, one standard is submitted as the 10th sample of each drill hole with an additional standard inserted for every subsequent 25 samples.

Standard assay results are reported along with the primary assay results and are captured by the acQuire® database during the normal importing routine. Upon receipt, the results for the standards are compared with certified values by the project geologist using graphical reports generated by acQuire® database utilities. From 2008 to March 2018, analyses for jobs are rejected if one standard per submittal is outside of three standard deviations from the certified value, or if two standards per submittal are outside of two standard deviations from the certified value.

Beginning in March 2018, if the running mean on any standard assay over time (five sample moving average) exceeds the 2x standard-deviation limits, the batches associated to those samples causing the exceedance are re-assayed. As in the previous period, if a single sample exceeds the 3x standard-deviation limits, the associated batch is re-assayed.

Table 8-2: Standards Used at Greens Creek Since 2008
Hecla Mining Company – Greens Creek Mine

Standard Name		STD K	STD L	STD N	STD P	STD Q	STD-ME-15	STD S	STD T	STD S14
Description		200S Massive Ore Standard	5250 Low Grade Ore Standard	Gallagher Low Grade Ore Standard	NWW Massive Ore Standard	200S Exploration Grade Standard	Purchased from CDN	Exploration Grade Standard	Low Grade Ore Standard	Exploration Grade Standard
Source Material		Greens Creek UG Bulk Sample	Greens Creek UG Bulk Sample	Greens Creek UG Drill Core	Greens Creek UG Bulk Sample	Greens Creek UG Drill Core	Cerro de San Pedro deposit, San Luis Potosi, Mexico	Greens Creek UG Drill Core	Greens Creek UG Drill Core	Greens Creek UG Drill Core
Years Used	2008	X	X							
	2009	X	X	X						
	2010	X		X	X					
	2011	X	X	X	X	X				
	2012	X		X	X	X	X			
	2013			X	X	X	X	X	X	
	2014			X	X		X	X	X	
	2015			X	X	X	X	X	X	X
	2016					X	X			X
	2017									
	2018							X		X
	2019									
	2020									

Standard Name		STD T14	STD U	STD V	BLK-BHQ1	BLK-MBL1	BLK-BHQ2	STD V17	STD T17	STD U18
Description		Moderate Grade Ore Standard	Exploration Grade Standard	Moderate Grade Ore Standard	Blank Rock Standard (basalt)	Blank Rock Standard (marble)	Blank Rock Standard (basalt)	5250 High Grade Ore Standard	9A Moderate Grade Ore Standard	Low Grade Standard
Source Material		Greens Creek UG Drill Core	Greens Creek UG Drill Core	Greens Creek UG Drill Core	Brown's Hill Quarry, Fairbanks	Vigaro Marble Chip Landscape Rock	Brown's Hill Quarry, Fairbanks	Greens Creek UG Bulk Sample	Greens Creek UG Bulk Sample	Greens Creek UG Drill Core
Years Used	2008									
	2009									
	2010									
	2011									
	2012									
	2013									
	2014									
	2015	X								
	2016	X	X	X						
	2017	X	X	X	X					
	2018	X	X	X	X			X	X	X
	2019				X			X	X	X
	2020				X	X	X	X	X	X

Table 8-3: Standards Used at Greens Creek – Source, Characterization, and Recommended Values
Hecla Mining Company – Greens Creek Mine

Standard Name	STD K	STD L	STD N	STD P	STD Q	CDN-ME-15	STD S	STD T	STD S14
Description	200S Massive Ore Standard	5250 Low Grade Ore Standard	Gallagher Low Grade Ore Standard	NWW Massive Ore Standard	200S Exploration Grade Standard	Low Grade Ore Standard	Exploration Grade Standard	Low Grade Ore Standard	Exploration Grade Standard
Source Material	UG Bulk Sample	UG Bulk Sample	UG Drill Core	UG Bulk Sample	UG Drill Core	Commercial	UG Drill Core	UG Drill Core	UG Drill Core
Source Facility	Hazen Research Inc.	Hazen Research Inc.	Hazen Research Inc.	Hazen Research Inc.	CDN	CDN	CDN[1]	CDN	CDN[2]
Certificate Date	5-May-2000	2-Dec-2003	6-Nov-2006	14-Apr-2010	May, 2010	2012	Oct, 2012	Oct, 2012	Aug, 2014
					Certificate Values				
AuA	0.794 oz/ton	0.051 oz/ton	0.062 oz/ton	0.193 oz/ton	0.006 oz/ton (0.193 g/t)	0.04 oz/ton (1.386 g/t)	0.011 oz/ton (0.371 g/t)	0.072 oz/ton (2.482 g/t)	0.026 oz/ton (0.902 g/t)
Ag	13.2 oz/ton	13.6 oz/ton	4.62 oz/ton	9.2 oz/ton	0.385 oz/ton (13.2 ppm)	0.992 oz/ton (34 g/t)	0.216 oz/ton (7.4 ppm)	8.225 oz/ton (282 ppm)	0.202 oz/ton (7 ppm)
Cu	0.229 %	0.186%	0.129%	0.244%	-	0.014 %	0.215%	0.197%	0.01% (95.1 ppm)
Pb	6.75%	1.64%	2.56%	10.7%	0.35%	0.413%	0.05%	3.35%	0.09% (871 ppm)
Zn	17.4%	3.54%	4.99%	19.4%	0.67%	0.251%	0.214%	7.34%	0.2% (1961 ppm)
Fe	15.7%	1.67%	6.88%	16.4%	8.9%	-	10.34 %	3.01%	5.82%

Standard Name	STD T14	STD U	STD V	BLK-BHQ1	BLK-MBL1	BLK-BHQ2	STD V17	STD T17	STD U18
Description	Moderate Grade Ore Standard	Exploration Grade Standard	Moderate Grade Ore Standard	Blank Rock Standard	Blank Rock Standard	Blank Rock Standard	5250 High Grade Ore Standard	9A Moderate Grade Ore Standard	Low Grade Standard
Source Material	UG Drill Core	UG Drill Core	UG Drill Core	Quarried Basalt	Quarried Basalt	Quarried Basalt	UG Bulk Sample	UG Bulk Sample	UG Drill Core
Source Facility	CDN[2]	CDN[2]	CDN[2]	Browns Hill Quarry, Fairbanks	Vigaro Marble Chip Landscape Rock	Browns Hill Quarry, Fairbanks	CDN[2]	CDN[2]	CDN[2]
Certificate Date	Sept, 2014	Aug, 2016	Aug, 2016	2017	2020	2020	June, 2018	June, 2018	Sept, 2018
Certificate Values									
Au	0.198 oz/ton (6.78 g/t)	0.016 oz/ton (0.547 g/t)	0.037 oz/ton (1.262 g/t)	-	-	-	0.078 oz/ton (2.663 g/t)	0.1 oz/ton (3.422 g/t)	0.011 oz/ton (0.36 g/t)
Ag	6.154 oz/ton (211 ppm)	1.511 oz/ton (51.8 ppm)	9.421 oz/ton (323 ppm)	-	-	-	66.79 oz/ton (2290 ppm)	10.821 oz/ton (371 ppm)	2.094 oz/ton (71.8 ppm)
Cu	0.600%	0.097%	0.272%	-	-	-	0.877%	0.215%	0.077%
Pb	5.01%	1.36%	3.85%	-	-	-	5.51%	5.83%	0.34%
Zn	19.85%	2.74%	8.43%	-	-	-	10.43%	13.84%	1.12%
Fe	25.25%	7.99%	9.16%	-	-	-	5.29%	17.61%	6.13%

Notes:

1. CDN values for Au and Pb are provisional; all other elements are certified
2. CDN certified values based on aqua-regia digest, four acid digest results also provided in certificate.

Rejected jobs are re-assayed for the element or elements that failed. Control charts are generated and reviewed by year; all standards have performed with satisfactory accuracy and precision for Au, Ag, Pb, and Zn throughout their use. An example of the statistics and control charts reviewed for Standard T17 for 2020 is presented in Table 8-4 and Figure 8-1 for Ag and Au, and Figure 8-2 for Pb and Zn.

The statistics and controls charts show some variability with a few instances outside the 2x standard deviation 'warning limits'. Most of the data and the overall trends are within the acceptance limits for the period indicating acceptable accuracy and precision for the metal analyses.

Table 8-4: Standard T17 2020 Analytical Results – Bureau Veritas
Hecla Mining Company – Greens Creek Mine

	Statistic			
# of Analyses	333	333	333	333
# Outside Warning Limit	12	3	55	17
# Outside Error Limit	0	0	8	0
# of Analyses below Threshold	0	0	0	0
% Outside Error Limit	0	0	2.4	0
	Ag_ICP_oz/ton	**Au_FA_oz/ton**	**Pb_ICP_%**	**Zn_ICP_%**
Mean	10.83	0.097	5.9	13.6
Median	10.80	0.097	5.9	13.7
Min	10.16	0.084	5.5	12.9
Max	11.65	0.113	6.4	14.4
Standard Deviation	0.25	0.004	0.13	0.28
% Rel. Std. Dev.	2.33	4.435	2.20	2.03
Coeff. Of Var.	0.02	0.044	0.02	0.02
Standard Error	0.01	0.000	0.01	0.02
% Rel. Std. Err.	0.13	0.243	0.12	0.11
Total Bias	-0.02	-0.019	-0.01	-0.005
% Mean Bias	-1.51	-1.872	-1.3333	-0.46

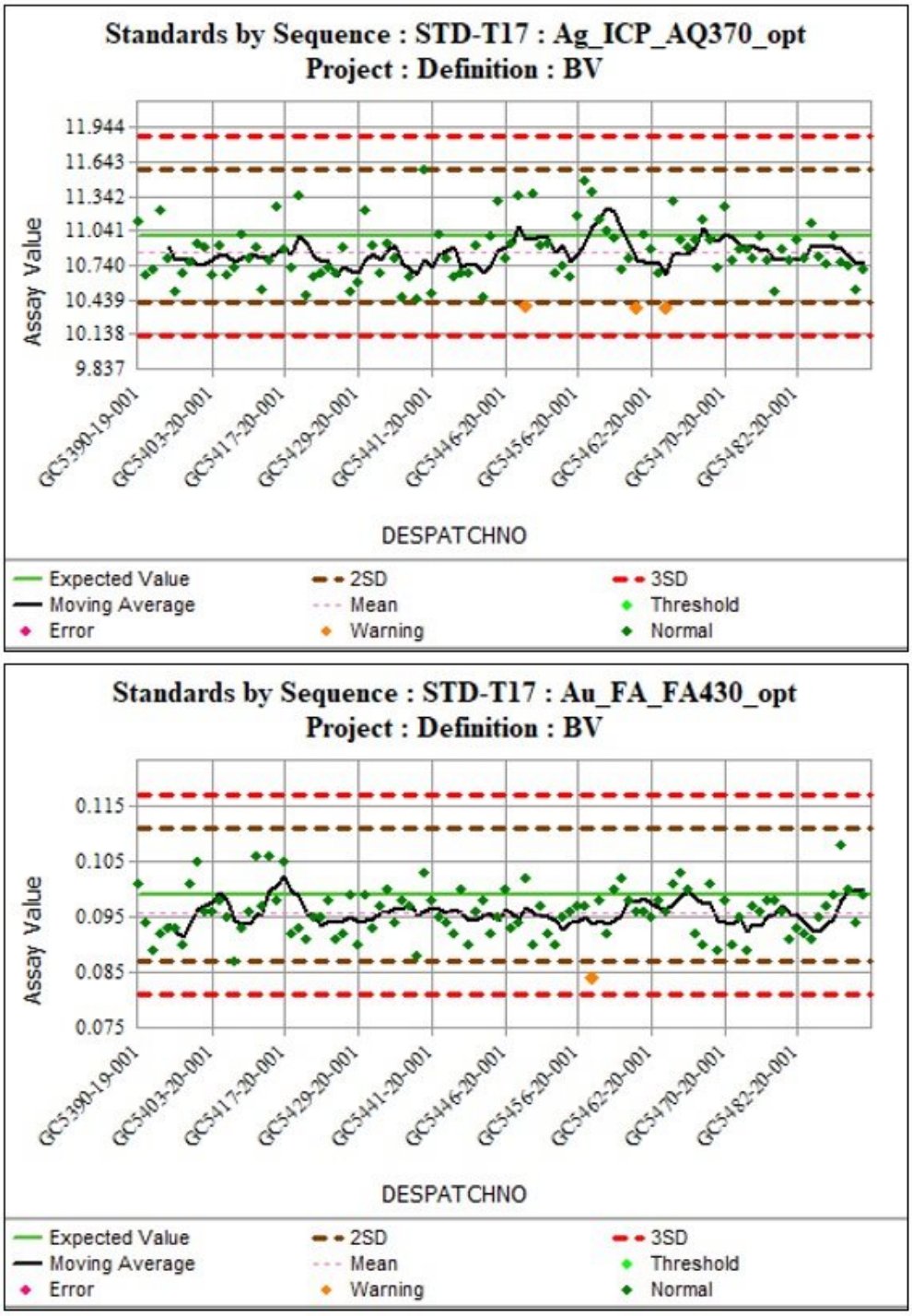


Figure 8-1: Standard Control Charts – Standard T17: Ag, Au – Bureau Veritas 2020

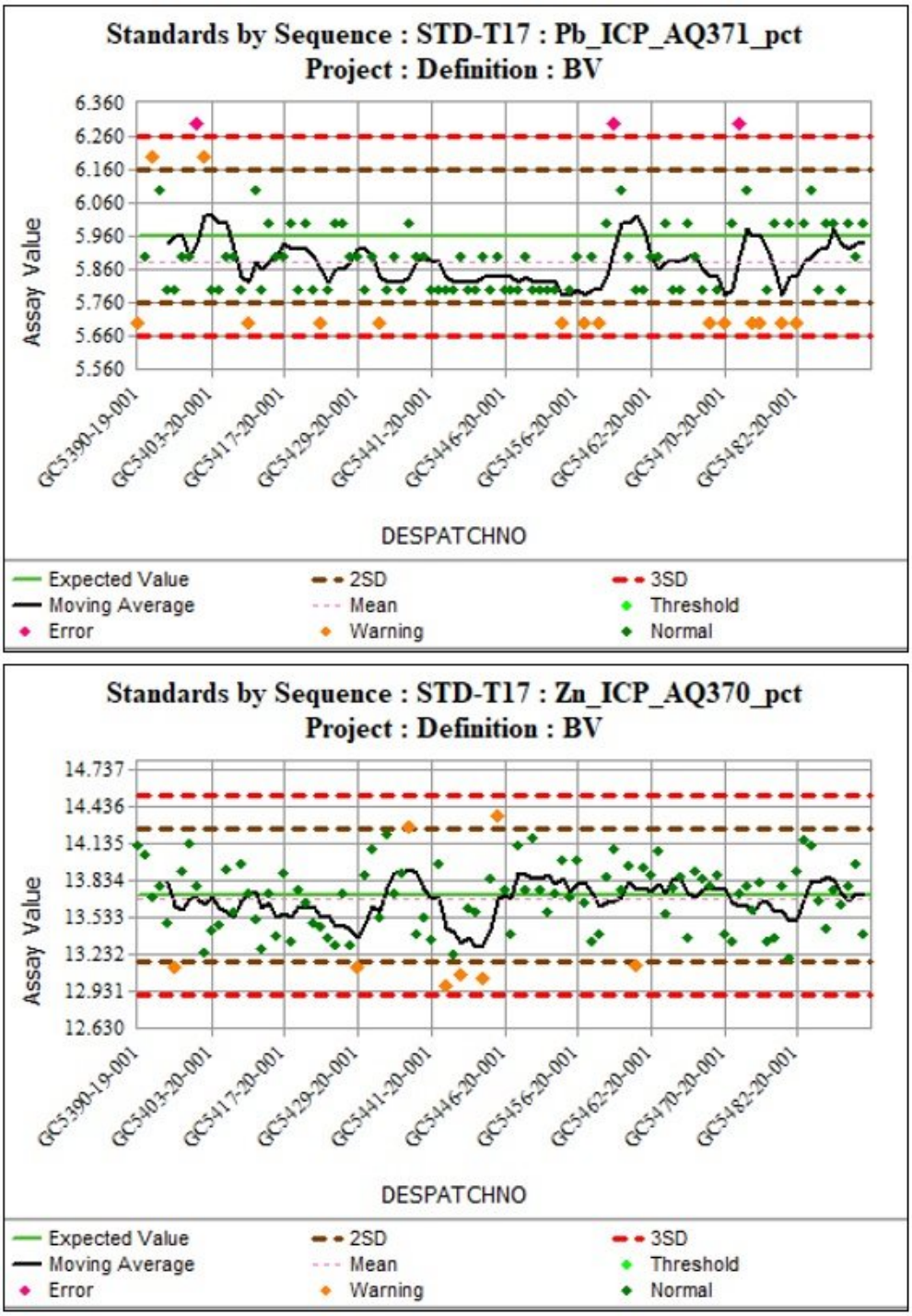


Figure 8-2: Standard Control Charts – Standard T17: Pb, Zn – Bureau Veritas 2020

8.6.2.2 Blanks

Prior to late 2017, no coarse blank material was used except for BV's internal blanks. To begin a blank program, a minus one inch crushed basalt was purchased from the Browns Hill Quarry in North Pole, AK, so that sample preparation and analytical processes could be tested. Starting in October 2017, blanks samples were inserted within each mineral intercept with an overall insertion rate of approximately one in 20 samples. The performance limits for this material are being evaluated as the analytical database increases.

For the coarse blank standards, any blank registering more than 3x the assay detection limit is reviewed. If the amount of contamination could contribute 10% or more of the metal seen in adjoining samples, the possibly contaminated samples are noted to the resource geologist. Though the contamination may have come during the comminution stage, the pulps of the likely contaminated sample are re-assayed. Pulp blanks inserted by the laboratory are also reviewed to determine if the contamination is occurring during the analytical stage. A letter is also sent to the preparation laboratory, notifying them of any contamination.

Blanks statistics and controls charts for 2020 are presented in Table 8-5 and Figure 8-3 for Au and Ag, and Figure 8-4 for Pb and Zn. Blanks statistics and controls charts show acceptable metal analyses with few warnings and anomalous results for the period. One instance shows anomalous results for Pb and Zn; but no significant contamination is interpreted.

Table 8-5: Blank BHQ1 – 2020 Analytical Results – Bureau Veritas
Hecla Mining Company – Greens Creek Mine

Statistics	ICP			FA
	(oz/ton Ag)	(% Pb)	(% Zn)	(oz/ton Au)
Number of Analyses	41	41	41	41
Number Outside Warning Limit	0	0	0	0
Number Outside Error Limit	0	0	0	0
% Outside Error Limit	0	0	0	0
Mean	0.0378	0.0030	0.0070	0.0001
Median	0.0300	0.0010	0.0010	0.0001
Min	0.0300	0.0010	0.0010	0.0001
Max	0.2700	0.0200	0.0300	0.0001
Standard Deviation	0.0392	0.0050	0.0080	0.0000

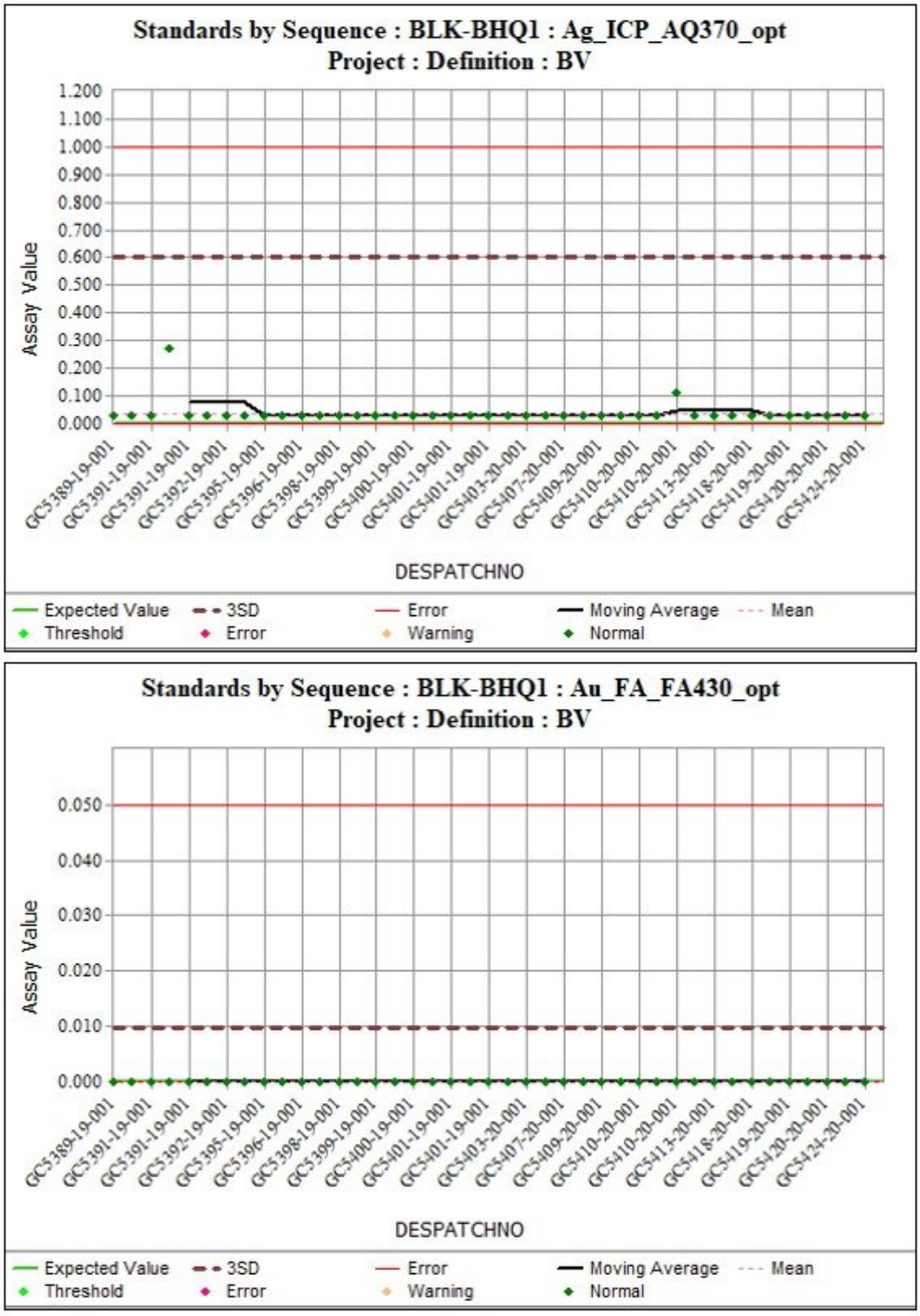


Figure 8-3: Standard Control Charts- Blank BHQ1: Au and Ag- Bureau Veritas 2020

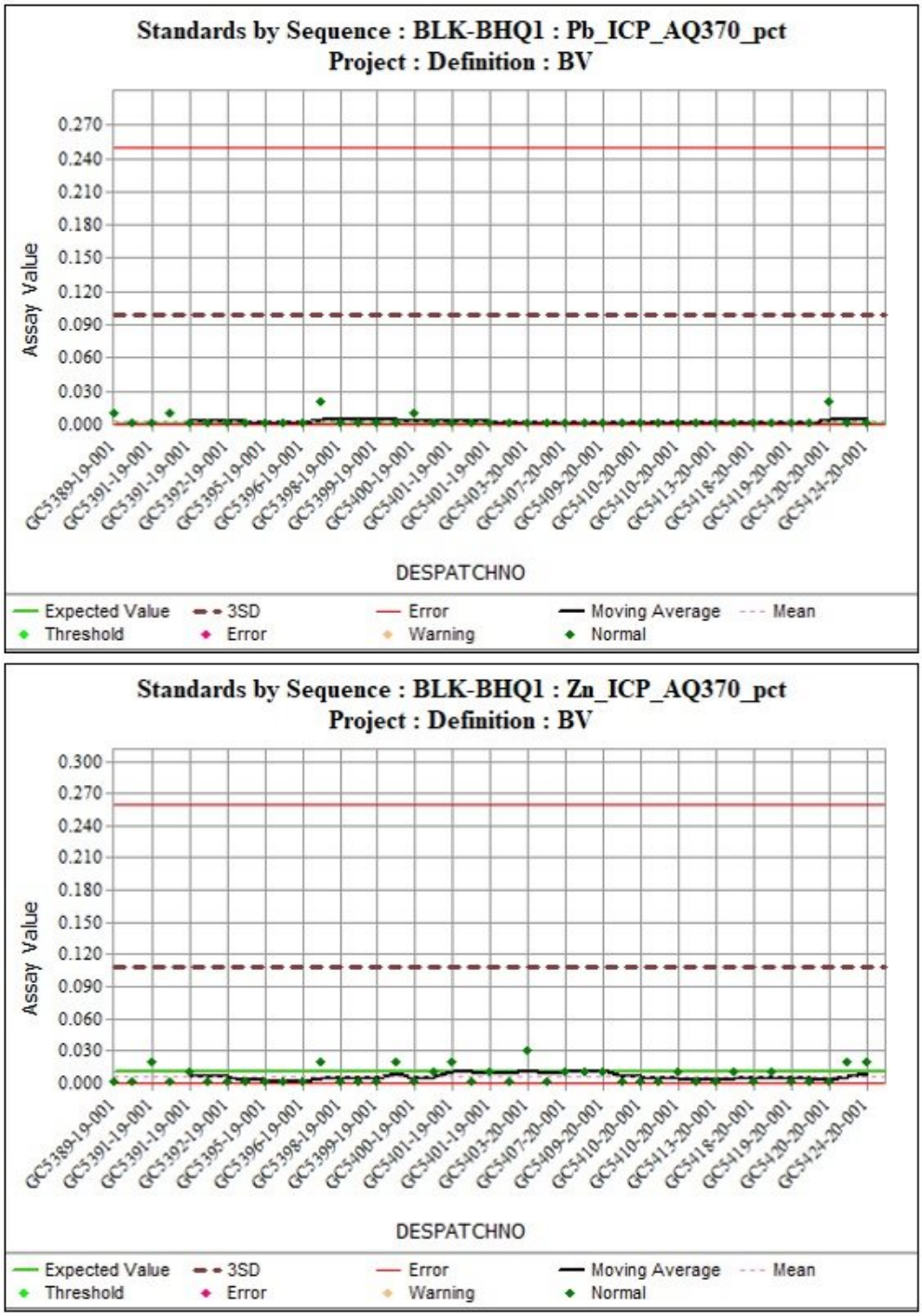


Figure 8-4: Standard Control Charts- Blank BHQ1: Pb and Zn- Bureau Veritas 2020

8.6.2.3 Duplicates

Coarse reject duplicate samples are randomly assigned at a rate of approximately one in every 36 samples by BV during the preparation stage of the process. These samples are an extra split from the crushed sample that is then treated as any other sample from that stage onward. Results for these samples are reported by the laboratory along with the primary assay results and are captured by the acQuire® database during the normal importing routine. The performance of these duplicates has been reviewed during various in-house quarterly and yearly studies and third-party audits.

From 2008 to present, pulp duplicate samples were randomly assigned at a rate of approximately one in every 36 samples and represent the repeat of a specific analytical run.

The current practice is to create a pulp duplicate for one in 20 samples. These duplicate samples are analyzed at BV with 50% of them also being analyzed at the Greens Creek Laboratory. Results for these samples are reported on the assay sheets and are imported into the acQuire database during the normal importing routine. The performance of these duplicates has been reviewed during various in-house quarterly and yearly studies and third-party audits. Scatterplots for the 2020 pulp duplicate data analyzed at BV are presented in Figure 8-5 for Ag and Au, and Figure 8-6 for Pb and Zn. The scatterplots show good agreement for Ag, Pb, and Zn in the important grade ranges, Au shows some variability. Additional checking for Au is ongoing.

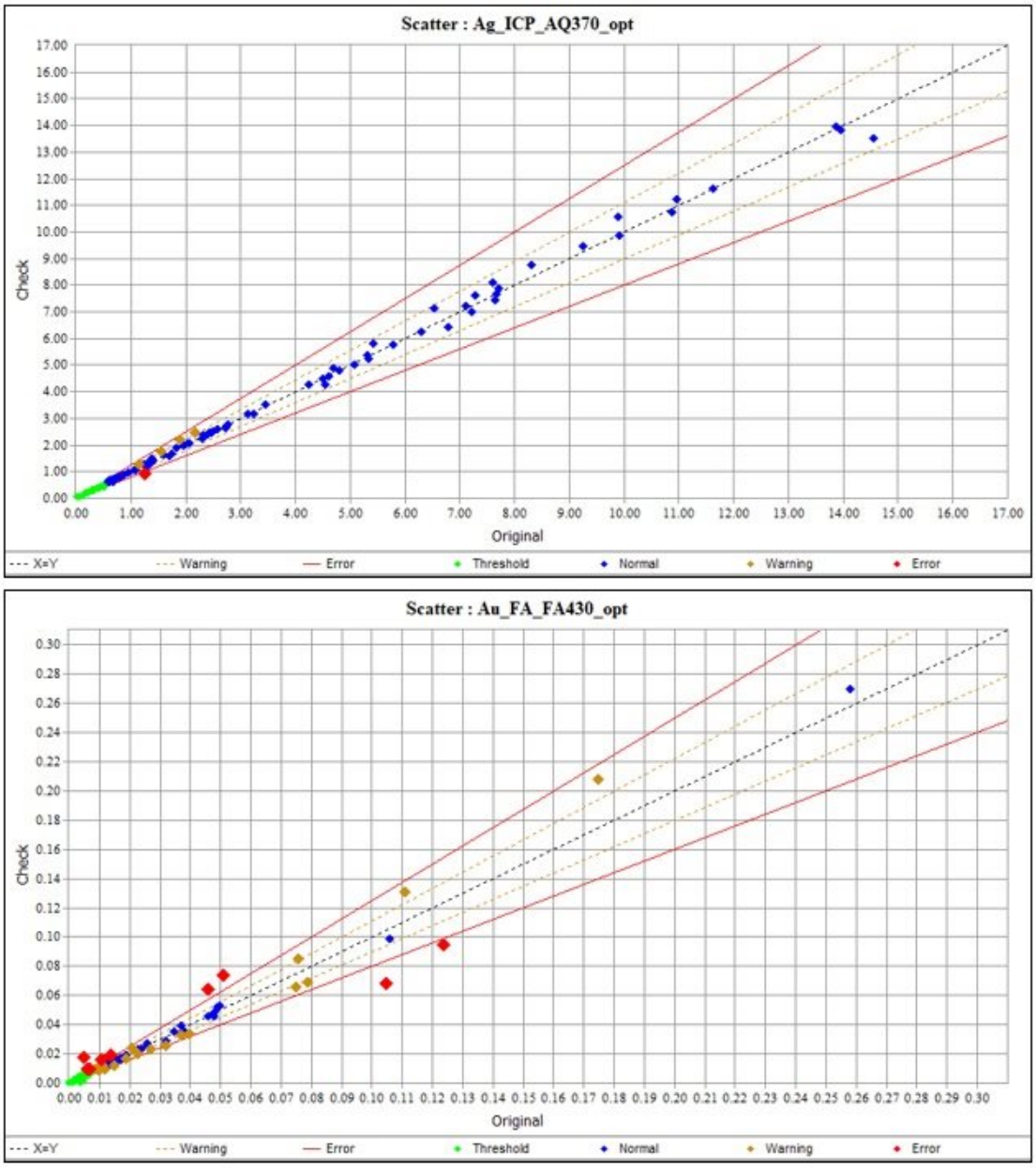


Figure 8-5: Pulp Duplicate Analyses for Ag and Au- Bureau Veritas 2018

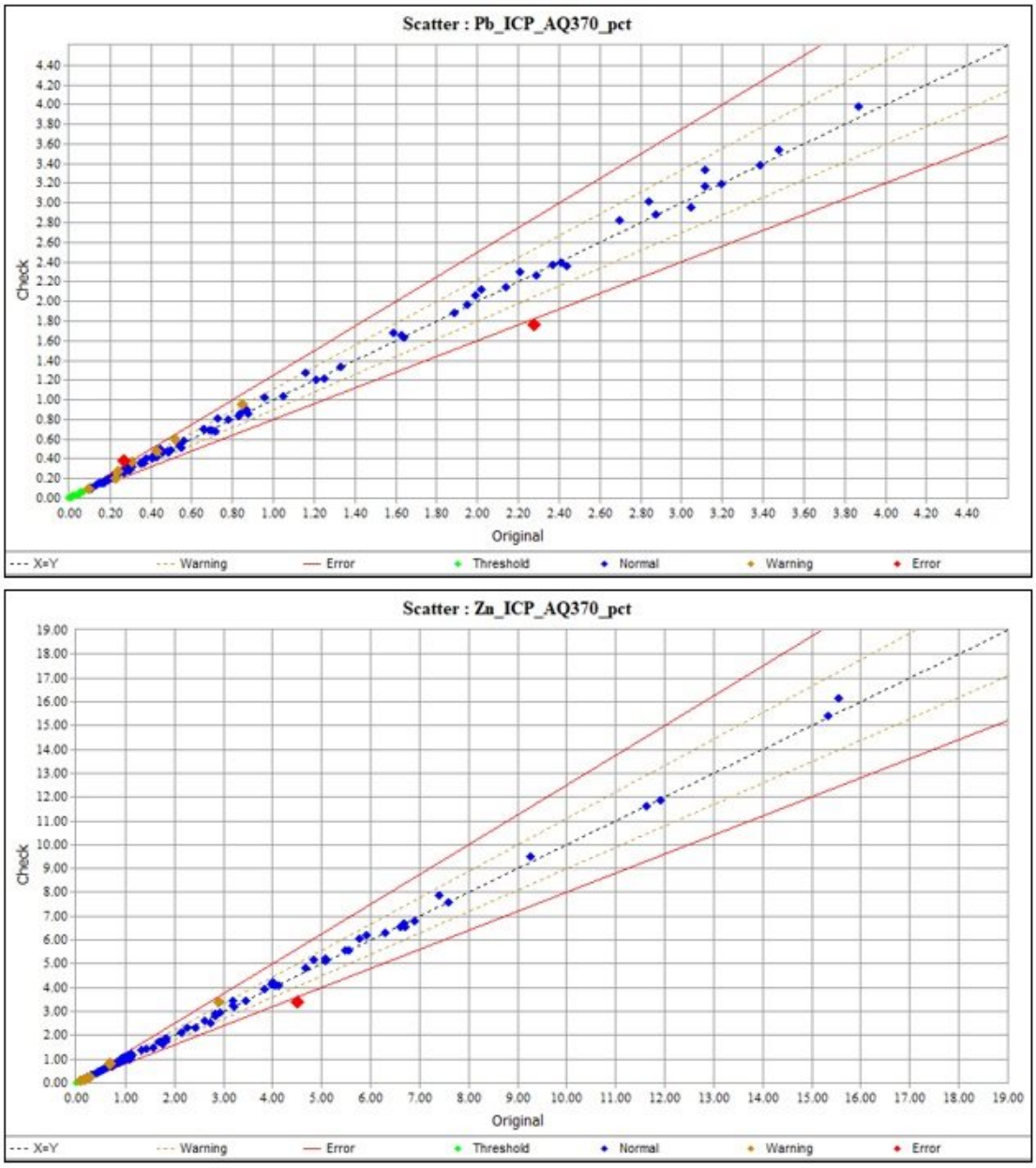


Figure 8-6: Pulp Duplicate Analyses for Pb and Zn- Bureau Veritas 2020

8.6.2.4 Check Assays

Samples for check assays are selected by the project geologist at a rate of approximately one in forty project samples. The project geologist assigns this designation based on lithology, with preference given to mineralized lithologies. An extra split is taken after pulverizing and returned to the project geologist. The project geologist dispatches a group of check samples to the Greens Creek Laboratory which is used as a check laboratory. Results are imported into the acQuire® database. The performance of these check assays has been reviewed during various in-house quarterly and yearly studies and third-party audits. Scatterplots for the 2020 pulp check data analyzed at the Greens Creek Laboratory are presented in Figure 8-7 for Ag and Au, and Figure 8-8 for Pb and Zn. Overall, the check assays agree satisfactorily with the original assays. There is some higher variance at low grades for all metals, but no observable bias. Further analysis of the check assays from the Greens Creek Laboratory is ongoing.

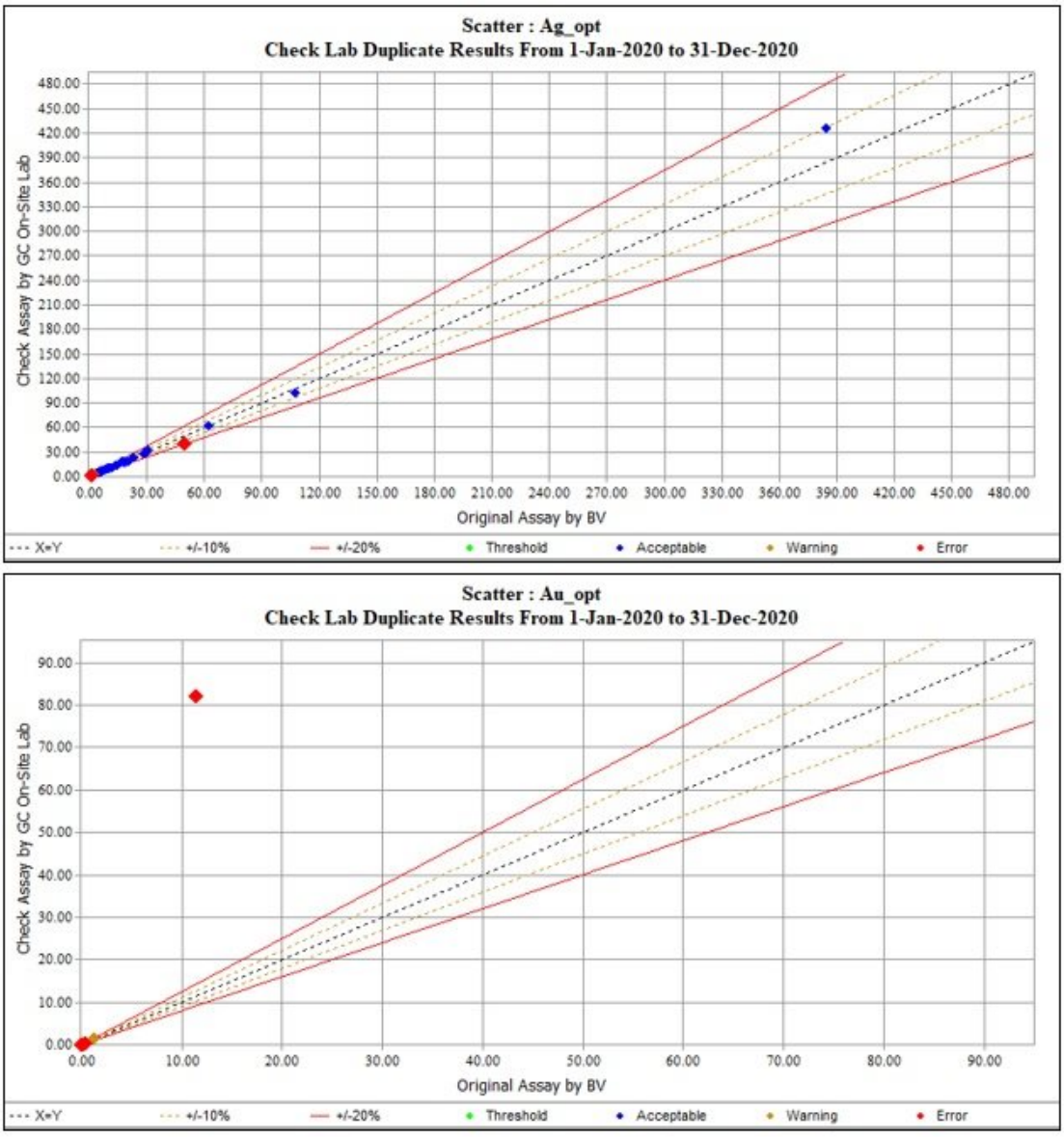
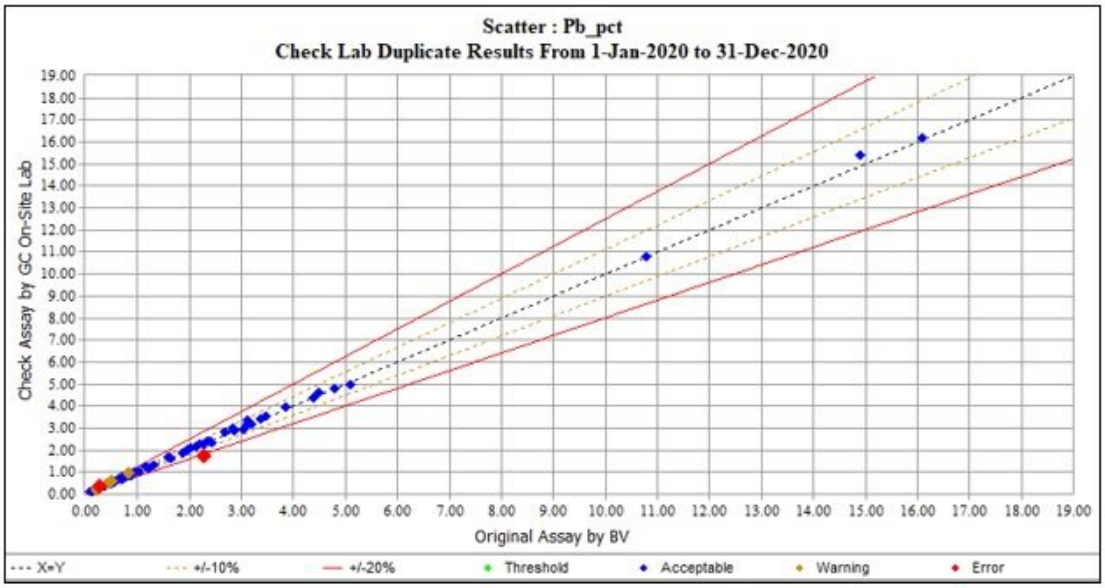


Figure 8-7: Pulp Check Analyses – Greens Creek Mine Laboratory: Ag, Au – 2020



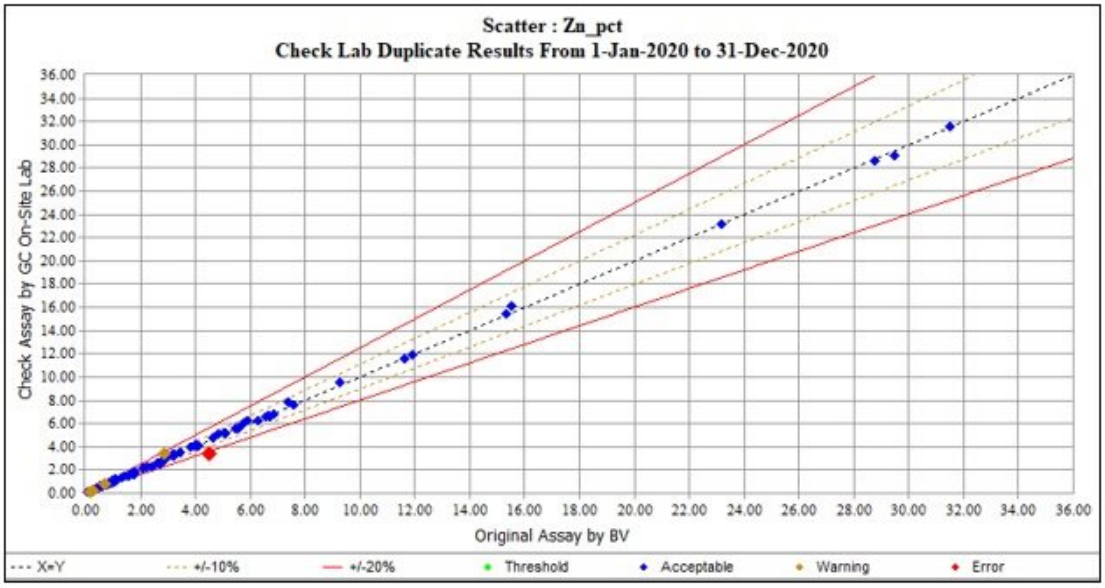


Figure 8-8: Pulp Check Analyses – Greens Creek Mine Laboratory: Pb, Zn – 2020

8.7 Databases

Drill hole and production face-sampling data are captured in a SQL database at Greens Creek that utilizes acQuire® software. These data include drill hole collars, down-hole surveys, assays, and geological descriptions. Standard database management techniques are utilized that limit access and user rights to ensure data integrity. The acQuire® system also has many built-in features that restrict data import and approvals and perform some data checking.

A drill hole data set is created for each zone based on geographic limits. Where drilling pierces multiple zones, caution is exercised to be certain that mineralization in a drill hole is properly assigned to its appropriate zone.

Primary original documents, logs, down-hole surveys, core photographs, and assay certificates are cataloged and stored on site. Digital copies are stored on networks drives that are routinely backed-up with copies stored in off site locations.

8.8 Drill Core and Sample Chain-of-Custody and Security

Drill core is transported to the core shed at the end of each drill shift by the drill crews and quick-logged each morning by the geology staff. Core is stored on surface at the 860-core shed until it can be logged.

After logging, core is separated into sampled and unsampled intervals and each is placed on a separate pallet. Core Technicians transport the pallets of core to be sampled to the underground sampling facility where it is cut or whole-sampled depending on the type of hole drilled. Samples are bagged in sturdy cloth bags and labeled with barcoded sample tags with a second sample tag in the bag. Bags are tied shut with string. Two samples are placed in a rice bag which is labeled with the dispatch number and number of that rice bag in the dispatch. A sample submittal form and standard samples are included in the first rice bag of the dispatch. Rice bags are placed into a supersack with one or more dispatches to fill the sack. All samples in each dispatch are kept together in a single super sack and the super sacks are labeled with the dispatches inside.

Supersacks are loaded into a shipping container and, when ready for shipment, a shipping manifest is created for the Warehouse and Surface Operations noting the container number and the contents. The shipping manifest and digital copies of the sample submittals are emailed to the BV Juneau Laboratory Manager. Surface Operations personnel transport the container to the dock at Hawk Inlet and it is loaded onto an Alaska Marine Lines (AML) barge. That barge is transported to Juneau and the container is delivered to the Juneau Prep laboratory by AML at which point the laboratory takes possession of the samples. AML is in possession of the container and samples while on the barge and the person receiving the container during delivery is recorded by AML. The progress of the container is tracked online from shipping to receiving.

The SRM inventory, returned coarse reject and pulp samples are secured and kept in locations with restricted access. The core is stored within the original boxes in a remote underground drift designated as a core archive.

8.9 Comments on Sample Preparation, Analyses, and Security

In the SLR QP's opinion, the sample preparation, analyses, and security procedures at the mine are acceptable, meet industry standard practice, and are adequate for Mineral Resource and Mineral Reserve estimation and mine planning purposes. In the SLR QP's opinion, the QA/QC program as designed and implemented by Hecla at the mine is adequate and the assay results within the database are suitable for use in a Mineral Resource estimate, based on the following:

- Face sampling covers sufficient area and is adequately spaced to support mine planning.
- Drill sampling is adequately spaced to first define, then infill, base metal anomalies to provide prospect-scale and deposit-scale drill data.
- Since 2008, data have been collected following industry standard sampling protocols (see Section 9 for discussion of third-party reviews).
- Sample collection and handling of core is undertaken in accordance with industry standard practices, with procedures to limit potential sample losses and sampling biases.
- Sample intervals in core, comprising one foot to five feet (0.3 m to 1.5 m) intervals, are considered to adequately represent the true thicknesses of mineralization. Not all drill material may be sampled depending on location and alteration.
- Sample preparation for samples that support Mineral Resource estimation has followed a similar procedure since 2008. The preparation procedure is in line with industry standard methods for polymetallic deposits.
- Exploration and infill core programs are analyzed by independent laboratories using industry standard methods for gold, silver, lead, zinc, copper, iron, and barium analyses. Current run-of-mine sample analyses are performed by the Greens Creek Laboratory.
- SG determination procedures are consistent with industry standard procedures. There are sufficient acceptable SG measurements to support the values utilized in tonnage calculations.
- Limited information is available on the QA/QC for the pre-1998 drill programs; however, sufficient programs of re-analysis have been performed that the data can be accepted for use in estimation (refer to Section 9).
- Typically, drill programs include the insertion of blank, duplicate, and standard samples. The QA/QC program results do not indicate any problems with the analytical programs, therefore the analyses from the core drilling are suitable for inclusion in Mineral Resource and Mineral Reserve estimation.
- Data collected are subject to validation, using in-built program triggers that automatically check data upon import to the database.
- Verification is performed on all digitally-collected data on import to the main database, including checks on surveys, collar co-ordinates, lithology data, and assay data. The checks are appropriate and consistent with industry standards.
- Sample security relies on the fact that the samples are always attended or locked in the on site logging or sampling facilities. Chain-of-custody procedures consist of filling out sample submittal forms that are sent to the laboratory with sample shipments and shipment tracking to ensure that all samples are received by the laboratory.
- Current sample storage procedures and storage areas are consistent with industry standards.

9.0 DATA VERIFICATION

9.1 External Reviews

Hecla and the Greens Creek Joint Venture (GCJV) operators have consistently involved third-party consultants in database reviews, Mineral Resource and Mineral Reserve estimates, and mine audits. This work is summarized in the following subsections, categorized below as 'legacy' (performed for the Greens Creek Joint Venture), and 'Hecla' (performed for Hecla after the company became 100% owner/operator of the Property in 2008).

9.1.1 Legacy Data Review

9.1.1.1 Mineral Resource Development Inc., 1997

A face-sampling study was conducted by Mineral Resource Development, Inc. (MRDI) to check for sampling bias, and to determine the level of reproducibility obtainable from face sampling, using a modified sample preparation protocol. Sample preparation and assay protocols were formulated to provide the analytical precision required.

9.1.1.2 Mineral Resource Development Inc., 1998

A review of the 1994 Southwest Feasibility Study (1994 FS) block models and their reconciliation to production for the Southwest Zone was undertaken.

The principal conclusions were:

- The mineral zones in the Southwest Zone have been deformed by multiple events, to the extent that they can no longer be considered stratiform.
- Overall, the 1994 FS model grade and tonnage have been confirmed by production (1997), with the exception of silver, which had been of lower grade than predicted.
- The 1994 FS model is very inaccurate in terms of predicting the locations and grades of mineral types.
- There was a significant amount of over-break and ore loss (particularly high silver zones) which resulted in a higher tonnage at a lower grade reaching the plant than was predicted by grade-control data. To some extent this over-break was desirable, as the value of high grade material in the structurally complicated Southwest Zone exceeds the cost of dilution, i.e., it is important to take some dilution to ensure as much as possible of the ore is recovered.

In June 1998, MRDI was contracted to assist in the preparation of Mineral Resource models for the three zones that were considered to be major contributors to the five year production schedule. The Southwest, Northwest West and 200 South zones were selected for this work. Greens Creek staff prepared all the geologic interpretations and worked under the direction of Dr. Harry Parker to develop appropriate modeling techniques including capping for gold and silver grades, composite length studies, and appropriate model estimation parameters model.

Review of the data collection and acquisition procedures showed that it followed industry standard practices for sampling, assaying, quality-control, and data entry and management. The interpreted mineralization envelopes were reasonable for the Southwest and 200 South zones. Concerns were expressed with the Northwest West model because the mixture of large, base metal, low grade areas of white carbonate mineral style with more massive, base metal-rich material could result in the over-projection of gold, lead, and zinc grades from composites of base metal-rich massive mineralization, and of silver grades from white carbonate mineral type. The results from the work completed by MRDI in 1998 have formed the basis for all subsequent modeling techniques up to 2018.

9.1.1.3 Mineral Resource Development Inc., 1999

A review was completed on the 5250 Zone model and Mineral Resource estimate reported in February 1999. The model was found acceptable for the purposes of reporting Mineral Resource estimates for the zone. Similar reviews were performed on the Southwest, Northwest West and 200S Zone models and estimates. The database was found to be acceptable for use in Mineral Resource estimation, and the resulting estimates were considered adequate for all three zones.

Recommendations relating to modeling and estimation focused on timely QA/QC reviews, data entry and data validation, and appropriate data archiving.

A review of the 1999 operating plan was performed in December 1999 on behalf of Standard Bank London Limited in support of the Project acquisition by Hecla and Pan American Silver Corporation. The operating plan was found to represent an appropriate response to the ongoing development of the Greens Creek operation, and the assumptions in the proposed operating and development plan were considered to be reasonable. A recommendation was made that documentation supporting mine plans should be collated.

9.1.1.4 AMEC, 2002

In October 2002, AMEC, the successor company to MRDI, audited the block model for the Central Zone. The evaluation compared the updated 2001 block model with that of the block model completed in 2000 and determined that a new model would be required. Recommendations were made in relation to modeling methods and reconciliation evaluations.

A Mineral Resource/Mineral Reserve audit was performed in December 2002 on the 2002 estimates to review supporting data, Mineral Resource estimates, mine designs and Mineral Reserve estimates to give an assessment of the reasonableness of the Greens Creek Mineral Reserve statement. The emphasis of the audit was on the 9A, Central West, 5250, Southwest Bench and Deep Southwest zones. Reviews of mine designs were conducted for the East, 200 South, Southwest, and Northwest West zone deposits. The independent review confirmed the 2002 Mineral Resource/Mineral Reserve statement.

A number of recommendations were made to address the areas of QA/QC management, consistent reproducibility of Au values at Acme, provision of documentation in relation to Mineral Resource/Mineral Reserve conversion procedures and supporting information and, establishment of grade control procedures in areas mined by longhole methods.

9.1.1.5 AMEC, 2003

The Greens Creek Joint Venture produced new Mineral Resource models in 2003. AMEC reviewed the changes and assisted in the completion of new models or model updates for two mineral zones, namely the 9A and Northwest West zones. In addition, AMEC reviewed the conversion of Mineral Resources to Mineral Reserves for the Northwest West Zone.

Drilling, sampling, sample preparation and assaying methods were considered to meet or exceed industry standard practice and results were considered adequate to support Mineral Resource estimates. Density measurements were adequate to support tonnage estimates. Minor errors with the down-hole survey data were not considered to affect estimates and could be remediated. The assay database showed an acceptable low error rate. Mineral Resource estimates for the 9A and Northwest West zones were accepted as reasonable. Conversion of the Mineral Resources at the Northwest West Zone to Mineral Reserves was considered to use appropriate modifying factors and the mine plan was achievable in the time-frame contemplated.

Recommendations included change of support analysis for Measured and Indicated Mineral Resources, and evaluation and quantification of dilution percentages to be expected by stope during mining activities.

9.1.1.6 AMEC, 2005

AMEC reviewed supporting data, Mineral Resource estimates, mine designs and Mineral Reserve estimates to give an assessment of the reasonableness of the Mineral Reserve statement for 2005. The deposits reviewed were Northwest West, 5250, Southwest Bench and 200S zones.

AMEC found the error rate for the lithology, sampled intervals, assays, and down-hole surveys to be acceptable, and considered the database acceptable for use in Mineral Resource estimation. Assay quality was controlled by a consistently applied system of standard reference materials (SRMs), pulp duplicate samples, coarse reject duplicate samples, and check assays. Mineral Resource and Mineral Reserve estimates were considered to be appropriately estimated.

Recommendations included: updating the database with missing Ba and ICP assays; checks of the methods whereby down-hole survey data are uploaded; review of potential assay bias at Acme for Ag and Pb; review of density values assigned to high Ba material; and quantification of dilution percentages to be expected by stope during drift and fill, primary longhole, and secondary longhole mining activities.

9.1.2 Hecla Database and Verification

9.1.2.1 AMEC, 2008

In 2008, AMEC audited the databases, data transfer, and data storage procedures for the 5250N, Northwest West and Gallagher zones. No significant errors that would preclude Mineral Resource or Mineral Reserve estimates were noted. A number of recommendations were made to address program improvements and to implement incremental checks and additional validation steps in the data collection, QA/QC verification, modeling, and estimation processes.

AMEC found the error rate for lithology codes within the mineral zones, sampled intervals, and assays in the Greens Creek databases to be acceptable to support Mineral Resource estimation for the Gallagher and 5250N zones, but found the error rate close to 1% for lithology and greater than 1% for assays in the Northwest West Zone. AMEC was unable to determine the precision of Au, Ag, Pb and Zn assays.

Key recommendations included:

- Integration of the QA/QC data into the site acQuire database.
- Reviewing of inconsistencies in Ba and ICP data.
- Procedures to ensure that errors identified with the database during the Datamine® modeling could be updated in acQuire®.
- Review of potential high biases in Pb and Ag results at Acme.

- Implementation of incremental checks and additional validation steps in the data collection and model completion process.
- Checks on the amount of contact dilution allowed for in the models.

AMEC also audited the Mineral Reserve and Mineral Resource statement. Scope items included auditing the database and review of supporting data, Mineral Resource estimates, mine designs, and Mineral Reserve estimates to give an assessment of the reasonableness of the Mineral Reserve statement for 2007. Mineral Resource estimates for the 5250N and Gallagher zones were reviewed, Mineral Reserve estimates were reviewed for Northwest West and 5250N zones, and the database was audited for all three zones.

9.1.2.2 AMEC, 2009

AMEC was requested to provide technical assistance with auditing the Project database and building of wireframe models for five zones (the Northwest-West, Upper Plate, Northwest-West South, 200 South-Deep, and Gallagher zones) and the old mining area of East Zone. The database audit was only partially completed, as only a portion of the QA/QC files were available at the time of the audit. Wire-frame modeling of the East Zone was also only partially completed due to time constraints.

Recommendations from this work included identifying and filing documentation of historic drill logs and collar details, maintenance of QA/QC data to facilitate data verification, validation of collar locations, review of East Zone survey measurements after magnetic declination is applied, modification of sampling protocols so that mineralization in non-traditional mineral lithologies is assayed, and improvement of database storage and import procedures between the acQuire® database and the Datamine® modeling and estimation software.

AMEC performed a review of the 2009 Mineral Resources and Mineral Reserves for 5250 and 9A zones, including reviews of supporting data, Mineral Resource estimates, mine designs, and Mineral Reserve estimates.

AMEC found the error rate for the lithology, sampled intervals, assays and down-hole surveys to be acceptable and considered the database acceptable for use in Mineral Resource estimation. Assay quality was controlled by a consistently-applied system of SRMs, pulp duplicate samples, coarse reject duplicate samples, and check assays. AMEC did not find a fatal flaw in mine operations, planning, scheduling, or budgeting that would prevent Hecla from executing their plans to mine the 5250 and 9A Mineral Reserves.

Recommendations arising from the audit included notations relating to inclusion of Ba and “over-limit” samples for Zn in the database, investigation of potential assay biases at Acme and the Greens Creek Laboratory, continued recommendations for real-time QA/QC monitoring, density assignments for white barite ore, and reconciliation.

9.1.2.3 AMEC, 2012 – 2013

AMEC was requested to conduct a review of Hecla’s 2011 Mineral Resources and Mineral Reserves for the Deep 200 South, Southwest Bench, East Zone, and Gallagher zones in early 2012. This report was finished and received by Hecla in September 2014.

AMEC found that the definition of the domains was done using applicable and reasonable parameters, care, and execution. Grade capping and compositing was found to be reasonable, and variography was adequately executed. Estimation plans were found to be adequate, and AMEC agreed with the Mineral Resource classification methods applied.

The mining review focused on the Southwest Bench Zone, as mining was active in this zone. AMEC did not find any fatal flaws in mine operations, planning, scheduling, or budgeting that would prevent Hecla from executing its plans to mine the Southwest Bench Mineral Reserve. Reconciliation between actual mined and model depletion showed significant variation and required addressing. Regular geotechnical reviews were recommended as mining advances. The development plan and equipment were considered appropriate for the Southwest Bench Zone.

Recommendations arising from the audit included compiling more formal documentation for Mineral Resource model reports for each mineralized zone; improving Mineral Resource model archiving procedures; investigating more comprehensive variography procedures, including locally varying anisotropy; tracking each mining area by tons produced by mining method, and capturing those volumes mined for the depletion model; generating a detailed ventilation model that shows areas by equipment used to improve the effectiveness of the total allotted airflows; creating an equipment maintenance schedule that showed the equipment purchase, rebuild, breakdowns, and planned maintenance schedule by maintenance bay and the personnel allotted to each in order to enable a more proactive approach to maintenance; production histories were recommended to be kept for each mining block; and production forecasts were recommended to include appropriate dilution and recovery.

9.1.2.4 AMEC Foster Wheeler, 2016

Hecla Greens Creek Mining Company (HGCMC) commissioned Amec Foster Wheeler to review the Mineral Resource models constructed by Hecla in 2016 for the NWW Zone (NWW) and the 5250 Zone (5250). This review included a site visit the Hecla offices in Juneau, AK from October 31 to November 4, 2016. During the site visit, the construction of the Mineral Resource model was discussed and reviewed with Hecla staff.

The project scope was to review the Mineral Resource models for the NWW (effective date July 26, 2016) and 5250 (effective date July 14, 2016) mineral zones. A review of the database was not included in the scope of work and Amec Foster Wheeler did not audit the database.

Amec Foster Wheeler found no significant errors in the Mineral Resource modeling methodology and found that model validations supported the grade estimates. Recommendations included better documentation of procedures and production of a final written report documenting the data used, data analysis, model construction, grade estimation methods and tabulation of the Mineral Resources. Alternative methods for estimating density and a modified Mineral Resource classification method to remove unrealistic isolated blocks were also recommended. Amec Foster Wheeler also suggested the inclusion of a complete set of cross-sections for each metal be archived with the models.

9.1.2.5 Roscoe Postle Associates, 2017

Roscoe Postle Associates Inc. (RPA), now part of SLR, was retained in 2017 by Hecla to complete a Mineral Resource and Mineral Reserve audit of Greens Creek to be used for internal purposes. At Hecla's request, RPA's audit focused on two of the nine mining zones, the 200 Deep South (200S) and Northwest West (NWW) zones. These zones contain approximately 50% of the Greens Creek Mineral Reserves.

RPA did not find any major issues in the Mineral Resource modeling methodologies but made many recommendations. The main recommendation was a modification to the workflow for the mineral selection/interpretation criteria to provide a more accurate reflection of the potentially economic mineralization and to be more flexible in responding to variations in metal prices and operating costs. To that end, RPA recommended that the NSR value using the Mineral Resource price deck be used to discriminate the potentially economic mineralization. Where possible, the mineral zone interpretation should also incorporate the detailed grade control mapping and sampling information. In 2017 and 2018, a new workflow was developed by the mine geology staff for mineral zone interpretation based on these recommendations. Testing and modifications of the Mineral Resource estimation workflow are ongoing.

Other recommendations made by RPA included updating the Mineral Resource classification scheme to eliminate artifacts created from the model re-blocking process and to improve the accounting procedure for mined volumes. Minor recommendations focused on dilution grades, mining recovery for longhole stopes, and mining depletion.

Finally, RPA recommended that a set of Standard Operating Procedures be prepared that describe each of the steps in the preparation of the Mineral Resource and Mineral Reserve statements and include a formal peer review process and sign-off procedure to ensure that each step of the workflow is completed in a consistent and proper manner. All of RPA's recommendations have been implemented or are in the process of being implemented.

9.2 Internal Reviews

Until 2006, all geological data were stored in an Ingres database. This became corrupted, but extraction of most files was possible. A period of approximately two years followed where the database consisted of a number of Microsoft Access® databases. In 2007 acQuire® software was purchased, and over the following three years, all data were transferred to the database. All drill hole assay data was reloaded from the original electronic assay files. All data were checked during the transfer process.

A standard set of referential integrity 'logic' checks are applied to the data as they are entered into the acQuire® database. These checks include checking for overlapping or gaps in intervals, validation of lithologic codes against lookup tables, and enforcement of unique records for sample numbers and drill hole names.

As data are extracted from the acQuire® database and brought into Datamine® for modeling, a second set of validation checks are performed. These checks include flagging drill holes with missing survey data, checking for overlapping intervals or gaps, lithologic code validation, flagging drill holes with anomalous calculated angular deviations, flagging sampled intervals that are missing assays or have returned values greater than the detection limit. Where errors are noted, the problems are corrected prior to the database being used for Mineral Resource estimation purposes.

9.2.1 acQuire Database Health Check

In early 2018, acQuire Software Pty Ltd was retained to perform a health check for the Greens Creek acQuire® database. A thorough review was requested to identify potential issues with the data, databases, and workspaces, and to recommend possible repair options and improvements. The database backups and acQuire® workspaces used for the health check were effective March 14, 2018.

This detailed review of the databases and workspaces found no serious issues that significantly impact database contents or integrity. Areas were identified where systems could be enhanced, cleaned up, or streamlined. The key recommendations for improving the existing system dealt with training of new users, database issues with missing, duplicate, or unnecessary fields, and upgrades to the acQuire® program and SQL Server maintenance and backups. Project personnel are working through the recommendations on the database issues.

9.3 SLR Data Validation Methods

Validation of the Greens Creek mine geological data by SLR began with a personal inspection by the geological QP, conducted from September 21 and September 22, 2021 where the following activities were carried out by the geological QP:

- Visited the core shack where examples of the mineralization and enclosing host rocks were inspected, logging and sampling procedures reviewed,
- Inspected the sample shipping arrangements,
- Visited the sample sawing and density measurement facilities,
- Visited several locations in the underground mines in which the nature of the mineralization was observed and the grade control mapping and sampling procedures were discussed,
- Visited one of the drilling stations where the drilling equipment was reviewed and the drilling and survey procedures were discussed,
- Carry out discussions with site geological staff in regards to the regional and local scale geology as well discussions on the potential for discovering additional mineralized deposits elsewhere on the Property, and
- Visited some of the mine stockpile areas, in addition to conducting a brief tour of the plant to inspect the sampling points used to determine the tonnages and grades processed.

A visit was made to the site sample preparation facility as well as the Greens Creek Laboratory during a previous site visit carried out in 2017.

In addition to personal inspections of the site, SLR carried out a program of validating the assay tables in the drill hole databases by means of spot checking a selection of drill holes that intersected the mineralization of the 200S, Northwest West, and 5250 deposits, as together these three deposits comprise the majority of the Mineral Resources and Mineral Reserves. SLR proceeded to carry out its drill hole database validation exercise by comparing the information contained within the assay tables of the digital databases against the assays presented in the original laboratory certificates. The selection of drill holes for validation considered the long production history of the mine and focused on those drill holes that contribute to the greater degree to the anticipated Mineral Resource and Mineral Reserve estimates.

Comparisons of the lithological information contained within the drill logs against the information contained within the digital databases were also carried out, as was a comparison of the results of the down-hole deviation measurements with those contained within the survey table of the drill hole database.

9.4 Comments on Data Verification

The process of data verification for the Project has been performed by external consultant firms from 1997 to 2013, as well as by Hecla personnel. Since 2013, all data verification has been done by project staff as the data are being collected and imported into the acQuire® database. The 2018 check on the acQuire® databases and workspaces carried out by Hecla found no serious deficiencies.

SLR considers that a reasonable level of verification is completed, and that no material issues would have been left unidentified from the programs undertaken. External reviews of the database have been undertaken in support of acquisitions, support of feasibility-level studies, and in support of Mineral Resource and Mineral Reserve estimates, producing independent assessments of the database quality. No significant problems with the database, sampling protocols, analytical flowsheets, check analysis program, or data storage were noted. Drill data are verified prior to Mineral Resource and Mineral Reserve estimation using various automated and manual checks.

The SLR QP is of the opinion that the data verification programs undertaken on the data collected from the Project adequately support the geological interpretations, validate the analytical and database quality, and support the use of the data in Mineral Resource and Mineral Reserve estimation and in mine planning. No significant sample biases were identified from the QA/QC programs undertaken, and sample data collected adequately reflect deposit dimensions, true widths of mineralization, and the style of the deposit.

10.0MINERAL PROCESSING AND METALLURGICAL TESTING

10.1 Metallurgical Test Work

Since mill construction and startup, numerous internal and external studies have been performed to investigate metallurgical issues and support mill modifications. Many of these are listed in Table 10-1.

Extensive initial test work programs were conducted at Noranda's Matagami Lake and Mattabi laboratories in Ontario, and at Dawson Metallurgical Laboratory in Salt Lake City, UT, as compiled and summarized by Banning (1983). Composites of various mineral types were developed using drill core samples. Results of these programs allowed the development of the basic Greens Creek lead-zinc flotation flowsheet, with inclusion of a gravity gold circuit. Primary grinding requirements for the white mineral types and massive sulfide types were developed and use of stage addition for flotation reagents was established, along with collector and modifier recommendations. These programs demonstrated the desirability of a preliminary carbon removal pre-flotation step and re-grinding of rougher concentrates prior to cleaner flotation.

Following mill start-up, investigations were pursued regarding alternatives to the originally installed plane table used for gravity recovery of relatively coarse free gold. The plane tables had proved to be labor intensive and did not perform up to expectations. Screening trials indicated that available centrifugal gravity concentrators would create water balance issues and that gravity spiral concentrators had better performance. They also indicated that re-grinding of spirals concentrate prior to final cleaning with a shaking table improved product grades significantly. Plant trials with spirals confirmed the screening results and a revised gravity circuit utilizing concentrating spirals, concentrate re-grinding and final tabling was implemented (Sawyer, 1997).

Mill expansion by way of construction of a new building primarily devoted to cleaner flotation circuits also allowed reallocation of existing equipment and floor space in the original mill building. Bench scale test work followed by plant trials in 1999 to 2000 produced results used to develop modifications to the plant flowsheet, size and specify required equipment and analyze economic consequences of the expansion. Resulting concentrate assay improvements, improved recoveries, and economically favorable redistribution of payable metals among the various concentrates indicated overall recovery improvements of 2% for lead, 8% for zinc, 1.5% for silver and 2% for gold.

Several formal and informal studies have been performed during the life of Greens Creek which investigated causes of poor mill recoveries. Two examples are an exhaustive 2007 study (Reynolds, 2007), which examined a variety of mineral types and mill products, and a more focused 2009 study, which examined mill feeds producing particularly low recoveries, as well as examining more typical feeds for comparison (Blake, 2009). Both studies considered analytical and classic mineralogical results as well as SEM and other instrumental approaches. Both studies concluded that the principal cause of poor flotation recoveries was the presence of extremely fine-grained minerals and intergrowths that cannot be economically liberated by grinding.

Table 10-1: Greens Creek Metallurgical Studies
Hecla Mining Company – Greens Creek Mine

Title, year	Facility	Description
Metallurgical Evaluation of the Greens Creek Orebody. Approx. 1983 (Banning, 1983)	Matagami, Mattabi, Dawson Metallurgical	Mineralogical, physical evaluations. Grinding studies. Flotation studies, including flowsheet development and reagent requirements. Gravity processing studies. Product evaluations.
Recovery of Gold by Gravity Separation at the Greens Creek Mine Alaska, 1997. (Sawyer, 1997)	Greens Creek	Describes test work, plant trials, evaluation and design of spirals gravity concentration circuit replacing original plane tables.
Three-Stage Lead and Zinc Cleaning for the Greens Creek Concentrator (Scheding, 2000)	Greens Creek	Summarizes bench scale and plant trial test work used for design and economic analysis of mill expansion via new cleaner building.
Performance Assessment and Optimization of the Greens Creek Grinding Circuit. (Jankovic, 2003)	Greens Creek	Review of Greens Creek grinding circuit performance.
Green's Creek Mine: A Mineralogical Characterization of Selected Ores and Plant Products (Reynolds, 2007)	Rio Tinto Research, Bundoora, Australia	Extensive mineralogic investigation of mineral styles and mill products.
Greens Creek Mine: Silver and Base Metal Mineralogy of a Suite of Products from the Lead Circuit (Blake, 2009)	Mineralogy Consultant, Clevedon, United Kingdom	Mineralogic investigation of selected mineral feeds and mill products.
Cleaner Flotation on a New Sample of Baritic Ore: Our Project P-4167(Armstrong, 2011)	Dawson Metallurgical	Evaluation of metallurgical response of mineral from new 5250 Zone mining area.
Backfill Acid Consumption (Asarte, 2011)	Greens Creek	Investigation on effect of mine backfill on mill process pH and of effect of sulfuric acid on performance.
Report of Effects of Carbon Dioxide and Sulfuric Acid to Modify pH for Flotation of 90% Ore/10% Backfill Composite Feed (Peterson, 2012)	Dawson Metallurgical	Investigation of carbon dioxide use as process pH control reagent.
Initial Evaluation of Carbon Dioxide for pH Control at Greens Creek(Tahija, Initial Evaluation of Carbon Dioxide Use for pH Control at Greens Creek, 2012)	Greens Creek, Dawson Metallurgical	Discussion of test work results and preliminary economic evaluation of carbon dioxide use.
On site SEM analysis one year trial (2013)	FEI/Bluecoast	Investigation of grind performance and flotation performance on a daily basis
Gravity gold investigation (2011-2015)	Greens Creek	Statistical studies of correlations between gravity gold recovery and mill and feed parameters.

The performance of the grinding circuit was reviewed in 2003 as part of planning for a contemplated increase in throughput. Findings included Bond Work Index values ranging from 11.9 kWh/ton to 12.8 kWh/ton, feed specific gravities ranging from 3.5 to 4.0 and Julius Kruttschnitt Mineral Research Centre (JKMRC) abrasion parameter (ta) values ranging from 0.51 to 0.88. Bond Index values referenced from a 1993 pilot plant ranged from 10.5 to 10.7 (Jankovic, 2003).

The grinding circuit and flotation circuit performance were monitored daily using an on site SEM for over a year through 2013. This data showed that much of the lead and silver could be collected using the second carbon column. The routing of the second carbon column was adjusted so the concentrate could be directed to the overall lead concentrate and allow for much of the lead and silver to be "scalped" off without the risk of recovery losses downstream. This resulted in an increase to the lead recovery of nearly 5% starting in September 2014.

Successful metallurgical testing was conducted on using carbon dioxide for pH control beginning in 2012 and implemented in the plant in early 2015. This resulted in an approximately 2% increase in lead recovery, a 5% increase in lead recovery, and a 3% increase in gold recovery.

Plant trial testing conducted throughout 2014 and into 2015 on an additional cleaning stage of gravity concentrating spiral in the gravity circuit has shown that a gold concentrate product could be made without the need for additional regrind and shaking table and then sent off site for further processing eliminating the need for a doré furnace as well. A third stage cleaner spiral was installed and implemented in the second half of 2015 and has resulted in an approximately 1% increase of gold recovery to gravity concentrate and has also eliminated the need for operation of a regrind mill and shaking table or the further processing of gold concentrate into doré.

On site plant trial testing in 2016 on the use of Woodgrove staged flotation reactor (SFR) cells showed better separation of zinc from iron in the swing cell and PM circuit. This was implemented in 2017 to improve zinc distribution to zinc concentrate and improve silver distribution to PM concentrate.

Metallurgical testing programs are continually conducted to evaluate possible changes in feed types from new mining areas, proposed changes in processing to improve recoveries and/or concentrate grades and to investigate factors causing lower than desired recoveries and concentrate grades. Some examples of such recent and current work include:

- Installation of FloatForce flotation agitators (2016 to present)
- Investigation of vibratory mills for use in regrind stage (2018)
- Investigation into alternative collector and promoter reagents (2017 to 2018)

10.2 Recovery Estimates

10.2.1 History

Figure 10-1 shows the change in throughput rate from 1989 through 2018.

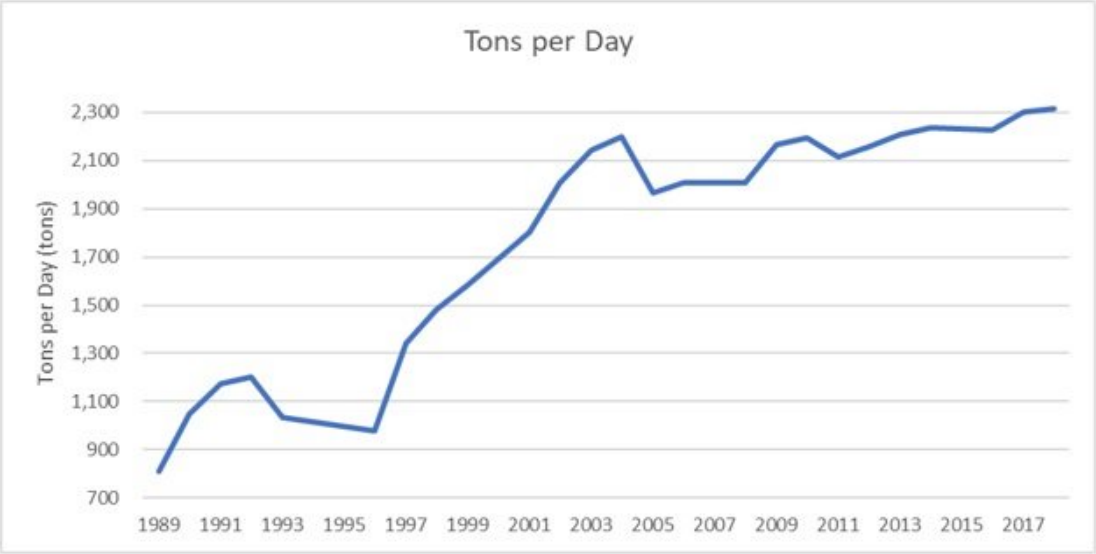


Figure 10-1: Incremental Throughput Improvements, 1989 through 2018

Production improvement efforts from commissioning through 2004 were centered mainly on increasing tonnage capabilities through the plant. This was a successful effort focused mainly in the grinding circuit and required minimal capital expenditures.

The cleaner expansion in 2000 was the first major capital project and was required to maintain the metallurgical performance at the increased throughput. Flotation capacity remained a significant issue and the cleaner circuits were again expanded in 2001 to help maintain metallurgical performance. In 2007, the lead rougher circuit capacity was expanded by 17% by adding two tank cells to the circuit.

10.2.2 Flotation Strategy Advancement

The plant was originally designed to skim off a small amount of high grade lead concentrate and then make a small amount of high grade zinc concentrate. The remaining flotation concentrates were directed to a PM sulfide concentrate. This strategy was effective because of the payment terms of the smelter contracts.

Efforts were made to maximize NSR by adjusting distributions and recoveries of the payable metals. Increasing lead concentrate production was the major goal in these efforts due to the more favorable payment terms for metals in this concentrate. The grade of the lead concentrate was allowed to drop in conjunction with increased lead and silver recovery to this concentrate.

In 2004, the market for PM concentrate was very tight due to the closure of several ISF plants. This forced a change in flotation strategy to prevent making large quantities of PM concentrate with limited marketability. Several flow changes in the plant enabled these changes to be effective. The lead concentrate grade targets were considerably reduced which increased lead concentrate quantities. The zinc targets remained constant and the additional throughput resulted in more zinc concentrate production. The PM production was significantly reduced to match market conditions. The change in strategy was necessary and recovery losses were minimized but evident.

In 2018, smelter terms improved and resulted in partial payment of lead in zinc concentrate and zinc in lead concentrate. This resulted in large increases of recoveries for lead and zinc to a payable concentrate. Depending on smelter market conditions, treatment terms and conditions are expected to vary and may impact payable metals recoveries and payout.

Figure 10-2 to Figure 10-5 show the changes in concentrate production and throughput over time. The distributions of recovered silver and gold into the gravity products and concentrates are shown in Figure 10-6 and Figure 10-7. Figure 10-8 shows the distribution of recovered zinc and lead into the respective lead, zinc, and PM concentrates.

Note that lead and zinc tonnage increased from 1989 to 2003 as the payables from PM concentrate sales became less favorable due to smelter market conditions as well as process and plant improvements made by Greens Creek. Lead concentrate grades slightly decreased over time due to favorable smelter terms allowing lower concentrate grades that resulted in higher lead recoveries. For similar reasons, but more dramatically, the zinc concentrate grades were significantly reduced with attendant recovery increases. After initial years of high zinc grades, the ability to lower the zinc concentrate grades resulted in higher zinc recoveries to the zinc concentrate; thereby, decreasing zinc recovery to the PM concentrate. The net effects on lead and zinc distributions to the respective primary concentrates to PM concentrate are shown in Figure 10-4 and Figure 10-5.

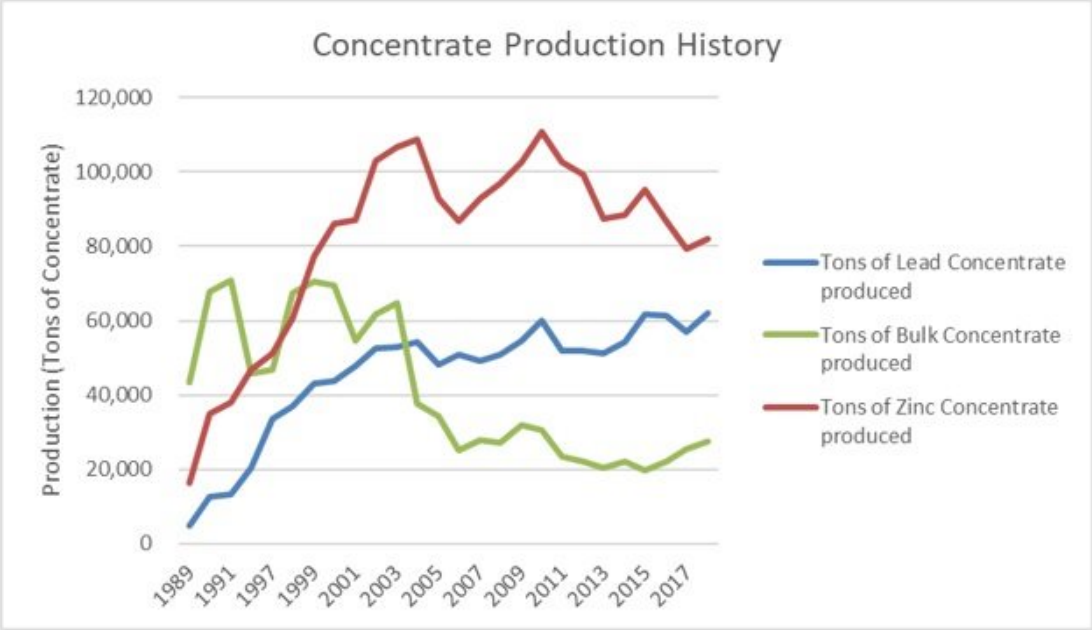


Figure 10-2: Concentrate Production History, 1989 to 2018

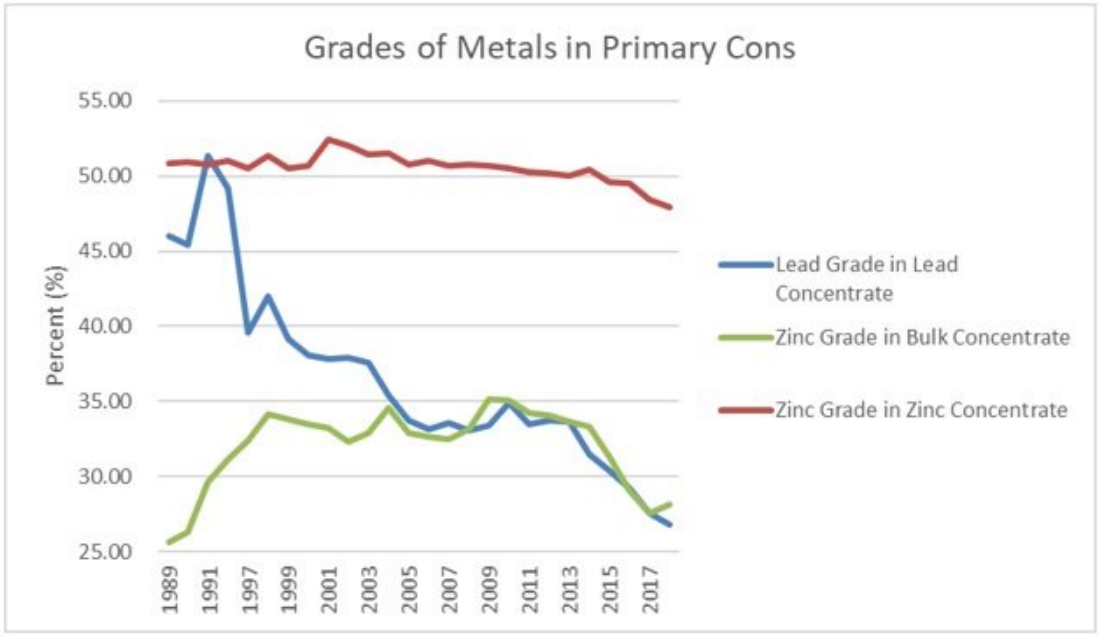


Figure 10-3: Changes in Metal Grades in Primary Concentrates, 1989 to 2018

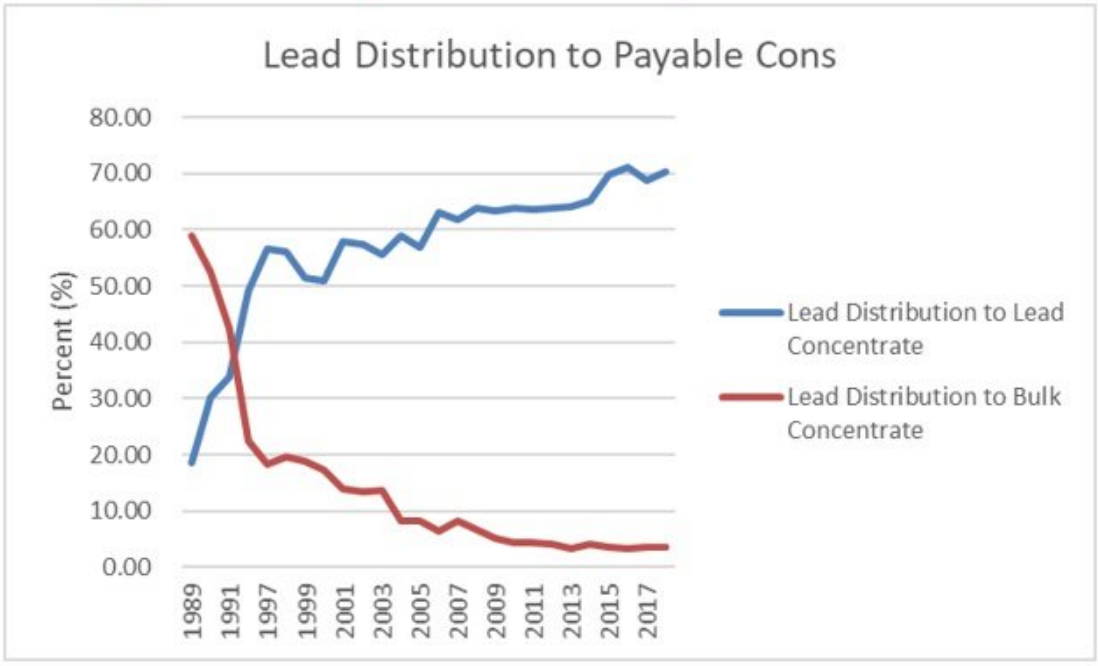


Figure 10-4: Changes in Lead Distribution in Primary Concentrates, 1989 to 2018

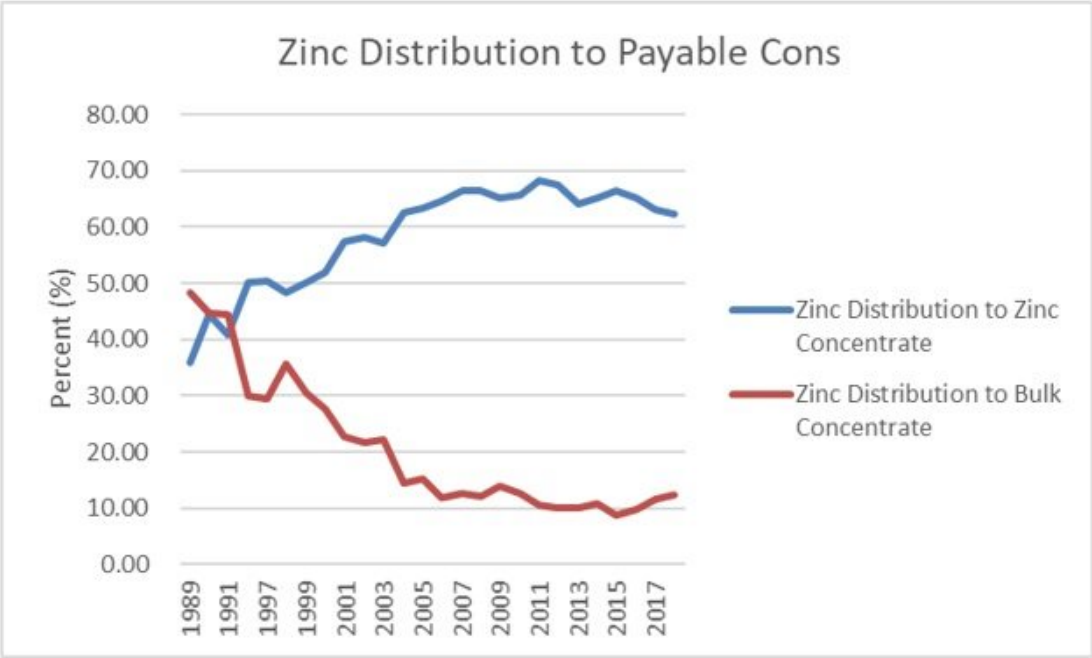


Figure 10-5: Changes in Lead Distribution in Primary Concentrates, 1989 to 2018

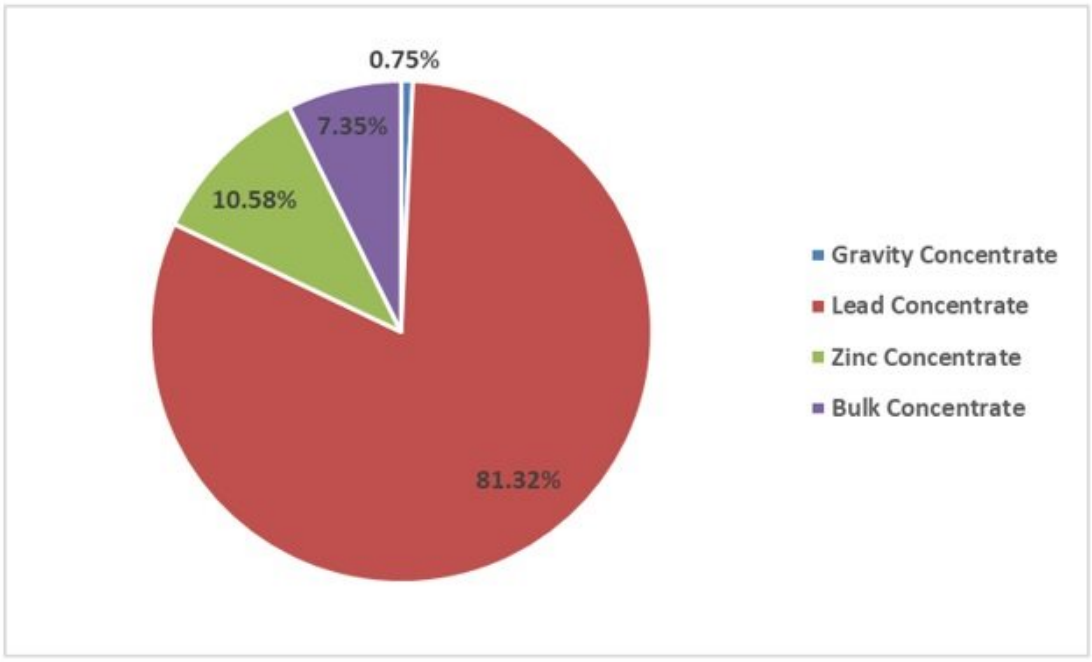


Figure 10-6: Distribution of Recovered Silver into Product Streams – 2018

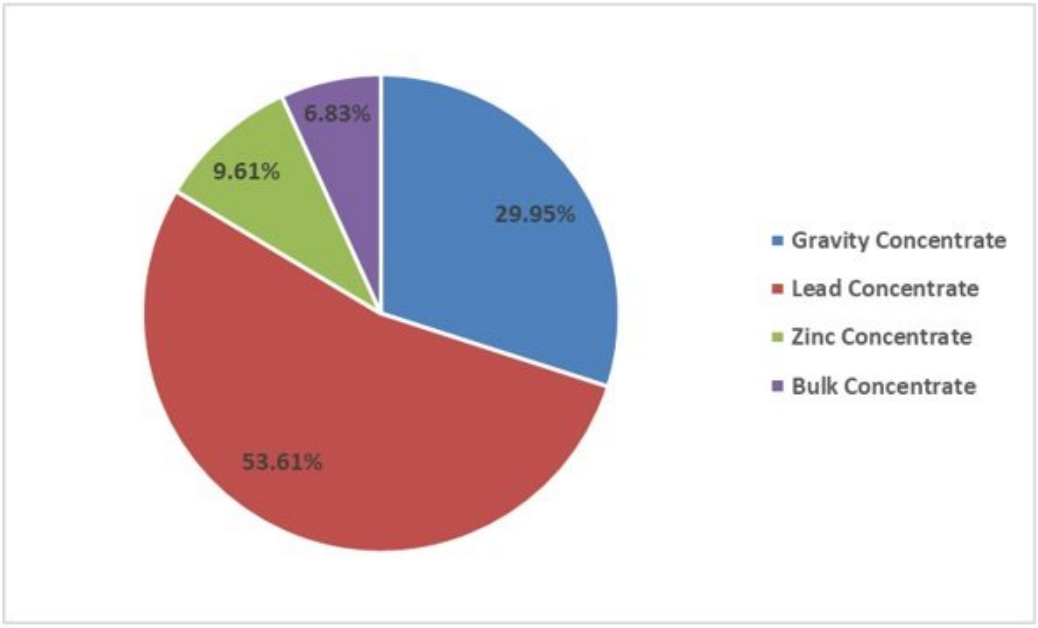


Figure 10-7: Distribution of Recovered Gold into Product Streams – 2018

In 2018, overall plant gold recoveries averaged 65% to 68%. A graphical view of the average 2018 metal distributions into the gold gravity, two primary concentrates and PM concentrate are shown in Figure 10-8.

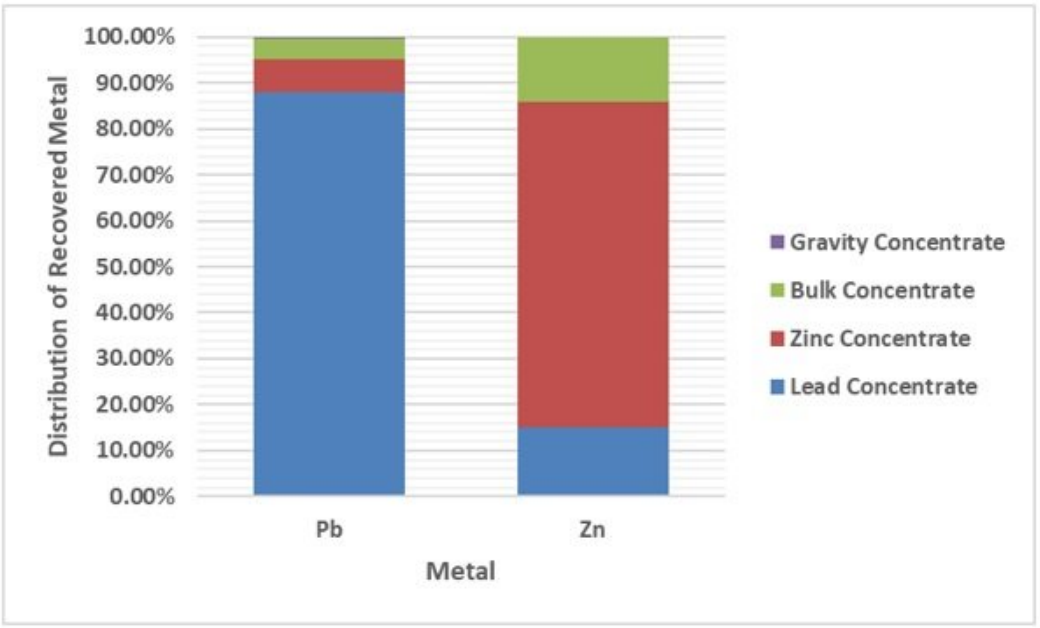


Figure 10-8: Distribution of Recovered Zinc and Lead into Product Streams – 2018

10.2.3 NSR Estimation

Greens Creek mineralization is a typical example of a polymetallic mineral deposit wherein a number of different metals contribute to the total revenue of any given ton of material. The metals that contribute to the revenue stream are silver, lead, zinc, and gold. Copper, while present in the Greens Creek deposits, is not recovered as a marketable product by the plant, and so no value is assigned to this metal. Hecla has elected to apply a conventional NSR approach for use in discriminating between ore and waste material but has applied a slight modification to this approach by including the price of each of the individual metals as a discrete input variable, as compared to including the price of the metal within the NSR factor. The metal prices are set by the senior management team on an annual basis.

Greens Creek metallurgists annually update a concentrator recovery model to estimate the metallurgical distribution of mill products as a function of ore feed grades and concentrate product quality constraints. The model is developed through extensive process simulation work and monitoring of actual plant performance over the prior 16 month period. Results of this model, average marketing terms, and metal prices are then used to develop a simplified equation to estimate the NSR value of Greens Creek ore as a function of ore grades and metal pricing.

The simplified equation uses two formulas for estimating the NSR value. One equation estimates the NSR value derived from the gravity circuit, while the second equation estimates the NSR value derived from the flotation circuit. The sum of these two equations makes up the total NSR value for each block. The equations used to prepare the estimates of the 2022 Mineral Resources and Mineral Reserves are as follows:

- Flotation NSR = 0.3400 * Au(oz/ton) * Au($/oz) + 0.6862 * Ag(oz/ton) * Ag($/oz) + 23.26 * Pb(%) * Pb($/lb) + 7.68 * Zn(%) * Zn($/lb) – 3.609 * Fe(%) + 27.35
- Gravity NSR = If (Au(oz/ton)> 0.026, 0, (0.2465*Au(oz/ton)-0.0065) * Au($/oz) * 0.9289
- Total NSR = Flotation NSR + Gravity NSR

The NSR formula factors are updated annually by the plant department with the most recent mill performance data to adjust for changes to the concentrator circuit, ore characteristics, and concentrate specifications. The NSR equations are used by the geology department to calculate the NSR in the geological block models.

10.2.4 Projected Life of Mine Recoveries

LOM projected recovery figures are as summarized in Table 10-2.

Table 10-2: Projected Life of Mine Recovery Estimates
Hecla Mining Company – Greens Creek Mine

Product	Recovery (%)			
	Lead	Zinc	Silver	Gold
Lead Concentrate	71.31	13.04	63.96	36.00
Zinc Concentrate	5.46	62.50	7.46	5.13
PM Concentrate	4.07	12.97	6.27	4.33
Gravity Concentrate	0.36	-	0.48	19.10

10.3 Metallurgical Variability

Samples selected for metallurgical testing during feasibility and development studies were representative of the various types and styles of mineralization within the different deposits. Samples were selected from a range of locations within the deposit zones. Sufficient sized samples were collected to ensure testing integrity.

10.3.1 Mill Feed Variability

The mine produces several mineral types differing in terms of mineralogy, mineral grain size and metals grades. Dilution rock types are also variable, with backfill from prior mining cycles typically being present in mill feed as well. No practical means of selective mining or stockpiling exists, as more than one mineralization type commonly is found even in a single working face and day to day production from multiple working places is necessary. Blending at the plant stockpile is utilized to maintain reasonably consistent mill feed over periods of a few days.

Mill control is largely based on process stream assays, as determined by on-line analyzers of these streams. Mill metals feed grades have an influence on recoveries, while gold and silver feed grades influence the precious metals grades of concentrates. Recoveries in the future are expected to be like those observed currently and experienced in past years.

10.3.2 Backfill Materials in Mill Feed

Backfill materials can be incorporated in the plant feed as diluting material mined in those portions of active stopes that are in direct contact with previous mining areas. Once in the plant, the backfill can raise flotation circuit pH levels, which can affect mill recoveries. Currently, Hecla manages fluctuating pH levels using carbon dioxide as a result of several studies completed (e.g., Asarte, 2011; Peterson, 2012; Tahija, 2012), and work remains ongoing to improve circuit performance on feed containing backfill.

10.3.3 Testwork Composite

In early 2011, the properties of average mill feed for 2012 to 2016 were estimated, in conjunction with geologic staff, on the basis of four major mineral types and average grades for each mineral type. During the summer and fall of 2011, mine geologists alerted the plant metallurgy staff when each mineral type would be available. Large samples of actual blasted and loaded mine muck produced from these faces were sampled to ensure that the sample would contain production-level amounts of dilution rock and backfill (Tahija, Large sample description, 2011).

Once adequate quantities of material representing each mineral type were collected, the sample lots were shipped to a firm specializing in crushing, blending, and splitting large mineral composites. A large composite weighing approximately 1,700 lb was prepared using a blending recipe, as directed by Hecla metallurgical staff, and split into smaller lots for ease in use (Phillips, 2011). These small lots, as well as leftover lots of the individual mineral types are held in refrigerated storage for use as needed in future metallurgical testing programs.

10.4 Deleterious Elements

The presence of the potentially deleterious elements arsenic, mercury and antimony was noted during initial testing (Banning, 1983). These elements are extremely difficult to separate due to the typical modes of occurrence, which are intergrowths or interstitial. Over the course of production and marketing, deleterious elements upon which customers have set limits include:

- Arsenic, mercury, and antimony in lead concentrates.
- Magnesium, arsenic, mercury, and cadmium in zinc concentrates.
- Magnesium, arsenic, mercury, and cadmium in PM concentrates.

Penalties charges have been applied against some shipments from time to time, most commonly for arsenic and mercury content. Other potential deleterious elements have been identified in geological and concentrate analyses, including selenium, fluorine, and thallium. These have not been present in high concentrations; overall these have not been and are not expected to be a significant issue from a concentrate sale standpoint.

10.5 Metallurgical Accounting

The 'filter cake balance', based on the assays and weights of final mill products, is the official production balance and is the most accurate in the long term, but the least meaningful for day to day flotation circuit control, due to thickener and stock tank inventory changes. Manual sampling is employed at the filter cake bays after an interval of a specified number of cycles. The fine particle size, effective blending and random nature of cake discharge all act to limit segregation and bias. Filter press load cells are calibrated monthly with a static weight. The four-idler semi-autogenous grinding (SAG) mill feed weightometer is calibrated by chain to within 0.5% on each shutdown. Good long term assay agreement is obtained between measured mill feed at the flotation feed sampler and the plant feed as calculated from filter cake assays, wet filter cake production tonnages from the load cells and the moisture contents of filter cake samples. On an annual basis, agreement between measured and recalculated mill feed assays ranges from 0.5% to 2% (gold being the least reliable and silver being the most reliable).

Full-stream samplers are installed to sample flotation circuit products at the feed to each of the four thickeners. These assays are used, together with the SAG mill feed dry tonnage and the thickener feed mass flow loop measurements, as initial estimates in mass-balancing.

10.6 Overall Process Monitoring and Control

The plant is highly instrumented, with operators accessing information directly from local instrument readouts, Allen Bradley Panelview programmable logic controller (PLC) terminals in the control room, or from the supervisory control and data acquisition (SCADA) system. Monitoring of trends in measured variables, setpoints, and control outputs takes place in the SCADA system. The process control scope is generally restricted to automatic control around manual setpoints, although substantial PLC programming has allowed the development of some integrated SAG mill, thickener, pressure filter, and mill water balance control integration.

11.0MINERAL RESOURCE ESTIMATES

11.1 Summary

Mineral Resource estimates have been prepared for each of the nine deposits found on the Property. The Mineral Resource estimation workflow adopts a NSR strategy in which the key payable metals are gold, silver, lead, and zinc. Each of these four metals contribute to the overall value of the material in approximately equal amounts.

A two-stage approach is undertaken when preparing the mineralization wireframe outlines for the nine deposits. The wireframing process begins with the creation of wireframe outlines using a modelling threshold of $50 NSR/ton so as to outline continuous volumes of mineralized material. A second set of mineralization wireframes are created using a threshold value of $140 NSR/ton that outline the higher grade portions of the mineralization. Grades are estimated using the OK interpolation method for gold, silver, lead, and zinc using information from capped, composited drill hole data. Grades are also estimated for non-payable metals and elements such as barium, calcium, and iron. No capping values are applied to non-payable metals.

Density values are calculated using a formula that considers the estimated barium, calcium, iron, lead, and zinc grades for each block. Mineral Resources have been classified in accordance with the S-K 1300 definitions for Mineral Resources. Classification criteria are set after considering the continuity of the grades of silver and zinc from available drill hole sample information.

Mineral Resource statements are prepared exclusive of Mineral Reserves using block models that have been depleted for mining activities as of December 31, 2021. The Mineral Resource estimates were prepared by Hecla and reviewed and accepted by SLR. Mineral Resources are stated using a threshold value of $215 NSR/ton for all zones except for the Gallagher deposit, where a threshold value of $220 NSR/ton is applied. The Greens Creek Mineral Resource estimate as of December 31, 2021 is presented in Table 11-1.

Table 11-1: Summary of Mineral Resources – December 31, 2021
Hecla Mining Company – Greens Creek Mine

Category	Tonnage	Grade				Contained Metal			
	(000 ton)	(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	(oz Au)	(oz Ag)	(ton Pb)	(ton Zn)
Measured	-	-	-	-	-	-	-	-	-
Indicated	8,355	0.10	12.8	3.0	8.4	835,900	106,670,300	250,040	701,520
Measured + Indicated	**8,355**	**0.10**	**12.8**	**3.0**	**8.4**	**835,900**	**106,670,300**	**250,040**	**701,520**
Inferred	2,152	0.08	12.8	2.8	6.8	163,700	27,507,500	60,140	146,020

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves and do not have demonstrated economic viability.
4. Mineral Resources are 100% attributable to Hecla.
5. Mineral Resource block models are prepared from drilling and sample data current as of October 31, 2021; all Mineral Resources have been depleted for mining as of December 31, 2021.
6. Mineral Resources are based on the following metal prices and cut-off assumptions: $1,700/oz Au, $21/oz Ag, $1.15/lb Pb, $1.35/lb Zn, NSR cut-off of $215 NSR/ton for all zones except the Gallagher Zone, which used a $220 NSR/ton cut-off.

7. The reasonable prospects for economic extraction requirement for Mineral Resources is satisfied by application of criteria that consider the spatial continuity of blocks above the nominated cut-off value as well as the practical aspects of extraction by means of underground mining methods.
8. Totals may not agree due to rounding.
9. Reporting units are imperial, Tons: dry short tons (dst); Au (troy ounces/dst); Ag (troy ounces/dst); Pb and Zn percent (%).

The SLR QP is of the opinion that with consideration of the recommendations summarized in Sections 1 and 23 of this TRS, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

11.2 Resource Database

The drill hole data used to prepare the year-end 2021 Mineral Resource estimates include assay information received as of the closing dates presented in Table 11-2. While all drill hole information is stored in an Acquire master database, separate subsets of the drill hole information are extracted for each of the mineral deposits and used for preparation of the Mineral Resource estimates by importing the data subsets into the Leapfrog software package. While detailed grade control channel sample information is also collected and stored in the master database, these data are not used for estimation of the Mineral Resources but rather are used as guides for the preparation of the geological and mineralization interpretations. Only the drill hole assay data are used for the estimation of the various grades into the block models.

The drill hole intercepts in the master database are uniquely coded to each zone by the geologists based on their understanding of the three-dimensional spatial continuity of the various mineralized deposits; however, a single drill hole may intercept multiple zones and so may be included in more than one data subset. The coordinate system used for Mineral Resource modeling is the local geologic grid (geo-grid). The coordinate systems used at Greens Creek, and transform properties are discussed in Section 7.1.1.

Table 11-2: Summary of Drill Hole Database Crystallization Dates
Hecla Mining Company – Greens Creek Mine

Zone	Database Crystallization Date
East	October 31, 2021
West	October 31, 2021
9A	October 31, 2021
Northwest West	October 31, 2021
Southwest	October 31, 2021
200S	December 5, 2021
5250	October 31, 2021
Gallagher	October 31, 2021
Upper Plate	October 31, 2021

Typically, non-mineralized units such as phyllite and argillite are assayed if they are observed to be mineralized with visually recognizable sulfides and are near the contacts with the massive/white sulfide mineral zones. Un-assayed samples are assigned a default grade of zero for all elements during the estimation process.

11.3 Geological Interpretation, Structure, and Mineralization Wireframes

11.3.1 Geological Interpretation

Hecla Greens Creek geologists have long understood that the various mineralized zones are located in close spatial relation to the contact between the stratigraphic footwall phyllite units and the stratigraphic hanging wall argillite units. This contact is referred to as the mine contact. The current form and location of this mine contact is a result of several episodes of folding and faulting such that its geometry can be very complex in places. The location of the mine contact is interpreted from all available drill hole, geological mapping, and grade control information. The estimation procedure begins with the creation of a three dimensional surface of this mine contact using the Geo/Edge functions of the Leapfrog v.2021.1.3 software package. Additional surface and geological interpretations are completed using the Studio RM Datamine version 1.5.47.0 software package as needed. As no other significant lithological contacts or stratigraphic marker units are present in the immediate mine area, only the interpreted location of the mine contact is prepared.

11.3.2 Structural Interpretation

Three significant faults are recognized in the immediate mine area: the Kahuna Fault, the Maki Fault, and the Gallagher Fault. The Kahuna Fault and the Maki Fault have been shown to merge together in the northwestern regions of the mine and diverge into separate faults in the central and southeast portions of the mine. Each of these three faults are interpreted to postdate the mineralization event and have been shown to offset and displace the mineralized zones. Descriptions of these were provided in Chapter 6.2.3.

Three dimensional surfaces of these faults are created using the Leapfrog software package using all available information collected from lithologic mapping, drill hole logging, and grade control programs. These fault surfaces are subsequently used to define and constrain the limits of the various mineralized zones.

11.3.3 Mineralization Wireframes

Hecla Greens Creek geologists construct mineralized envelopes which define the extent and volume of each mineral deposit. These envelopes are constructed using the implicit modelling functionality of the Leapfrog software package by viewing data in three dimensions, using a combination of ore lithologies, assay grades, and a review of structural continuity.

A NSR of $50 NSR/ton forms the basis for a preliminary interpretation, which is guided by the interpreted location of the mine contact. The NSR value for each sample in the drill hole database is calculated by multiplying the individual drill hole assay value by the corresponding NSR factor. These NSR factors are derived by the mine engineering staff in consideration of such input parameters as the metal prices, metallurgical recoveries, treatment and refining charges, concentrate grades, and contract penalty terms. Once the NSR value has been determined for each of the significant metals to be estimated, the NSR value for each metal is summed into a total NSR value for subsequent use in mineralization modelling.

A summary of the NSR factors used to prepare the mineralized wireframe boundaries for each of the mineralized zones is provided in Table 11-3. To be clear, the NSR factors created for the drill hole sample information are used for preparation of the three-dimensional outline of the mineralized zones only and are not used to estimate the NSR value to the block model. Only the individual metal grades of the drill hole samples are used to estimate grades into the block model. It is important to note that Hecla has elected to retain the price deck that was used for the preparation of the year-end 2018 Mineral Resource estimates to calculate the NSR value for the assay sample. Considering that the current prices used to prepare the year-end 2021 Mineral Resource estimate are higher, this approach will result in a conservative estimate of the Mineral Resources. SLR recommends that future Mineral Resource updates apply a metal price deck to the creation of mineralization wireframes that aligns with the prices used to prepare the Mineral Resource statements.

Table 11-3: Summary of Assay Database NSR Factors
Hecla Mining Company – Greens Creek Mine

Metal	Long Term Price	NSR Factor
Silver	US$17.25/oz	0.648
Zinc	US$1.00/lb	6.89
Gold	US$1,225/oz	0.338 (flotation), 0.2465 (gravimetric)
Lead	US$0.90/lb	13.1

When preparing Mineral Resource estimates for polymetallic deposits, it is often useful to understand the relative contribution to the overall value of the material of the each of the metals of interest. In the case of Greens Creek, revenues are derived from the sale of gold, silver, lead, and zinc. While copper is present locally, it is not present in sufficient quantities to warrant recovery and sale. The relative contribution of each of the four metals, based on the Mineral Resource and Mineral Reserve estimates completed as of year-end 2018 is presented in Figure 11-1. While silver can be seen to contribute to a large portion of the value of the ores at Greens Creek, the other three metals are also significant contributors to the overall value.

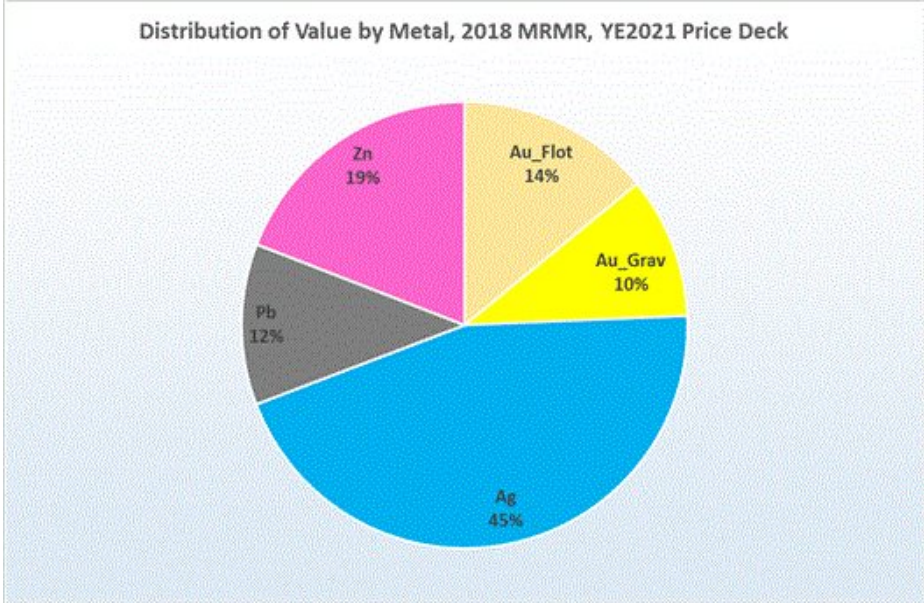


Figure 11-1: Distribution of Value by Metal

Two sets of wireframes are created for each zone. An initial shell is created using a threshold value of $50 NSR/ton whose purpose is to act as a guide for the creation of a higher grade wireframe as well as acting as a dilution shell. A second, higher grade shell is then created at a threshold value of $140 NSR/ton that is contained completely within the broader, lower grade dilution shell.

Full-length grade composites (i.e., a single composite value is created for the full width of the mineralized interval) were built in order to assist in the interpretation of the $50 NSR/ton shell, where samples are grouped (composited) and averaged continuously until the average NSR drops below $50 NSR/ton. These composites are built using the following parameters:

- Minimum thickness of composite is 10 ft unless high grade assays have enough metal content to mine the face economically.
- Internal waste may not be longer than seven feet.
- Internal waste will be included in the full-length composite if adjacent material on either side can average to the specified cut-off.

Wireframes are created using the geological modelling functions available in the Leapfrog software package, are snapped to the full-length grade composites, and are also snapped to the appropriate face samples that are assayed during the mining process.

Within the $50 NSR/ton shell, separate higher-value wireframes are created at an $140 NSR/ton threshold using a special interpolation process available in Leapfrog known as the FastRBF (radial basis function). Specifically, face samples and five foot composites created from raw drill hole assay files are interpolated using an indicator RBF function to create the $140 NSR/ton shell strictly within the $50 NSR/ton shell. The RBF function utilizes the structural forms defined for the $50 NSR/ton shell so as to provide a similar form to the $140 NSR/ton shell. A resource geologist then reviews and adjusts the results for proper volume and geologic continuity.

For grade estimation purposes, all boundaries between zones, structural domains, and NSR zones are considered as hard boundaries (i.e., samples are not shared between domains). Composite samples are coded by mineralized domain and NSR shell, with samples from each zone used in separate interpolation runs.

To better model thinner zones that are smaller than the minimum stope design dimensions, the waste shell is constructed around mineralized material to estimate the dilution grade that may be considered during the stope design phase. The perimeters for the waste model are created by expanding the $50 NSR/ton wireframes 10 ft from all boundaries. This waste shell is then used to create waste blocks and flag samples to be used for interpolation into these blocks.

Nine models were updated for the end of year (EOY, refers to work used to complete December 31 Mineral Resource and Mineral Reserve estimates and mine plans) 2021: 9A, SWB, East, West, 200S, Gallagher, Upper Plate, NWW and 5250 zones. East Zone

The East Zone is bounded by the Klaus Fault at lower elevations and the Maki Fault to the west. The Klaus Fault separates it from West Zone, and the Maki separates it from 9A Zone. The East Zone was modelled using Leapfrog’s vein system tool. Wireframes were built around grade composites using a $50 NSR/ton minimum and were snapped to mined-face data. The $140 NSR/ton shell was interpolated within the $50 NSR/ton shell using a combination of mined-face and assay data.

11.3.4 West Zone

The West Zone is bounded by the Klaus Fault at higher elevations and the Maki Fault to the west. The Klaus Fault separates the West Zone from the East Zone, and the Maki Fault separates the West Zone from the 9A Zone. It was modelled using a combination of Leapfrog's vein system tool and intrusion tool. Wireframes were built around grade composites using a $50 NSR/ton minimum and were snapped to mined-face data. The $140 NSR/ton shell was interpolated within the $50 NSR/ton shell using a combination of mined-face and assay data.

11.3.5 9A Zone

The 9A Zone is bounded by the Maki Fault to the east and the Kahuna Fault to the west. The Maki separates it from East and West zones, and the Kahuna separates it from the 5250, Southwest, and Northwest West zones. It was modelled using Leapfrog's vein system tool. Wireframes were built around grade composites using a $50 NSR/ton minimum and were snapped to mined-face data. The $140 NSR/ton shell was interpolated within the $50 NSR/ton shell using a combination of mined-face and assay data.

11.3.6 Northwest West Zone

The Northwest West Zone (NWW) is bounded by the Kahuna Fault to the east and the Upper Plate Shear Zone at higher elevations. Greens Creek geologists also apply domain boundaries to the zone, to separate it from SW and 5250 zones. This is due to differences in mineral trends between the three zones, as well as computational constraints seen during block model construction. The Kahuna Fault separates the 5250 Zone from the 9A Zone. The NWW Zone mineralization shell was created from sectional interpretations on mineralized intervals selected by the resource geologist. The interval selection process was done per drill hole primarily according to silver, zinc and lead grades with the general composite grade equaling $140 NSR/ton to $190 NSR/ton.

11.3.7 Upper Plate Zone

The Upper Plate Zone is bounded by the Upper Plate Shear Zone at lower elevations and the Kahuna Fault to the east. The Kahuna Fault separates it from the 9A and West zones, and the shear zone separates it from Northwest West Zone. It was modelled using Leapfrog's vein system tool. Wireframes were built around grade composites using a $50 NSR/ton minimum and were snapped to mined-face data. The $140 NSR/ton shell was interpolated within the $50 NSR/ton shell using the structural form of the $50 NSR/ton shell and assay data.

11.3.8 Southwest Zone

The Southwest Zone is bounded by the Kahuna Fault to the east. Greens Creek geologists also apply domain boundaries to the zone to separate it from NWW and 5250 zones. This is due to differences in mineral trends between the three zones, as well as computational constraints seen during block model construction. It was modelled using a combination of Leapfrog's vein system tool and intrusion tool. Wireframes were built around grade composites using a $50 NSR/ton minimum and were snapped to mined-face data. The $140 NSR/ton shell was interpolated within the $50 NSR/ton shell using a combination of mined-face and assay data.

11.3.9 200 South Zone

The 200 South Zone is bounded by the Gallagher Fault to the west. Greens Creek geologists also apply domain boundaries to the zone to separate it from the Southwest. This is due to a desire to maintain historical consistency, as well as to address computational constraints seen during block model construction. The Gallagher Fault separates it from the Gallagher Zone. The 200 South Zone was modelled using a combination of Leapfrog's vein system tool and intrusion tool. Wireframes were built around grade composites using a $50 NSR/ton minimum and were snapped to mined-face data. The $140 NSR/ton shell was interpolated within the $50 NSR/ton shell using a combination of mined-face and assay data.

11.3.10 5250 Zone

The 5250 Zone is bounded by the Kahuna Fault to the east and the Upper Plate Shear Zone at higher elevations. Greens Creek geologists also apply domain boundaries to the zone to separate it from SW and NWW zones. This is due to differences in mineral trends between the three zones, as well as computational constraints seen during block model construction. The Kahuna Fault separates it from the 9A Zone. The 5250 Zone mineralization shell was created from sectional interpretations on mineralized intervals selected by the resource geologist. The interval selection process was done per drill hole primarily according to silver, zinc and lead grades with the general composite grade equaling $140 NSR/ton to $190 NSR/ton.

11.3.11 Gallagher Zone

The Gallagher Zone is bounded by the Gallagher Fault to the east. The Gallagher Fault separates it from the 200 South Zone and modelled using a combination of Leapfrog's vein system tool and intrusion tool. Wireframes were built around grade composites using a $50 NSR/ton minimum and were snapped to mined-face data. The $140 NSR/ton shell was interpolated within the $50 NSR/ton shell using the structural form of the $50 NSR/ton shell and assay data.

11.4 Exploratory Data Analysis

Exploratory data analysis (EDA), in the form of summary statistics, correlation matrices, histograms, cumulative probability plots and XY plots are performed separately for each mineralized domain on both uncapped and capped sample and composite values for Ag, Zn, Au and Pb along with the sample lengths to aid in the selection of suitable parameters relative to mineralization. Summary statistics for the raw assay values for each mineralized domain are provided in Table 11-4.

Table 11-4: Descriptive Statistics of the Raw Assay Values by Domain
Hecla Mining Company – Greens Creek Mine

Item	Silver	Gold	Lead	Zinc	Silver	Gold	Lead	Zinc
		East Zone				**West Zone**		
Mean	12.5	0.10	3.0	7.4	10.4	0.13	3.0	9.5
Median	4.7	0.034	1.4	4.2	5.1	0.09	1.6	7.5
Standard Deviation	38.7	0.59	4.1	8.3	34.2	0.38	3.6	8.4
Coefficient of Variation	3.01	6.08	1.4	1.12	3.3	2.98	1.2	0.9
Minimum	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	1,798.2	53.82	43.4	58.8	2,078.3	34.15	54.9	51.2
Number of Samples	5,580	5,394	5,394	5,394	19,081	19,082	19,082	19,082
		9A Zone				**Northwest West Zone**		
Mean	11.0	0.10	3.4	9.0	9.9	0.10	2.8	8.5
Median	5.4	0.05	1.9	7.4	4.2	0.07	1.1	6.3
Standard Deviation	38.3	0.33	4.0	8.0	39.0	0.29	3.6	8.3
Coefficient of Variation	3.5	3.39	1.2	0.9	4.0	2.84	1.3	1.0
Minimum	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	2,399.5	25.53	30.0	45.9	3,437.3	55.368	34.0	46.0
Number of Samples	9,071	9,071	9,071	9,071	18,506	18,506	18,506	18,506
		Upper Plate Zone				**Southwest Zone**		
Mean	10.6	0.04	1.8	4.2	19.3	0.10	3.3	6.9
Median	3.9	0.01	1.0	2.5	7.0	0.03	1.6	3.6
Standard Deviation	24.8	0.21	2.4	4.9	59.4	0.32	3.9	8.1
Coefficient of Variation	2.3	5.7	1.3	1.2	3.1	3.31	1.2	1.2
Minimum	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	686.7	11.384	22.7	27.9	4,440.8	31.334	35.5	61.1
Number of Samples	1,677	1,677	1,677	1,677	19,654	19,655	19,654	19,654
		200 South Zone				**5250 Zone**		
Mean	13.7	0.11	2.9	7.3	12.7	0.050	2.8	6.8
Median	5.9	0.04	1.3	3.5	5.6	0.02	1.8	4.5
Standard Deviation	24.8	0.21	3.6	8.6	31.4	0.12	2.9	6.7
Coefficient of Variation	1.8	1.85	1.2	1.2	2.5	2.50	1.1	1.0
Minimum	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	687.7	11.537	34.8	47.1	1,881.2	6.857	31.3	57.2
Number of Samples	21,386	21,386	21,386	21,386	9,984	9,984	9,984	9,984

Item	Silver	Gold	Lead	Zinc	Silver	Gold	Lead	Zinc
			Gallagher Zone					
Mean	5.0	0.081	2.4	5.2				
Median	3.0	0.04	1.6	3.5				
Standard Deviation	10.7	0.19	2.6	5.8				
Coefficient of Variation	2.1	2.35	1.10	1.1				
Minimum	0.0	0.00	0.0	0.0				
Maximum	335.8	5.340	18.5	34.6				
Number of Samples	2,510	2,510	2,510	2,510				

11.5 Treatment of High Grade Assays

11.5.1 Capping Levels

Grade capping is the sole method used to limit the spatial extrapolation of the occasional high, isolated precious metal grades. Capping analyses undertaken at Greens Creek include the use of probability plots, the Parrish (1997) decile method, and consideration of experience gained from operations. For all the zones modeled the results are compared and an appropriate value is determined for use as the grade cap. For low to moderate drill density areas, methods tend to compare favorably. Capping levels are applied at the sample level only. Table 11-5 summarizes the caps imposed by zone.

Table 11-5: Summary of Capping Values by Deposit
Hecla Mining Company – Greens Creek Mine

Element/unit	East	West	9A	NWW	SW	200S	5250	Gallagher	Upper Plate
Ag (oz/ton)	259.26	387.24	188.10	239.00	222.00	283.08	318.36	141.00	116.47
Zn (%)	42.46	40.85	42.87	45.00	37.50	46.49	41.45	34.00	28.00
Au (oz/ton)	1.766	1.461	1.565	0.860	1.680	2.020	1.477	1.340	1.093
Pb (%)	26.74	20.70	23.32	22.00	22.00	22.09	19.69	16.50	1515

11.6 Compositing

Composite lengths for interpolation purposes are set to a constant length of five feet and are applied to the capped assay values using the functions available in the Leapfrog software package. Composites start and stop at the $50 NSR/ton, and $140 NSR/ton boundaries.

Two methods have been utilized to handle intervals where the flagged length is not an integral multiple of the design composite length. If any un-assayed intervals are present within the mineralized wireframe surfaces, the payable metal values (gold, silver, lead, and zinc) are set to zero. Non-payable elements are left as null (missing value).

SLR recommends that the impact of treating any unsampled intervals for the non-payable metals (such as barium, calcium, and iron) as null values upon the calculation of the block density values be evaluated.

When composites do not reach the full specified interval length, shorter samples are created that are cut at the boundary. The descriptive statistics of the capped, composited assay values are presented in Table 11-6.

Table 11-6: Descriptive Statistics of the Composited Assay Values by Domain
Hecla Mining Company – Greens Creek Mine

Item	Silver	Gold	Lead	Zinc	Silver	Gold	Lead	Zinc
		East Zone				**West Zone**		
Mean	12.1	0.08	2.8	6.9	9.6	0.11	2.9	9.2
Median	5.8	0.04	1.6	4.5	5.3	0.09	1.8	7.5
Standard Deviation	21.6	0.13	3.5	7.2	17.9	0.12	3.2	7.8
Coefficient of Variation	1.8	1.67	1.6	1.0	1.81	1.08	1.1	0.9
Minimum	0.0	0.000	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	259.3	1.78	26.7	42.5	355.5	1.46	20.7	40.9
Number of Samples	3,578	3,578	3,578	3,578	13,940	13,940	13,940	13,940
		9A Zone				**Northwest West Zone**		
Mean	9.6	0.09	3.2	8.5	9.2	0.10	2.8	8.5
Median	5.6	0.05	2.0	7.2	4.6	0.08	1.4	6.7
Standard Deviation	13.8	0.12	3.5	7.7	15.2	0.10	3.31	7.7
Coefficient of Variation	1.4	1.37	1.1	0.9	1.67	0.99	1.20	0.9
Minimum	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	188.1	1.57	23.3	42.4	239.0	0.86	22.0	45.0
Number of Samples	6,558	6,558	6,558	6,558	13,437	13,437	13,437	13,437
		Upper Plate Zone				**Southwest Zone**		
Mean	9.6	0.03	1.8	4.1	16.4	0.09	3.0	6.3
Median	4.5	0.011	1.2	2.8	7.3	0.03	1.7	3.9
Standard Deviation	14.3	0.08	1.9	4.0	24.1	0.16	3.4	7.1
Coefficient of Variation	1.48	2.44	1.08	1.0	15	1.89	1.1	1.1
Minimum	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	115.8	0.938	15.2	24.2	222.0	1.68	22.0	37.5
Number of Samples	1,017	1,017	1,017	1,017	15,001	15,001	15,001	15,001

Item	Silver	Gold	Lead	Zinc	Silver	Gold	Lead	Zinc
		200 South Zone				5250 Zone		
Mean	13.6	0.11	2.9	7.3	12.1	0.05	2.7	6.6
Median	7.0	0.05	1.6	4.2	6.4	0.02	1.9	4.9
Standard Deviation	20.0	0.16	3.2	8.0	18.1	0.07	2.5	5.9
Coefficient of Variation	1.5	1.44	1.1	1.1	1.50	1.56	0.93	0.9
Minimum	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0
Maximum	280.2	1.949	22.1	46.5	298.9	1.480	19.6	41.1
Number of Samples	14,398	14,398	14,398	14,398	6,904	6,904	6,904	6,904
		Gallagher Zone						
Mean	5.0	0.078	2.4	5.2				
Median	3.3	0.04	1.8	3.9				
Standard Deviation	7.44	0.11	2.2	5.0				
Coefficient of Variation	1.5	1.41	0.9	1.0				
Minimum	0.0	0.00	0.0	0.0				
Maximum	106.8	1.265	16.4	31.7				
Number of Samples	1,597	1,597	1,597	1,597				

Note:

1. Gold and silver in oz/ton. Lead and zinc in percent.

11.7 Trend Analysis

11.7.1 Grade Contouring

As aids in understanding the spatial distributions of the various metal grades and carrying out the estimation process, three-dimensional contours were prepared for selected deposits using the functionality available in the Leapfrog (v.21.1.3) software package. In brief, the process for creating three-dimensional contours begins with the selection of the desired contour intervals. These are then used by the software package to create three-dimensional iso-surfaces (surfaces of equal values) of the target metal grades from the uncapped, composited drill hole assay information. The resulting iso-surfaces are then trimmed by the mineralization wireframe outline. The resulting contours can then be viewed in three dimensions or in sectional/plan views. Samples of the three-dimensional contoured gold, silver, lead, and zinc grades for the 200S deposit are presented in Figure 11-2 to Figure 11-5, respectively.

Examination of the three-dimensional contour data shows a clear spatial zonation of the gold, lead, and zinc grades whereby the higher grades for these metals are located in the northern portion of the wireframe model. In contrast, silver exhibits a general negative correlation with the gold, lead, and zinc values for this wireframe whereby the higher silver values can be seen to concentrate towards the central portions of the $50 NSR/ton wireframe model.

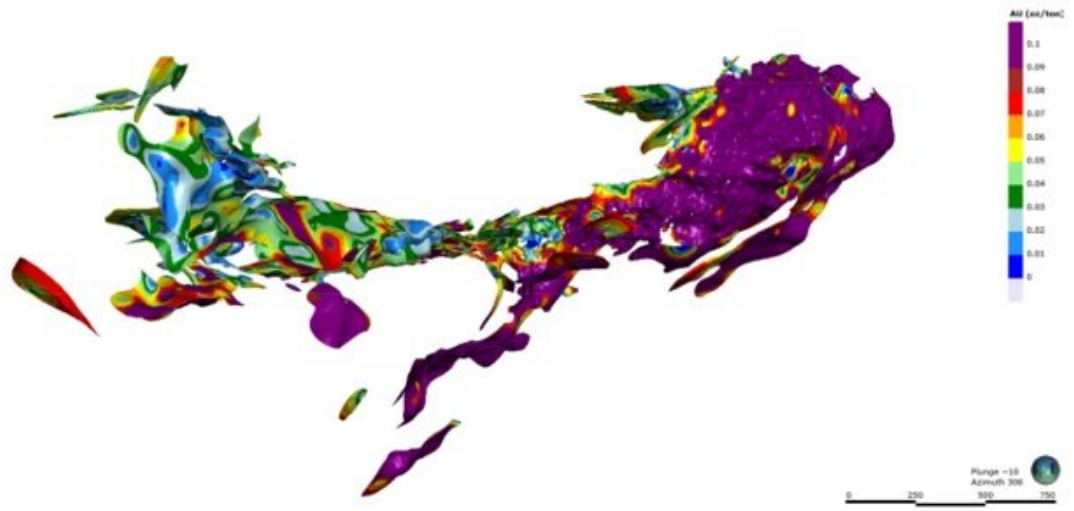


Figure 11-2: Three-Dimensional Contours of Gold for the $50 NSR/ton Wireframe, Looking Northwest, 200S Deposit

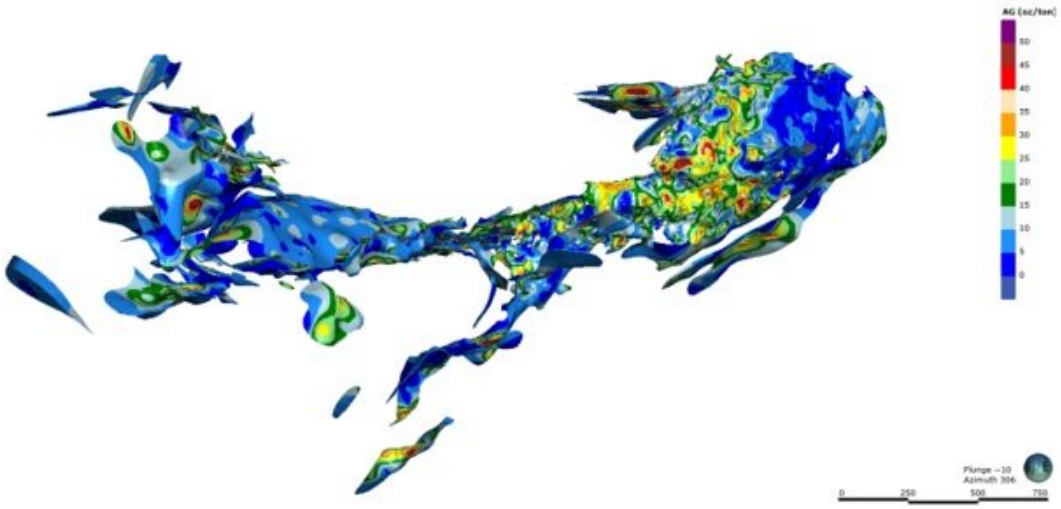


Figure 11-3: Three-Dimensional Contours of Silver for the $50 NSR/ton Wireframe, Looking Northwest, 200S Deposit

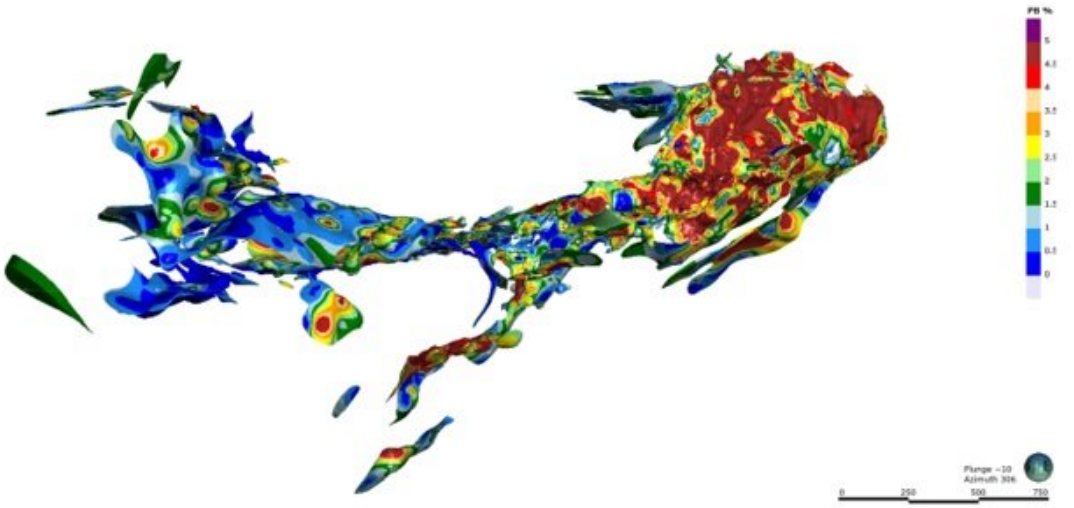


Figure 11-4: Three-Dimensional Contours of Lead for the $50 NSR/ton Wireframe, Looking Northwest, 200S Deposit

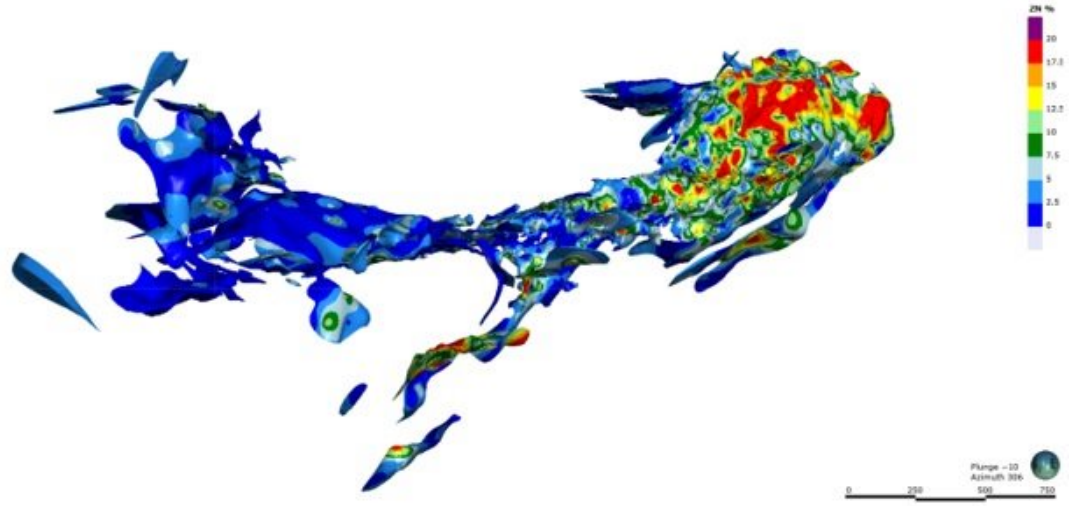


Figure 11-5: Three-Dimensional Contours of Zinc for the $50 NSR/ton Wireframe, Looking Northwest, 200S Deposit

11.7.2 Variography

The analysis of the spatial continuity of the mineralization found in the nine deposits present at Greens Creek was carried out using the variography functions of the Leapfrog software package. Individual normal score variograms were constructed using the sample data contained within the $140 NSR/ton, $50 NSR/ton, and waste wireframe modes for gold, silver, lead, and zine for each of the nine deposits. The variogram analyses began with selection of an appropriate nugget (C0) for each metal from down-hole variograms. Directional variograms were then constructed for the major, semi-major and minor axes using either a single structure or two structures.

Experimental variograms were also constructed for barium, calcium, iron, arsenic, copper, and antimony. For zones with low drilling density, directional variograms are calculated along the axes of anisotropy as defined by the overall trend and geometry of the interpretations. Nugget values generally range between 0 to 50% of the sill, with Pb and Zn typically lower than Au and Ag. Structural ranges can range from less continuous (approximately 10 ft) to showing good continuity (>200 ft) depending on the element and direction. Figure 11-6 to Figure 11-9 present examples of experimental and modeled variograms for gold, silver, lead, and zinc for the 200S deposit, respectively. It is important to note that the dip values are stated using the Datamine convention in which downward dipping features are expressed as positive numbers, and vice-versa.

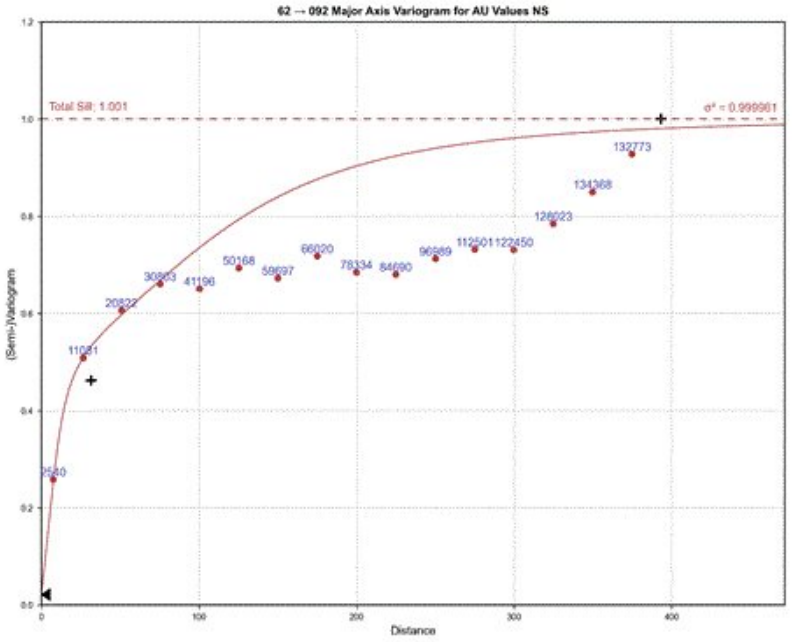


Figure 11-6: Normal Scores for Gold, 200S Deposit Major Direction, $140 NSR/ton Wireframe

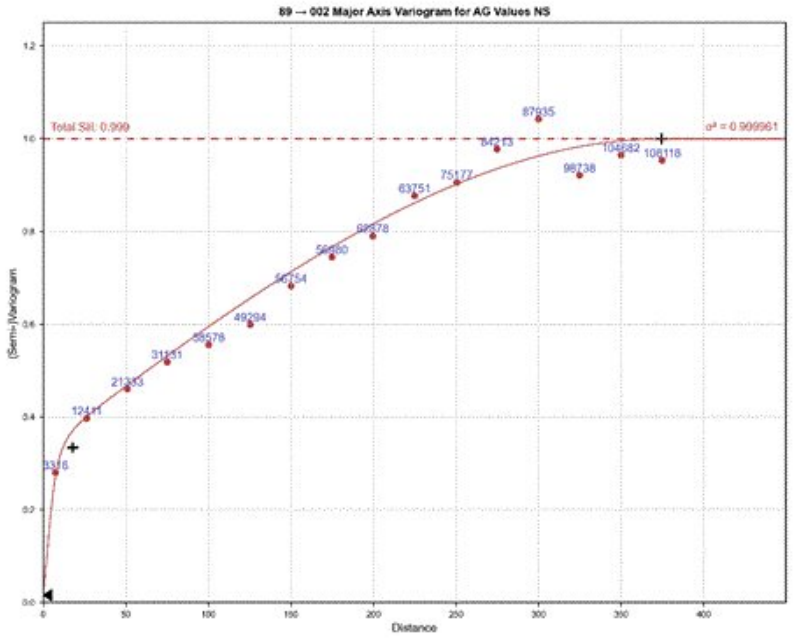


Figure 11-7: Normal Scores for Silver, 200S Deposit Major Direction, $140 NSR/ton Wireframe

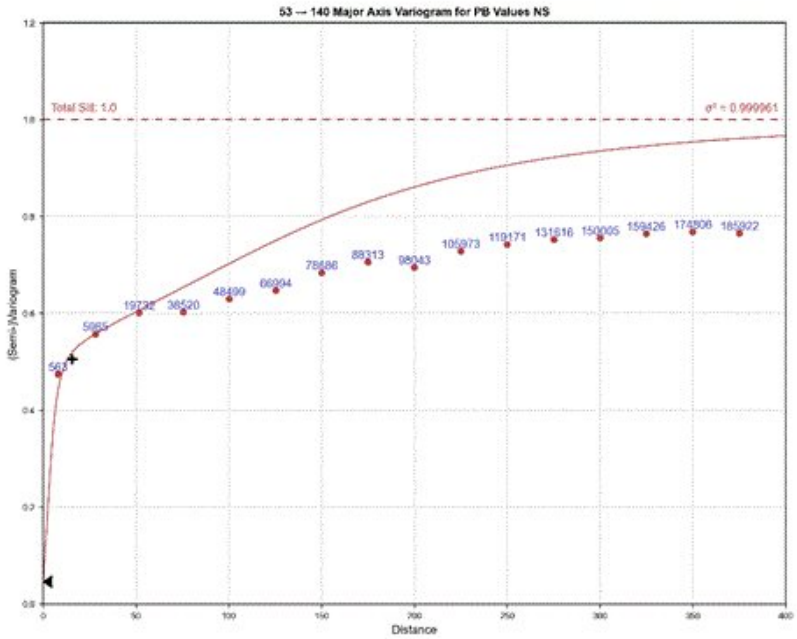


Figure 11-8: Normal Scores for Lead, 200S Deposit Major Direction, $140 NSR/ton Wireframe

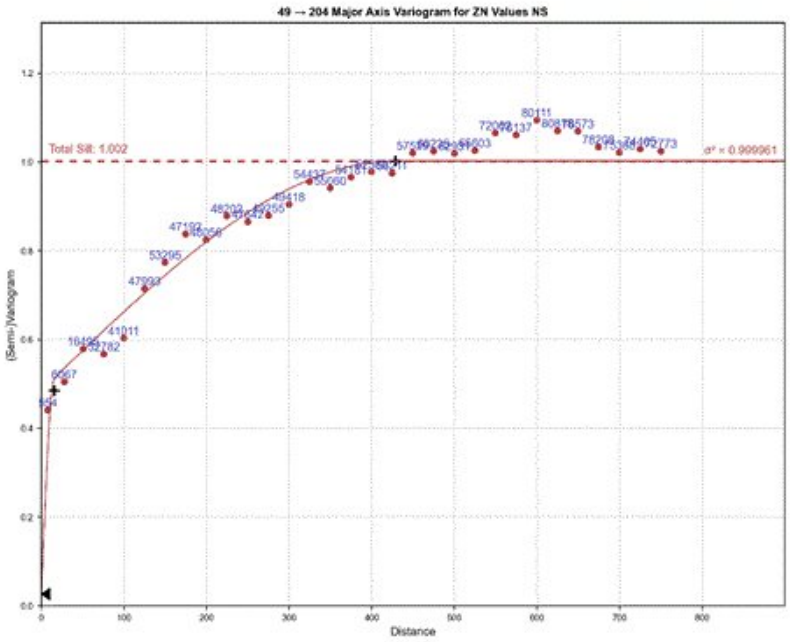


Figure 11-9: Normal Scores Variogram for Zinc, 200S Deposit Major Direction, $140 NSR/ton Wireframe

11.8 Bulk Density

Considering the wide range of bulk densities or ore grade and waste materials that are encountered in the mine, Greens Creek geologists have developed and refined a stoichiometric approach to calculating the bulk densities making use of chemical formulas for principal ore and gangue minerals. As a result of study work carried out by the geological team, individual formulae have been developed for each deposit using the general formula of:

$$Bulk\ Density\ (tonnes/m^3) = constant + a*(Ba\%) + b*(Fe\%) + c*(Pb\%) + d*(Zn\%) + e*(Ca\%).$$

The relevant coefficients are shown in Table 11-7.

Table 11-7: Summary of Density Coefficients by Deposit
Hecla Mining Company – Greens Creek Mine

Deposit	9A	NWW	5250	200S	UPP	GAL	East	SWB
Constant	2.6952	2.7322	2.9326	2.9677	2.7322	2.6272	2.5574	2.6844
Ba_coeff (a)	0.0330	0.0408	0.0300	0.0325	0.0408	0.0309	0.0401	0.0294
Fe_coeff (b)	0.0430	0.0405	0.0312	0.0352	0.0405	0.0319	0.0446	0.0381
Pb_coeff (c)	0.0000	0.0503	0.0196	0.0591	0.0503	0.0298	0.0000	0.0162
Zn_coeff (d)	0.0000	0.0128	0.0033	0.0000	0.0128	0.0122	0.0139	0.0041
Ca_coeff (e)	0.0113	0.0091	0.0000	0.0000	0.0091	0.0000	0.0106	0.0043

Depending upon the assay protocol in place at the time of sampling, some core samples do not have the full suite of validated assays required by these formulae. The following hierarchical approach is taken to assign a density to a sampled interval:

1. Sample has a full suite of validated assays: Use full regression formula.

2. Sample has full suite except Ba: If logged as a non-baritic mineral type, assign a default value for Ba based on zone statistics for non-white baritic mineral samples and apply the full regression. The default Ba value is only used for density assignment and not for interpolation.

3. Sample does not meet the criteria for 1 or 2 above but has a measured SG: Assign measured SG as final sample density.

4. Sample does not meet criteria for 1 to 3 listed above: Assign a default SG based on logged mineral type. Default values are determined by zone/lithological type during EDA.

Where the bulk densities of the samples in the drill hole database have been determined by direct measurement, those direct measurements are used to estimate the bulk densities into the block model for the immediate vicinity of the drill hole. For those remaining materials not in close proximity to a drill hole, the block density is calculated using the appropriate values estimated into the block model.

11.9 Excavation Volumes

As-mined volumes are determined using survey information of the excavated volume collected using Trimble Robotic Total Stations and Data Collectors, and the field data are processed using the Deswik.CAD 3D Mine Modeling Software package. These surveys of the excavated volumes are performed by setting up a total station on a temporary point (tripod) and resection (with a minimum of two survey control points) is performed to determine the instrument location in 3D space. Once the resection procedure is performed and is of adequate quality (minimal standard deviations) a “detail” is done by the surveyor on the excavated area, “shooting” points on the sill (floor), back (roof), and ribs (walls/face) with XYZ coordinates collected for each surveyed point. This data is then processed with Deswik.CAD software package to create point clouds for the floor and back shots, and a polyline rib outline of the open area. These points are then used to create a 3D wireframe model of the excavation by means of triangulation.

11.10Block Model Construction

For interpolation purposes, a block size of 5 ft x 5 ft x 5 ft (x, y, z) was selected. This dimension functions well in fitting mineralization with narrow widths or having complex geometrical shapes, but also can be conveniently upblocked to match the selective mining unit (SMU), or the minimum stope design dimension, of 10 ft x 10 ft x 15 ft. Initial block models are created for each of the nine deposits present at Greens Creek with the Leapfrog Edge software package, using a non-rotated, whole block approach and a parent block size as stated above. No sub-blocking or partial percentages are used.

Once the initial block models are complete, revised block models are created where the initial blocks for all zones are re-blocked larger to dimensions measuring 5 ft x 5 ft x15 ft. These re-blocked models are then forwarded to the mine engineering department for use in mine planning.

For the thin, vein-like zones or benches, the size of the mineralized material within the envelope is commonly less than the SMU size. To accommodate evaluations on the thin veins a 10 ft block model buffer is created around mineralized blocks. Blocks in the buffer model are estimated separately. The buffer blocks are then used to estimate the grade of the material that may be included as dilution to meet the minimum stope design. This step typically occurs during the stope design process.

11.11Estimation/Interpolation Methods

Grades are estimated in the block model using the composited drill hole data sets. In addition to the four principal metals of economic interest (gold, silver, lead, and zinc) and the three metals/elements required for calculation of the block density (barium, iron, and calcium), the grades of arsenic, mercury, and antimony are also estimated in support of prediction of their values in the final concentrates. The grades for all models are estimated using OK as the primary estimation method. Separate estimation runs were performed for each of the $140 NSR/ton, $50 NSR/ton, and waste wireframe models for each deposit. Each of the wireframe domains were treated as "hard" boundaries so that only those composite samples contained within each of the wireframe domains were used for grade estimation, and the resulting estimated grades were only coded to those blocks lying within the respective wireframe model. A discretization of 2:2:2 was applied for the OK estimation.

Grades are also estimated using the inverse distance squared (ID^2) interpolation algorithm and the nearest neighbor (NN) method for validation purposes. Dynamic anisotropy is employed, where the interpreted geologic structure guides the search orientations by actively reorienting the search ellipse based on the strike and dip of nearby wireframe triangles. Two estimation passes are carried out using the search strategies as shown in Table 11-8.

Table 11-8: Summary of Search Strategies
Hecla Mining Company – Greens Creek Mine

Item	Pass 1	Pass 2
Range	100% of Variogram	100% of Variogram
Minimum No. Comps	3	1
Maximum No. Comps	16	25
Minimum No. Quadrants	2	1
Maximum Samples per Quadrant	8	- -
Maximum Comps per DDH	6	6

Once the grade estimations have been completed, the bulk densities of each block are calculated by applying the formulae described in Chapter 11.8 above. In consideration that the block models are created in the Imperial measurement system, the bulk densities are then converted to inverse tonnage factors for use in preparing Mineral Resource and Mineral Reserve reports.

A series of NSR values are also prepared from the estimated block grades for use in subsequent mine planning and Mineral Resource and Mineral Reserve reporting. The methodology and formulae used to prepare the NSR values have been presented in Chapter 10.2.3 above. The following metal prices have been adopted for use in calculating the year-end 2021 Mineral Resource NSR values. These metal prices were adopted by Hecla in consideration of the current and long term market price trends, contract obligations, and general market outlook. A comparison of metal price decks used for the 2020 and 2021 Mineral Resource estimates is presented in Table 11-9.

Table 11-9: Summary of Mineral Resource Metal Prices, 2020 and 2021
Hecla Mining Company – Greens Creek Mine

Metal	2020 Mineral Resource Prices	2021 Mineral Resource Prices
Gold	US$1,500/oz	US$1,700/oz
Silver	US$21.00/oz	US$21.00/oz
Lead	US$1.15/lb	US$1.15/lb
Zinc	US$1.35/lb	US$1.35/lb

11.12 Depletion for Mining Activities

Once all grade estimation activities have been completed, the block models are then coded so as to reflect those volumes that have been excavated due to mining activities. All block models are coded with the excavation volumes that are current as of December 31, 2021.

11.13 Block Model Validation

Estimation validation is done by performing one or more of the following checks on the model:

- Review and inspection of parameter files (Datamine macros and Leapfrog calculations) used in the Mineral Resource estimation
- Visual inspection of results by metal on plan and section.
- Comparison of OK or ID and NN distributions (Table 11-10).
- Analysis of grade profiles by easting, northing and elevation using swath plots (Figure 11-10 to Figure 11-13).
- Visual comparison of the estimated grade distributions with the 3D contoured grade distributions of the informing samples (Figure 11-14 to Figure 11-17).
- External spot-checks of key calculations such as block kriging and compositing.

The checks showed the models were acceptable for use in Mineral Resource and Mineral Reserve estimation.

Table 11-10: Block Statistics- Nearest Neighbor vs Ordinary Kriging
Hecla Mining Company – Greens Creek Mine

Zone	N Blocks	AgOK	AgNN	%Diff	ZnOK	ZnNN	%Diff	PbOK	PbNN	%Diff	AuOK	AuNN	%Diff
WEST	525,357	13.18	12.93	1.9%	12.22	12.11	0.9%	3.96	3.92	1.0%	0.1440	0.1415	1.7%
9A	251,897	12.92	12.96	-0.3%	11.93	11.93	0.0%	4.38	4.39	-0.3%	0.1221	0.1220	0.0%
SWB	309,861	25.64	25.62	0.1%	10.24	10.18	0.5%	4.83	4.79	0.7%	0.1504	0.1486	1.2%
200S	445,651	20.55	20.51	0.2%	9.61	9.57	0.4%	3.91	3.89	0.5%	0.1591	0.1588	0.2%
GAL	50,454	8.39	8.46	-0.9%	8.33	8.15	2.1%	3.82	3.83	-0.1%	0.1283	0.1273	0.8%
UPPL	40,497	18.10	17.20	5.0%	6.72	6.50	3.3%	3.22	3.03	5.8%	0.0462	0.0454	1.7%
EAST	173,516	19.62	19.58	0.2%	10.88	10.58	2.8%	4.27	4.20	1.6%	0.1259	0.1229	2.4%
5250	241,187	18.40	18.26	0.8%	8.49	8.59	-1.1%	3.79	3.85	-1.4%	0.0745	0.0752	-1.0%
NWW	374,218	12.56	12.48	0.6%	12.27	12.33	-0.4%	3.89	3.93	-1.2%	0.1304	0.1305	0.0%

Note:

1. oz/ton Ag, % Zn, % Pb, oz/ton Au

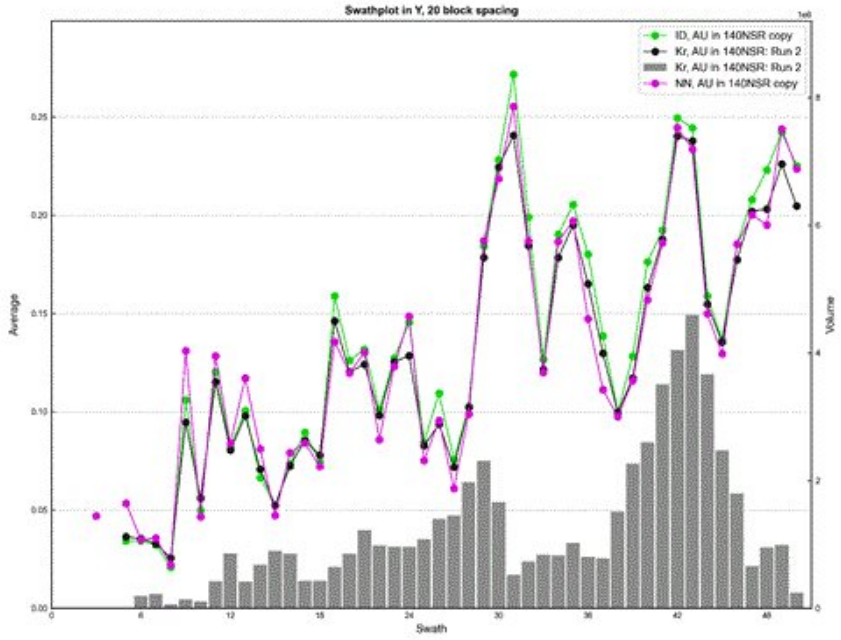


Figure 11-10: Swath Plot by Northing for Gold - $140 NSR/ton Wireframe, 200S Deposit

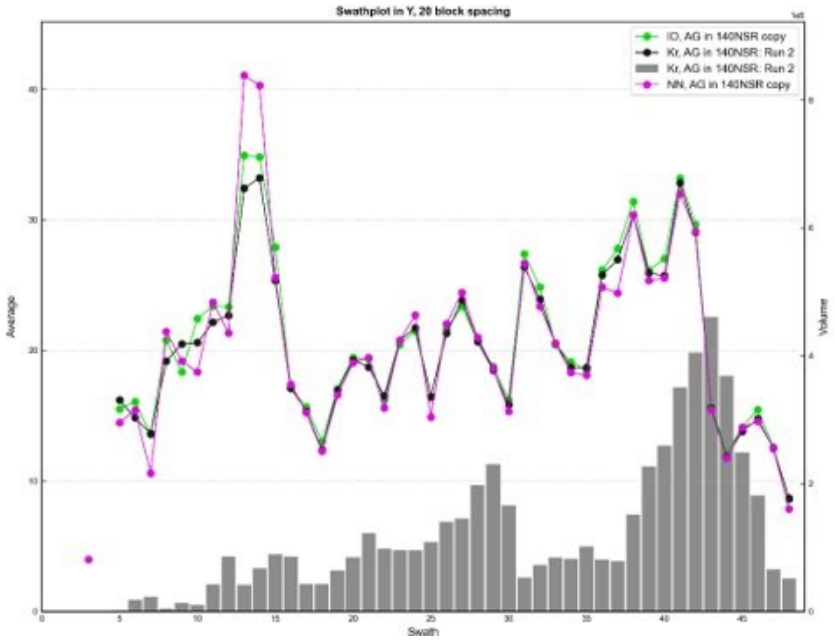


Figure 11-11: Swath Plot by Northing for Silver- $140 NSR/ton Wireframe, 200S Deposit

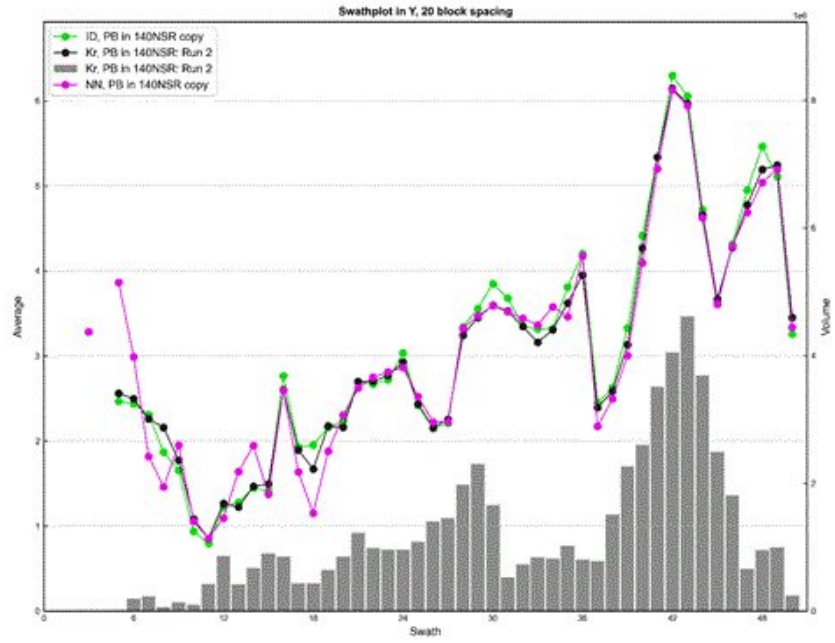


Figure 11-12: Swath Plot by Northing for Lead- $140 NSR/ton Wireframe, 200S Deposit

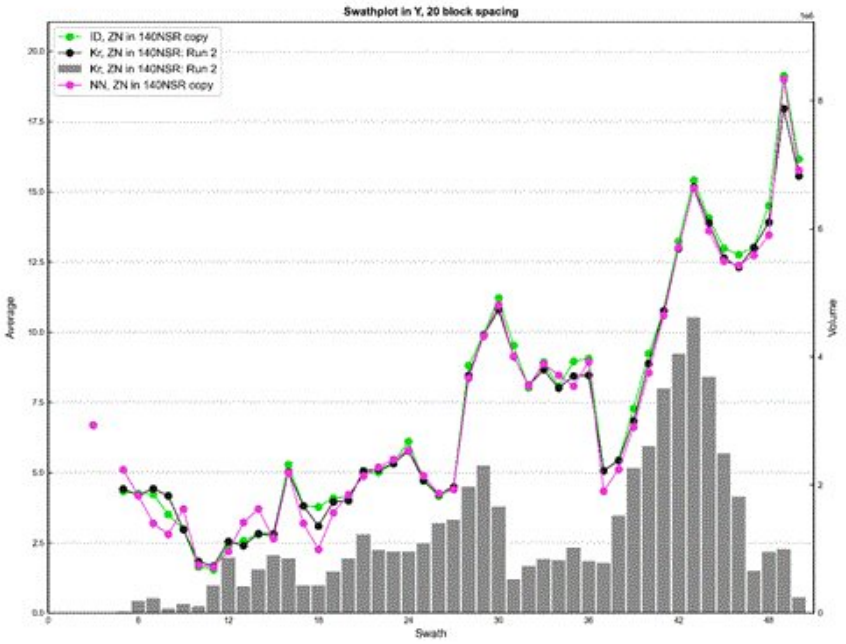


Figure 11-13: Swath Plot by Northing for Zinc - $140 NSR/ton Wireframe, 200S Deposit

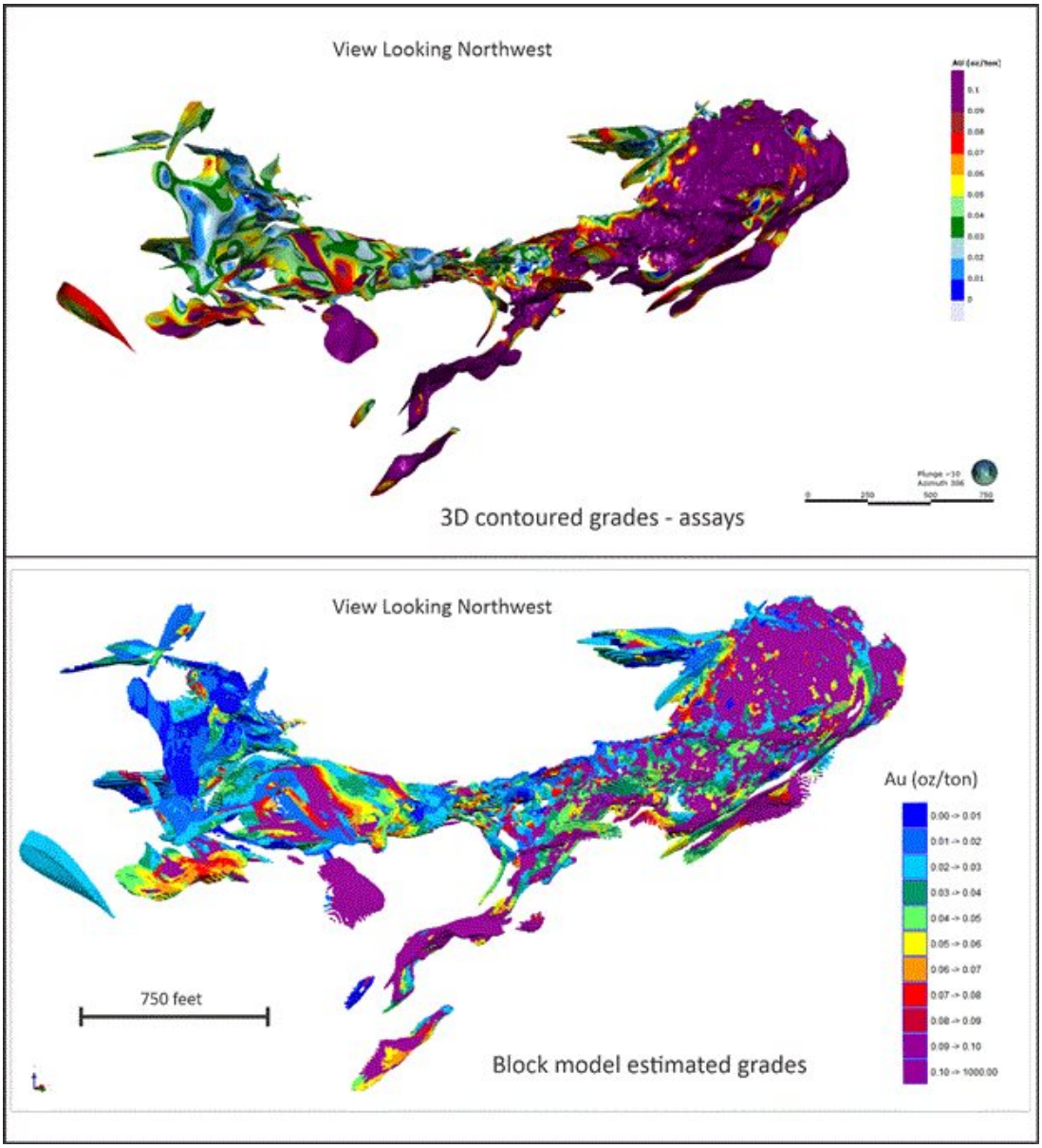


Figure 11-14: Comparison of 3D Contoured Grades with Block Model Estimated Grades, Gold, 200S Deposit

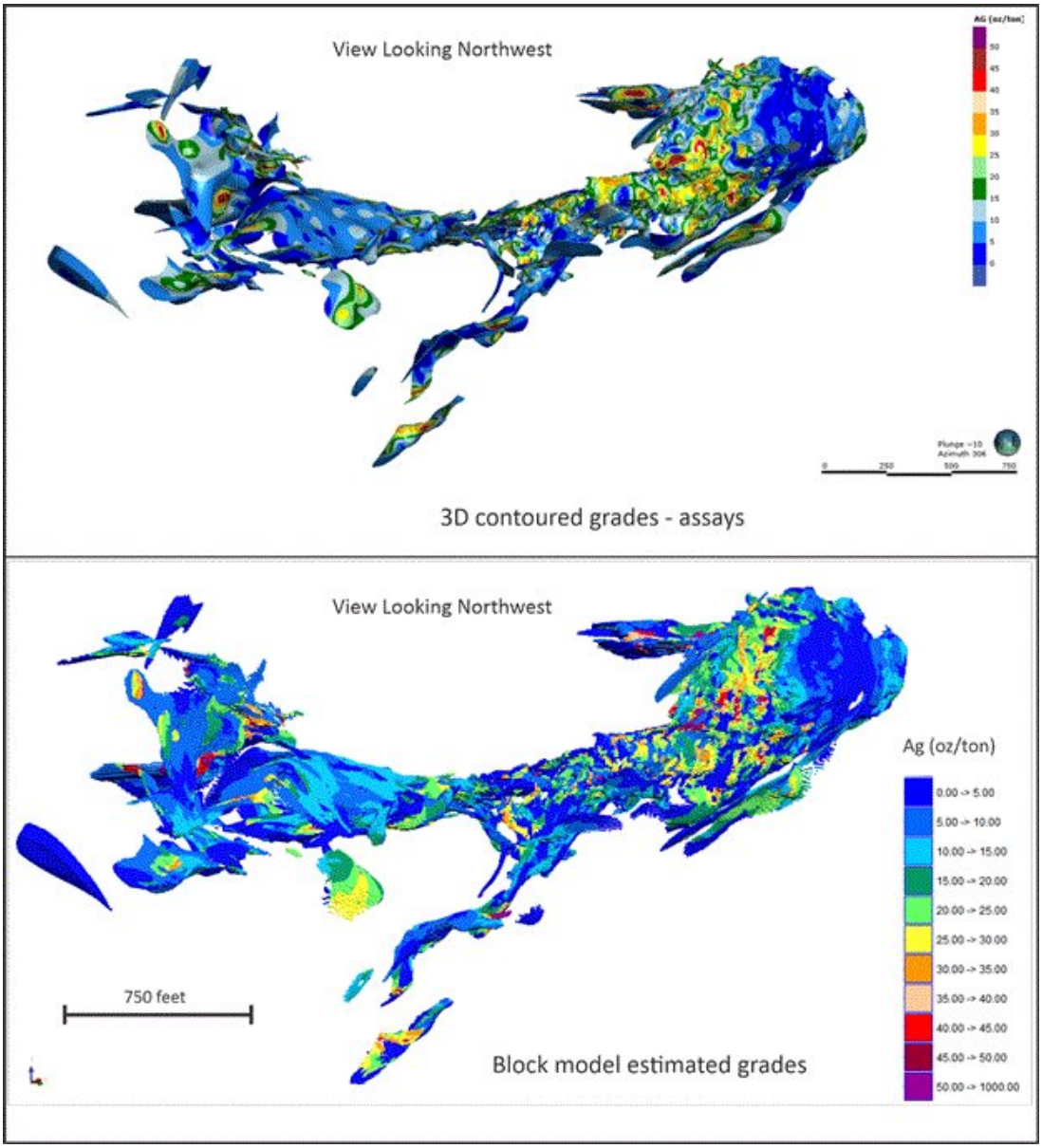


Figure 11-15: Comparison of 3D Contoured Grades with Block Model Estimated Grades, Silver, 200S Deposit

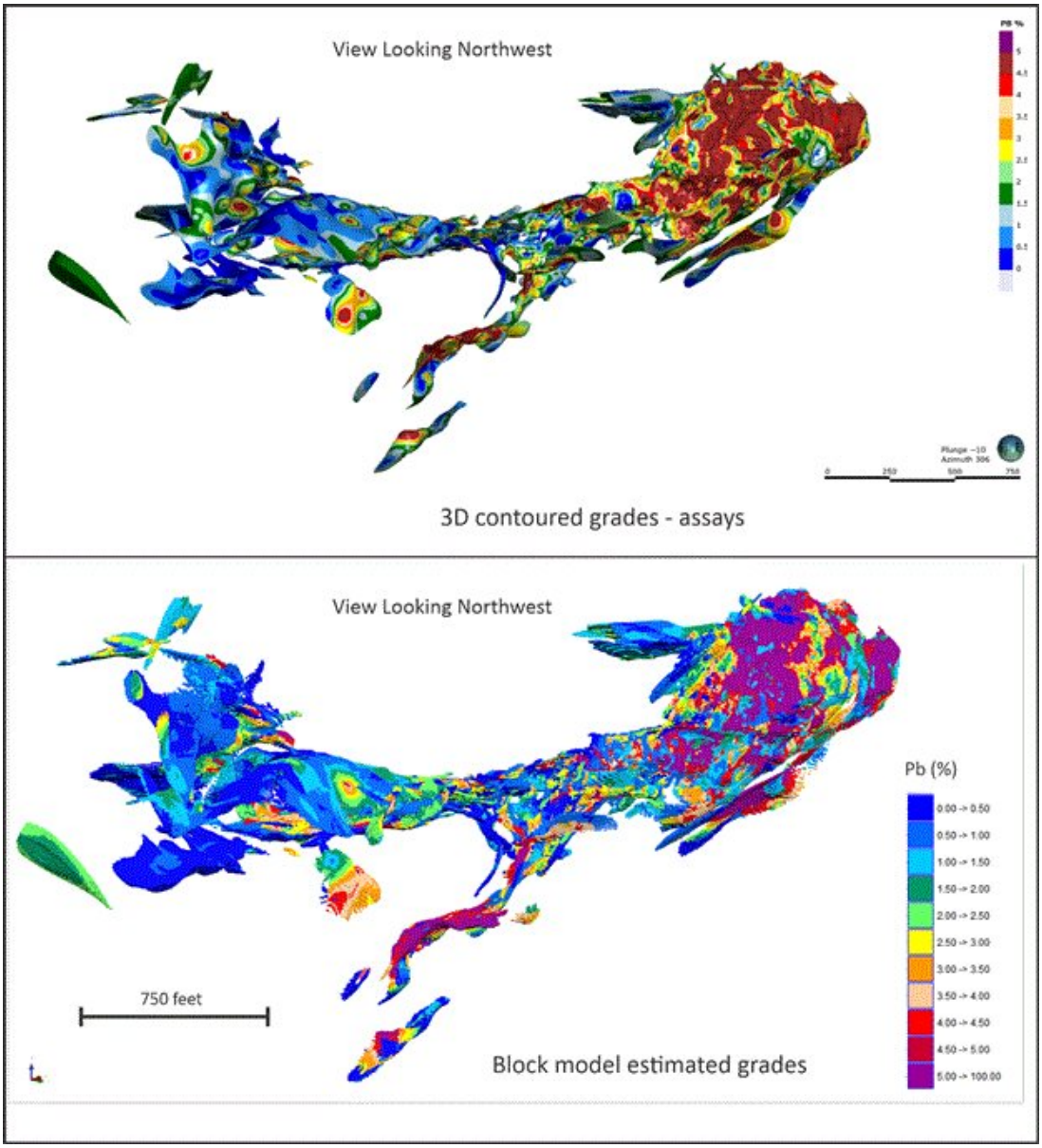


Figure 11-16: Comparison of 3D Contoured Grades with Block Model Estimated Grades, Lead, 200S Deposit

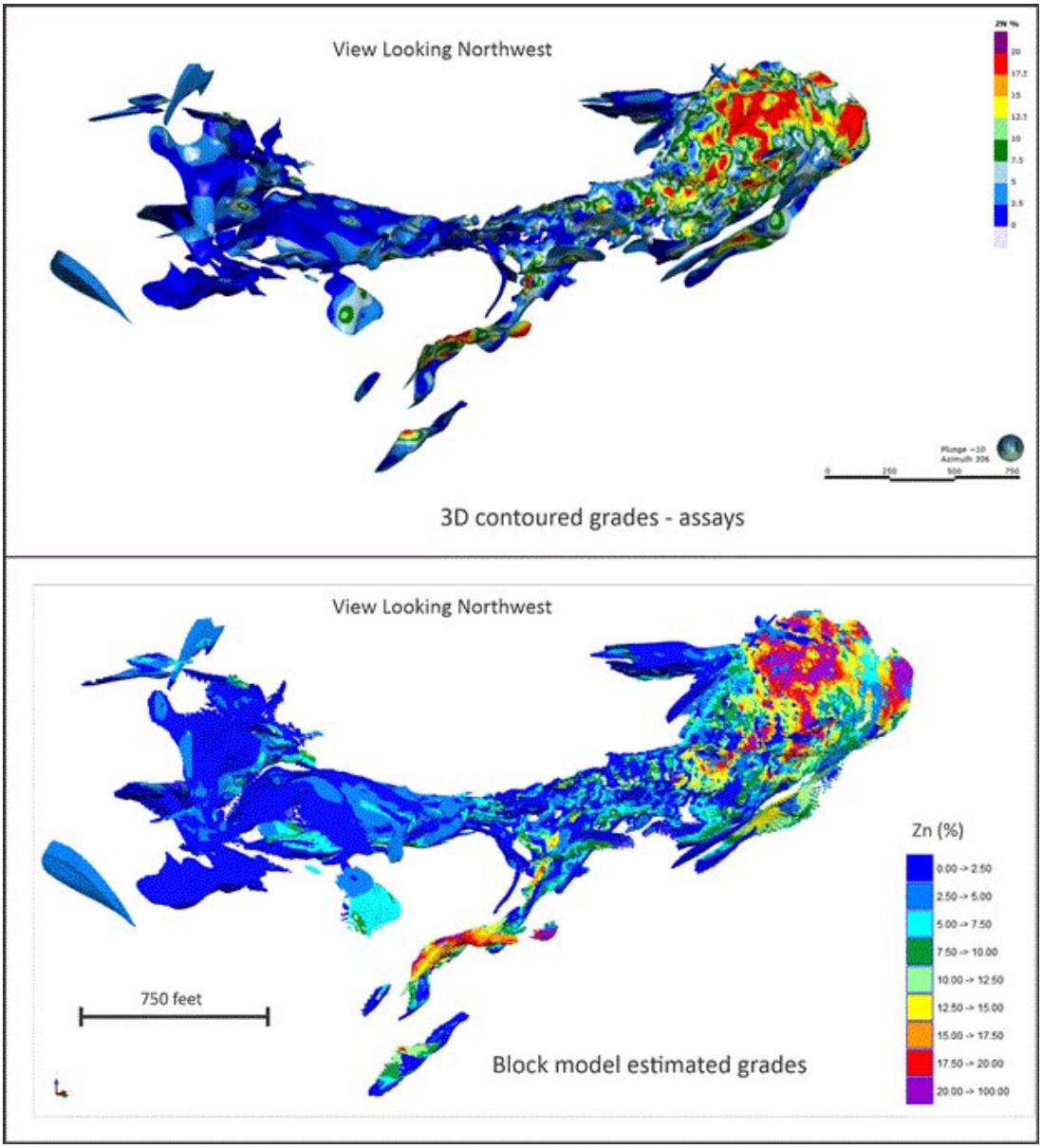


Figure 11-17: Comparison of 3D Contoured Grades with Block Model Estimated Grades, Zinc, 200S Deposit

11.14 Cut-Off Grade (Value)

Metal prices used for reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources. For resources, metal prices used are slightly higher than those for reserves. Considering that revenue is realized from the extraction and sale of gold, silver, lead, and zinc from Greens Creek, Mineral Resources are reported using a NSR approach in which the dollar contribution from the sale of each metal is summed into a single revenue factor. The threshold value (cut-off grade) for Mineral Resource reporting is then set to meet or exceed the estimated operating costs for each deposit (Table 11-11). Operating costs are estimated from information collected during normal course operations at the mine as well as considerations of potential future changes to the operating costs. The operating cost components related to each of the deposits are averaged to derive site-wide operating costs. The cost inputs for determining the threshold value for reporting of Mineral Resources include the anticipated costs of sustaining capital items and capitalized development.

Table 11-11: Summary of Estimated Operating Costs for Mineral Resource Reporting
Hecla Mining Company – Greens Creek Mine

Item	Value
West, 9A, SW, 200S, Upper, East, 5250, and NWW Deposits	
Mining Cost ($/ton)	75.33
Processing Costs ($/ton)	33.29
Surface Operations Costs ($/ton)	27.49
Environmental Costs ($/ton)	3.82
General & Administration Costs ($/ton)	32.25
Sustaining Capital ($/ton)	42.81
Royalty Charges ($/ton)	0.00
Reporting Threshold (Cut-off Value)	**$215/ton**
Gallagher Deposit	
Mining Cost ($/ton)	75.33
Processing Costs ($/ton)	33.29
Surface Operations Costs ($/ton)	27.49
Environmental Costs ($/ton)	3.82
General & Administration Costs ($/ton)	32.25
Sustaining Capital ($/ton)	42.81
Royalty Charges ($/ton)	5.00
Reporting Threshold (Cut-off Value)	**$220/ton**

11.15 Classification of Mineral Resources

Definitions for resource categories used in this TRS are those defined by SEC in S-K 1300. Mineral Resources are classified into either the Indicated or Inferred categories. No material is classified into the Measured category.

In order to determine appropriate classification standards, the spatial continuity of the mineralization as determined from the variography studies for each zone are considered for Ag (lower continuity) and Zn (higher continuity).

Classification distances are set at a range that corresponds with a certain percentage of the total sill for Ag and Zn as read off the semi-variograms. Indicated blocks need to fall within an average of 70% of the sill-range of the major axis semi-variogram for both elements.

Table 11-12 shows the classification parameters used for assigning material into the Indicated Mineral Resource category. All remaining blocks within the $140 NSR/ton wireframes that were not classified into the Indicated category are assigned into the Inferred Mineral Resource category.

Table 11-12: Summary of Classification Parameters by Zone
Hecla Mining Company – Greens Creek Mine

Parameter	Gallagher	5250	200s	NWW	9a	SW	West	Upper Plate	East
Max. Avg. Distance (ft)	60	65	120	100	65	58	85	85	60
Min. No. Composites	3	3	3	3	3	3	3	3	3
Max. No. Composites	16	16	16	16	16	16	16	16	16
Min. No. Quadrants	2	2	2	2	2	2	2	2	2
Max. No. Comps per Quadrant	8	8	8	8	8	8	8	8	8
Max. No. Comps per Drill Hole	6	6	6	6	6	6	6	6	6

11.16 Reasonable Prospects of Economic Extraction

Over 20 years of production experience demonstrates that the mineral deposits at Greens Creek are amenable to extraction using underground overhand cut and fill and longhole stoping methods, with marketable concentrates being produced from gravity concentration and flotation concentration processing methods. Based on this production history, the following assumptions have been applied to determine the extent of the classified material that might have a reasonable expectation of economic extraction.

As with previous years a 5 ft x 5 ft x 5 ft block model and a re-blocked 5 ft x 5 ft x 15 ft block model was created for each zone by the geology team. The models were subsequently used by the engineering department to design Mineral Reserve shapes with the thinner and more horizontal mineral zones utilizing the 5 ft x 5 ft x 5 ft model. Once Mineral Reserve shapes were designed the Mineral Reserve was calculated based on the 5 ft x 5 ft x 15 ft re-blocked model.

For Mineral Resource reporting, the models were depleted for mined as-builts and for the Mineral Reserve shapes. Deswik software package was used to prepare the depleted block models.

Mineral Resource statements were then prepared from those depleted Mineral Resource models using the Datamine software package and by applying the following workflow:

- Depending on the mineral zone, either the 5 ft x 5 ft x 5 ft or 5 ft x 5 ft x15 ft model was viewed in plan at mid-block with the NSR values displayed. Polygons were drawn at mid-block around the depleted Mineral Resource blocks so that:
  - All blocks >$215 NSR/ton immediately adjacent to the designed Mineral Reserve shapes were enclosed.
  - All blocks >$215 NSR/ton that may be separated from the designed Mineral Reserve shapes were enclosed if the blocks were seen to be continuous in 3D to contain a total of approximately 20,000 tons or more. Where these blocks were only a single block wide (five feet), they were not enclosed.
  - No blocks >$215 NSR/ton immediately adjacent to as-builts were enclosed unless those blocks were judged to be sufficiently continuous and wide enough to support a separate stope.
  - Once blocks were selected in the appropriate model, they were reported without any dilution from neighboring blocks with <$215 NSR/ton values.
- The Gallagher and Upper Plate zone Mineral Resource polygons were drawn every five feet in elevation at mid-block on the 5 ft x 5 ft x 5 ft model. Once blocks were selected and coded the Mineral Resource report used the 5 ft x 5 ft x 5 ft model. This approach was taken as the mineral zones are often thin and shallowly dipping. The guiding principle on selecting the >$215 NSR/ton blocks was to keep a 10 ft mining width over 20,000 tons if away from a Mineral Reserve shape. A cut-off value of >$220 NSR/ton was used for the Gallagher deposit to reflect the increased mining costs and royalty obligations.
- The 200S Zone Mineral Resource polygons were drawn every 15 ft in elevation while viewing the 5 ft x 5 ft x 15 ft model and mid-block elevation. Those polygons were extruded into 15 ft high selection volumes that coded blocks as Mineral Resource within the 5 ft x 5 ft x5 ft model. The 5 ft x 5 ft x 5 ft model was then used to report the Mineral Resource statement. The 5 ft x 5 ft x 5 ft model was chosen so as to not overly dilute (and reduce) the Mineral Resource with 15 ft high blocks which often split the thin vein and create artifact zones of Mineral Resource parallel to each other simply due to the larger blocks splitting the vein or not.
- The remaining Mineral Resource polygons of the 9A, East, SWB, West, NWW and 5250 zones were drawn every 15 ft in elevation while viewing the 5 ft x5 ft x 15 ft models. The polygons were extruded into 15 ft high selection volumes to code the 5 ft x 5 ft x 15 ft model blocks as Mineral Resource. Only blocks > $215 NSR/ton were selected for tabulation of the Mineral Resource which was performed on the 5 ft x 5 ft x 15 ft model. The thicker model was chosen for these zones as the mineralization is often thicker and does not display the artifact banding that the other thinner and more horizontal mineral bodies did.

11.17 Mineral Resource Statement

Mineral Resource statements are prepared in consideration of the relevant technical and economic parameters, along with those volumes in the block models that have been depleted for mining. As the Mineral Resources are stated exclusive of Mineral Reserves, those volumes in the respective block models that have been classified into the Mineral Reserve categories are excluded from the Mineral Resource reports. Mineral Resources are also required by S-K 1300 to demonstrate Reasonable Prospects for Economic Extraction (RPEE). This requirement is satisfied by the application of criteria that consider the spatial continuity of blocks containing NSR values above the nominated cut-off value as well as the practical aspects required for extraction by means of underground mining methods, as discussed above.

Hecla cautions that Mineral Resources that are not Mineral Reserves and have not demonstrated economic viability. Indicated Mineral Resources are reported in Table 11-13. Inferred Mineral Resources are reported in Table 11-14. Comparisons with the previous Mineral Resource estimate is presented in Table 11-15.

11.17.1 Risk Factors That May Affect the Mineral Resource Estimate

Factors which may affect the Mineral Resource estimates include:

- Due to variations in the global supply chains, the actual metal prices realized at the time of production may differ from the long term metal prices that were used in the preparation of the Mineral Resource statements. Lower zinc metal prices realized at the time of production may result in a decrease in Mineral Resources. In SLR's opinion the Mineral Resources are not sensitive to variations in the prices of gold, silver lead or zinc from those used in the current Mineral Resource statement.
- Changes to design parameter assumptions that pertain to creation of reporting volumes.
- Changes to geotechnical, mining, and metallurgical recovery assumptions.
- Changes to the formula used to generate the block model NSR values.
- Changes to the assumptions used to generate the reporting NSR cut-off value.
- Changes in interpretations of mineralization geometry and continuity of mineralization zones resulting from additional drill hole information and channel sample assays, and new geological mapping information.
- Due to the reliance of the estimation of the density on the estimate of metal grades for those portions of the mineralization located in areas with a low density of sample information, the tonnage for those portions can vary at a local scale if the actual metal grades differ from the estimated metal grades.

Table 11-13: Measured and Indicated Mineral Resources December 31, 2021
Hecla Mining Company – Greens Creek Mine

	Tonnage	Grade				Contained Metal			
	(ton)	(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	(oz Au)	(oz Ag)	(ton Pb)	(ton Zn)
Measured Resources									
East	- -	- -	- -	- -	- -	- -	- -	- -	- -
West	- -	- -	- -	- -	- -	- -	- -	- -	- -
9A	- -	- -	- -	- -	- -	- -	- -	- -	- -
NWW	- -	- -	- -	- -	- -	- -	- -	- -	- -
SW	- -	- -	- -	- -	- -	- -	- -	- -	- -
200S	- -	- -	- -	- -	- -	- -	- -	- -	- -
5250	- -	- -	- -	- -	- -	- -	- -	- -	- -
Gallagher	- -	- -	- -	- -	- -	- -	- -	- -	- -
Upper Plate	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total Measured	**0**	**0.00**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**
Indicated Resources									
East	514,800	0.09	12.2	2.8	7.6	45,100	6,267,700	14,300	39,380
West	2,620,700	0.12	10.7	3.0	9.6	309,600	28,046,200	79,840	250,410
9A	592,000	0.09	10.4	3.5	9.4	54,600	6,131,600	20,680	55,410
NWW	1,188,900	0.09	9.3	2.6	8.6	111,700	11,062,200	30,320	102,330
SW	838,900	0.07	18.5	3.2	6.5	62,600	15,517,900	26,780	54,940
200S	1,693,400	0.11	16.3	2.9	7.7	194,500	27,653,300	49,400	130,590
5250	520,400	0.05	14.4	3.1	7.9	26,400	7,482,800	16,190	40,860
Gallagher	194,100	0.13	8.0	3.5	7.9	24,300	1,561,000	6,840	15,270
Upper Plate	191,600	0.04	15.4	3.0	6.4	7,100	2,947,800	5,690	12,340
Total Indicated	**8,355,000**	**0.10**	**12.8**	**3.0**	**8.4**	**835,900**	**106,670,300**	**250,040**	**701,520**
Total Measured and Indicated	**8,355,000**	**0.10**	**12.8**	**3.0**	**8.4**	**835,900**	**106,670,300**	**250,040**	**701,520**

Table 11-14: Inferred Mineral Resources - December 31, 2021
Hecla Mining Company – Greens Creek Mine

	Tonnage	Grade				Contained Metal			
	(ton)	(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	(oz Au)	(oz Ag)	(ton Pb)	(ton Zn)
Inferred Resources									
East	425,200	0.09	12.8	2.4	6.7	36,300	5,449,400	10,110	28,350
West	407,800	0.08	10.0	2.6	6.7	31,600	4,078,500	10,520	27,400
9A	392,400	0.08	10.5	3.3	8.7	32,300	4,115,100	13,060	34,070
NWW	35,000	0.06	9.6	2.2	6.3	2,100	335,900	770	2,190
SW	278,000	0.07	14.4	2.5	5.1	18,200	4,014,700	7,050	14,200
200S	118,000	0.10	27.1	2.3	4.7	12,200	3,197,300	2,710	5,550
5250	58,700	0.04	11.0	3.5	7.6	2,200	648,300	2,050	4,440
Gallagher	221,100	0.09	9.8	3.6	7.5	20,600	2,174,300	7,860	16,560
Upper Plate	215,400	0.04	16.2	2.8	6.2	8,200	3,494,100	6,010	13,250
Total Inferred	**2,151,700**	**0.08**	**12.8**	**2.8**	**6.8**	**163,700**	**27,507,500**	**60,140**	**146,020**

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves and do not have demonstrated economic viability.
4. Mineral Resources are 100% attributable to Hecla.
5. Mineral Resource block models are prepared from drilling and sample data current as of October 31, 2021; all Mineral Resources have been depleted for mining as of December 31, 2021.
6. Mineral Resources are based on the following metal prices and cut-off assumptions: $1,700/oz Au, $21/oz Ag, $1.15/lb Pb, $1.35/lb Zn, NSR cut-off of $215 NSR/ton for all zones except the Gallagher Zone, which used a $220 NSR/ton cut-off.
7. The reasonable prospects for economic extraction requirement for Mineral Resources is satisfied by application of criteria that consider the spatial continuity of blocks above the nominated cut-off value as well as the practical aspects of extraction by means of underground mining methods.
8. Totals may not agree due to rounding.
9. Reporting units are imperial, Tons: dry short tons (dst); Au (troy ounces/dst); Ag (troy ounces/dst); Pb and Zn percent (%).

Table 11-15: Comparison of 2020 and 2021 Mineral Resource Statements
Hecla Mining Company – Greens Creek Mine

Category	Tonnage	Grade				Contained Metal			
	(ton)	(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	(oz Au)	(oz Ag)	(ton Pb)	(ton Zn)
Mineral Resources as of December 31, 2020									
Measured and Indicated	8,895,000	0.10	12.9	3.0	8.3	881,300	114,680,600	266,110	739,020
Inferred	1,766,700	0.08	13.2	2.8	7.0	145,400	23,370,400	49,670	123,480
Mineral Resources as of December 31, 2021									
Measured and Indicated	8,355,000	0.10	12.8	3.0	8.4	835,900	106,670,300	250,040	701,520
Inferred	2,151,700	0.08	12.8	2.8	6.8	163,700	27,507,500	60,140	146,020
Difference									
Measured and Indicated	-540,000	0.00	-0.1	0.0	0.1	-45,400	-8,010,300	-16,070	-37,500
Inferred	385,000	0.00	-0.4	0.0	-0.2	18,300	4,137,100	10,470	22,540
% Difference									
Measured and Indicated	-6%	0%	-1%	0%	1%	-5%	-7%	-6%	-5%
Inferred	22%	0%	-3%	0%	-3%	13%	18%	21%	18%

Gains and losses are essentially explained by:

- Geological reinterpretation of mineralized zones resulting from new drill hole information and new grade control mapping and sample data.
- Conversion of Inferred Mineral Resources into Indicated Mineral Resources.
- Reclassifying Measured Mineral Resources to Indicated Mineral Resources.
- Changes in the cut-off value from $190 NSR/ton to $215 NSR/ton for all zones except Gallagher and $220 NSR/ton for the Gallagher deposit.
- Changes to the metal price selection.
- Conversion of Mineral Resources into Mineral Reserves.
- Mining depletion.
- Subtraction of low grade Mineral Resources (below cut-off grade).

The QP is of the opinion that the Mineral Resources for the Project, which have been estimated using information obtained from core drill data, geological mapping, and grade control sampling programs, have been performed to industry best practices, and conform to the requirements of S-K 1300. The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that would materially affect the Mineral Resource estimate.

12.0 MINERAL RESERVE ESTIMATES

12.1 Summary

The Mineral Reserve estimates, as prepared by Hecla and reviewed and accepted by SLR, reported as of December 31, 2021 are summarized in Table 12-1.

It should be noted that at Greens Creek, due to the complexity of the deposit, there is a tendency to mine a significant amount of material outside of the Mineral Reserves each year. This is typically Inferred Resources at the margins of Mineral Reserves, and additional reserve grade material not previously identified by the definition diamond drilling program. The estimated material mined outside of the Mineral Reserves include 37%, 30%, and 17% during 2019, 2020, and 2021 respectively. All efforts are taken by Greens Creek staff to include only Measured and Indicated Resources when converting these to Mineral Reserves. Although this is difficult any inclusion of Inferred material is considered, in SLR's opinion, to be minimum and not material.

Table 12-1: Summary of Mineral Reserves – December 31, 2021
Hecla Mining Company – Greens Creek Mine

Category	Tonnage	Grade				Contained Metal			
	(000 ton)	Ag (oz/ton)	Au (oz/ton)	Pb (%)	Zn (%)	Ag (000 oz)	Au (000 oz)	Pb (000 tons)	Zn (000 tons)
Proven	2	9.60	0.075	1.66	4.54	18	0.1	0.0	0.1
Probable	11,074	11.31	0.085	2.55	6.55	125,201	945.6	282.2	725.8
Total Proven + Probable	**11,076**	**11.31**	**0.085**	**2.55**	**6.55**	**125,219**	**945.7**	**282.3**	**725.9**

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Mineral Reserves were estimated by Hecla and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla.
4. Mineral Reserves are estimated at an NSR cut-off of $215 NSR/ton for all zones except the Gallagher Zone, which used a $220 NSR/ton cut-off $215 NSR/ton.
5. Mineral Reserves are estimated using an average long term price of $1,600/oz Au, $17.00/oz Ag, $0.90/lb Pb, and $1.15/lb Zn.
6. A minimum mining width of 4.6 m (15 ft) was used.
7. A density of 0.075 t/ft^3 was used for waste material.
8. Totals may not add due to rounding.
9. Reporting units are imperial, Tons: dry short tons (dst); Au (troy ounces/dst); Ag (troy ounces/dst); Pb and Zn percent (%).

The SLR QP is not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

12.2 Conversion to Mineral Reserves

Mineral Reserves have been estimated from the Mineral Resource block model, which is developed by the geology department and updated regularly to incorporate new information (see Section 11). All zones in the geological model are considered for conversion from Mineral Resource to Mineral Reserve as the models are updated.

The following criteria were used to convert Mineral Resources to Mineral Reserves:

- Only Measured and Indicated Mineral Resources are considered.
- Dilution is included in the Mineral Reserve estimate.
- Mineral Reserves are supported by an economic mine plan.
- The reference point for Mineral Reserves is the plant feed. Metallurgical process losses are not considered when determining the Mineral Reserves.

The Greens Creek Mineral Reserves Estimate was created with Deswik software using similar methodologies and basic assumptions as previous annual Mineral Reserve estimates. All areas are designed for either longhole stoping (where the mineralized zone is sufficiently vertical), drift and fill stoping, or overhand cut and fill stoping.

The design process begins by creating a grade shell of the resource block model to highlight Measured and Indicated Mineral Resource blocks with an NSR in excess of the $215 NSR/ton cut-off. Areas with sufficient amounts of these blocks are targeted for evaluation as potential Mineral Reserves.

A detailed stope design is created for each level considering appropriate stoping criteria such as stope dimensions, level spacing, geological and geotechnical factors, the shape of the mineral zone, and any nearby previous mining. This is followed with the creation of 3D primary development and access ramp designs, as well as supporting infrastructure excavations.

The minimum mining height and width is 15 ft, which is the smallest dimension that can effectively accommodate Greens Creek's mining equipment. In areas to be mined with drift and fill methods, the centerline of each planned drift is created to maximize the planned mineral extraction in each 15 ft vertical interval of the block model. These centerlines are then extruded into 15 ft wide by 15 ft high three-dimensional solids to reflect the nominal stoping dimension.

3D solids are also created in the areas where longhole mining is planned. The height and width of these solids reflect the actual longhole design. Most longhole stopes are 25 ft wide with a variable height. The dimensions of longhole stopes vary significantly depending upon the shape of the mineral zone, the competence of the rock, and the limitations of drilling equipment.

The stope design wireframes are then evaluated against the geologic block model to generate tons and grade for each stope, determined from the model blocks that fall within the design. The block models are depleted as part of this process to account for historic mining, replacing previously mined blocks with backfill grades. Dilution factors are then added to account for rock overbreak and backfill dilution. Once the mine design is completed and interrogated, the designed stopes and mine development are exported to Deswik Scheduler where an optimized schedule is generated.

12.2.1 Probable and Proven Mineral Reserve Classifications

Current practice at Greens Creek is to classify all in-situ underground Reserves as Probable Mineral Reserves. The only material included in the "Proven" Mineral Reserve category is the relatively small amount of ore tonnage present in the surface stockpile.

12.2.2 Handling of Waste and Inferred Mineral Resource Inside Mineral Reserve Wireframes

Areas of Inferred Mineral Resource and waste are not targeted for inclusion in the stope design wireframes used to determine the Mineral Reserve. The waste material are regions of the block model that did not meet NSR cut-off and were therefore not given a resource classification. To generate a feasible mining shape, block model cells of Inferred Mineral Resource class and waste are sometimes incidentally included within the extents of stope design wireframes that primarily target Measured or Indicated Mineral Resource material.

When this occurs, the metal value is removed from the proportion of the wireframe that encompasses Inferred Mineral Resource blocks. The metal value within the waste blocks is maintained. Inferred Mineral Resources of 6.7 Moz Ag, 43,200 oz Au, 36,600 tons Zn and 14,700 st Pb lie within the boundaries of the Mineral Reserve wireframes and have been discounted from Reserves. Current practice is to also exclude this material from the Inferred Mineral Resource totals since the tons (but not the metal) are already encompassed by the Mineral Reserve.

SLR is of the opinion that this methodology can be improved upon. Waste material has not been classified as a Mineral Resource and should thus be treated as Inferred material with metal value removed. It may be reasonable to assign background metal values equivalent to those used for "Rock Overbreak Dilution" (discussed in Section 12.7) to both Inferred and Waste material. SLR investigated the impact that these changes would have on the Mineral Reserve and the result was immaterial.

12.3 NSR Formula

The NSR value per ton of the mineralized material is determined with a formula that is required due to the complexity of the combination of concentrates produced at Greens Creek. The mine produces four different concentrates, including a silver, zinc, PM, and gravity concentrate. Each of these have different payability factors and smelter terms. The ore value is therefore expressed in terms of NSR rather than by metal grade. The NSR formula is determined by the Greens Creek metallurgy group and is based on linear regression (line of best fit) between the metal content and NSR values of a wide variety of Greens Creek ore types and grades. The formula accounts for metallurgical recoveries, payability terms, and smelter charges for the four types of concentrate produced. It is important to note that the NSR value cannot be used to determine the individual NSR for each metal, it rather provides an estimate of all metals combined. This is due to the complex interaction of the different metal grades in the milling process. For example, the silver reports to the silver concentrate where it has the best payability terms, hence changes to the lead grade of the plant feed can impact the recovery and payability of the contained silver by affecting the proportion of silver that reports to each type of concentrate. The NSR formula for the EOY 2021 reserves is expressed as follows:

Flotation NSR:	{(0.3400 * [Au oz/ton] * [Au $/oz]) + (0.6862 * [Ag oz/ton] * [Ag $/oz]) + (23.26 * [Pb %] * [Pb $/lb.]) + (7.68 * [Zn (%)] * [Zn $/lb.]) - (3.609* [Fe (%)])} + $27.35	
Gravity NSR:	IF [Au oz/ton] < 0.026	0
	IF [Au oz/ton] >= 0.026	(0.2465 * [Au oz/ton]-0.0065) * [Au $/oz] * 0.9289)

Total NSR = [Flotation NSR] + [Gravity NSR]

12.4 Metal Price Assumptions

Metal prices used for Reserve estimation were supplied by Hecla Corporate and are shown in Table 12-2.

Table 12-2: Metal Price Assumptions
Hecla Mining Company – Greens Creek Mine

Category	Ag ($/oz)	Au ($/oz)	Pb (%/lb)	Zn ($/lb)
Metal Price	17.00	1600	0.90	1.15

Hecla historically uses different metal prices for Mineral Reserve estimation and LOM planning exercises. Using the 'LOM Price' deck results in an increase in average NSR over the LOM of approximately $26/ton. To maintain and permit auditability, and allow for clearer sensitivity analyses, SLR recommends the use of a single price deck for all long range planning and reserve estimation exercises.

12.5 Cut-off Grade and "Must-Take" Ore

The cut-off grade (COG) NSR value used for stope design of all mining methods is $215/ton. This COG reflects the actual property-wide cash costs distributed on a per ton basis as well as an allocation for the expected cost of sustaining capital items including capitalized development. The breakdown of this cost is presented in Table 11-11.

The Gallagher Zone is subject to a royalty amounting to approximately 3% of NSR unless extralateral rights are established. This was accounted for in mine planning processes by increasing the NSR COG by $5.0/ton to $220/ton for the Gallagher Zone. This potential royalty has been included when evaluating the economics of the area. The Greens Creek geology group is advancing the process of determining whether extralateral rights have been established for this zone which would negate the potential royalty.

Mining plans will frequently require mining through Mineral Resource areas of less than $215 NSR/ton material to access more distant above-cut-off value ore. When low grade Mineral Resource must be mined to access a higher grade area, a "must-take" cut-off of $90 NSR ton is applied. Since this material must be mined regardless of NSR value it can be profitably milled if the NSR exceeds $90 NSR/ton, which covers incremental milling and administrative costs. Therefore, any Measured or Indicated Mineral Resource intersected by development and resulting in a diluted grade above $90 NSR/ton is considered ore and is included in the Mineral Reserve, while any material below $90 NSR/ton is treated as waste.

12.6 Other Mineral Reserves Criteria

All undeveloped mining levels are subjected to an economic analysis to ensure that the operating cash flow produced from the extraction of the Mineral Reserves (above $215 NSR/ton) exceeds the marginal development cost to access the level. This becomes an important criterion for certain levels at the margins of the mineral body which require a large amount of development to access but contain relatively low ore tonnage.

For Mineral Reserves located at shallow depths relative to surface topography, a minimum crown pillar criterion of 100 ft has been applied.

Historic mining and backfill are considered when evaluating an area for inclusion in Mineral Reserve. Historically mined areas with incomplete as-built surveys are not eligible to be included in Mineral Reserve until a complete set of reliable as-builts is located.

Certain historical mining panels are recorded as being filled with loose waste rock or unconsolidated tailings instead of cemented backfill. This prohibits any mining adjacent or underneath the affected area, and generally results in the sterilization of the potential Mineral Reserve. Certain areas which contain adjacent ore of very high grades are evaluated on a case-by-case basis for re-entry, removal of the waste or tailings, and placement of cemented backfill.

Geotechnical factors are considered when determining Mineral Reserves. Small areas of above-cut-off grade material have been excluded from the Mineral Reserve due to high geotechnical risk (highly stressed pillars adjacent to large backfilled longhole blocks). These areas may be added to Mineral Reserves in the future if geotechnical analysis demonstrates they can be extracted safely and economically.

12.7 Dilution

Dilution in the 2022 LRP comes from three sources:

12.7.1 Dilution Within the Designed Stope Volume

All block models have a waste model enveloping the ore blocks which allows dilution to be accounted for in the mine design process. In some areas the mineralization may be thinner than the 15 ft minimum mining width. If the ore has sufficiently high grade, this dilution will be intentionally mined and is accounted for when the designed ore volume is interrogated against the block model.

12.7.2 Rock Overbreak Dilution

A certain percentage of overbreak is normal and expected when mining using drill and blast methods. When multiple drifts are planned to be mined adjacent to each other, some of this overbreak material will be accounted for by the tonnage otherwise expected from subsequent panels.

In other instances, the overbreak will be low grade waste material that would not be targeted for mining. This overbreak is accounted for by applying an empirically derived dilution factor of 6%, with metal grades as listed in Table 12-3.

Table 12-3: Rock Dilution Grades
Hecla Mining Company – Greens Creek Mine

Metal	Unit	Rock Dilution Grade
Ag	oz/ton	1.000
Au	oz/ton	0.010
Pb	%	0.25
Zn	%	0.75
Cu	%	0.10
Fe	%	5.50

12.7.3 Backfill Dilution

When mining adjacent to previously backfilled drifts, some amount of overbreak will occur into the backfill. An empirically derived dilution factor of 6% was used in all mined stopes to account for this backfill dilution. At other times, backfill is contained within the planned stope volume due to mining adjacent to a backfilled drift with an irregular back, rib, or sill. The backfill contains a small amount of residual metal value as it consists of cemented tailings from the Greens Creek mill. Grades used for backfill dilution are based on historical tailings assays provided by the plant and are presented in Table 12-4.

Table 12-4: Backfill Dilution Grades
Hecla Mining Company – Greens Creek Mine

Metal	Unit	Backfill Dilution Grade
Ag	oz/ton	4.800
Au	oz/ton	0.066
Pb	%	1.04
Zn	%	1.78
Cu	%	0.15
Fe	%	14.61
Density	tons/ft^3	0.075

SLR notes that tailings metal contents in the actual 2021 dataset are lower grade than those used in backfill dilution assumptions. The impact of this grade discrepancy was calculated for the 2023 production year. Total metal mined content would be overestimated for each metal by 1% Ag; 2.6% Au, 0.7% Pb, and 0.6% Zn% using the above backfill grades versus recent tailings grades. SLR recommends that Hecla update backfill metal grades in future LRPs to better represent expected tailings grades.

12.8 Extraction

There is not an extraction (recovery) factor applied in the stope design as the majority of the extraction or mining recovery will typically be over 100%. SLR recommends evaluating the extraction performance of longhole stoping areas and consider the application of a modifying factor to account for any identified losses. In SLR's experience a 95% extraction factor would be a typical value used in this scenario to account for losses through potential hang-ups, equipment limitations, and reduced selectivity.

12.9 Mineral Reserves Statement

Mineral Reserves estimates include consideration of environmental, permitting, legal, title, taxation, socio-economic, marketing, and political factors, and constraints. The Mineral Reserves are acceptable to support the mine planning. Mineral Reserves have an effective date of December 31, 2021 and are reported using a fully diluted NSR cut-off of $215 NSR/ton for all zones and all mining methods (Table 12-5).

Table 12-5: Greens Creek Mineral Reserve Estimate
Hecla Mining Company – Greens Creek Mine

		Grade				Contained Metal			
Probable Mineral Reserves	**Tonnage (000 ton)**	**Ag (oz/ton)**	**Au (oz/ton)**	**Pb (%)**	**Zn (%)**	**Ag (000 oz)**	**Au (000 oz)**	**Pb (000 ton)**	**Zn (000 ton)**
200S	3,031.8	12.00	0.101	2.04	5.09	36,400	306.0	61.8	154.4
5250	721.8	14.36	0.047	2.80	6.90	10,400	34.2	20.2	49.8
9A	1,243.4	9.35	0.068	3.28	7.98	11,600	84.7	40.8	99.2
East	1,456.4	10.87	0.082	2.15	5.92	15,800	119.0	31.3	86.3
Gallagher	335.2	5.67	0.123	3.19	7.05	1,900	41.3	10.7	23.6
NWW	1,732.5	10.53	0.092	2.55	7.62	18,200	160.2	44.2	132.0
SW	724.2	13.47	0.056	2.82	5.83	9,800	40.4	20.4	42.2
Upper Plate	323.5	13.57	0.044	2.22	4.58	4,400	14.2	7.2	14.8
West	1,504.9	11.10	0.097	3.02	8.20	16,700	145.6	45.5	123.4
Total Probable Mineral Reserves	11,703.8	11.31	0.085	2.55	6.55	125,200	945.6	282.2	725.8
Proven Mineral Reserves (Stockpile)	1.9	9.60	0.075	1.66	4.54	0	0.1	0.0	0.1
Total Proven and Probable Reserves	11,075.7	11.31	0.085	2.55	6.55	125,200	945.7	282.3	725.9

Notes

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Mineral Reserves were estimated by Hecla and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla
4. Mineral Reserves are estimated at a NSR cut-off of $215 NSR/ton for all zones except the Gallagher Zone, which used a $220 NSR/ton cut-off $215 NSR/ton.

5. Mineral Reserves are estimated using an average long term price of $1,600/oz Au, $17.00/oz Ag, $0.90/lb Pb, and $1.15/lb Zn.
6. A minimum mining width of 4.6 m (15 ft) was used.
7. A density of 0.075 t/ft^3 was used for waste material.
8. Totals may not add due to rounding.
9. Reporting units are imperial, Tons: dry short tons (dst); Au (troy ounces/dst); Ag (troy ounces/dst); Pb and Zn percent (%).

The distribution of Greens Creek Mineral Reserves by Mineral Zone is shown in Figure 12-1.

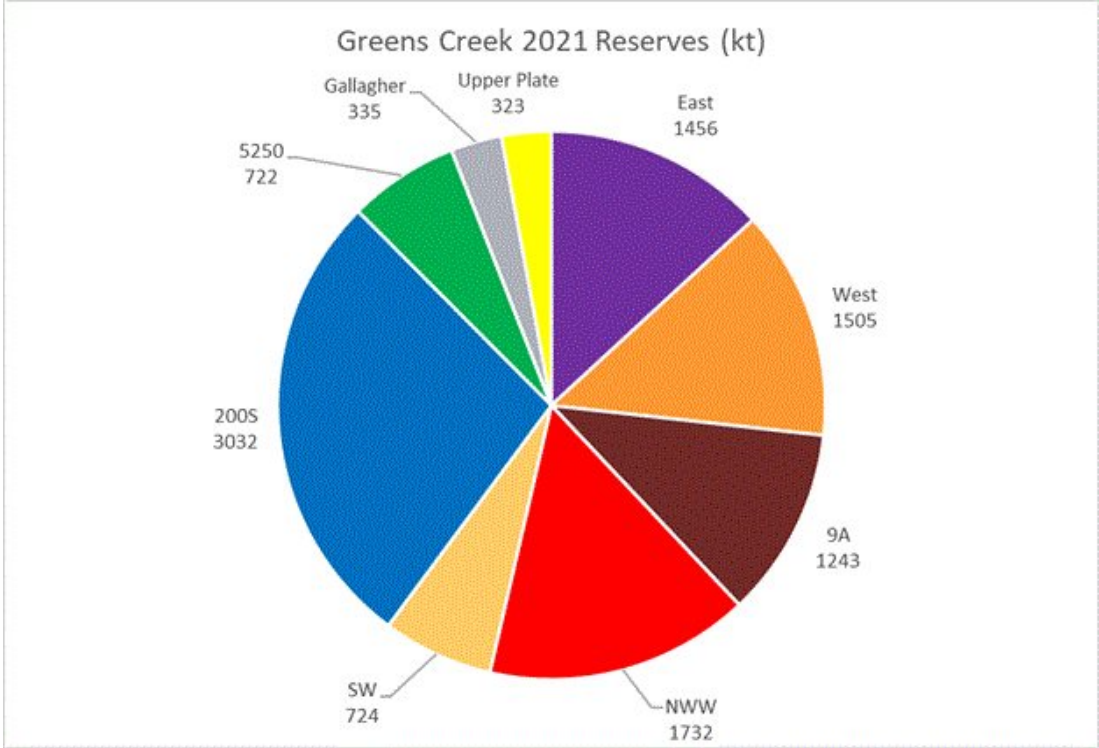


Figure 12-1: Distribution of Mineral Reserves by Mineral Zone

12.10 Factors That May Affect the Mineral Reserve Estimates

Factors that may affect the Mineral Reserve estimates include:

- Metals price assumptions.
- Variations in short term marketing and sales contracts.
- Changes to the Mineral Resource block model.
- Changes to the assumptions that go into defining the NSR cut-off.
- Assumptions relating to the geotechnical and hydrological parameters used in mine design.
- Metallurgical recovery factors: recoveries vary on a day to day basis depending on the grades and mineralization types being processed. These variations are expected to trend to the forecast LOM recovery value for monthly or longer reporting periods.

- Variations to the permitting, operating, or social license regime.

12.11 Reconciliation

Greens Creek performs periodic reconciliations of Mineral Reserve models to the mine and plant performance, including three factors: mine reported production versus block model depletion (F1), mill feed versus mine reported production (F2), and mill feed versus block model depletion (F3). Reconciliation data for 2021 production is shown in Table 12-6.

Table 12-6: Greens Creek Reconciliation Data for 2021
Hecla Mining Company – Greens Creek Mine

Factor	Description	Tonnage	Grade				Contained Metal			
		(000 ton)	Ag (oz/ton)	Au (oz/ton)	Pb (%)	Zn (%)	Ag (000 oz)	Au (000 oz)	Pb (000 ton)	Zn (000 ton)
	Model Depletions	704	14.5	0.083	3.5	8.7	10,200	58.6	24.5	61.3
	Mine Reported	841	13.8	0.072	3.1	7.6	11,600	60.2	25.6	63.9
	Mill Feed	842	15.7	0.082	3.1	7.6	13,200	68.7	26.4	63.8
F1	Mine/Model	1.19	0.95	0.86	0.88	0.87	1.13	1.03	1.05	1.04
F2	Mill/Mine	1.00	1.13	1.14	1.03	1.00	1.13	1.14	1.03	1.00
F3	Mill/Model	1.20	1.08	0.98	0.90	0.87	1.29	1.17	1.08	1.04

The estimated mined and mill feed grades for 2021 are lower than model predicted grades (F1) of the depleted Mineral Reserve for all four metals. Mined tons are 19% higher than model, which can largely be attributed to mining a large proportion of ore from outside of reserves. This was calculated to be 17% of the total ore in 2021 and reflects the mining of Inferred Mineral Resource at the margins of certain mine levels which is not included in Mineral Reserve. It also included additional ore identified during the mining process that was not previously defined with drilling and therefore was not included in the Mineral Resource models.

In 2018 Greens Creek implemented a short term model that incorporates face mapping data that is believed to have resulted in more realistic mining reserve shapes in the model. Changes to the ore density in the model were also implemented around the same time. Both changes have helped to reduce error in the 'mine to model' and 'mill to model' factors since that time, as shown in Table 12-7. Grade estimates for silver and gold in the model have continued to fall within their historic norm and within an acceptable error range of 10%. However, grade accuracy for lead and zinc were lower in 2021 than in the previous five years. Greens Creek is embarking on an exercise to identify the sources of error in the short term model and to reduce the variance. The reduced mine versus model grade (F1) was offset by higher than mill versus mine grades (F2) for silver and gold. These results bring the plant versus model grades (F3) for silver and gold more in-line with the historical trends over the mine life.

Historical Mill-Model reconciliation factors (F3) for the last five years are shown in Table 12-7.

Table 12-7: F3 Factors by Year: Mill Production / Mineral Reserve Depletion
Hecla Mining Company – Greens Creek Mine

Year	Grade				Tonnage (ton)
	(oz/ton Au)	(oz/ton Ag)	(% Pb)	(% Zn)	
2017	1.07	1.08	0.97	0.94	1.46
2018	1.07	1.12	0.97	0.94	1.74
2019	1.01	1.04	0.97	0.99	1.58
2020	1.08	1.14	0.96	0.98	1.36
2021	0.98	1.08	0.90	0.87	1.20

13.0 MINING METHODS

13.1 Underground Mine Access and Layout

The underground mine is accessed by a portal (920 Main) on the 920 ft elevation, located in the same general area as the plant, stockpile pad, and administration building. The 920 Main is the primary equipment and personnel entrance to the mine as well as the primary air intake.

A secondary escapeway portal (the 59 Secondary Escapeway) is located immediately adjacent to the 920 portal and offers a secondary egress from certain areas of the mine.

A third portal is located above the mine site at the 1350 elevation, this portal is used as a ventilation exhaust and secondary escapeway. The 1350 portal is not normally used for haulage or personnel access due to the steep surface access roadway which is not maintained during winter months.

All active areas of the mine are accessed via one or more of the nine major ramp systems:

- 29 Ramp
- 4055 Ramp
- 48 Decline / 37 Ramp
- 5250 Ramp
- 45 Decline
- 31 Ramp
- 2853 Ramp
- 2950 Ramp
- 480 Ramp

Most ramps are connected via cross cuts at various locations, therefore most working areas have multiple options for equipment access in the event a particular ramp is blocked for rehab or utility work. However, two of the ramp systems, the 5250 and 480 ramps, have a single route for mobile equipment access. These ramps feature laddered escapeway raises to enable airflow and a secondary means of egress.

A general mine layout schematic for the underground ramp system is shown in Figure 13-1. See Section 13.16.5 (“Mine Plan Overview”) for views of the as-built wireframes for the ramp system.

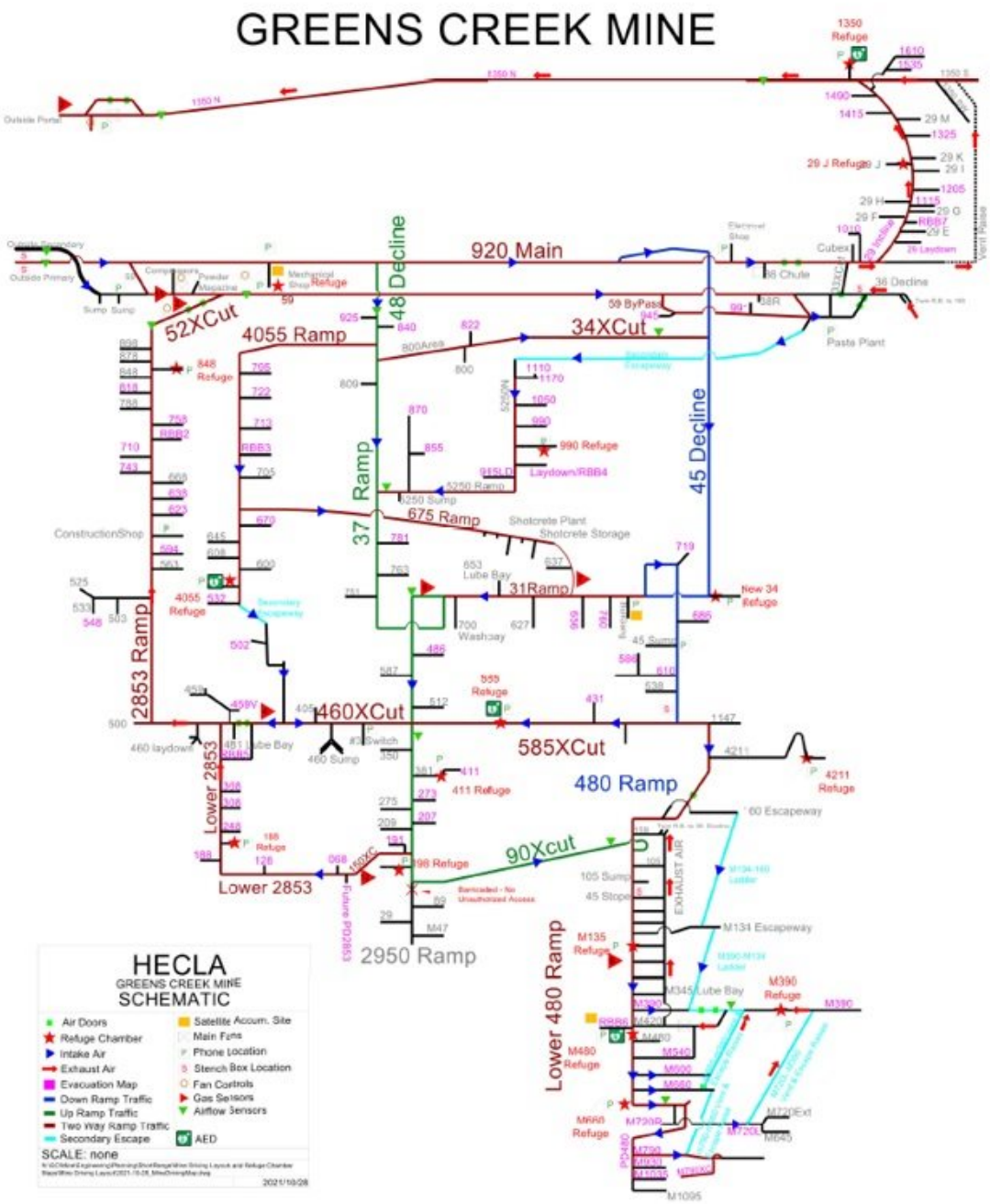


Figure 13-1: Underground Mine General Layout Schematic

13.2 Mine Development

Mine development is undertaken with fully mechanized drill and blast methods. Conventional diesel-powered rubber-tired equipment is used. Blastholes are drilled by a fleet of twin & single boom drilling jumbos. Blasting is carried out with mobile explosives loading vehicles utilizing bulk emulsion. Mucking and hauling is via load-haul-dump units (LHDs) and end-dump articulated haul trucks.

Ground support activities are performed with mechanized bolting equipment. Jacklegs are not used for face drilling or ground support installation. Primary ground support consists of split set and Swellex friction rock bolts and wire mesh. Cable bolts and wet-process shotcrete is applied as required, and there is an ongoing project to install fully grouted rebar bolts in existing and new haulage ways for LOM support.

Currently, most primary ramp development and ore access drives are driven with an arched profile at 16.0 ft width by 17.5 ft height. The back height is increased in areas where fans are to be installed or truck loading is to occur. Some of the historical ramp development was driven at smaller dimensions which can still accommodate most of the current equipment fleet. Primary haulage ramps are driven at a gradient of no more than -15%, with -12.5% being typical. Ore access drives are driven at a decline of -15% to -18% from the haulage ramp. In-Stope waste and secondary development drives are typically driven at 15.0 ft width by 15.0 ft height with gradients dependent on ore geometry.

Other mine workings include raises which serve as ventilation routes, secondary escapeways, and muck transfer passes. Vertical development is currently undertaken by a raiseboring contractor. Many historical raises are in use which were developed using a variety of methods including raiseboring, Alimak, and longhole (drop) raising.

Development is split into capitalized and expensed categories as follows:

Capital Development:

- Primary Ramp Development (PD)
- Primary Ore Access (POA)
- Definition Drifting (DEF)

Expensed Development:

- In-Stope Waste (ISW)
- Secondary Development (SD) (stope re-access breastdowns)

13.3 Production Mining

Most production mining is completed using cut and fill and drift and fill techniques. Mining blocks are accessed through a primary ore access in waste. Once in ore drifting continues until waste is encountered. The drift is then backfilled before an adjacent ore drift is mined. Secondary development accesses are developed to meet ore mining requirements and are typically started by wall or backslashing a previously mined primary or secondary access. Production mining typically progresses in a bottom to top sequence such that mining occurs on top of previously backfilled lifts. Conventional drill and blast techniques and equipment are used with resources shared across the operation.

Due to the complex and variable orebody geometry each block requires a unique design and sequencing methodology. An example of a typical cut and fill mining block is shown in Figure 13-2.

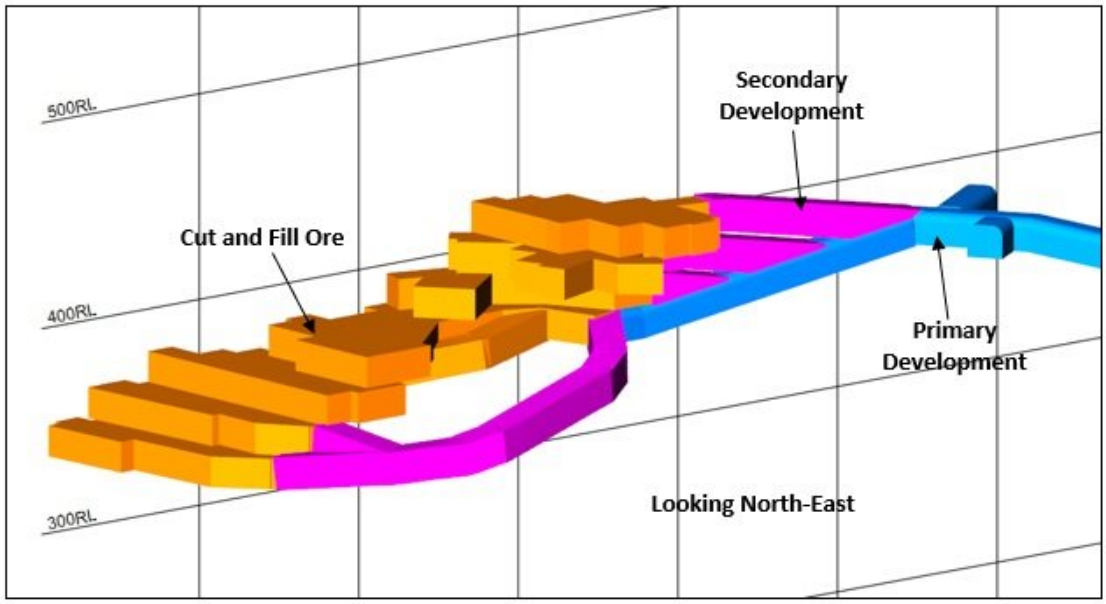


Figure 13-2: Typical Cut and Fill Design from NWW Zone

Longhole stoping is used where the mineral body is sufficiently steep and/or thick and geotechnical conditions are favorable. There is no standardized design due to the highly variable geometry of the mineral zones. Both longitudinal and transverse methods are used depending on the local shape of the mineral zone.

Typically, overcut and undercut drives are driven at widths between 15 ft and 25 ft and separated by thicknesses ranging from 30 ft to 75 ft vertically. Where development of an overcut is not economic, the longhole may be mined as a backstope where ground conditions warrant.

Ore zones are drilled and blasted from the overcut (with Cubex drill) or undercut (with Simba drill). Extraction occurs via remote mucking on the undercut level, and then the stope is filled from the overcut level. In the case of longhole backstopes, filling is achieved by drilling a borehole from higher elevation workings into which a paste pipe is inserted.

Transverse stoping layouts are designed as primaries and secondaries, with primary and secondary stopes being similar in size. This enables additional working faces as well as the opportunity to use mine development waste for backfill of secondaries.

Figure 13-3 presents a typical longhole design from the 5250 zone.

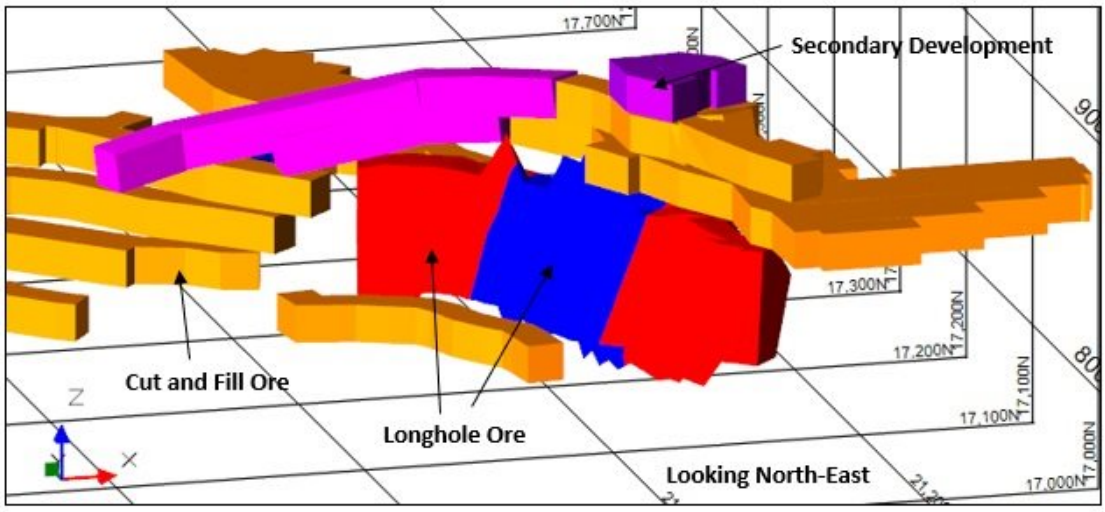


Figure 13-3: Typical Longhole Design from 5250 Zone

13.3.1 Grade Control

Grade control is maintained by production geologists in cut and fill headings. The lithologies in each face are mapped and sampled to determine if any adjustments are necessary to keep the heading in the ore. The geometry of the mineralized lithology is frequently very complex, as shown in Figure 13-4.

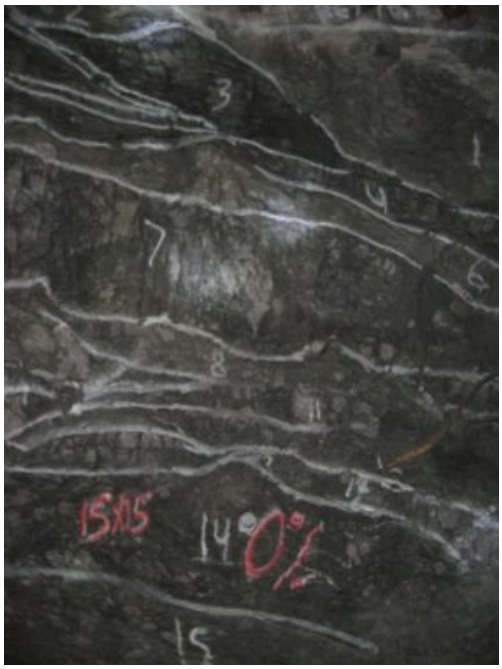


Figure 13-4: Active Face

13.4 Ore Handling

Ore handling is performed with a fleet of underground haulage trucks and scooptrams or LHDs. All LHDs are equipped with remote operating capability and can be operated from an operations room on surface. This allows mucking to take place during blast and shift change.

All ore is trucked out of the mine to the surface mill stockpile, located approximately 450 ft from the 920 Portal. The underground haulage fleet consists primarily of 40 ton articulated end-dump haul trucks. A haul truck automation project is being advanced that will increase fleet capacity.

Haulage distances are highly variable since active working headings are located throughout all elevations of the mine. A round trip from the ore pad to the M720 (currently the lowest production level in the mine) is approximately seven miles.

The two mine ramps which are driven in an upwards direction (29 Ramp and 5250) feature muck pass raises to facilitate material handling.

13.5 Waste Handling

Waste is either trucked out of the mine to the Site 23 waste disposal area located approximately 0.5 mi from the 920 portal or is placed in previously mined-out stopes when available. If no future mining is planned directly alongside or underneath, waste can be used to backfill cut and fill stopes by placement on the sill with subsequent placement of cemented tailings on top. The waste used to backfill secondary longhole stopes is dumped near the top cut and pushed into the empty stope using an LHD or jammer.

13.6 Mine Backfill

Backfill of mined-out voids is achieved via three methods:

- **Paste fill**: cemented tailings are trucked from the plant to the underground paste plant where they are pumped into the mined-out voids via a network of pipes. This method is low cost but is not practical for all areas of the mine where pumping pressures would be too high.
- **Jam (conventional) fill**: Where delivery of paste fill is not feasible, cemented tailings are trucked to the heading and compacted using jammer equipment. This method is more flexible but more costly than paste fill.
- **Waste fill**: Loose waste rock is placed in areas where structural support of the mined-out void is not necessary to enable future mining. This enables a reduction in the amount of waste rock that must be impounded on surface.

In the cut and fill excavations, extracted panels are typically “tight-filled” with a combination of cemented tailings and waste, allowing further panel extraction alongside and between backfill. The backfill mixture is typically composed of dewatered tailings and 5% cement content. When future mining is planned directly underneath a filled area, 8% cement content is used enabling the backfill to support the future back span. The tailings are batched with cement on surface and hauled either to the stope (for jam filling) or to the paste plant where water is added, and the mixture is then pumped directly to the stope.

To prevent the placed pastefill from flowing out of the stope being backfilled, a shotcrete “paste wall” is built or a plug of cemented tailings is jammed into the heading. This will make the heading airtight, so “breather pipes” are installed through the paste wall in addition to the paste pipe to allow excess air and water to evacuate the heading as it is being filled to prevent the creation of paste voids. The paste line is flushed with air and water at the completion of each pour to clear and clean the line.

Primary longhole stopes are filled with paste backfill, containing a cement content of 5% to 8%. This allows the safe extraction of secondary blocks between backfill, while minimizing dilution. Secondary longhole stopes are filled with waste rock from mine development wherever possible.

The paste plant was commissioned in 2001 and located in the 59 Drift is approximately 3,600 ft from the 920 Portal. The plant features a dump hopper, mixer, and two positive displacement paste pumps. A backfill QA/QC program is in place with samples tested regularly to ensure the required design strength.

Backfill criteria are as follows.

Target % Solids:

- Paste fill: 77%
- Jam fill: 86%

Minimum fill strength requirement is dependent upon desired application:

- Ribs (for drifting alongside fill): 25psi
- Longhole stopes (tall ribs): 70psi
- Back (for drifting underneath fill): 150psi

Typical minimum strength (UCS) achieved with 28 day cure time:

- Paste fill with 5% cement: 100psi
- Paste fill with 8% cement: 200psi

13.7 Ventilation

The mine is ventilated using an exhausting system with a design capacity of 450 kcfm. Intake air is drawn into the mine from the 920 Portal and the 59 Escapeway Portal. Exhaust air exits the mine via the 1350 Portal and the 2853 Exhaust Raise. A schematic of the ventilation airflows is shown in Figure 13-5.

Primary ventilation is achieved with four main underground fans:

- 500 hp, 84 in. dia. located near the 1350 portal (259 kcfm) – Main Fan
- 350 hp, 84 in. dia. located near the bottom of the 2853 Raise (153 kcfm) – Main Fan
- 500 hp, 84 in. dia. located on the M390 Drift (152 kcfm) – Booster Fan
- 75 hp, 42 in, dia. compressor room fan exhausting to the 2853 Raise (38 kcfm) – Main Fan

Secondary ventilation of achieved with auxiliary heading fans (ranging from 40 hp to 150 hp) which pull air from the main ramps and force-ventilate the working faces via plastic hardline and vent bag, as shown in Figure 13-6.

Both primary and auxiliary fans can be controlled from surface using the mine's SCADA system. Since blasting is initiated from surface, the local auxiliary fan is turned off remotely prior to the shot and then turned back on immediately afterwards to clear blasting gases.

The underground air flow is controlled by several sets of ventilation doors and numerous permanent bulkheads which separate intake from exhaust circuits. There is no provision for heating the intake air. Mine water and discharge lines located near the 920 Portal consist of insulated "Arctic Pipe" to prevent freezing.

Shop facilities include fire doors as required per MSHA regulation. The 920 Main shop includes a dedicated exhaust raise and fan which sends shop exhaust directly to the 1350 Main Fan where it promptly flows out the 1350 Portal.

The 500hp booster fan in the M390 level to provide for additional airflow capacity due to a planned increase in mining activity in this area, as well as to manage heat load as the mine workings progress to greater depth. This fan will operate initially at significantly less than maximum capacity using a variable frequency drive (VFD) however is intended to be ramped up in future years if ventilation requirements increase in this area.

Secondary ventilation is a material proportion of the mine's overall electricity consumption. A ventilation on demand (VOD) system is currently in place in a limited number of headings and is planned to be extended to the remainder of the mine. This system involves the installation of a VFD on the secondary fan which is linked to the radio-frequency identification or RFID transponder located on each piece of equipment and personnel cap lamp.

The VOD system automatically turns off the fan when the heading is inactive (no personnel present). The VOD system also adjusts the VFD setting to the appropriate power level based on the ventilation needs of the heading's current occupants – "low" for personnel and light utility vehicles, "high" for larger equipment.

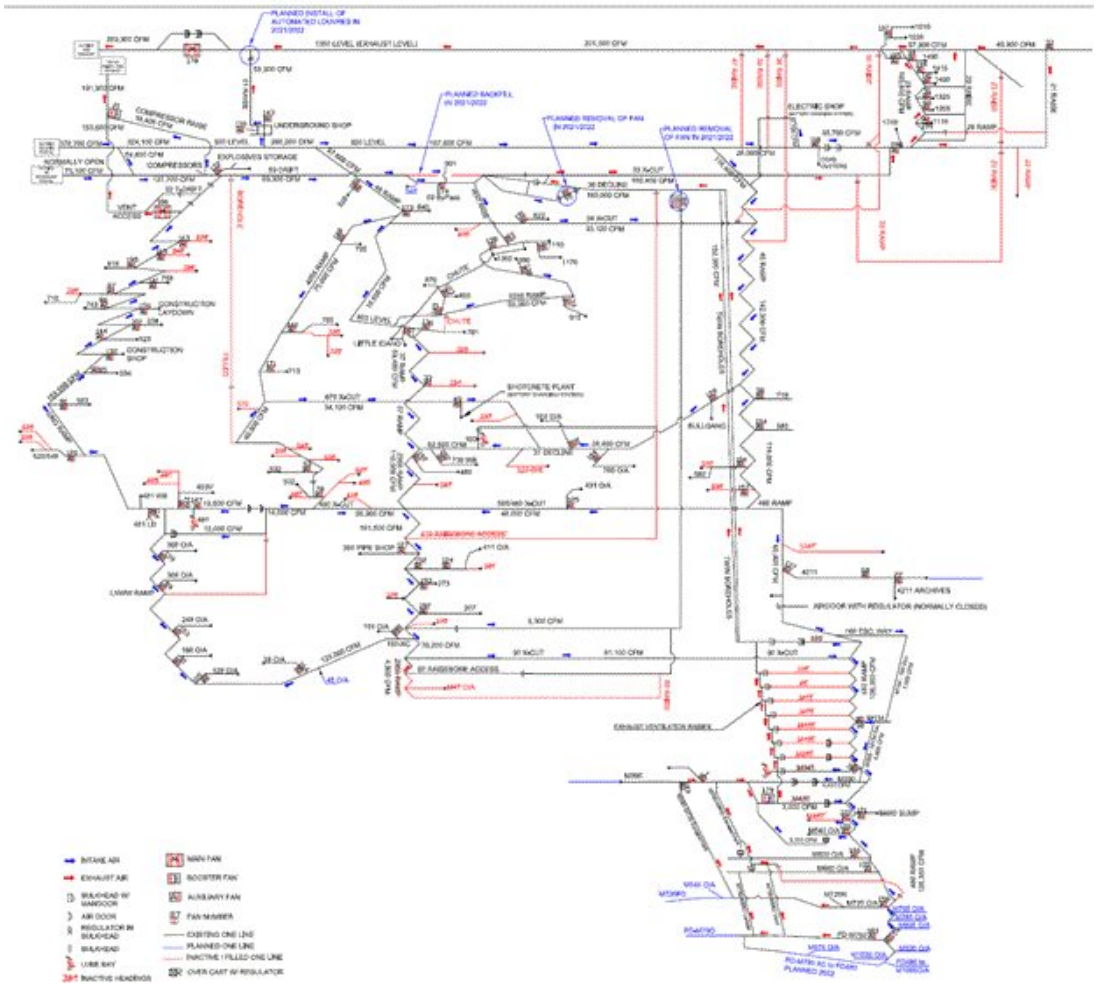


Figure 13-5: Mine Ventilation Schematic

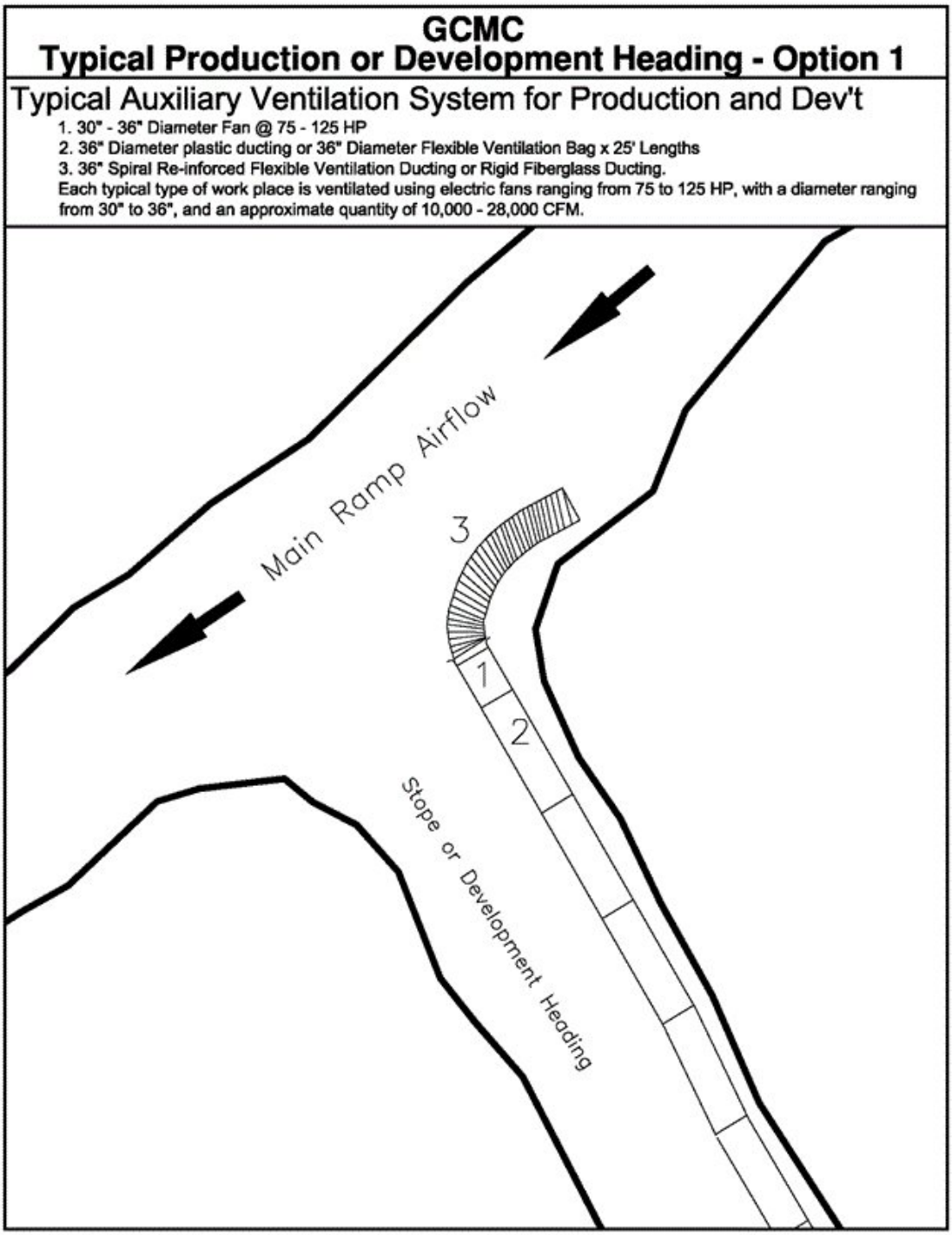


Figure 13-6: Typical Auxiliary Fan Layout

13.8 Communications and Emergency Infrastructure

Underground communications systems include: a leaky-feeder radio system, mine phones placed throughout active working areas, and an underground Wi-Fi network.

There is a stench alert system located at the 920 Portal as well as other key locations throughout the mine. This system can be activated remotely through the SCADA system or manually at the stench release locations.

There are several refuge chambers located at key areas throughout the mine; these refuge chambers are connected to the mine compressed air system to provide a breathable atmosphere in case of a mine fire or other underground hazardous atmosphere. In the event of a failure or contamination of the compressed air system, the refuge chambers have oxygen bottles and CO_2 scrubbers. The chambers also contain water, medical supplies, toilets, mine radios connected to the leaky feeder system, and mine phones.

13.9 Blasting and Explosives

Blasting is carried out primarily with the use of bulk emulsion transported to the heading with a powder truck containing an emulsion pump. Non-electric (nonel) blasting caps are used for drifting and i-Kon-II electronic caps are used in longhole stoping.

Bulk emulsion is transported by ISO containers to permanent underground storage tanks located in the underground powder magazine on the 59 Drift. The cap mag is also located in this area.

Blasting takes place at the end of shift after all personnel have left the mine. Each round is initiated by an electronic cap tied into a remote blasting box which is controlled through the centralized electronic blasting system. Blasting gases are monitored remotely using a network of sensors at various locations along the airflow exhaust routes to ensure that the mine atmosphere is safe prior to re-entry.

Greens Creek is a sulfide mineral deposit and has historically experienced occasional sulfide dust ignitions with blasting. These ignitions caused minor damage to infrastructure located near the face (including ventilation bags and utility lines). Current practice is to identify high sulfide headings based on face sampling and to wet down the back and ribs near the face immediately prior to blasting. This minimizes the quantity of sulfide dust which becomes airborne during blasting and reduces the chance of a secondary sulfide dust ignition.

13.10 Ground Support

The Greens Creek Ground Control Management Plan (GCMP) summarizes how the mine deals with the ground conditions created due to mining. The mineral deposits at Greens Creek have undergone several folding sequences that have resulted in a contorted rock mass yielding a complex structural system. Standard ground support designs are used based on design conditions, primarily related to back span.

The mineralized material is the strongest and most competent material in most areas of the mine. Mineral lithologies have a rock strength of up to 30,000 psi. The structural footwall unit, composed primarily of phyllite, has a rock strength of up to 15,000 psi. The structural hanging wall unit, composed primarily of argillite, has a rock strength of up to 7,000 psi.

The ground support strategy in use at the mine uses the concept of rock reinforcement and surface control to construct a stable support arch for the specified excavation geometry. Rock reinforcement or rock bolts clamp the arch together and assures its integrity and strength. Surface support ensures an intact and regular excavation profile that allows the bolts to perform at maximum efficiency.

The following ground support is typical for most new development and production areas at Greens Creek:

- Split sets 39 mm, six feet in length are installed on a four feet by four feet pattern in the back and ribs. Galvanized split sets are used for all development headings and other areas which will be open for longer than six months. Plain steel split sets are used in short term production areas.

- Swellex bolts are installed on a five feet by six feet pattern in the back unless a higher density is specified due to unusual ground conditions. The length of the Swellex is dependent upon the heading width. Swellex are not installed when mining underneath backfill

- Galvanized wire mesh is used in both rock and backfill. Mesh is installed on the back and ribs to within seven feet of the mine floor.

- Main haulage ramps and other LOM excavations are supported by fully grouted rebar bolts which are installed in campaigns after development of the ramp segment has been completed. This provides very long term corrosion-resistant ground support. Rebar bolts of eight foot length installed on five feet by six feet spacing in the back.

Cable bolts and wet-process shotcrete are applied as required to support occasional areas of large span or poor ground. Shotcrete is also applied to areas of permanent infrastructure as well as muckbays and loading areas to minimize damage to the wire mesh caused by inadvertent scraping with the mucker bucket.

Greens Creek experiences areas of corrosion of ground support due to the galvanic process involving the steel, sulfides, graphitic and atmospheric conditions. The argillite, especially with elevated sulfide and/or graphite content, is particularly aggressive to steel. Thin-walled friction bolts, such as Swellex or split sets, are susceptible because of the large surface area in contact with the ground and minimal thickness. Corrosion can occur inside the bolt (away from the collar) and unobservable. The result can be an unanticipated ground failure because the load carrying capacity of the system degrades over time.

To mitigate issues with ground support corrosion, current Greens Creek practice is to install galvanized ground support in areas which will be open for longer than six months. Very long term openings (such as LOM haulage ramps and other infrastructure excavations) are bolted with fully grouted rebar bolts which provide a high degree of corrosion resistance. Greens Creek also has an active rock bolt pull testing program.

A variety of historical ground support systems are still in place throughout the mine due to the large extent of haulage ramp which was developed prior to the implementation of current ground support standards. Certain older areas are supported primarily by split sets and steel mats. The mine has an ongoing rehab program and historical areas are progressively being brought to current support standards with fully grouted rebar bolts. Approximately 25% of haulage ramp is now supported with rebar. Near term plans include a campaign of cable bolting for haulage ramp intersections and other existing areas of wide span.

13.11 Underground Water Handling

13.11.1 Background

The mine is considered a dry mine. The mine is overlain by mountainous topography that offers little opportunity to develop a perched water table of significant volume. The average annual precipitation at the 920 ft elevation ranges from 67 in. to 80 in. Despite this surface precipitation, the water that is continuously pumped out of the mine due to groundwater sources ranges from approximately 25 to 50 gpm.

The ultimate mine depth is planned to extend to approximately 1,500 ft beneath sea level and the coastline is approximately 5.5 mi from the mine site.

The Maki Fault is a major geological feature encountered at the mine. This fault, and sympathetic Maki-like faults, intersect the Greens Creek drainage and provide the most probable conduit for water ingress into the mine. The Maki Fault has been intersected on numerous occasions in the mine workings at various orientations and elevations. On at least one occasion it has exhibited high pressure water inflows upon exposure. These inflows bled off quickly.

13.11.2 Hydrological Investigation

Prior to a mining a new zone, definition holes are drilled to investigate the ore extent, grade, and quantify the presence of groundwater. Holes are drilled with a packer in-case excess water pressure is encountered such that pressure can be bled off in a controlled manner. Typically, only low pressure is encountered, and any pressure can be quickly bled off.

While completing definition drilling in the upper East Ore Zone (above elevation 1610) significant groundwater was encountered with instantaneous flow rates greater than 400 gpm. Flow rates and pressures did not dissipate so holes were shut-off and grouted. Greens Creek currently plans to conduct a hydrologic study of this area to better define flow rates and recharge rates and determine the preferred control methods.

If recharge rates are high pre-grouting of the area may be required prior to development into the zone to limit water ingress. Limiting water inflow is important to ease mining, maintain ground stability, and limit long term water treatment costs. The proportion of Mineral Reserve tonnage which is affected by this groundwater is approximately 240kt, equivalent to 2.2% of overall Mineral Reserve.

13.11.3 Pumping and Discharge System

The mine uses many small local water collection sumps into which drill water and groundwater collected at the face is pumped. Water from these local sumps is then pumped into one of the four main sumps located in the 920 Main, the 45 Ramp, the 460 XC, and the 480 ramp. The main sumps each include multiple bays which allow slimes to settle. The water is then decanted and pumped out of the mine to the 920 water treatment plant (see section 15.6.1). The slimes are mucked using an LHD and gobbed underground.

13.12 Underground Electrical System

High voltage power enters the mine at 4160V from a main switchgear room located on surface. Power is then fed from this switchgear room to four underground switchgear rooms which serve separate regions of the mine. Each underground switchgear room in turn feeds a network of mine power centers (MPCs) which reduce the voltage to 480V and supply power to local loads (including fans, pumps, and drill power).

13.13 Compressed Air System

The mine compressed air system consists of three 480V compressors located underground (Sullair LS-25S 250L at 250 hp ea) and one diesel compressor located on surface (Sullair 900 at 265 hp). Total system capacity is 4,550 cfm. The underground compressor room has a dedicated exhaust fan to the 2853 Raise.

13.14 Underground Mobile Equipment

Conventional underground mining equipment is used to support the underground mining activities. This equipment is standard to the industry and has been proven on site. Table 13-1 shows the major underground equipment that is currently operational at Greens Creek. Greens Creek currently uses one Sandvik LH514 LHD which is capable of semi-autonomous operation as well as one Sandvik LH514 LHD which can be operated via a tele-remote system from surface. This equipment enables production activities to continue during the shift change and post-blasting periods when no personnel are allowed underground.

Table 13-1: List of Major Underground Equipment
Hecla Mining Company - Greens Creek Mine

Equipment Type	Unit Make	Unit Model	Quantity
Backfill Truck	ATLAS COPCO	MT2010	4
Backfill Truck	ATLAS COPCO	MT436B	5
Bolter	SANDVIK	DS311D-EC	5
Bolter	SANDVIK	DS410-C	1
Bolter	SANDVIK	ROBOLT 320-30SSW	1
Bolter	SANDVIK	SECOMA ROBOLT 05	1
Bolter	TAMROCK	ROBOLT 07-330 S	1
Bolter	TAMROCK	ROBOLT 7 737SSW	1
Bolter	MACLEAN	975 OMNIA	1
Boom Truck	GETMAN	A64	2
Dozer	CATERPILLAR	D4G	2
Excavator	JOHN DEERE	50G	1
Flatdeck Truck	GETMAN	A64	1
Flatdeck Truck	NORMET	UTIMEC LF130	1
Grader	CATERPILLAR	120G	2

Equipment Type	Unit Make	Unit Model	Quantity
Haul Truck	ATLAS COPCO	MT436B	5
Haul Truck	ATLAS COPCO	MT2010	2
Jumbo Drill	SANDVIK	DD31140C	1
Jumbo Drill	SANDVIK	DD420	1
Jumbo Drill	TAMROCK	H105D	2
Jumbo Drill	TAMROCK	H205D	2
LHD	ATLAS COPCO	ST7	4
LHD	CATERPILLAR	236B	1
LHD	SANDVIK	LH514	7
Lift Truck	DUX	S1SL6000	1
Lift Truck	GETMAN	A64	5
Longhole Drill	ATLAS COPCO	SIMBA H157	1
Longhole Drill	CUBEX	Orion	1
Lube Truck	GETMAN	A64	2
Portable Compressor	CATERPILLAR	900H	1
Powder Truck	GETMAN	A64	3
Shotcrete Pump	SCHWING	SP305	1
Shotcrete Sprayer	NORMET	SPRAY MEC 1050W	1
Telehandler	CATERPILLAR	TH406C	1
Telehandler	CATERPILLAR	TH514	2
Transmixer	BTI	SCT-6RD	2
Transmixer	NORMET	LF500	1

13.15 Maintenance

Mobile equipment maintenance facilities are located both underground and on surface. Comprehensive maintenance tracking and reporting systems, in addition to preventive maintenance (PM) programs are well established. Frame-up rebuilds are performed based on engine hours, as recommended by the equipment supplier, and/or based on component wear factors. Major overhauls and rebuilds are often done offsite at a contracted facility.

13.16 Mine Plan

13.16.1 Introduction

The Greens Creek LOM plan has been scheduled using Deswik software. Price assumptions, cutoff grade, and all other criteria are the same as applied to Mineral Reserves as discussed in Section 12. Production totals match the Mineral Reserves estimates presented in Section 12.

13.16.2 Production Mining

The goal of the LOM plan is to create a schedule which maintains steady silver production for as long as possible while maximizing near term grades to optimize the NPV. A secondary objective is to minimize and smooth near term development requirements.

Target longhole production is 300 tpd until all longhole stopes are depleted. In the current mine plan this occurs in 2022. Greens Creek will continue to pursue the conversion of planned cut and fill mining to longhole where the ore geometry is conducive to longhole mining methods. From an operational perspective, longhole tonnage is used to smooth the day to day variations in cut and fill production. Current Greens Creek practice is to maintain at least one shot longhole available to be mucked to make up for any short term cut and fill production shortfall.

The mine life extends to 2035 with a constant total production rate of 840,000 stpa or 2,300 stpd through to 2034 followed by one partial year of production.

Ore drifting advance rates for cut and fill mining and longhole top/bottom cut development are typically no more than 4.0 ft/day per face. This is a relatively slow advance rate which allows ample time for geological mapping and sampling to maintain a high level of grade control due to the geometric complexity of the mineral body. Scheduled advance rates are reduced when drifting size is significantly larger than normal (for example, many longhole top/bottom cuts are 25 ft wide and therefore scheduled at 2.5 ft/day per face).

- Towards the end of the mine life as the number of ore faces drops, the advance rate per heading will need to increase to maintain 2,300 stpd. Greens Creek is planning to ramp up development advance rates to 6.0 ft/day which is considered achievable based on the following reasons:
- With fewer available ore faces, additional mining resources can be applied to each face.
- Most of the ore to be mined near the end of the mine life will be remnants of levels which have been active for significant lengths of time. Mining will take place above, below and/or adjacent to previously mined panels. These areas are therefore well-defined with a large amount of geologic mapping and face sampling data, reducing the need for extensive mapping and sampling to maintain grade control on advance.

Figure 13-7 presents the LOM plan ore production, while Table 13-2 presents the mine production overview.

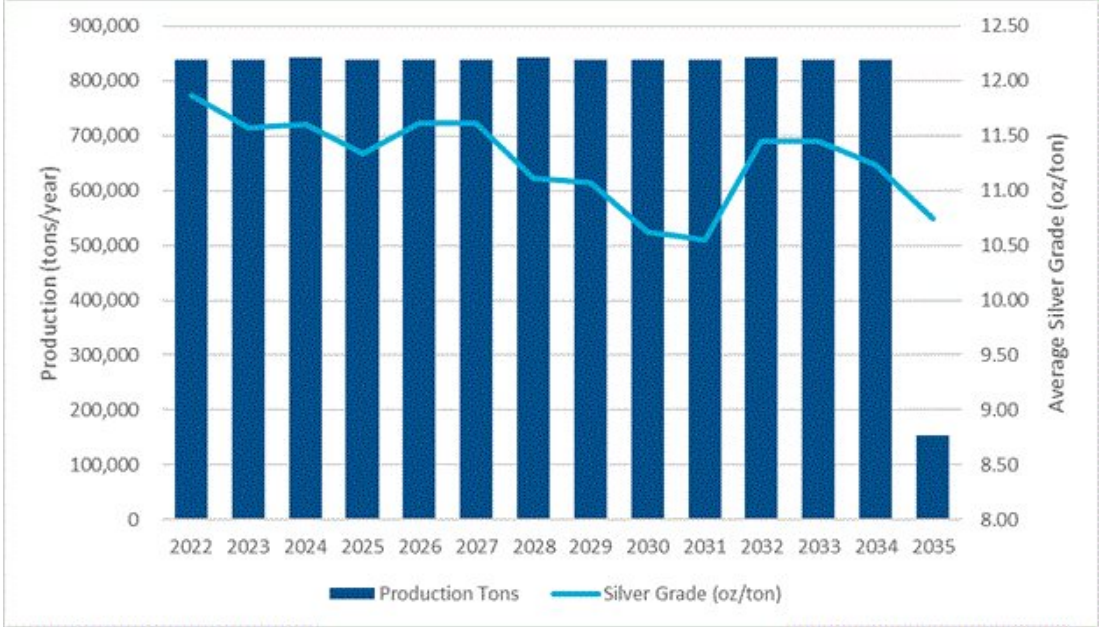


Figure 13-7: Mine Plan – Life of Mine Ore Production

Table 13-2: Mine Plan – Mine Production Overview
Hecla Mining Company - Greens Creek Mine

	Silver (oz/ton Ag)	Gold (oz/ton Au)	Lead (% Pb)	Zinc (% Zn)
Next Five Years (2022 to 2026)	11.60	0.083	2.59	6.75
LOM Average (2022 to 2035)	11.31	0.086	2.55	6.56

SLR notes that the maximum production rate of 2,300 stpd is maintained through to the end of the mine life and in SLR's opinion this appears to be optimistic given the reduction in available mining areas that will occur. Additionally, it is common to have difficulty maintaining an adequate workforce as the mine life ends and it is expected that this will impact productivities in the last years of operation.

13.16.3 Backfilling

Overall backfill rates are scheduled at a placement rate of 600 stpd per backfill heading. Planned total monthly backfill tonnages are aligned with historic actuals for a production rate of 2,300 stpd ore. It is assumed that 75% of the volume of mined void each month will require cemented backfill, of which two-thirds is placed as paste fill and one-third is placed as jam fill with cemented tailings. Waste fill is assumed to be the lesser of 7,300 tons/month or the total monthly production of #2-4 (acid-generating) development waste. All #1 (inert) development waste is assumed to be hauled to surface since it is required for use as dry stack capping material.

A delay of three days is assumed between the completion of mining in a heading and the beginning of backfill to allow for final mapping & surveying, heading cleanup, removal of utilities and installation of paste pipe.

13.16.4 Mine Development

Mine development requirements over the LOM are shown below in Table 13-3.

Table 13-3: Mine Plan – Development Schedule
Hecla Mining Company - Greens Creek Mine

	Capital	Expensed	Total Lateral	Vertical
2022	5,620	5,982	11,602	0
2023	6,462	9.033	15,494	0
2024	6,518	9,448	15,966	570
2025	6,502	9,713	16,215	13
2026	6,138	9,761	15,899	0
2027	6,103	10,701	16,805	597
2028	5,863	12,233	18,096	1,941
2029	1,790	10,872	12,662	206
2030	1,834	11,723	13,557	0
2031	1,661	8,856	10,517	0
2032	1,027	9,087	10,115	0
2033	838	6,038	6,876	0
2024	1,407	3,956	5,362	0
2035	275	4,337	4,612	0
Total Development – LOM (2027 to 2035)	52,039 ft	121,738 ft	173,777 ft	3,326 ft

Lateral development requirements in feet per day are presented in Figure 13-8.

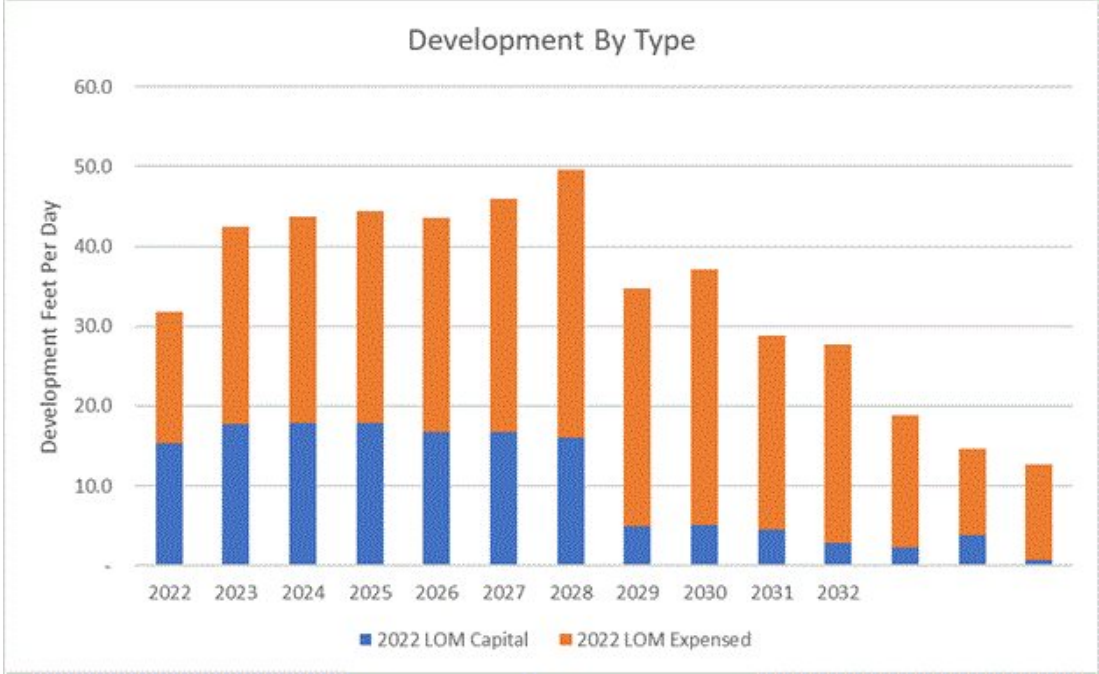


Figure 13-8: Life of Mine Expensed and Capital Development

Expensed development is scheduled at a maximum advance rate of 4.0 ft/day per face. Capital development is scheduled at a maximum advance rate of 3.5 ft/day per face due to the slightly larger heading profile. Because mine development is undertaken by the same crews and equipment as mine production, development faces are typically advanced at relatively low rates in a stop-start fashion when mining resources are available and not required for production activities.

SLR notes that the Expensed Development requirements in the LOM plan are high compared to Greens Creek actuals, and that up to 10 expensed development headings will need to be advanced to meet the development requirements in 2028. The development designs and development schedule used in the LOM were derived from different sources due to the fact that Greens Creek carries two mine designs: a Mineral Reserves design, and LRP design. The LRP includes the recovery of Inferred Resources, in addition to the Mineral Reserves presented in this TRS. However, the LRP contains the most up to date development schedule and was thus used as the basis for Expensed development requirements in this TRS. After examining the two mine designs and schedules SLR is of the opinion that Expensed Development requirements are overestimated in the LOM plan and recommends that Greens Creek update their mine design and schedule to reflect the development requirements more accurately.

Capital development requirements by mining zone is shown in Figure 13-9.



Figure 13-9: Life of Mine Capital Lateral Development by Zone

The capital development planned for 2022 is 15 ft/day, equivalent to just over one round per day, ramping up to 18 ft/day for 2024.

The primary focus of capital development in 2022 will be advancing the 480 ramp and M790 drift to the next breakthrough, with rates as follows:

- 480 heading: 3 ft/day = One round every two days
- M790 heading: 3 ft/day = One round every two days
- All others combined:7 ft/day = One round every two days

When this breakthrough occurs in late February 2022, it will allow access to four new ore levels which will be developed in 2022. This is shown in Figure 13-10 below.

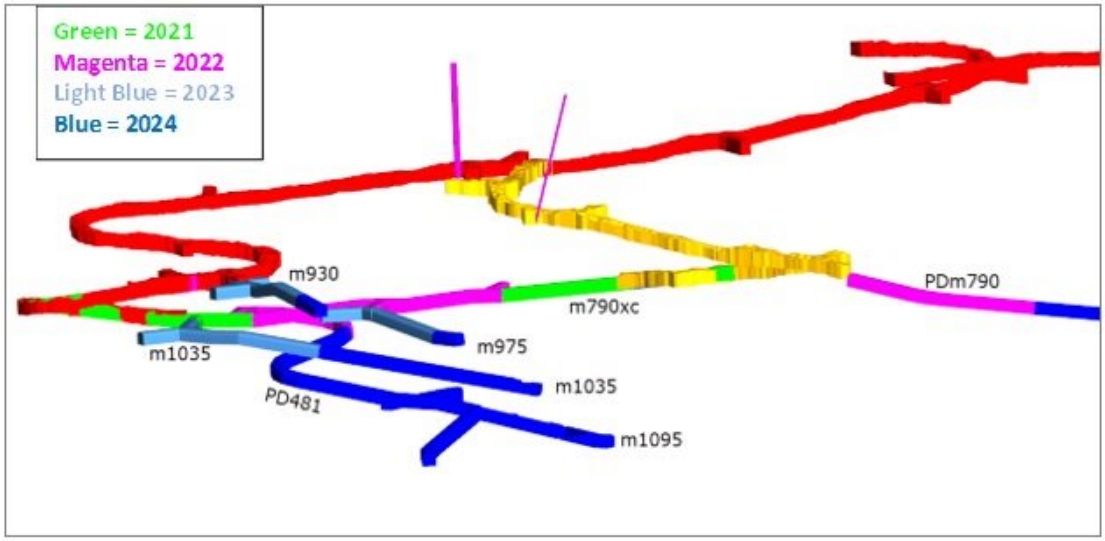


Figure 13-10: Mine Development 2021 to 2024

The M790 drift will provide access to the high potential drilling targets as shown in Figure 13-11.

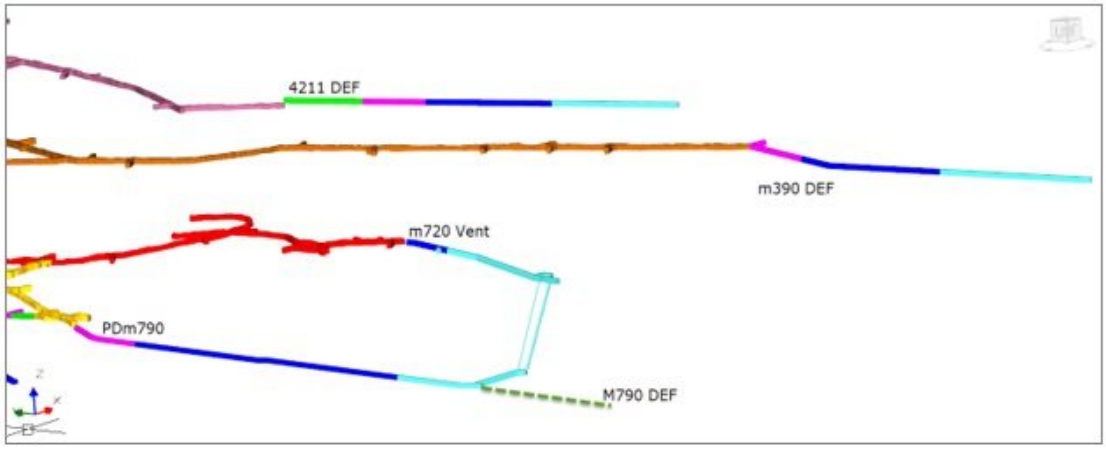
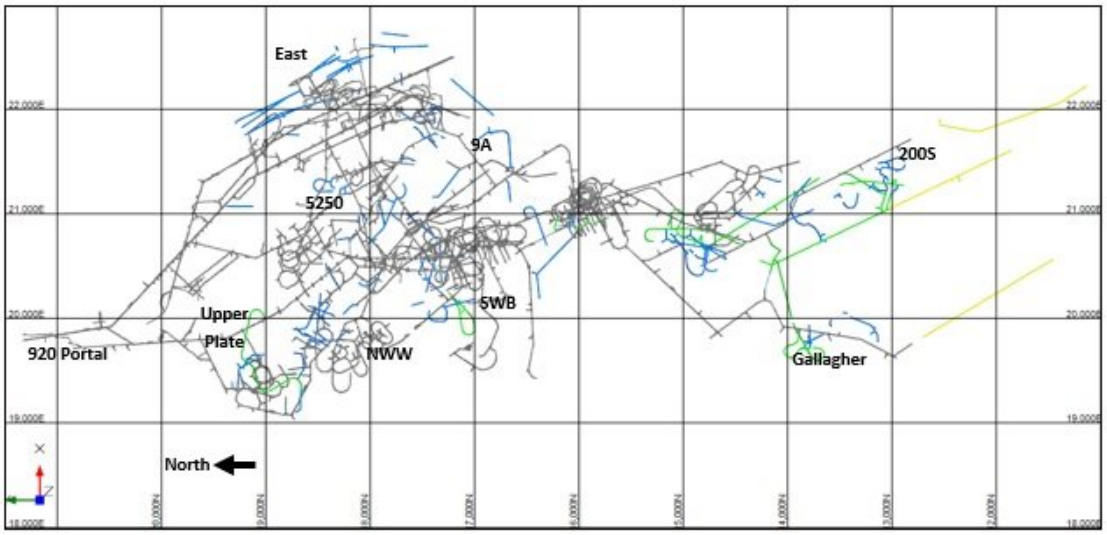


Figure 13-11: Mine Development

Vertical development is achieved via raiseboring and is undertaken by a contractor. Most vertical development remaining in the mine plan consists of paired sets of raises: an eight foot diameter bald ventilation raise adjacent to a 42 in. diameter escapeway raise lined with laddertube. Vertical advance rates are scheduled at 4.0 ft/day to account for mobilization, setup, piloting, and laddertube installation in addition to the actual raisebore excavation.

13.16.5 Mine Plan Overview

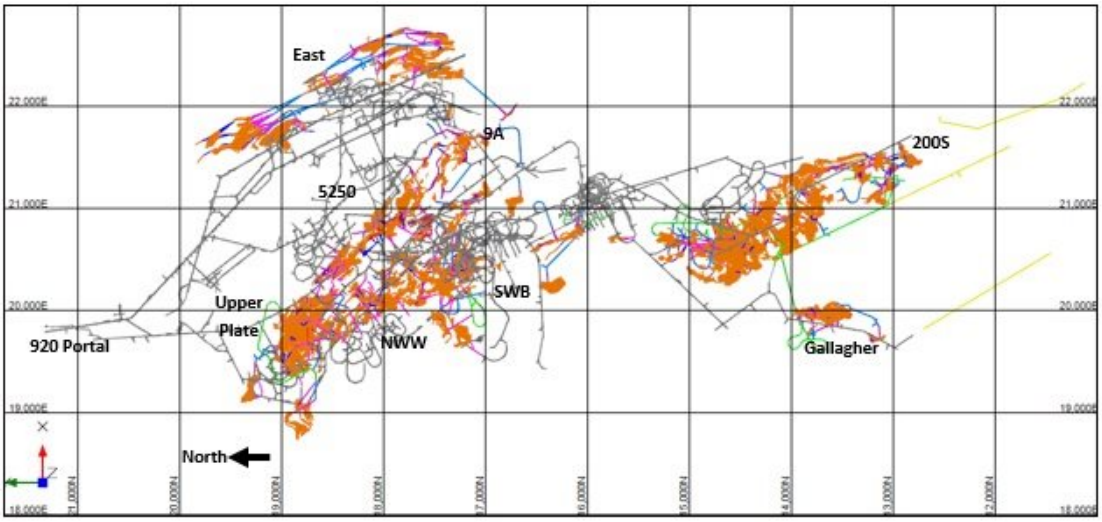
Figure 13-12 to Figure 13-15 show the existing and planned primary development for the mine.



Notes:

1. Green: Haulage Ramp – Blue: Ore Access Drive – Yellow: Definition Drilling Drift

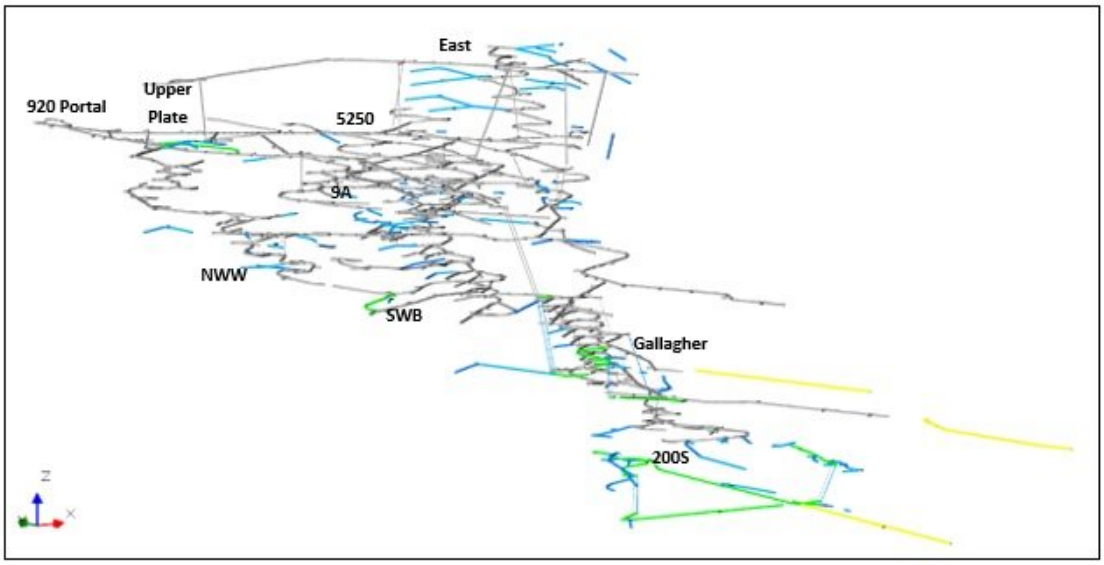
Figure 13-12: Plan View- Existing and Planned Primary Mine Development through 2032



Notes:

1. Green: Haulage Ramp, Blue: Ore Access Drive, Yellow: Definition Drilling Drift, Orange: Ore, Pink: In-Stope Waste

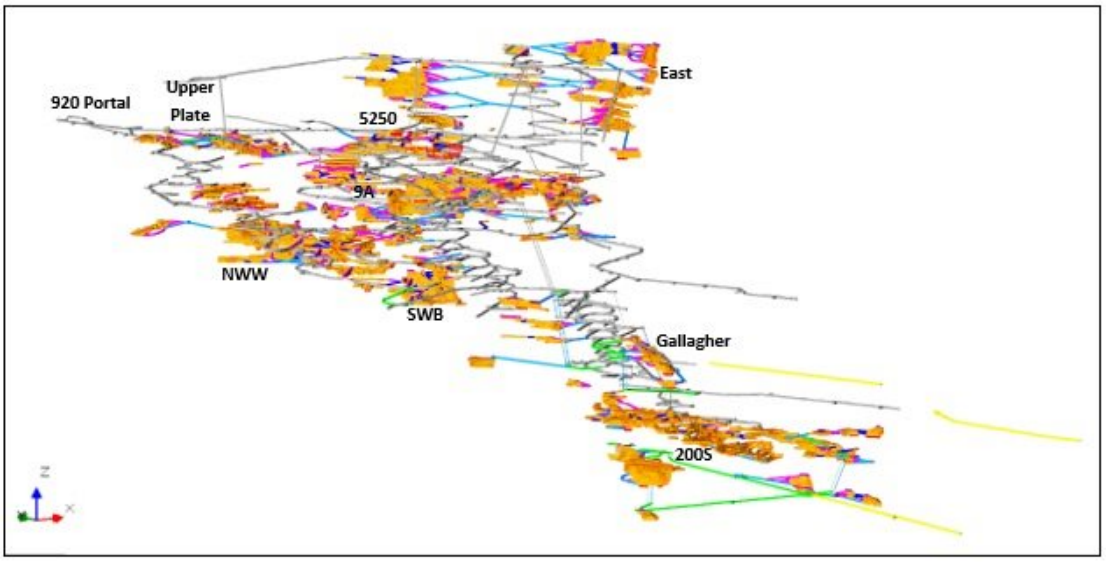
Figure 13-13: Plan View- Existing and Planned Mine Development including Mineral Reserves



Notes:

1. Green: Haulage Ramp – Blue: Ore Access Drive – Yellow: Definition Drilling Drift

Figure 13-14: 3D View- Existing and Planned Primary Mine Development through 2032



Notes:

1. Green: Haulage Ramp, Blue: Ore Access Drive, Yellow: Definition Drilling Drift, Orange: Ore, Pink: In-Stope Waste

Figure 13-15: 3D View- Existing and Planned Mine Development including Mineral Reserves

13.16.6 Timeline of Key Events in the Mine Plan

Red numbers indicate the location of the item discussed in the mine plan Figure 13-12 to Figure 13-15.

- 2022
  - Breakthrough of the 480 ramp to the M790 exploration drift, establishing several new high grade production levels in the 200S Zone.
- 2022
  - Initiation of East Ore 29 Up-Ramp development after completion of hydrologic study (see section 13.11).
- 2023
  - Completion of the M790 exploration drift, a key drilling platform for the most prospective remaining untested geology in proximity to the mine.
- 2024
  - PD480 ramp reaches the bottom of the 200S body. Mining begins of the deepest Mineral Reserves at Greens Creek: 1,410 ft below sea level, approximately 4,600 ft below surface topography.
  - Initiation of Gallagher Zone ramp development.
- 2025
  - Completion of Gallagher ramp, begin mining Gallagher Zone.
- 2035
  - End of Mine Life.

13.16.7 Mine Plan Discussion

A large proportion of Greens Creek Mineral Reserves are at locations in proximity to existing haulage ramps. Approximately 80% of Mineral Reserve tonnage either already has an access developed or can be accessed with a relatively short cross cut from an existing ramp. These ramps are actively used as haulage ways and ventilation airflow routes and are maintained in good condition.

This results in less development schedule risk to mine production. New haulage ramps are continuously advanced to provide access to higher grade ore, particularly in the deeper areas of the mine. However, if this development falls behind schedule, new ore headings can be established by driving short ore access drifts from existing haulage ramps, ensuring sufficient working areas to achieve target production tonnage.

This situation is due to the large amount of historical ramp development completed at much lower metal prices, resulting in a large amount of current Mineral Reserve tonnage that was accessible but left behind as uneconomic by previous mining. In recent years, significant amounts of ore have also been discovered in proximity to existing ramps. This material had not been discovered previously due to limited exploration drilling budgets during periods of lower metal prices.

Ore production is sourced from multiple mineral zones throughout every year of the mine life. This reduces the potential for equipment congestion or infrastructure bottlenecks in any one zone.

The Expensed Development presented in the LOM plan does not well represent how the orebody will be mined. SLR is of the opinion that a mine design and associated schedule should be developed to best recover Proven and Probable Reserves. Stope designs that are economically dependent on the occurrence of Inferred material should be avoided where possible. An additional LRP could then be developed using the base plan, created based on Mineral Reserves, that targets recovery of Inferred Resources. It is acknowledged that given the long operating history and experience with underground grade control at Greens Creek that the plan put forth is workable, however SLR believes that more robust plan could be developed using the approach described above.

14.0 PROCESSING AND RECOVERY METHODS

14.1 Process Flowsheet

The plant is a conventional SAG mill-ball mill grinding and flotation concentrator producing three saleable flotation concentrates and a gravity concentrate.

- Carbon is removed from the circuit using column flotation prior to base metal flotation producing a carbon concentrate that is discarded to tailings.
- A gravity circuit comprising spiral concentrators treats a bleed stream from the grinding circuit cyclone underflow to produce a gravity concentrate containing precious metals that is further processed off site.
- Silver concentrate is produced in a rougher-cleaner flotation circuit including re-grinding of the cleaner circuit feed. The silver concentrate is relatively low grade, at approximately 35% Pb, but carries a large proportion of the silver in mill feed.
- Zinc concentrate is produced in a rougher-cleaner flotation circuit including re-grinding, using lead rougher tailings as feed. The zinc concentrate typically contains 46% Zn to 50% Zn, which is a normal grade, and considerably less silver than the silver concentrate.
- PM concentrate is produced in a complex circuit treating cleaner tailings from both the lead and zinc circuits. It is a relatively low grade zinc concentrate, at 30% Zn, with a smaller amount of lead and some silver. PM concentrate has a relatively limited market so silver and zinc concentrates production is preferred over that of PM.

A summary of the unit operations in the concentrator include:

- Stockpiling and blending of underground ore
- Primary SAG milling
- Primary screening
- Secondary screening
- Ball mill grinding
- Hydrocyclone classification
- Spiral concentration for gravity recovery of precious metals from cyclone underflow
- Column flotation of graphitic carbon and carbonaceous materials
- Lead rougher flotation column – concentrate to final concentrate thickener
- Lead rougher flotation in conventional cells
    - Lead rougher concentrate regrinding in tower mill
    - Lead unit flotation cell in regrind mill cyclone underflow – concentrate to final silver concentrate thickener
    - Lead rougher concentrate cleaning in three stages
    - Lead cleaner concentrate to silver concentrate thickening and filtration
- Lead PM rougher flotation of lead cleaner tailings
    - Lead PM cleaner flotation with concentrate to lead regrinding

- PM conditioning of lead PM rougher tailings
  - PM flotation in Woodgrove SFR cells
  - Woodgrove concentrates to zinc regrinding
  - Woodgrove tailings to PM flotation column
  - PM column flotation followed by three stages of conventional rougher cells
  - PM cleaner flotation
  - PM concentrate thickening and filtration
- Zinc rougher flotation of lead rougher tailings
  - Zinc rougher concentrate regrinding in a tower mill
  - Zinc unit flotation cell in regrind mill cyclone underflow – concentrate to final zinc concentrate thickener
  - Zinc concentrate cleaning in three stages or two stage cleaning plus scavenger
  - Zinc cleaner concentrate to concentrate thickening and filtration
  - Zinc cleaner tailings to zinc tank cell
  - Zinc tank cell concentrate to zinc regrinding
  - Zinc tank cell tailing combined in PM flotation column
- Tailings thickening and filtration, carbon column concentrate, zinc rougher tailings and PM rougher tailings

The plant flowsheet is shown as Figure 14-1.

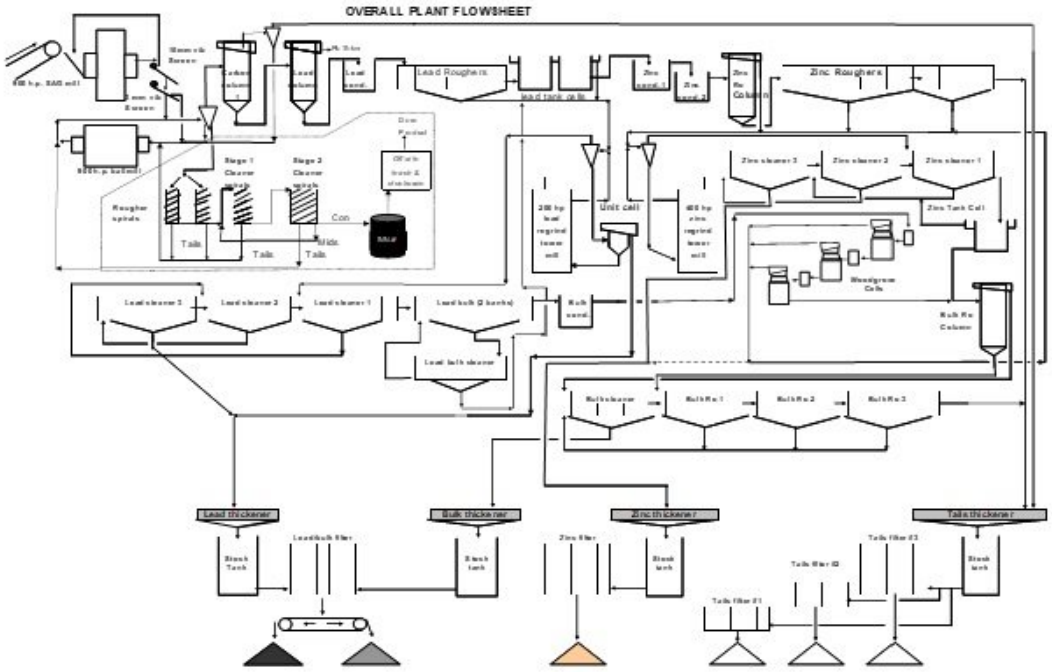


Figure 14-1: Greens Creek Plant Flowsheet

14.2 Mill Process Description

14.2.1 Material Stockpiling and Blending

Mined ore is delivered to the plant stockpile near the portal by underground haulage trucks. Ore is stockpiled on a coarse ore pad with two active stockpiles. One stockpile is constructed by back dumping run of mine ore on a ramp and dozing to produce even layers, while the other stockpile is reclaimed by dozing slots down through the steep face of the ramp into day piles with a Caterpillar D8 dozer. Stockpiles range in volume from two to ten days capacity (4,000 tons to 20,000 tons). A Caterpillar 980 loader is used to transfer blended material through a fixed grizzly with 15 in. square apertures located above a dump pocket with a 60 ton, 35 min capacity. Grizzly oversize material is broken using a hydraulic rock-breaker. Grizzly undersize material is drawn from the dump pocket using a 48 in. variable speed apron feeder, which loads the ore onto the 48 in. SAG mill feed conveyor at a rate of 95-110 WT/h (wet tons per hour). The feed rate is controlled using a belt weightometer.

14.2.2 Primary Grinding

The ore is delivered to a 16 ft diameter by five feet long Marcy semi-autogenous SAG mill which operates in closed circuit with a primary vibrating screen with eight millimeter apertures. The SAG mill drive train consists of a 900 hp induction motor, Dodge gearbox and Allen Bradley variable speed drive. Mill charge weight is measured by bearing pressure. The plant is operated at an operator selected feed rate and mill load based on a feed trunnion bearing pressure target setpoint. The plant control system adjusts the plant rotational speed to maintain the target bearing pressure. Ball charge varies between 16% to 18 % by volume and 4.5 in. diameter steel balls are added as required to maintain mill capacity.

14.2.3 Secondary Grinding

Primary screen undersize (-8 mm) flows by gravity to a secondary vibrating screen with four millimeter apertures. The secondary screen oversize (+4 mm) is directed to the feed end of the ball mill. The undersize from the screen reports to the ball mill discharge (cyclone feed) box where it combines with the discharge from the 900 hp 11 ft diameter x 13 ft long EGL Marcy overflow ball mill, before being pumped to a cluster of five 10 in. diameter Warman Cavex cyclones. Two inch diameter forged steel balls are added to maintain a target mill power draw of 600 kW. Four cyclones are usually in operation at 2300 tpd, with the underflow from one cyclone being diverted through the gravity circuit for free gold recovery prior to return to the feed end of the ball mill. The other three cyclone underflows are directed back to the feed end of the ball mill. Water is added to the cyclone feed pump box to maintain a target cyclone feed density, while pump speed is adjusted to maintain cyclone feed pressure. Target cyclone feed density is occasionally overridden to control the pump box level between low and high limits. Cyclone overflow at 48% to 52 % solids yields a particle size range of 80% passing (P_{80}) 70 µm to 85 µm and P_{95} 140 µm to 160 µm. An Outokumpu PSI 200 particle size monitor is currently used to monitor cyclone overflow on a continuous basis. This Outokumpu unit is being upgraded to a Metso-Outotec PSI-300 particle size monitor in Q4 2021. A 60 in. diameter Sweco trash screen has been installed on the cyclone overflow stream to remove unwanted debris from the process stream prior to flotation.

14.2.4 Gravity Concentration

A gravity concentration circuit is operated to improve overall gold recovery, percent of payable gold and revenue turnaround. Free gold, mainly in the form of electrum, is concentrated in the ball mill circulating load to approximately 1.0 oz/ton by virtue of its density and malleability. There are three stages of gravity concentration. Two banks of eight double-start spirals are installed for roughing to a grade of 3.0 oz/ton Au, with a single bank of two double-start spirals for secondary circuit cleaning to 6.0 oz/ton Au. Concentrates from the secondary cleaner are pumped to a single start finishing spiral to 25 oz/ton Au to 50 oz/ton Au. Rougher spiral tailings are returned to the feed end of the ball mill and rougher spiral concentrate is pumped to the cleaner spirals. Second stage Cleaner spiral tailings are pumped to the feed end of the ball mill. Third stage spiral tails are directed back to the feed to the second stage spirals. The third stage spiral concentrate is passed through a vibrating screen to remove relatively coarse (+ 30 mesh) material and then captured in barrels and shipped to an off site toll facility where it is treated using intensive cyanidation to recover precious metals. The gravity concentrates typically recover 15% to 20% of the gold in mill feed and less than 1% of the silver. The coarse fraction contains a significant amount of tramp copper wire fragments, which tend to interfere with intensive cyanidation. It is planned to treat the relatively small volume of coarse material separately, simplifying and improving the treatment of the fine fraction.

14.2.5 Flotation Concentrate Regrinding Circuits

Lead rougher concentrate and zinc rougher concentrate are reground in similarly configured tower mill circuits. These tower mills were installed in 1992 to compensate for additional mill feed rate and finer intergrowth of the ore being processed. Rougher concentrates are pumped with the plant discharge to a cluster of five inch by six inch diameter Krebs cyclones. Cyclone underflow flows by gravity to feed each mill, the ground slurry discharges from the overflow at the top of the plant and flows by gravity through a unit flotation cell to the cyclone feed pump box closing the circuit. The target sizing for cyclone overflow slurry from both circuits is P_{80} 20 µm (98% passing 38 µm). Metso Outotec 200 hp and 400 hp Vertimills are employed for lead and zinc rougher concentrate regrind respectively. Both mills are equipped with magnetic liners and loaded with 0.5 in., 12% chrome grinding balls.

A unit flotation cell is installed in the tower mill circuit to recover galena, gold and silver from the lead regrind cyclone underflow and to reduce overgrinding. The unit cell concentrates flow by gravity to the silver concentrate thickener and the unit cell tailings flow to the tower mill feed ports.

14.2.6 Flotation Circuits

All flotation is carried out in conventional Outokumpu mechanical flotation cells, unless otherwise noted. Cyclone overflow is diluted from 48% to 52% solids to 45% solids before gravitating to a 60 in. Sweco trash screen and on to one eight-foot diameter carbon flotation column cell. This column flotation cell removes naturally floatable material (graphite, carbonaceous pyrite, talc, and layered silicates) from the ore and directs it to a smaller 30 in. Sweco trash screen. The carbon concentrate is screened at one millimeter to remove trash that floated with the carbon concentrate and then pumped at > 45 psi through six two-inch Krebs cyclones. Carbon cyclone underflow, comprising 75% of the cyclone feed weight, along with the carbon flotation tailings is directed to lead rougher flotation feed. Removal of naturally floatable material greatly reduces collector consumption and greatly improves lead rougher selectivity, for less than 2% loss of the value metals in feed.

A seven foot diameter column flotation cell is now being used for lead rougher flotation. Lead rougher flotation takes place at a pH of 8.5 to 9.2 in this column followed by 2 - 3 x 300 ft^3 cells and two 20 m^3 tank cells. Carbon dioxide, CO_2 is being added to the circuit to reduce the pH of the lead rougher slurry when the feed contains significant amounts of backfill. The concentrate from the lead rougher column is sent directly to final silver concentrate thickener. A low grade (<20% Pb) lead rougher concentrate is recovered from the remaining rougher cells, reground to P_{80} 20 µm, and then cleaned at pH 8.0 in 10 ft^3 to 100 ft^3 cells. The lead cleaning circuit comprises three stages in closed circuit, the first, second and third stages containing 2 x 4 plus 1 x 2, 1 x 3 plus 1 x 2 and 1 x 3, 100 ft^3 cells respectively. Zinc depression is accomplished using zinc sulfate in lead roughing and lead cleaning. Lead rougher tails are conditioned with lime and then copper sulfate is added prior to zinc roughing. Several options have been installed on the lead cleaning circuit. There are options to run the circuit as a two-stage cleaner or as a two-stage cleaner plus scavenger.

Lead cleaner tailings are pumped to a bank of 2 - 3 x 100 ft^3 lead-PM rougher cells at pH 8.5. The lead-bulk rougher concentrate is cleaned in 3 x 100 ft^3 cells in closed circuit to form one component of the final PM concentrate. This concentrate also has the option of being pumped back to the lead cleaners for re-cleaning. Lead-PM rougher tailings report to the PM conditioner and on to three Woodgrove staged flotation reactor (SFR) cells, collectively referred to as the swing cells. This bank of cells can operate as a PM rougher or as a scavenger on the lead side PM tailings. The concentrate from the swing cells will report to the zinc rougher concentrate pump box where it is mixed with the concentrate from the zinc roughers and pumped on to the zinc cleaners. Other options available are to send the concentrate from these cells directly to zinc or PM concentrate or to the zinc side PM cleaners for upgrading. The zinc cleaner option has become the standard flow location. The tailings from the swing cells form part of the feed to the zinc-PM rougher circuit.

Zinc roughing is carried out at a pH of 10.0 - 10.5 in a seven feet diameter by 30 ft high zinc rougher column, followed by five 300 ft^3 cells in series with three 100 ft^3 cells. A zinc column scalp option is also available to send zinc column concentrate directly to the final zinc concentrate thickener. Zinc rougher tailings form most of the final tails flow. Rougher concentrate is reground to P_{80} 20 µm before being fed to the zinc cleaning circuit at pH 10.5 - 11.0. The zinc cleaning circuit comprises three stages in closed circuit, the first, second and third stages containing 2 x4 plus 1x2, 1 x 2 plus 1x4 and 1 x 4, 100 ft^3 cells respectively. Zinc cleaner tailings join the swing cell tailings to feed the seven foot diameter by 30 ft high zinc-PM rougher column, the tails from which feed 12 (or nine) x 100 ft^3 zinc-PM rougher cells. Zinc-PM rougher tailings are directed to final tailings, while zinc-PM rougher concentrate is cleaned once in 3 x 100 ft^3 cells in closed circuit with the rougher, with zinc-PM cleaner concentrate forming the other component of final PM concentrate. Zinc cleaner cell capacity can be reconfigured from three stages to two stages of cleaning at high zinc head grades.

Pumping of most flotation circuit streams is carried out by four inch and six inch vertical spindle Sala pumps, which cope well with variable flow rates and frothy pulps.

14.2.7 Flotation Circuit Control

Flotation circuit performance is monitored by on-stream analysis of eighteen flotation circuit streams for lead, zinc, copper, silver, iron, and percent solids every 15 min using a PERI on-stream analyzer. Bredel peristaltic pumps are used to pump sample streams from in-line samplers to multiplexers located above the analysis zone. Similar pumps are also used to pump to a second PERI on-stream analyzer in the cleaner building. Mass flow is calculated on each concentrate stream providing an estimated concentrate mass yield for each concentrate. On-stream assays for all streams are used with feed tonnage and concentrate mass flow estimates and balanced on the SCADA system for an estimated on-line mass balance. Daily composites of on-stream analysis samples are collected and assayed to monitor and correct on-stream analyzer (OSA) calibration.

The Metallurgical group provide flotation grade targets to the operators. The operators then adjust rougher and cleaner mass yields towards these grade targets, while retaining overall responsibility for maximizing selectivity between sphalerite and galena/tetrahedrite by manual control of reagents.

14.2.8 Concentrate and Tailings Filtration

Silver, PM, and zinc concentrates and final tailings are pumped to their separate thickeners, which are respectively 30 ft, 20 ft, 30 ft, and 60 ft in diameter (10 m, six meters, 10 m, and 20 m). All thickeners have been retrofitted with high capacity auto dilution feedwells.

Thickener underflows are pumped by Warman variable speed horizontal spindle pumps or diaphragm pumps at 65 to 70% solids to individual stock tanks and into Metso-Outotec (Sala) filter presses using high pressure Warman pumps. Thickener underflows are fully instrumented for flow, density, and pressure to allow thickener inventory control and to eliminate sanding problems.

All filter presses are equipped for diaphragm pressing and cake blowing using regular plant air. All presses are mounted on four load cells, the outputs from which are summed and converted to a weight relative to tare weight. This is used at various points in the press cycle to monitor degree of slurry filling, degree of completion of diaphragm press and air blow cycles, completeness of cake discharge, and the weight of cake produced on each cycle.

A single 24-plate press is dedicated to zinc concentrate filtration, while another 18-plate press is used to filter silver and PM concentrates batchwise as demanded by silver and PM stock tank levels. The zinc filter cake falls directly to the zinc concentrate storage bay below, while a shuttle conveyor directs the silver/bulk press output to the correct storage bay, depending on the origin of the filter feed slurry. Concentrate filter cycles yield between 2.5 tons and three tons of filter cake every seven to eight minutes at 8% to 11% moisture. Tailings filtration is carried out in three to 34 plate Sala presses of similar design, each press yielding four tons to 4.5 tons of filter cake at 11% to 12% moisture every seven to eight minutes. Tailings filter cake falls into storage bays located near the batch plant feed hopper.

14.2.9 Backfill Plant

Tailings are sent to the surface batch plant based on the requirement in the underground mine for backfill. Tailings are fed to a feed hopper and conveyed to a batch mixer or pug mill. Cement and water are added to meet either a 5% mix or an 8% mix depending on the desired underground specification. The mixer discharges to a truck loading hopper and is held until the underground mine haul trucks drive into the plant and request a load. The trucks haul the tailings backfill either directly to a heading for use as conventional backfill or to the underground paste plant. At the underground paste plant, tailings backfill is blended with water and the resulting slurry pumped to headings for use as paste backfill.

14.2.10 Concentrate Storage and Tailings Placement

Concentrates are hauled approximately eight miles from the plant in dedicated 50 tons Maxhaul trailers by tractor units to separate stockpiles within the Hawk Inlet concentrate storage building. Excess tailings filter cake is trucked to the tailings area for dry placement and compaction according to an engineered design.

14.2.11 Laboratories

The plant department performs all on site sample preparation and reports assays on all samples from mine and mill production, underground exploration, ship loading, smelter outturn and water treatment. The facilities include an integrated sample preparation area, fire assay laboratory and metallurgical laboratory, together with a separate wet assay laboratory. A total of 10,000 to 15,000 determinations per month are carried out. Silver and gold determinations are by fire assay, while lead, zinc, copper, and iron are by atomic absorption. Payable base metals in final concentrates are by titration.

14.3 Materials, Water and Power Consumption

14.3.1 Reagents and Materials Consumption

Reagents are pumped from the reagent mixing and storage area to head tanks at appropriate locations in the flotation circuit. The head tanks are equipped with computerized solenoid discharge valves for gravity addition of flotation reagents including xanthate, copper sulfate, zinc sulfate, 3413 and MIBC to the flotation cells. Flocculants are added by positive displacement pumps (Pulsafeeder, Liquid Metronics, or Moyno). The CO_2 is added using customized mixing panels to inject the CO_2 into a water stream.

Table 14-1 lists the process consumables used during 2021 in the concentrator along with their location and function.

Table 14-1: Reagent and Consumable Summary Table 2021 Actuals
Hecla Mining Company – Greens Creek Mine

Consumable	Location	Application	Units	Consumption
4.5 in. SAG mill balls	Primary grinding	Grinding Media	lb/ton	0.585
Two inch ball mill balls	Secondary grinding	Grinding Media	lb/ton	0.846
0.5 in. regrind balls (12% Cr)	Lead and zinc regrinding	Grinding Media	lb/ton	0.312
Carbon Dioxide Liquid, CO_2	Lead roughing/cleaning	pH Modifier	lb/ton	1.589
Zinc sulfate monohydrate	Lead roughing/cleaning	Zn Depressant	lb/ton	0.395
Sodium isopropyl xanthate, SIPX	All circuits	Collector	lb/ton	0.355
Aerophine 3413 promoter	Lead roughing/cleaning	Collector	lb/ton	0.098
Copper sulfate pentahydrate	Zinc and PM circuits	Activator	lb/ton	0.745
MIBC	All circuits	Frother	lb/ton	0.089
Lime (unslaked)	Zinc/PM, water plants	pH Modifier	lb/ton	1.695
Cement	Backfill Plant	Backfill	lb/ton	54.304
Z Floc 2525	All thickeners	Non-ionic Flocculant	lb/ton	0.021
Ferric chloride (42%)	Water treatment plants	Coagulant	lb/ton	0.576
Goldenwest 774	Water treatment plants	Anionic Flocculant	lb/ton	0.029
Antiscalant ML27	Water treatment plants		lb/ton	0.040

14.3.2 Process Water Supply, Consumption and Treatment

Fresh water is used to supply a potable water system, gland water, mine water and water for reagent mixing, with the balance available being distributed between the grinding and lead cleaner flotation circuits. Process water is used where the elevated pH and dissolved salts have little or no impact on flotation response or in high volume utility applications where some solids loading can be tolerated (e.g., froth control on thickeners and pump boxes). Reclaim water is used in applications where either pH control and/or high clarity and/or trash removal is desirable (e.g., filter cloth wash sprays and additional grinding circuit, lead circuit or PM circuit dilution water). On average, approximately 75% of total water consumption is recirculated, unless low water levels mandate restricted withdrawal to maintain flows in Greens Creek. Under these conditions, reclaim water is substituted for fresh water and process water for reclaim water until water recycle rate approaches 95%, with a corresponding loss in flotation selectivity. Recycle of mine water to the plant can result in flotation difficulties due to residual drilling polymer and other contaminates.

The IDI water treatment plants comprise the following components: a reaction vessel where ferric chloride is added to precipitate as iron hydroxide; a ‘rapid mix’ vessel where the flow is contacted with recirculated ferric sludge and an anionic high molecular weight polymer to occlude heavy metal precipitates and residual solids from the waste water stream; a clarifier and rake unit to generate a high density underflow sludge and a clear overflow, generally below one sixth of the maximum instantaneous NPDES permit direct discharge limits of 1.0 ppm total Zn, 0.6 ppm total Pb and 0.3 ppm total Cu. Monthly average limits are one half of these values. Dissolved and total metals are monitored every 12 hours by grab sampling and AA analysis, while pH and turbidity of effluent are monitored continuously. The 400 and 800 gpm plant sludges have sufficient metal values to yield a positive NSR when recycled to the PM thickener for disposal with concentrate.

Concentrator personnel also maintain and operate a 400 gpm-rated IDI plant near the plant, while Surface Operations operate a 2400 gpm-rated IDI plant at the TDF. The 400 gpm plant treats excess tailings thickener overflow, mine water and 920 area surface runoff. The tailings area plant treats runoff water and percolation water intercepted from the tailings piles, as well as retreating effluents from the 920 area.

14.3.3 Power Consumption

The plant requires approximately 4.8 MW of power to operate at full capacity.

14.4 Production and Recovery Forecasts

The Greens Creek LOM plan for the plant assumes similar throughputs, recoveries, and concentrate grades to those achieved in recent years, based on projected mill feed grades provided by geology and mine staff for the LOM. Mill production, feed grades and recoveries are consistent for both the five year and 10 year LOM plan. The average annual production for the period is 950,000 tons of ore with total Pb, Zn, Ag and Au recoveries of 81%, 89%, 80%, and 69%, respectively. The plant is projected to produce approximately 12,000,000 oz Ag and 83,000 oz Au per year, with most of the precious metals reporting to the silver concentrate, and 18% of the Au reporting to the gravity concentrate. The primary grades of the Pb, Zn and PM concentrates are 27.5% Pb, 47.5% Zn and 25% Zn respectively.

Table 14-2 shows forecast five year average and LOM production forecast including mill feed tonnages and grades, primary concentrate grades and metal recovery to each concentrate. Table 14-2 also presents the five year and LOM silver, zinc and PM concentrate quantities and concentrate grade forecast. The projections are very consistent until the final year, 2032 when production tapers and ends.

Table 14-2: Five Year and Life of Mine Production Forecast
Hecla Mining Company – Greens Creek Mine

Parameter	Units	Five Year Average (2022 to 2027)	LOM Total (2022 to 2032)
Total Mill Feed			
Tons	ton	949,433.3	9,828,333.0
Zinc	%	6.99	6.67
Lead	%	2.77	2.57
Silver	oz/ton	12.88	11.63
Gold	oz/ton	0.09	0.09
Contained Metals in Mill Feed			
Zinc	ton	66,414.2	672,304.9
Lead	ton	26,329.4	264,534.6
Silver	oz	12,224,494.5	115,567,476.9
Gold	oz	82,646.5	891,233.6
Average Primary Metal Concentrate Grades			
Lead in Silver Concentrate	%	27.5	27.5
Zinc in Zinc Concentrate	%	47.5	47.5
Zinc in PM Concentrate	%	25.0	25.0

Parameter	Units	Five Year Average (2022 to 2027)	LOM Total (2022 to 2032)
Weighted Average Mill Recoveries			
Zinc in Silver	%	11.7	11.1
Zinc in Zinc	%	64.4	64.6
Zinc in PM	%	12.9	13.0
Total Zinc Recovery	%	89.0	80.7
Lead in Gravity	%	0.3	0.3
Lead in Silver	%	70.0	69.4
Lead in Zinc	%	6.5	6.5
Lead in PM	%	4.4	4.6
Total Lead Recovery	%	81.3	73.6
Silver in Doré	%	0.6	0.6
Silver in Silver	%	61.6	61.1
Silver in Zinc	%	9.5	9.4
Silver in PM	%	7.9	8.0
Total Silver Recovery	%	79.6	72.0
Gold in Doré	%	18.4	18.5
Gold in Silver	%	39.1	38.3
Gold in Zinc	%	6.4	6.3
Gold in PM	%	5.3	5.3
Total Gold Recovery	%	69.2	62.2

Table 14-3: Concentrate Production and Grade Forecast
Hecla Mining Company – Greens Creek Mine

Parameter	Units	Five Year Average (2022 to 2027)	LRP Total (2022 to 2032)
Silver Concentrate Grade			
Zinc	%	11.6	12.2
Lead	%	27.5	27.5
Silver	oz/ton	113.6	127.2
Gold	oz/ton	0.49	0.77
Concentrate	tons	67,076	668,649
Zinc Concentrate Grade			
Zinc	%	47.5	47.5
Lead	%	1.9	1.8
Silver	oz/ton	13.1	12.4
Gold	oz/ton	0.06	0.07
Concentrate	tons	89,959	913,144
PM Concentrate Grade			
Zinc	%	25.0	25.0
Lead	%	3.4	3.3
Silver	oz/ton	28.7	27.4
Gold	oz/ton	0.13	0.15
Concentrate	tons	34,328	349,224

15.0 INFRASTRUCTURE

15.1 Site Layout

The major infrastructure areas (Figure 15-1 to Figure 15-8) supporting operations at Greens Creek include the 920/860 Area, Site 23, Hawk Inlet, TDF Area, Young Bay dock, 13 mi of connecting roadways, a power intertie connecting Greens Creek to the Juneau area power grid, and various pipelines and outfalls for wastewater and stormwater.

The 920 Area is located adjacent to the main portal at the 920 ft elevation or approximately eight road miles from the tidewater facilities located at Hawk Inlet. Located at the 920 Area are the plant, backfill batch plant, power-house, water treatment plants, surface maintenance shop, main warehouse, administrative offices, and fuel storage tanks. There is also a summer-only road to the 1350 exhaust portal.

The 860 Area, which is immediately adjacent to the 920 Area, has additional office buildings, assay laboratory, and core-logging facilities. Site 23, which is adjacent to the 860 Area or approximately 0.2 mi from the 920 Area, is the active waste rock storage facility and includes a helipad and shotcrete batch plant.

The dry stack TDF includes all the tailings produced to date that have not been placed as backfill underground. Ponds 7 and 10 and a 2500 GMP industrial wastewater treatment plant are located at the TDF Area.

Support facilities at Hawk Inlet include core storage; concentrate storage; a deep-water port that accommodates cargo ships, freight barges and fuel barges; warehouse; sanitary sewer and potable water treatment; fuel storage; and camp housing.

The Young Bay facility consists solely of a boat dock for the crew transport ferry that runs twice daily from Juneau, parking for buses, and a generator for powering lighting.

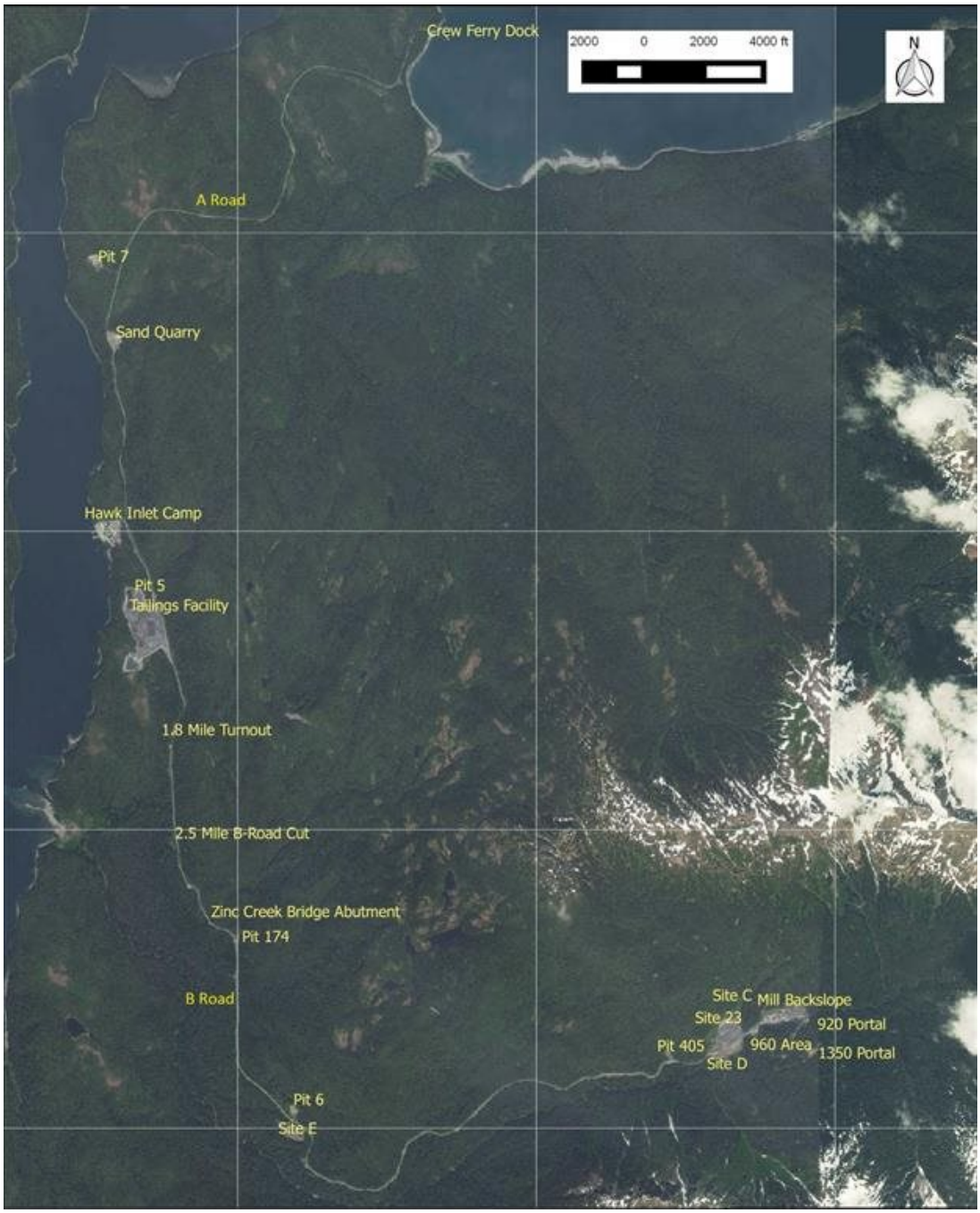


Figure 15-1: Infrastructure Layout Map



Figure 15-2: Hawk Inlet Infrastructure

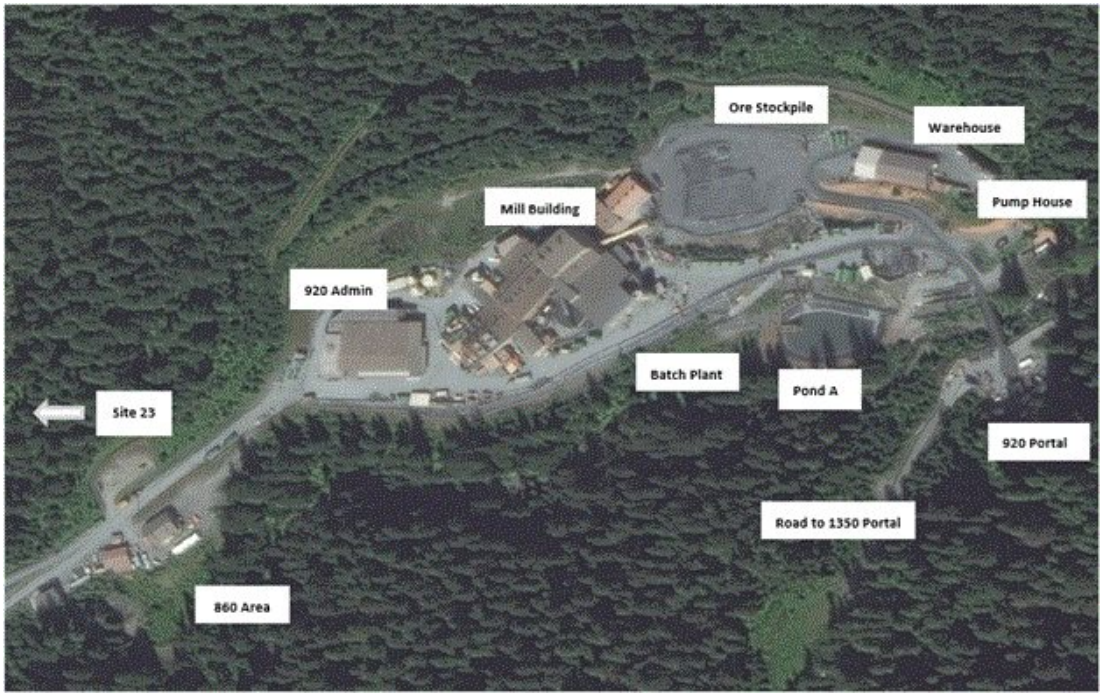


Figure 15-3: 920 & 860 Mine Site Area



Figure 15-4: Hawk Inlet Facilities



Figure 15-5: 920 Area Facilities

15.2 Roadways

Two mine roads link the Young Bay and the Hawk Inlet sites with the mine/mill site. A five mile long, 18 ft wide road ("A Road") allows transport of personnel from the Young Bay dock to Hawk Inlet. An 8.5 mi, 20 ft wide road ("B Road) allows transport of personnel, supplies, and concentrate between Hawk Inlet and the mine, as well as transport of dry tailings from the mine to the TDF. Several borrow pits lie along the roadways.

Hecla's policy for travel on these single-lane roads with turnouts requires that all employees and contractors maintain radio contact during transit. Limited public access to the road system is allowed. The roads are occasionally used by hunters who access Admiralty Island via private boat.

15.3 Tailings Disposal Facilities

The plant generates approximately 1,800 dry tons of filter-pressed tailings per day, or approximately 650,000 stpa. These tailings are dewatered in a filter press at the plant, with approximately 50% of the tailings being mixed with cement and hauled back into the underground mine for disposal in mined-out areas as backfill.

The remaining 50% of the tailings are transported from the plant on the B Road using covered 45 ton haul trucks to a surface TDF located near Hawk Inlet.

At the TDF, tailings are end dumped and placed using bulldozers. The tailings are placed and compacted in lifts in a manner to minimize surface infiltration and promote runoff.

Leachate is contained using a system of geomembrane liners, cutoff walls, and above and below liner drainage systems. Surface water is managed via a system of lined ditches and culverts. Outside slopes are capped with carbonate-rich mine development rock (argillite or type 1) to protect against erosion and to provide geochemical buffering capacity for the potentially acid-generating tailings.

The TDF has undergone multiple staged, incremental expansions as the mine life has been extended over time. The “Stage 3” expansion was recently completed which will accommodate projected mine tailings storage requirements through the end of the mine life in 2030. Early-stage engineering studies are underway to determine modifications to the plan of operations to accommodate additional material beyond the current Greens Creek Mineral Reserve life.

The following items are monitored at the TDF:

- Surface and ground water quality
- Water levels with wells and piezometers
- Geochemical properties of the tailings
- Geotechnical stability
- Aquatic biology in several small, adjacent creeks



Figure 15-6: Hawk Inlet Dry Stack Tailings Disposal Facility

15.4 Mine Development Rock Disposal Facilities

The current development rock storage area is Site 23 located 1,100 ft west of the 920 mine site. It is used to store potentially acid-generating mine development rock which cannot be used for capping tailings (see Section 15.3). Site 23 currently has a total capacity of 2.1 Mst and is expected to reach this capacity in early 2021 based on the planned mine development schedule.

At this time several options are being evaluated to optimize the development of Site 23 within approved boundaries to provide additional storage for development rock. Once the capacity of Site 23 is exhausted, development rock can be hauled to the TDF and/or used to backfill abandoned access ramps underground.

Ultimately, the material stored at Site 23 will be hauled underground during reclamation activities. This material will fill most of the void left by mine access ramps and other workings.

Historic development rock storage areas are found primarily at two locations:

- Site D, immediately down slope of Site 23 and
- Site E, located at mile marker 4.6 on the B Road, approximately half the road distance between Hawk Inlet and the mine portal.

Site E is currently undergoing a multi-year removal and reclamation effort. The material from Site E is disposed of with tailings at the TDF.

15.5 Stockpiles

In addition to Site E, discussed in Section 15.4, reclamation material storage stockpiles are located at various points along the haul road (B Road) connecting the 920 Area and Hawk Inlet.



Figure 15-7: Site 23 Waste Rock Storage Facility

15.6 Water Supply

15.6.1 920 Water System

The 920-water system draws up to 700 gallons per minute (GPM) from Greens Creek via three intake screens in stream bed for use in the plant and the mine. This water is referred to as fresh water. Fresh water is pumped to a head tank at elevation 1,160 ft or directly to the plant.

Two discharge pipelines are installed in the head tank providing gravity flow for the fresh and fire water systems. The fire water pipeline is installed in the bottom of the 1160 head tank. The fresh water pipe line is installed above the fire water pipeline allowing storage for the firewater system.

Up to 10 GPM is pulled from the fresh water and is filtered, chlorinated, and stored in three tanks totaling 28,000 gallons for potable water.

15.6.2 Hawk Inlet Water System

Water infiltrates from Cannery Creek into two caisson-type wet wells:

- Caisson no. 1 pumped/gravity feed to the Hawk Inlet storage/fire tanks and
- Wet well 18 pumped feed to the TDF wheel wash area supply tank.

The withdrawal from Cannery Creek is limited to 104,000 gpd. Control of each system is based on demand and corresponding storage tank levels.

Water from caisson no. 1 is pumped to three 20,000-gallon tanks located outside the Hawk Inlet water utilities building. Of this initial 60,000 gallons, 45,000 gallons are reserved for the fire suppression systems. Water demand by the camp facilities, wash down and domestic uses is drawn from these storage tanks. These tanks also supply the potable water filtration system where fresh water is filtered, chlorinated, and stored in a fourth 20,000-gallon tank before distribution in the Hawk Inlet camp.

15.7 Water Management

Greens Creek is in a maritime environment and receives considerable precipitation (refer to Section 4.2). Non-contact water is diverted from the site by upland ditches and drains and discharge to the numerous fresh water courses found adjacent to the site.

Management of contact water is undertaken to protect the environment. Contact water includes the following:

- water withdrawn from Greens Creek and Cannery Creek
- stormwater, and
- ground water from underdrain systems, curtain drains, and collected seeps.

The following flow chart displays the current water management system at Greens Creek. Note that all contact water reports to Ponds 7 and 10 collectively referred to as Pond 7/10.

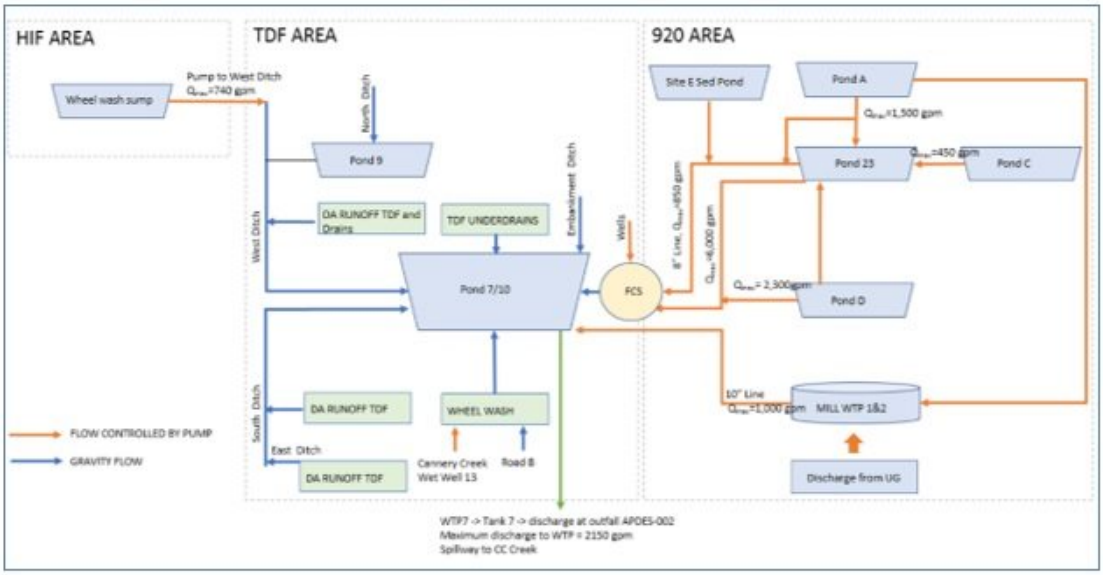


Figure 15-8: Greens Creek Water Management Flowchart

15.7.1 920 Area Water Management

All water collected and/or used at the 920 Area is ultimately piped to Pond 7/10 at the TDF, and from there is treated by the TDF water treatment plant (TDF WTP) prior to discharge into Hawk Inlet.

Underground discharge water is sent to the plant where it is combined with tails thickener discharge and sent to the two 920 water treatment plants (920 WTP) and ultimately piped to Pond 7/10.

15.7.1.1 Contact Water

The main objective of the 920 Area stormwater systems is to protect the environment by controlling contact water at the site for treatment. The stormwater system at the 920 Area mill site is in place to route, contain, treat, store, recycle and export stormwater from the mine and plant.

Water is routed through the system as follows:

- site collection ditches and lift stations to sediment removal basins
- detention Pond A; and
- to mill for recycling or Pond 7/10 via pipelines buried adjacent to the B Road.

In general, all water considered “contact” water is contained at the 920 Area and eventually treated at the TDF WTP. Surface water conveyance systems at the 920 Area are designed to handle a 10 year/24 hour storm event.

15.7.1.2 Water Treatment

Two chemical precipitation plants (CPPs) are used to treat wastewater and are configured and designed to route water back to the plant or to Pond 7/10.

15.7.1.3 Site 23 Water Management

All water collected and/or used at the 860 and Site 23 area is ultimately piped to Pond 7/10 at the TDF, and from there is treated by the TDF WTP prior to discharge into Hawk Inlet.

Pond D receives water from runoff and the Site D curtain drain system. This water is generally recycled for use in the plant but can be routed to Pond 23 as needed. Pond 23 receives stormwater from Site 23 curtain drains and discharge from Pond A, Pond D, and Pond C. Water from Pond 23 reports to Pond 7/10.

15.7.2 TDF and Hawk Inlet Water Management

15.7.2.1 Hawk Inlet Contact Water

The Hawk Inlet system routes, stores, collects, and exports water to the TDF area for additional treatment and ultimate discharge.

Contact water is received from the following sources:

- hawk Inlet stormwater drainage
- hawk Inlet wheel wash facility
- wash-down from concentrate storage and ship loader; and
- treated and disinfected domestic sewage treatment effluent.

These waters report to de-gritting basin number DB-04, where the heaviest material settles out. Flows are then routed by gravity to the stormwater wet well (integral to the wheel wash building), where it is pumped to Pond 7/10 for additional treatment at the TDF WTP and ultimate discharge to seawater through the APDES outfall 002 located in Hawk Inlet.

15.7.2.2 TDF Contact Water

A series of perimeter ditches at the TDF capture surface contact water from precipitation. All surface flows report to Pond 7/10. A series of complex underdrains exist throughout the TDF and at Pond 7/10. All underdrains gravity flow to perimeter ditches or lift stations referred to as wet wells. Water is pumped from the wet wells to perimeter ditches or via pipes to Pond 7/10.

15.7.2.3 TDF Water Treatment Plant

All waste, contact, and process water from the 920, 860, Site 23, Hawk Inlet Facility, and the TDF areas ultimately report to Pond 7/10. Pond 7/10 stores water before treatment in the TDF WTP. It provides surge protection for stormwater flows. It is designed to handle the 25 year / 24 hour storm site wide. Pond 7/10 has a total capacity of 66.66 ac feet. Water collected in Pond 7/10 is pumped to the TDF WTP, which is a chemical precipitation plant (CPP). Effluent water (post treatment) is discharged to Hawk inlet via APDES outfall 002.

15.8 Power and Electrical

The mine's electrical power needs are met by utilizing a combination of two sources. The primary source is from purchased power generated by the local Juneau power utility. The Juneau power grid is connected to the Greens Creek grid by an undersea cable and a 13 mi long 69 kV aerial power line. This power is generated by hydroelectric dams and is available to Greens Creek except when reservoir levels fall below predetermined limits.

The secondary source is on site diesel-powered generation. This system includes two separate power-houses that contain nine generating units capable of producing 11.25 MW. The on site generators include a mixture of reciprocating and turbine generators.

15.9 Concentrate Handling

Concentrates are transported from the plant to Hawk Inlet using the same 45 ton trucks that are used for transporting tailings. The Hawk Inlet facilities include an approximately 30,000 ton capacity concentrate storage building located near tidewater. Concentrates are loaded onto bulk transport ships using a covered telescoping conveyor.

15.10 Fuel

Fuel arrives at the Hawk Inlet port facility by ocean barges that serve southeast Alaska. It is pumped directly into a 200,000 gallon storage tank that is equipped with full spillage containment. The fuel is then delivered by 9,500 gallon tanker trailers to the 920 Area fuel storage area, which consists of three fully contained tanks yielding a storage capacity of approximately 156,000 gallons.

When electricity is supplied by the local utility intertie, fuel is delivered at one to two month intervals as needed. When the mine is required to operate the diesel generators to supply power to the site approximately 150,000 gallons is delivered weekly.

15.11 Accommodation Camp

A 331 bed camp facility with kitchen is located at Hawk Inlet. This is used by staff working a rotational schedule.

15.12 Other Supplies

All supplies are delivered to the Hawk Inlet port facility via freight barge. Supplies destined for the 920 area are transported by truck. Trash, waste, and empty shipping containers are also loaded back onto barges at the Hawk Inlet port. Both Hawk Inlet and the 920 area have warehouse facilities for material storage and handling. Aggregates are delivered to Hawk Inlet by barge and are stockpiled at various locations throughout the mine site.

15.13 Communications

Corporate communications on the mine site are handled over fiber-optic cables, leased from GCI Communication Corp, utilizing voice-over-internet-protocol technology.

Process control management is accomplished over an internal Ethernet system utilizing both fiber optic and Cat5 communications. The internal fiber optic system extends into the mine and is utilized to monitor/control fan systems, monitor mine gasses, and track equipment and personnel. A SCADA program is used, allowing remote monitoring and control from multiple sites. A single, site-wide standard is accomplished utilizing "Ignition SCADA" software.

Vehicle safety and emergency reporting and communication are accomplished using an island- and mine-wide radio system with dedicated channels for mill operations, mine operations, and road operations. The radio system extends throughout the underground mine by use of a leaky feeder system. Vehicle safety on the surface and underground is enhanced with a proximity detection and collision avoidance system.

A hard-wired mine phone system is also installed throughout the mine with direct communication to supervisory offices and the medical office.

In the event of a fiber optic failure, a backup microwave system is in place to ensure site safety. Emergency satellite phones are also available at both the Hawk Inlet and 920 offices.

16.0 MARKET STUDIES

The mine has now been operational for a 30 year period, and continuously operational for the last 23 years, and has current contracts in place for silver, zinc, and precious metals flotation concentrate sales, doré refining, concentrate transportation, metals hedging, and other goods and services required to operate an underground mine.

16.1 Markets

16.1.1 Overview

Global mined zinc output is approximately 13 million tonnes per annum (Mtpa), contained in approximately 25 Mt zinc concentrate. Global zinc smelting capacity is approximately 14 Mtpa Zn and includes 1.0 Mt to 1.5 Mt of capacity to refine zinc secondary by-products into metal.

Global mined lead output is only approximately 4.6 Mtpa, contained in approximately 8.0 Mt lead concentrates. Global lead smelting capacity is significantly higher at 6.7 Mt Pb and also includes the capability to produce approximately 1.0 Mt Pb from scrap and residues.

Hecla produces approximately 53,000 Mtpa Zn and 44,000 Mtpa Pb in concentrates at its two mines in Alaska and Idaho. Hecla's total output comprises less than 1% of both global zinc mine capacity and global lead mine capacity. Because Hecla's concentrate products also contain significant amounts of payable gold and silver, they are sought after by smelters who capture additional value from recovering precious metals through processing and refining zinc and silver concentrates. The current market for Hecla concentrate products is both very liquid and very strong, globally. Hecla's primary customer base operates in Korea, Japan, Canada, and China. Its concentrate products have also been exported to and processed in Mexico, Belgium, Italy, England, Germany, and the Netherlands.

Global silver supply is approximately 1.0 billion ounces with mine production accounting for around 80% of silver supply. The majority of silver produced is as a by-product of lead, zinc, copper, and gold mines. According to the Silver Institute, lead-zinc mines are the biggest contributors to global silver supply, accounting for approximately 32% of silver mine production in 2020. Mexico, China, and Peru produce 50% of world's silver, while the United States accounts for only 4% of world silver production.

Silver demand is primarily composed of Industrial demand, which accounts for 50% of total silver demand of 1.0 billion ounces. Investment demand (physical and exchange traded products) and jewelry and silverware account for 25% share each respectively. Silver has the highest electrical conductivity of all metals and this property positions silver as a unique metal for multitude of uses in electronic circuitry in automotive and electronics. Silver's use in photovoltaic cells has also seen a rapid expansion in the past five years and is expected to be one of the key growth areas in green energy.

Gold supply is approximately 165 Moz Au, with mine production contributing 75% of gold supply and recycling accounting for the remaining 25%. In terms of gold demand, jewelry fabrication accounts for approximately 55% of total demand while Investment in physical bars, coins and Exchange Traded Funds is at 25% of overall demand. Gold's use in technology applications was around 11 Moz Au, or 8% of total demand in 2021, according to the World Gold Council. Accommodative fiscal and monetary policies globally due to COVID-19 lent support to investment demand for gold in 2020 as gold prices reached record levels in 2020.

16.1.2 Commodity Price Projections

The metal prices used in the estimation of Mineral Resources and Mineral Reserves are determined by Hecla's corporate office in Coeur d'Alene, Idaho, USA. Greens Creek Mineral Reserves are estimated using a silver price of $17.00/ounce, lead price of $0.90/lb, zinc price of $1.15/lb, and a gold price of $1,600/oz. Mineral Resources are estimated using a silver price of $31.00/ounce, lead price of $1.15/lb, zinc price of $1.35/lb, and a gold price of $,1,700/oz. The difference in prices is the result of a longer historical period used as the basis for the Mineral Resource estimation.

Table 16-1 shows the realized metal prices Hecla has received for sales of its products.

Table 16-1: Hecla Historical Average Realized Metal Prices
Hecla Mining Company – Greens Creek Mine

Metal Prices	2019	2020	2021	Three Year Average
Silver ($/oz)	16.65	21.15	25.24	21.01
Lead ($/lb)	0.91	0.84	1.03	0.93
Zinc ($/lb)	1.14	1.03	1.44	1.20
Gold ($/oz)	1.413	1,757	1,796	1,655

The economic analysis performed in the LOM plan assumes an average silver price of $21.00/oz, lead price of $0.95/lb, zinc price of $1.25/lb, and a gold price of $1,650/oz based upon analysis of consensus metal price forecasts by financial institutions. Based on macroeconomic trends, the SLR QP is of the opinion that Hecla's realized metal pricing will remain at least at the current three year trailing average or above for the next five years.

16.2 Contracts

16.2.1 Concentrate Sales

Hecla has agreements at typical lead and zinc concentrates industry benchmark terms for metal payables, treatment charges and refining charges for concentrates produced from the mine. The major customers since 2018 included Korea Zinc (39.3%), Cliveden (13.6%), Mitsui Mining & Smelting (11.8%), and Teck Metals Limited (14.7%). These custom smelters are located in Canada, Japan, and South Korea. Figure 16-1 shows the product sales by country for Greens Creek products.

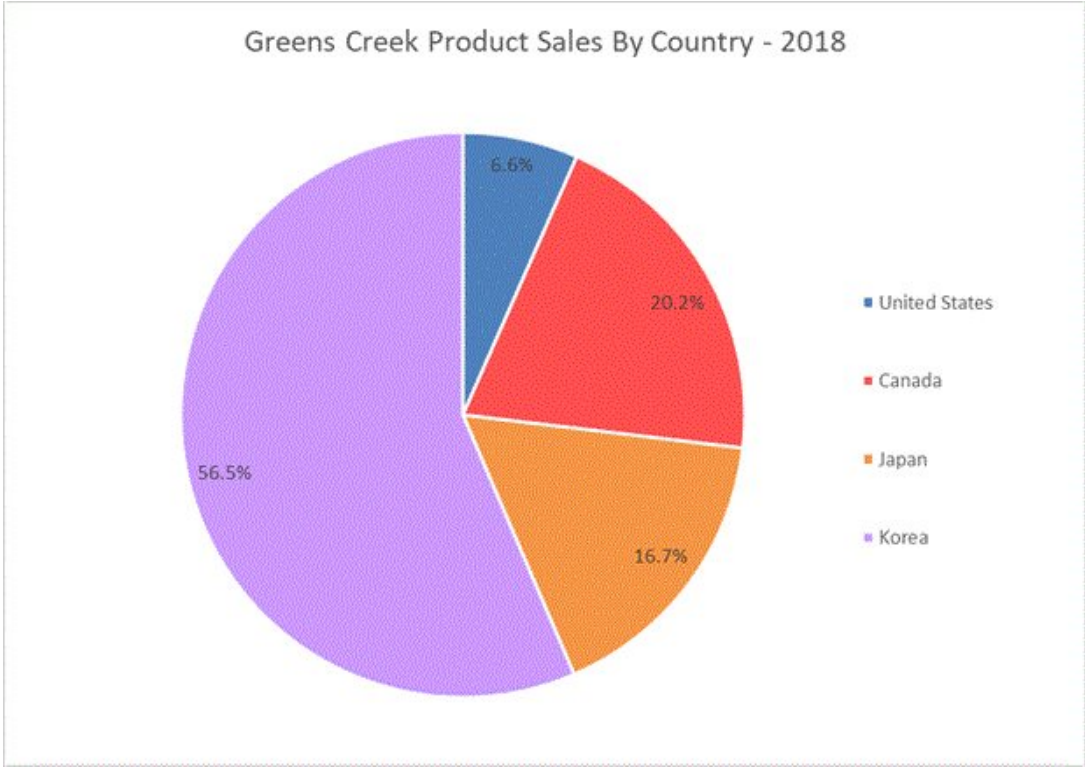


Figure 16-1: Concentrate Destinations

Hecla has had concentrate sales frame contracts in place since the beginning of operations in 1989. These contracts are typical sales contracts in the industry and most include an evergreen component so remain in effect from year-to-year after the initial term until cancelled. For those that don't include an evergreen component new frame contracts are negotiated at the end of their terms. When surplus tonnage is available, spot sales contracts are arranged six to 12 months in advance of shipment. For all of Hecla's sales contracts, the title and risk of ownership of the concentrates transfers either at the load port or discharge port.

Treatment costs and refining costs vary depending on the concentrate type and the destination smelter. Table 16-2 summarizes the average metal payability factors.

Table 16-2: Payability and Treatment Charges Summary
Hecla Mining Company - Greens Creek Mine

Description	Silver	Zinc	Precious Metals
Pb	90-95	None	90-95
Zn	0-10	83-85	83-85
Ag	90-95	50-65	70-80
Au	90-95	25-45	55-65
Base TC $/dmt	120-150	200-220	Zinc +10-15

Greens Creek concentrates are higher in precious metals content, but lower in lead and zinc content than typical lead, zinc, and PM concentrates. With regard to Greens Creek's PM concentrate, this product requires treatment at Imperial Smelting Furnaces (ISFs) which are declining in number due to more efficient technologies coming on-line. All bulk concentrate tonnage anticipated to be produced at Greens Creek is committed to our current frame contract on an evergreen basis. Hecla has also previously delivered PM concentrate to China and Korea and has those relationships in place should it be necessary to place additional PM concentrate tonnage at any time during LOM operations.

Gravity concentrate is shipped to a processor in Kimberly, ID (Metals Research) for treatment through their oxygenated-cyanide leach process. Once treated, Metals Research produces doré bars and forwards them to Metalor on Hecla's behalf for further refining under a toll refining agreement. Upon receipt of doré bars from Greens Creek, Metalor further refines the material and Hecla's pool accounts are credited with ounces of gold and silver bullion from this process. The gold bullion is sold on a biweekly basis to a large bank at prevailing spot prices. The silver bullion is sold to Metalor on a quarterly basis at prevailing spot prices with refined metals being sold to various metal traders.

Lastly, the tailings resulting from the oxygenated-cyanide leach process at Metals Research are sent via truck to Teck's smelter in Trail, BC on a quarterly basis for further processing and eventual disposal.

16.2.2 Forward Sales

Hecla utilizes financially-settled forward contracts to manage the exposure to changes in prices of zinc, lead, silver, and gold contained in concentrate shipments between the time of sale and final settlement. In addition, we utilize financially-settled forward contracts to manage the exposure to changes in prices of zinc and lead (but not silver and gold) contained in our forecasted future concentrate shipments. These contracts do not qualify for hedge accounting and are marked-to-market through earnings each period.

16.2.3 Other Contracts

A Contract of Affreightment is in place with an international shipping company covering the shipments of the silver, zinc, and PM concentrates from the Greens Creek port facilities at Hawk Inlet, AK to overseas discharge ports serving the smelter customers. The current Contract of Affreightment has a term of two years and expires at the end of December 2019. Negotiations are currently underway for a new Contract of Affreightment with the same shipping company.

Several other contracts have been utilized for other goods and services required to operate an underground mine. Large contracts include lease of office facilities in Juneau, lease of a boat dock at Auke Bay, AK for employee parking and boat dock facilities, employee marine transportation services for the Greens Creek workforce to commute from Auke Bay to Admiralty Island, contract drilling services for surface exploration and underground core drilling, camp catering and housekeeping for an employee camp facility, barge transportation of supplies and equipment from Seattle to Admiralty Island and small float plane and helicopter support.

A contract is in place with the local Juneau electric utility for any excess hydroelectric power not required for the City and Borough of Juneau.

On occasion, mining contractors are employed for specific mine development projects.

Many supplies contracts are in place with suppliers for purchase of various goods; the largest contracts include purchase of fuel, reagents, ground support, and leases of mining equipment.

17.0 ENVIRONMENTAL STUDIES, PERMITTING, AND PLANS, NEGOTIATIONS, OR AGREEMENTS WITH LOCAL INDIVIDUALS OR GROUPS

Greens Creek has a well-established and effective environmental and permitting management program. Staff is knowledgeable and experienced in site and regulatory requirements. Budgets are reasonable and there were no critical path permitting items referenced that would limit production. A reclamation/closure plan and estimates to perform this activity are in place. The budgets and staffing to perform required programs are adequate and indicative of activities and responsibilities.

17.1 Environmental Studies and Monitoring

Greens Creek has been collecting environmental data and monitoring environmental conditions and compliance since the 1980s. Environmental monitoring programs are in place to assess compliance with permits and standards.

Greens Creek falls under Hecla's Environmental Management System (EMS) which follows a 13 element plan-do-check-act approach that ensures continuous improvement around issues including obligation registers, management of change, air quality, water and waste management, energy management, training, and reporting. This system promotes a culture of environmental awareness and innovation throughout the company. The EMS program is benchmarked against ISO-14001 and complements Canada's Towards Sustainable Mining (TSM) program.

Internal and external audits are performed to assess compliance with corporate, permit, regulatory and industry requirements. Findings are documented and tracked.

17.2 Permitting

Permitting at Greens Creek falls within the purview of numerous entities (regulatory and non-regulatory) on the federal, state, and local levels. These agencies require oversight, registration, and/or notification prior to initiating or significantly modifying facilities and operations at the mine. All necessary registrations, authorizations and permits required for operations to date, and for continued operation of this facility, are in place. Although some permits have expired or are set to expire, renewal applications are filed with the appropriate agency in each case or other measures were taken, as necessary, to administratively extend the prior conditions until such time as a renewed permit or additional authorization to utilize is issued.

A list of the current permits in place is included in Table 17-1.

Table 17-1: Current Project Permits/Approvals
Hecla Mining Company – Greens Creek Mine

Description	Reference #	Agency	Date of Approval	Category
APDES/NPDES Permit Name Change Renewal Request	AK-004320-6	ADEC/EPA	5/20/05; Effective 7/01/05 Renewal 10/01/15-9/30/20	Water
401 Certification for NPDES Permit	AK-004320-6	ADEC	3/31/2005	Water
401 Certification for 404 Permit	404 Permit	ADEC	6/20/2014	Water
Health Permit Cannery Camp - (Food Service)	113010178	ADEC	1/2018	Facilities
Waste Management Permit	2014DB0003 [Replaces 0211-BA001]	ADEC	8/11/2014 – 8/10/2019	Waste
Title V Air Quality Operating Permit	AQ0302TVP03 (replaces AQ302TVP02 Revision 1)	ADEC	7/01/08 (orig.) Revised 7/13/2016 – 6/16/2021	Air
Owner Requested Limit (ORL) Air Quality Operating Permit	0853ORL02	ADEC	3/11/10	Air
Cooperative Service Agreement	Letter of Agreement	ADEC	4/27/09	Other
Underground Secondary Containment Agreement	Letter of Agreement	ADEC & SPAR	12/30/08	Spill
Corrosion Control Addition Approval	Plan Rev #4874; PWSID #113560	ADEC	11/19/09	Water
Drinking Water System Classification Letter	PWSID #113560	ADEC	3/7/2017	Water
Drinking Water System Classification Letter	PWSID #119205	ADEC	3/7/2017	Water
Waiver Asbestos Monitoring Affidavit	PWSID #113560	ADEC	12/28/2001	Water
Waiver Asbestos Monitoring Affidavit	PWSID #119205	ADEC	12/28/2001	Water

Description	Reference #	Agency	Date of Approval	Category
Waiver SOC & OOC Monitoring; PMP Certification	PWSID# 113560	ADEC	1/01/11; 6/03/15; 10/30/18	Water
Waiver SOC & OOC Monitoring; PMP Certification	PWSID# 119205	ADEC	1/01/11; 6/03/15; 10/30/18	Water
Certificate of Approval to Operate a Dam – Pond 7	AK00307 FY2018-18-AK00316	ADNR	4/19/2018	Facilities
Hazard Potential Classification and Jurisdictional Review Pond 10	NID ID# AK00316	ADNR	2/2/2018	Facilities
Hazard Potential Classification and Jurisdictional Review Pond 23	N/A	ADNR	2/2/2018	Facilities
Hazard Potential Classification and Jurisdictional Review A Pond	N/A	ADNR	2/2/2018	Facilities
Hazard Potential Classification and Jurisdictional Review C Pond	N/A	ADNR	2/2/2018	Facilities
Hazard Potential Classification and Jurisdictional Review D Pond	N/A	ADNR	2/2/2018	Facilities
Hazard Potential Classification and Jurisdictional Review Sand Pit	NID ID# AK00317	ADNR	2/2/2018	Facilities
Certificate of Approval to Modify a Dam	FY2019-11-AK00317	ADNR	9/6/2018	Facilities
Certificate of Approval to Operate a Dam	FY2019-12-AK00317	ADNR	9/17/2018	Facilities
Right of Way Permit (Marine Outfall to Hawk Inlet)	ADL 105124 Amendment 2	ADNR	7/01/91 Amended 5/01/08 for name change; 7/2016: renewed for 25 years	Land
Tideland Lease (Young Bay Dock)	ADL 106488; Amendment1 Amendment 2	ADNR	1/25/00 5/01/08 4/28/2015	Land

Description	Reference #	Agency	Date of Approval	Category
Tideland Permit (Mooring Buoy in Hawk Inlet)	LAS 19928	ADNR	10/06/2015	Land
Water Right # 656 (Cannery Creek - 17,000 Gal/Day - Public Supply) Name Change	ADL 43347	ADNR	10/06/86	Water
Temporary Water Use Permit (Cannery Creek 103,400 gal/day)	TWUP J2000-10	ADNR	10/06/00	Water
Water Use Permit (700 gal/min-Greens Creek-for milling purposes) Name Change	LAS 11807	ADNR	10/05/88	Water
Water Use Permit (Five dewatering wells within mill site complex, 10 gpm limit) Name Change	LAS 11808	ADNR	10/05/88	Water
Temporary Water Use Authorization - 109	TWUA F2015-109	ADNR	2/23/2016	Water
Temporary Water Use Authorization - 110	TWUA F2015-110	ADNR	2/23/2016	Water
Temporary Water Use Authorization – 111	TWUA F2015-111	ADNR	2/23/2016	Water
Temporary Water Use Authorization – 112	TWUA F2015-112	ADNR	2/23/2016	Water
Temporary Water Use Authorization – 113	TWUA F2015-113	ADNR	2/23/2016	Water
Temporary Water Use Authorization - 114	TWUA F2015-114	ADNR	2/23/2016	Water
Fish Habitat Permit	FH-08-III-0210	ADF&G	7/15/08	Wildlife
Fish Habitat Permit	FH14-I-0040	ADF&G	6/20/14	Wildlife
Culvert 1 – Stream No. 111-41-10190	FH14-I-0109	ADF&G	4/27/15 (does not expire)	Wildlife
Culvert 1 – Stream No. 111-41-10190	FH14-I-0109	ADF&G	4/27/15 (does not expire)	Wildlife
Culvert 2 – Drainage to Fowler Creek	FH14-I-0110	ADF&G	4/27/15 (does not expire)	Wildlife
Culvert 3 – Drainage to Fowler Creek	FH14-I-0111	ADF&G	4/27/15 (does not expire)	Wildlife
Water Withdrawal Point 1 – Zinc Creek	FH15-I-0024	ADF&G	4/27/15 (does not expire)	Wildlife

Description	Reference #	Agency	Date of Approval	Category
Water Withdrawal Point 2 – Little Sore Creek	FH15-I-0025	ADF&G	4/27/15 (does not expire)	Wildlife
Water Withdrawal Point 3 – Little Sore Creek	FH15-I-0026	ADF&G	4/27/15 (does not expire)	Wildlife
Plywood flume for stream gauge – Tributary Creek	FH15-I-0133	ADF&G	8/18/15 (does not expire)	Wildlife
Water Withdrawal Point	FH18-I-0128	ADF&G	9/7/2018	Wildlife
Mining License	APMA Ref # J55571 License No 99475	ADOR (AK Dept. Of Revenue)	5/1/2018	Land
Large Mine Permit	M-02-95	CBJ	Summary approval granted 8/12/14	Land
Facility Response Plan	EPA #FRPAKA0096 USCG GPO Append 9	EPA / USCG	Reviewed and accepted by USCG 9/3/2014	Spill
Underground Injection Well Class V (Tailings Materials to Active Stope Areas)	N/A	EPA	Notification sent 9/03/98	Waste
Underground Injection Well Class V (#33 Decline in Mine/Mill used for temporary storage of approximately one million gallons of water)	N/A	EPA	Notification sent 11/16/94	Waste
Underground Injection Well Class V (Stope 21AS in Section 21, Zone 8 of the Mine used to permanently store sludge and sediment)	N/A	EPA	Notification sent 11/16/94	Waste
Underground Injection Well Class V (380 cy of settleable solids and water stored temporarily in stope off the 33 Cross Cut)	N/A	EPA	Notification sent 11/21/94	Waste
Landing Facility Location Identifier (Hawk Inlet Federal Aviation Administration)	HWI Private Airport	FAA	9/6/01	Transportation
Radio Station Authorization (FCC Registration Number (FRN) 0008396178)	WNMG649	FCC	10/4/14	Other
Radio Station Authorization	WPLY665	FCC	6/5/13	Other

Description	Reference #	Agency	Date of Approval	Category
Radio Station Authorization	WPMJ594	FCC	12/5/13	Other
Radio Station Authorization	WQBL479	FCC	10/10/14	Other
Radio Station Authorization	WRV305	FCC	6/5/14	Other
Memorandum of Understanding (USFS, ADEC, ADNR MOU for single bond)	Reclamation Bond	Multi-Agency	2014 Amended 6/08/09 for name change	Other
Radioactive Material License (Radioactive materials license (Fixed & mobile))	50-23276-01 Amendment 17	NRC	5/22/18	Other
Tailings Expansion October 31, 2019	POA-1988-269-M7	USCOE	1/6/15	Facilities
Certificate of Adequacy Waiver (Waiver to the Oil & Garbage requirements of 30 CFR 158.150)	16450	USCG	1/27/92	Transportation
Certificate of Documentation (UMTB 165 Replacement Young Bay Breakwater (in Juneau)	642888	USCG	8/24/17	Transportation
ATF Explosives Permit	9-AK-110-33-8G-91620	USDJ	N/A	Other
Hazardous Materials Certificate of Registration	050615 551 053XZ for registration years 2018-2021	USDOT	7/1/2018 – 6/30/2021	Transportation
Lease-Mine Portal/Mill Site (61.19 ac)	4050-03 Amendment 6	USFS	Original 8/12/86; Amendment 6 issued 4/27/94	Land
Lease for Milling - 1350 Portal and Campsite (9.82 ac)	4050-09	USFS	12/31/86	Land
Communications Site (microwave tower) Special Use Permit (0.18 ac) Amendment 2	ADM113 (renum.4050-11); Amendment 2 name change ADM227	USFS	6/15/09	Land/Communications
Special Use Permit-Road (146 ac) Amendment 1	ADM4050-02; ADM228	USFS	12/31/97; 6/15/09	Land

Description	Reference #	Agency	Date of Approval	Category
Waste Area E (10.8 ac) Amendment 3	4050-08; Amendment 1; Amendment 2; Amendment 3 number changed to ADM229	USFS	10/27/87; 11/23/87; 1/24/01; 06/15/09	Land
Lease for Mining (123 ac) Tailings & Pipeline – Stage II Expansion Amendment 2	ADM 4050-10 Amendment 1: Amendment 2 number changed to ADM230	USFS	9/01/88; 4/05/04; 6/15/09	Land
Decision Notice – Approval of Surface Exploration EA 2017	Decision Notice	USFS	4/14/17	Land/Exploration
GPO Appendices Appendix 1 Appendix 2 Appendix 3 Appendix 4 Appendix 5 Appendix 6 Appendix 7 Appendix 8 Appendix 9 Appendix 10 Appendix 11 Appendix 12 Appendix 13 Appendix 14 Appendix 15	GPO's	USFS	11/1/2014 5/1/2002 8/1/2017 8/1/1995 3/1/2016 6/1/2016 8/1/2014 1/1/1999 3/1/2014 2/1/2013 11/1/2014 6/1/2016 12/1/2005 7/1/2016 11/1/2014	Land
Joint Venture Agreement-Hawk Inlet Warranty Deed	N/A	N/A	1/10/78 Effective 09/30/84	

Hecla has filed an amendment to its General Plan of Operations (critical path permit) to expand its TDF by approximately 13.7 ac. The expansion is primarily inside the existing USFS lease area and will allow mine operations to continue past 2031, when the current facility is expected be full. Other supporting permits/amendments will follow. Budget and schedule for these permitting activities are reasonable and provide for contingency/appeal(s).

17.2.1 Site Monitoring

Greens Creek operates through permission granted by multiple permits, which are summarized in Table 17-1. The permits contain requirements for site monitoring including air, water, waste, and land aspects of the Property. The permit-required data are maintained by the facility, and exceptions to the monitoring obligations are reportable to the permitting authority. Monitoring is conducted in compliance with permit requirements, and management plans are developed as needed to outline protocols and mitigation strategies for specific components or activities.

17.2.2 Water

Greens Creek is in a maritime environment and receives considerable precipitation. Non-contact water is diverted from the site by upland ditches and drains, monitored and discharge to the numerous freshwater courses found adjacent to the site.

Management and monitoring of contact water is undertaken to meet permitting requirements and protect the environment. Contact water includes the following:

- water withdrawn from Greens Creek and Cannery Creek
- stormwater
- ground water from underdrain systems, curtain drains, and collected seeps

All water collected and/or used at the 920 Area is ultimately piped to Pond 7/10 at the TDF, and from there is treated by the TDF WTP prior to discharge into Hawk Inlet. Monitoring occurs regularly according to permit requirements (prior to discharge).

Underground discharge water is sent to the plant where it is combined with tails thickener discharge and sent to the 920 WTP.

17.2.3 Hazardous Materials, Hazardous Waste, and Solid Waste Management

Greens Creek manages its hazardous materials, hazardous wastes and solid wastes in accordance and compliance with issued permits and applicable regulatory requirements.

17.2.4 Tailings Disposal, Mine Overburden, and Waste Rock Stockpiles

Greens Creek generates approximately 1,800 dry tons of filter-pressed tailings per day, or approximately 650,000 stpa. These tailings are dewatered in a filter press at the plant, with approximately 50% of the tailings being mixed with cement and hauled back into the underground mine for disposal in mined-out areas as backfill. The remaining 50% of the tailings are transported from the plant on the B Road using covered 45 ton haul trucks to a surface TDF located near Hawk Inlet. At the TDF, tailings are end dumped and placed using bulldozers. The tailings are placed and compacted in lifts in a manner to minimize surface infiltration and promote runoff.

The Greens Creek mineralized material is comprised of massive sulfides in a temperate rainforest environment. Proper management of the waste materials from the mining process is of primary importance due to potential acid rock drainage (ARD) and metals leaching considerations. Regulatory oversight is rigorous, and the relationship between the agencies and the mine is transparent.

Waste materials are regulated under the State's Waste Management Permit, which involves provisions for building contained waste storage facilities, diverting water from the facilities, and capturing and treating all water that contacts the waste.

17.3 Reclamation and Closure

Returning the land to a safe use condition as a publicly owned national forest is the intent for closure. The closure strategy's physical aspects are designed to return the disturbed areas to near natural conditions to the extent practical and utilize established industry standards, such as common civil works activity using mobile equipment for grading, contouring, and re-vegetating with native species. Power and utilities will be maintained if necessary for water treatment during the closure period and beyond, as required by regulation. Facility and structure removal is well defined, and standard industry practice will be employed to remove specified structures and facilities from the Property. For planning and estimating purposes, all facilities will eventually be removed from the Property, but some features of the infrastructure may be maintained past the substantial completion of reclamation to accommodate monitoring and treatment systems. Provisions for operational support during the closure period and beyond are included in the cost estimates.

17.3.1 Reclamation and Permit Requirements

Greens Creek has prepared a reclamation and closure plan to address interim, concurrent, final reclamation and post-mining land use of the mine. The reclamation and closure plan and closure cost estimates are submitted to the USFS as required under 36 CFR 228.1 et. seq. and 36 CFR 228A. Concurrently, the reclamation and closure plan and cost estimate are submitted to ADNR and ADEC in accordance with AS 27.19.010 et. seq., 11 AAC 97.100 et. seq., AS 46.03.010 et. seq., and 18 AAC 60.25 et seq.

The reclamation and closure plan sets performance goals applicable to interim, concurrent, and final reclamation, and addresses post-closure monitoring requirements. It also sets scheduling and other standards for reclamation and for final closure planning requirements, and it explains how detailed, regularly updated reclamation task planning will be used for purposes of calculating a reclamation bond. Reclamation practices will utilize best practicable established and accepted technologies and methodologies suitable for the southeast Alaska environment.

17.3.2 Reclamation and Closure Cost

Greens Creek has developed a Closure, Reclamation, Post-Closure, and Cost Estimate Plan (Plan). This Plan is intended to satisfy four distinct objectives:

1. Return surface disturbed areas to a stable and productive condition following mining
2. Provide for public safety
3. Protect long term land, water, air, and biological resources in the area
4. Provide funding and financial assurance guarantee the reclamation/closure will occur

The most recent version of the Plan was updated in 2020 and utilized the 2021 LOM Plan to estimate the schedule for post closure activities. The updated 2021 LOM Plan has forecasted production to 2036. Major closure and reclamation activities are assumed to begin the year following the cessation of production (2037) and last for approximately three years. Post-Closure activities primarily consist of long term water treatment and monitoring immediately following closure and extending for a period of 30 years.

As shown (updated November 2019), the total financial responsibility required is $108,219,855.

Reclamation and closure costs are generally categorized (broken down) as follows:

- Holding year (2034) = $5,864,383
- Reclamation Phase (2035 to 2037) = $54,929,942
- Long Term Care Phase (2038 to ?) = $47,425,530

The reclamation estimate is derived from the Standardized Reclamation Cost Estimator (SRCE) model, developed by SRK Consultants, and used at Greens Creek since 2011. The SRCE model uses a unit cost approach and categorizes direct cost estimates into seven elements, representing different property closure aspects. These seven elements are: 1) Earthwork/Contouring, 2) Revegetation/Stabilization, 3) Detoxification/Water Treatment/Disposal of Wastes, 4) Structure, Equipment, and Facility Removal, 5) Monitoring, 6) Construction Management and Support, and 7) Closure planning, G&A, Human Resources. The total reclamation cost is the sum of these seven elements (direct costs) plus the indirect costs (a percentage of the direct costs).

This number will be updated in 2024 or as part of the TDF permitting effort, whichever comes first. ARO legal obligations are updated regularly and based upon existing site conditions, current laws, regulations, and costs to perform the permitted activities. The ARO is to be conducted in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 410.

17.4 Social Governance

Greens Creek is a major economic and philanthropic pillar in Southeast Alaska. It is Juneau's largest taxpayer and largest private-sector employer. It helps support more than 50 non-profits in the Juneau area, including the Pathways to Mining program at the University of Alaska Southeast. Recently, Hecla Mining Company, through its Charitable Foundation, committed up to $125,000 in financial assistance to support community needs during the COVID-19 crisis.

Greens Creek looks for opportunities to work collaboratively with stakeholders to support activities that are of benefit to the communities in which the company operates.

SLR was not able to independently verify adequacy of management of social issues and though no specific adversarial issues were raised, it was relayed by staff that Greens Creek, in most cases, has a positive relationship with stakeholders.

Government, community relations representatives and staff from Greens Creek formally and informally engage with the community on an ongoing basis and serve as the face of the company. They sit on boards of community and business organizations at regional and local levels, participate in discussions with government officials, and act as a point of contact within the community. In doing so, they keep stakeholders apprised of critical issues to the operations, understand important topics in the community, and seek to listen to any questions or concerns. Greens Creek indicated that this strategy allows them to maintain an ongoing relationship with stakeholders and collaborate with communities to find solutions should any issues arise.

18.0 CAPITAL AND OPERATING COSTS

Hecla's forecasted capital and operating costs estimates are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would be classified as Class 1 with an accuracy range of -3% to -10% to +3% to +15%.

18.1 Capital Cost Estimates

Greens Creek has been in operation for decades hence there are no preproduction capital costs to consider. Capital costs over the LOM total $294.2 million and are summarized in Table 18-1.

Table 18-1: Capital Cost Summary
Hecla Mining Company - Greens Creek Mine

Item	Cost ($000)
Capitalized Mine Development	100,929
Capitalized Definition Drilling	36,411
Other Capital Expenditures	173,430
Capital Lease Financing	(16,553)
Total	**294,216**

Note:

1. Totals may not agree due to rounding.

18.1.1 Basis of Estimate

The mine sustaining capital is shown in Table 18-1. The mine development is carried out by HGCMC employees with no contractors currently included in the schedule to carry out sustaining mine development, drift rehabilitation work and other construction work. Contingency is added to the planned capital estimates. Contingency percentages typically applied range from 5% to 30% based on the characteristics of the underlying work program.

18.1.2 Mine Capital Costs

Capital development costs have been estimated based on the expected amount of development in each year and the anticipated costs of development. This is derived from past experience with updates to the cost based on projected changes in items that would affect costs. Total LOM mine development is estimated at $102 million.

Included within the mine capital cost estimate is provision for underground mine rehabilitation; these costs are primarily ground support and labor costs, which are estimated based on expected rehabilitation activities to be performed in specific years.

18.1.3 Capitalized Definition Drilling Costs

Capitalized drilling expenditures are estimated based on the anticipated amount of drilling in a specific year and an expected cost for the drilling program for each specific year. Total LOM capitalized drilling costs are projected to be $36.4 million.

18.1.4 Other Capital Costs

Process capital costs are estimated based on specific projects which are anticipated to be undertaken. In these cases, cost estimates are provided by project management, and long term capital is anticipated based on prior experience regarding the amount of sustaining capital which is expected for the plant to maintain anticipated production levels. The capital costs other than the mine sustaining development and definition diamond drilling are listed in Table 18-2.

Table 18-2: Other Capital Cost Summary
Hecla Mining Company - Greens Creek Mine

Item	Cost ($000)
Mine Mobile Equipment	56,277
Other Mine Equipment	6,537
Process Plant	14,685
Surface Infrastructure (Amortizable Assets)	51,636
Surface Infrastructure (Other)	25,560
Surface Mobile Equipment	15,865
Environmental	2,870
Total	**173,430**

Note:

1. Totals may not agree due to rounding.

Working capital costs, composed of accounts receivable, accounts payable, and product and supply inventories, are included in in the mine cash flow and net to zero over the LOM. Accounts receivable balances fluctuate based upon period-end sale amounts and the average duration of time between shipments and receipt of payment. Accounts payable vary over time based upon the average portion of a period's expenditures that are typically unpaid at the end of the period. Inventory values fluctuate based upon the estimated quantities of product produced and the average duration of time between production and sale of products. Depending on the assumptions in the LOM, the working capital variation at the end of the mine life can be positive or negative. In the case of the Greens Creek Mine, Hecla expects the end-of-life sums received from sales of the final concentrate parcels produced to be greater than the other working capital items, such that an estimated $18.0 million cash inflow is expected, which will result in working capital to draw down to zero.

18.2 Operating Cost Estimates

18.2.1 Operating Cost History

The operating costs for Greens Creek for the period 2016 to 2021 are summarized in Table 18-3.

Table 18-3: 2016 to 2021 Operating Cost Data
Hecla Mining Company – Greens Creek Mine

	Units	2016	2017	2018	2019	2020	2021
Production Costs							
Mining	$ millions	56.7	59.5	60.3	68.2	65.9	68.9
Mill	$ millions	26.1	27.2	28.3	31.3	30.6	29.6
Surface Operations	$ millions	18.0	18.8	19.7	22.5	20.0	20.5
Environmental	$ millions	2.5	2.4	2.9	2.7	2.8	2.7
Administration	$ millions	22.7	22.6	23.0	24.4	30.3	29.9
Total	**$ millions**	**125.9**	**130.5**	**134.3**	**149.1**	**149.6**	**151.5**
Cost per ton milled							
Mining	$/ton	69.48	70.86	71.37	80.57	80.58	81.79
Mill	$/ton	31.99	32.38	33.53	37.02	37.37	35.12
Surface Operations	$/ton	22.01	22.42	23.30	26.63	24.42	24.29
Environmental	$/ton	3.04	2.82	3.44	3.14	3.37	3.20
Administration	$/ton	27.88	26.98	27.18	28.82	37.02	35.52
Total	**$/ton**	**154.40**	**155.46**	**158.82**	**176.19**	**182.75**	**179.92**

18.2.2 Operating Cost Estimate

Operating costs over the LOM total $194.70/t milled and are summarized in Table 18-4.

Table 18-4: Operating Cost Summary
Hecla Mining Company – Greens Creek Mine

	Units	Total	2022	2023	2024	2025	2026 to 2035
Production Costs							
Mining	$ millions	1,035.1	74.1	73.7	73.1	72.9	741.4
Mill	$ millions	402.3	30.2	30.6	30.2	30.1	281.2
Surface Operations	$ millions	297.8	22.5	22.5	22.7	22.5	207.6
Environmental	$ millions	44.3	3.4	3.4	3.4	3.4	30.9
Administration	$ millions	376.5	28.3	28.4	28.6	28.5	262.6
Total	**$ millions**	**2,156.0**	**158.4**	**158.6**	**157.9**	**157.5**	**1,523.6**
Cost per ton milled							
Mining	$/ton	93.47	88.25	87.79	86.79	86.87	98.95
Mill	$/ton	36.33	35.95	36.49	35.92	35.82	36.66
Surface Operations	$/ton	26.90	26.75	26.86	26.92	26.87	26.94
Environmental	$/ton	4.00	4.00	4.00	3.99	4.00	4.00
Administration	$/ton	34.00	33.77	33.81	33.95	34.00	34.04
Total	**$/ton**	**194.70**	**188.71**	**188.94**	**187.58**	**187.56**	**200.60**

18.2.3 Basis of Estimate

Total LOM operating costs are anticipated to be $194.70/ton milled. The operating costs included in the LOM are derived from the 2021 actuals for the near term and adjusted for factors regarding expected cost changes in the later years. The budget is built using various cost inputs including operating experience, quotes from various service providers, anticipated personnel changes, and changes in production.

Diesel fuel was estimated at $2.50/gallon through the LOM; however, fluctuations in the price of diesel fuel will affect operating costs.

Power is both purchased from the local utility company at a rate of approximately $0.13/kWh and generated on site for an expected LOM rate of $0.50/kWh. The LOM plan estimates purchasing 769 million kWh of power from the locally utility and generating 132 million kWh on site.

18.2.4 Mine Operating Costs

Mining costs of $93.47/ton milled include both production mining and ore access development costs.

The LOM production mining cost per ton is anticipated to be $75.69/ton milled. These costs include expected direct costs for the ore mining process (drilling, blasting, mucking, hauling, backfill) such as labor, ground support, explosives, and diesel fuel.

In addition to the production mining costs, ore access development costs are anticipated to be $17.79/ton milled which accounts non-capitalized waste development necessary to access the ore.

Both costs also include indirect cost allocations for equipment and electrical maintenance, underground service crews and mine management and technical service costs.

18.2.5 Process Operating Costs

LOM milling cost per ton is anticipated to be $36.33/ton milled. These costs include labor, maintenance, reagents, grinding media, and electricity. Mill consumables and electricity were estimated based on an expected usage rate per ton milled; other costs such as labor were estimated as fixed costs.

18.2.6 Surface Operating Costs

Surface operation costs are estimated at $26.90/ton milled. These costs primarily consist of labor, surface maintenance costs, fuel, and power usage. Activities included in these costs include concentrate and tailings haulage, road maintenance, tailings placement, buildings maintenance, concentrate ship loading, freight haulage and water treatment operations.

18.2.7 Environmental Operating Costs

Environmental operating costs are estimated at $4.00/ton milled. These costs primarily consist of labor specific to the environmental department.

18.2.8 General and Administrative Operating Costs

G&A operating costs are estimated to be $34.00/ton milled over the LOM. These costs mainly consist of labor for accounting, human resources, purchasing, health and safety, management, various insurance costs, property taxes, communications, and IT services. In addition to these costs, G&A costs include costs for providing camp facilities and transportation services for the Greens Creek workforce.

18.2.9 Workforce Summary

The current Greens Creek manpower total 457 persons. The breakdown by department is shown in Table 18-5.

Table 18-4: Current Manpower
Hecla Mining Company – Greens Creek Mine

	Hourly FTE	Salary FTE	Total
Mine	155	21	176
Mill	49	6	55
Surface Operations	49	4	53
Environment	2	5	7
Maintenance	122	7	129
Administration	18	19	37
Total	**395**	**62**	**457**

The Greens Creek full time equivalent (FTE) manpower for 2020, 2021, and the LOM plan is summarized in Table 18-6.

Table 18-5: LOM Manpower Levels
Hecla Mining Company – Greens Creek Mine

	Hourly FTE	Salary FTE	Total
2020 Actual	375	61	436
2021 Actual	395	62	457
2022 - 2026	420	75	495

SLR notes that most of the workforce increase is planned in the mining department, and that an additional 30 mine department personnel are expected to be hired through 2022. The workforce increase will be critical to achieving the planned production increase and this represents some risk to the LOM plan, considering the skilled nature of the work and the worldwide demand for skilled personnel.

19.0 ECONOMIC ANALYSIS

19.1 Economic Criteria

An after-tax Cash Flow Projection has been generated from the LOM production schedule and capital and operating cost estimates and is summarized in Table 19-2. A summary of the key criteria is provided below.

19.1.1 Physicals

- Total mill feed processed: 11.1 Mst
- Average processing rate: 2,300 stpd with following production profile shown in Table 19-1.

Table 19-1: Production Summary
Hecla Mining Company – Greens Creek Mine

Commodity	Head Grade	% Recovery	Recovered Metal	Annual Production	Payable Metal
Gold	0.09 oz/ton	72.8	0.69 Moz	52,000 oz/year	0.58 Moz
Silver	11.3 oz/ton	76.5	95.7 Moz	7.3 Moz/year	85.6 Moz
Lead	2.5%	78.4	443 Mlb	34 Mlb/year	338 Mlb
Zinc	6.6%	86.1	1,250 Mlb	94 Mlb/year	865 Mlb

19.1.2 Revenue

- Metal prices used in the economic analysis are constant US$1,650/oz Au, US$21/oz Ag, US$0.95/lb Pb, and US$1.25/lb Zn.
- Revenue is calculated assuming the above metal price forecast and incorporates a $2.7 million hedge loss for lead and zinc over the first three years of cash flow.
- Average LOM concentrate freight cost: $57/wmt CIF to customer's discharge points.
- Average LOM treatment charge: $115/dmt silver concentrate, $173/dmt to $202/dmt zinc and precious metals concentrate.
- Average LOM refining costs for concentrates: $0.07/dmt.
- Average doré refining cost: $2.10/oz Au.

19.1.3 Capital and Operating Costs

- Mine life of 14 years
- LOM capital costs of $294.2 million
- LOM site operating cost of $194.70/ton milled
- LOM closure/reclamation $92.8 million, including $87.3 million for final reclamation in year after final production

19.1.4 Taxation and Royalties

Mining companies doing business in Alaska are primarily subject to U.S. corporate income tax, Alaska State income tax and Alaska Mining License tax. The State of Alaska levies a mining license tax on mining net income received in connection with mining properties and activities in Alaska, at a rate of $4,000 plus 7% over $100,000. The U.S. corporate income tax rate is 21% and the Alaska state income tax rate in 9.4%.

No income tax is anticipated to be payable over the LOM. Hecla plans to use a combination of existing and forecasted depreciation expenses, allocation of expenses from other entities within the consolidated tax group, percentage depletion allowance, and existing net operating losses to generate zero annual taxable income through LOM. However, the mine will still incur $35 million for AK state mining taxes during LOM.

The Property is subject to an 2.5% NSR royalty to a third party (Bristol Royalty) over approximately 11.2% of production.

19.2 Cash Flow Analysis

SLR has reviewed the Hecla's Greens Creek Reserves only model and has prepared its own unlevered after-tax LOM cash flow model based on the information contained in this TRS to confirm the physical and economic parameters of the mine.

The Greens Creek economics have been evaluated using the discounted cash flow method by considering annual processed tonnages and grade of ore. The associated process recovery, metal prices, operating costs, refining and transportation charges, and sustaining capital expenditures were also considered.

The annual cash flow, presented in Table 19-2 with no allowance for inflation, show a pre-tax and after-tax NPV, using a 5% discount rate, of $772 million and $747 million, respectively. The SLR QP is of the opinion that a 5% discount/hurdle rate for after-tax cash flow discounting of long lived precious/base metal operations in a politically stable region is reasonable and appropriate and commonly used. For this cash flow analysis, the internal rate of return (IRR) and payback are not applicable as there is no negative initial cash flow (no initial investment to be recovered) since Greens Creek has been in operation for a number of years.

Table 19-2: Life of Mine Indicative Economic Results
Hecla Mining Company – Greens Creek Mine

Project Timeline				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Commercial Production Timeline in Years				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Time Until Closure in Years		US$ & US Units	LOM Avg / Total	14	13	12	11	10	9	8	7	6	5	4	3	2	1	-1
Market Prices																		
Gold		US$/oz	$1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690	1,690
Silver		US$/oz	$21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Lead		US$/lb	$0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Zinc		US$/lb	$1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Physicals																		
Total Ore Processed		000t	11,078	360	360	362	360	360	360	362	360	360	360	362	360	360	355	-
Gold Grade, Processed		oz/ton	0.09	0.08	0.08	0.08	0.09	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	-
Silver Grade, Processed		oz/ton	11.3	11.9	11.6	11.6	11.3	11.6	11.6	11.1	11.1	10.6	10.9	11.5	11.5	11.2	10.7	-
Lead Grade, Processed		%	2.5	2.6	2.6	2.6	2.6	2.5	2.4	2.5	2.6	2.7	2.7	2.4	2.4	2.5	2.7	-
Zinc Grade, Processed		%	6.6	6.9	6.9	6.9	6.7	6.4	6.0	6.3	6.4	6.7	6.8	6.2	6.3	6.6	7.3	-
Contained Gold, Processed		000 oz	947	67	70	69	73	73	72	72	72	72	74	75	75	73	32	-
Contained Silver, Processed		000 oz	125,226	9,966	9,713	9,767	9,516	9,750	9,743	9,353	9,298	8,915	9,062	9,642	9,634	9,435	3,685	-
Contained Lead, Processed		000 ton	282	22	22	22	22	23	20	23	23	22	23	23	20	23	8	-
Contained Zinc, Processed		000 ton	726	58	58	58	56	54	51	53	54	56	57	58	58	55	21	-
Average Recovery, Gold		%	72.8%	74.2%	72.9%	71.0%	73.2%	71.8%	73.0%	72.9%	74.2%	73.2%	74.0%	74.6%	73.8%	73.4%	73.4%	-
Average Recovery, Silver		%	76.5%	78.6%	79.0%	78.5%	79.0%	78.2%	78.4%	76.4%	77.7%	74.0%	75.3%	74.3%	72.4%	70.5%	70.5%	-
Average Recovery, Lead		%	78.4%	79.0%	81.0%	80.7%	81.3%	79.3%	76.3%	78.0%	80.0%	79.4%	79.1%	74.5%	72.7%	74.3%	74.3%	-
Average Recovery, Zinc		%	86.2%	88.3%	88.2%	87.2%	87.5%	85.9%	85.0%	85.9%	87.0%	86.2%	86.9%	83.7%	82.9%	84.7%	84.7%	-
Recovered Gold		000 oz	800	50	51	49	53	52	53	52	54	52	54	56	55	52	9	-
Recovered Silver		000 oz	95,788	7,818	7,751	7,663	7,579	7,637	7,644	7,363	7,228	6,651	6,878	7,168	6,963	6,653	1,362	-
Recovered Lead		000 ton	222	18	18	18	17	17	18	17	17	18	18	15	15	15	3	-
Recovered Zinc		000 ton	625	51	51	50	49	46	42	45	47	48	50	48	48	47	9	-
Payable Gold		000 oz	575	42	42	40	45	43	45	44	45	43	45	47	46	43	7	-
Payable Silver		000 oz	85,911	7,041	6,970	6,873	6,817	6,868	6,889	6,618	6,496	5,984	6,183	6,431	6,237	5,917	1,088	-
Payable Lead		000 lb	393,156	26,916	27,305	27,416	26,704	25,712	24,248	25,637	26,212	27,200	27,343	22,884	22,088	23,168	4,629	-
Payable Zinc		000 lb	864,013	71,074	69,882	69,053	66,878	63,726	59,660	61,997	63,619	66,055	68,054	63,330	63,409	66,005	13,409	-
Cash Flow																		
Gold Gross Revenue	29%	$000s	953,107	68,680	69,335	66,781	73,609	71,076	74,068	72,323	74,027	70,599	74,873	77,351	76,647	71,476	11,767	-
Silver Gross Revenue	45%	$000s	1,804,143	147,895	146,389	144,331	143,158	144,224	144,674	134,779	138,416	124,630	125,758	135,047	130,971	124,257	23,701	-
Lead Gross Revenue	8%	$000s	323,249	25,573	26,424	26,111	25,445	24,426	23,034	24,355	24,901	25,928	25,981	21,740	20,988	22,008	4,398	-
Zinc Gross Revenue	28%	$000s	1,033,037	88,842	87,352	87,316	83,548	79,657	74,575	77,497	79,534	83,568	85,020	79,188	79,262	82,506	16,782	-
Pb and Zn hedge gain/(loss)		$000s	(2,667)	(3,013)	262	5,101	-	-	-	-	-	-	-	-	-	-	-	-
Gross Revenue Before By-Product Credits	**100.0%**	**$000s**	**4,156,886**	**322,547**	**330,213**	**325,640**	**325,960**	**319,384**	**316,351**	**308,954**	**314,867**	**304,700**	**312,412**	**310,776**	**305,196**	**300,096**	**56,628**	-
Gold Gross Revenue		$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver Gross Revenue		$000s	1,804,143	147,895	146,389	144,331	143,158	144,224	144,674	134,779	138,416	124,630	125,758	135,047	130,971	124,257	23,701	-
Lead Gross Revenue		$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc Gross Revenue		$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross Revenue After By-Product Credits		**$000s**	**1,804,143**	**147,895**	**146,389**	**144,331**	**143,158**	**144,224**	**144,674**	**134,779**	**138,416**	**124,630**	**125,758**	**135,047**	**130,971**	**124,257**	**23,701**	-
Mine Cost		$000s	(1,095,135)	(74,084)	(73,697)	(73,068)	(72,990)	(73,690)	(83,864)	(86,921)	(86,130)	(86,728)	(80,274)	(80,836)	(74,906)	(70,978)	(20,072)	-
Mill Cost		$000s	(402,327)	(30,177)	(30,636)	(30,240)	(30,072)	(29,903)	(30,730)	(30,838)	(30,664)	(30,679)	(30,628)	(30,641)	(30,569)	(30,579)	(5,990)	-
Surface Operations Cost		$000s	(297,888)	(22,455)	(22,547)	(22,665)	(22,554)	(22,478)	(22,618)	(22,682)	(22,607)	(22,809)	(22,602)	(22,654)	(22,594)	(22,595)	(4,382)	-
Environmental Cost		$000s	(44,297)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(5,999)	(634)	-
Administration Cost		$000s	(376,456)	(28,349)	(28,381)	(28,583)	(28,542)	(28,580)	(28,580)	(28,653)	(28,580)	(28,580)	(28,580)	(28,658)	(28,580)	(28,580)	(5,222)	-
Concentrate Freight Cost		$000s	(114,749)	(9,528)	(9,296)	(9,204)	(8,947)	(8,955)	(8,078)	(8,423)	(8,699)	(8,957)	(9,204)	(8,087)	(7,961)	(8,587)	(1,865)	-
TC/RC Cost		$000s	(423,538)	(34,923)	(34,573)	(34,173)	(33,493)	(32,540)	(31,397)	(31,524)	(32,267)	(32,096)	(32,041)	(30,995)	(30,459)	(31,042)	(5,990)	-
Ekhral Royalty		$000s	(10,133)	(783)	(803)	(803)	(794)	(780)	(778)	(754)	(768)	(799)	(757)	(762)	(748)	(734)	(132)	-
Subtotal Cash Costs Before By-Product Credits		**$000s**	**(2,709,480)**	**(269,455)**	**(269,296)**	**(262,035)**	**(260,605)**	**(199,884)**	**(209,870)**	**(218,370)**	**(211,614)**	**(212,727)**	**(209,487)**	**(206,068)**	**(195,836)**	**(196,254)**	**(49,866)**	-
By-Product Credits		$000s	2,352,705	175,082	169,844	165,309	182,402	175,159	171,677	174,175	178,451	180,090	186,674	175,730	174,345	176,839	32,927	-
Total Cash Costs After By-Product Credits		**$000s**	**(356,775)**	**(28,373)**	**(99,446)**	**(96,726)**	**(78,203)**	**(24,724)**	**(37,693)**	**(43,995)**	**(32,562)**	**(32,637)**	**(21,773)**	**(30,275)**	**(24,836)**	**(19,415)**	**(16,939)**	-
Operating Margin	35%	$000s	1,447,486	119,492	126,523	127,555	124,871	119,500	106,982	95,784	103,254	91,973	103,965	104,772	106,141	104,882	16,763	-

Project Timeline			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Commercial Production Timeline in Years			2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Time Until Closure in Years	US$ & US Units	LOM Avg / Total	14	13	12	11	10	9	8	7	6	5	4	3	2	1	-1
EBITDA	$000s	1,487,486	119,492	126,524	127,555	124,371	119,900	106,512	95,724	103,958	91,979	103,965	104,732	106,141	108,582	10,761	-
Depreciation/Amortization Allowance	$000s	(442,428)	(38,937)	(32,629)	(29,111)	(56,513)	(50,853)	(49,060)	(37,684)	(37,291)	(26,211)	(20,354)	(26,152)	(17,335)	(18,754)	(3,874)	-
Earnings Before Taxes	$000s	1,004,992	82,555	94,254	98,444	67,858	69,047	57,521	58,120	66,662	65,769	83,611	78,620	88,806	89,828	6,889	-
AK Mine License Tax	$000s	(35,085)	(2,873)	(3,279)	(3,423)	(2,374)	(2,392)	(2,017)	(2,024)	(2,328)	(2,291)	(2,916)	(2,741)	(3,086)	(3,003)	(228)	-
Income Tax Payable	$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Income	$000s	969,907	79,683	90,975	95,021	65,484	66,655	55,505	56,096	64,340	63,471	80,695	75,879	85,727	86,826	6,661	-
Non-Cash Add Back - Depreciation	$000s	442,428	38,937	32,629	29,111	56,513	50,853	49,060	37,684	37,291	26,211	20,354	26,152	17,335	18,754	3,874	-
Working Capital	$000s	-	(1,249)	(5,214)	(3,659)	1,118	(2,018)	(1,929)	(3,000)	(1,000)	(1,000)	(1,000)	(1,000)	-	-	-	17,953
Operating Cash Flow	$000s	1,412,331	115,371	120,390	120,472	123,615	115,090	103,636	90,780	100,631	88,682	100,049	101,031	103,062	105,579	10,535	17,953
Capital Spend	$000s	(294,230)	(30,542)	(28,062)	(25,691)	(34,469)	(34,978)	(29,609)	(30,905)	(28,001)	(9,966)	(5,890)	(3,242)	(2,006)	(2,058)	(520)	-
Closure/Reclamation Costs	$000s	(92,782)	(512)	(620)	(689)	(523)	(694)	(900)	(900)	(900)	(300)	(300)	(300)	(300)	(300)	(300)	(87,648)
Total Capital	$000s	(386,999)	(31,054)	(28,682)	(26,380)	(34,994)	(35,673)	(29,509)	(31,805)	(29,101)	(10,266)	(6,190)	(3,542)	(2,306)	(2,358)	(820)	(87,648)
Cash Flow Adj./Reimbursements	$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LOM Metrics																	
Economic Metrics																	
Discount Factors	EOP	5%	0.9524	0.9070	0.8638	0.8227	0.7835	0.7462	0.7107	0.6768	0.6446	0.6139	0.5847	0.5568	0.5303	0.5051	0.4810
a) Pre-Tax																	
Free Cash Flow	$000s	1,060,487	79,189	87,027	87,716	90,995	82,010	75,144	63,579	72,758	80,707	96,775	100,230	102,957	103,884	9,943	(69,692)
Cumulative Free Cash Flow	$000s		79,189	166,215	253,932	344,927	426,937	502,081	565,660	637,419	718,126	814,896	915,126	1,018,083	1,119,967	1,129,910	1,060,417
NPV @ 5%	$000s	771,996	75,418	78,988	75,775	74,862	67,257	56,078	44,784	49,319	52,025	59,412	56,609	57,160	55,081	5,022	(38,627)
Cumulative NPV	$000s		75,418	154,354	230,126	304,989	372,246	428,324	473,082	522,401	574,426	633,837	690,446	747,606	802,687	807,709	769,082
b) After-Tax																	
Free Cash Flow	$000s	1,025,333	76,317	83,765	84,288	88,621	79,618	73,127	59,556	71,630	78,436	93,860	97,439	99,859	98,881	9,615	(69,692)
Cumulative Free Cash Flow	$000s		76,317	160,065	244,353	332,975	412,592	485,719	545,275	616,705	695,121	788,981	886,420	986,328	1,085,209	1,094,825	1,025,333
NPV @ 5%	$000s	745,690	72,683	75,962	72,811	72,909	62,382	54,568	42,325	48,347	50,548	57,622	57,000	55,805	52,439	4,866	(38,627)
Cumulative NPV	$000s		72,683	148,645	221,456	294,365	356,748	411,316	453,641	502,988	553,536	611,157	667,157	722,962	775,401	780,267	741,640
Operating Metrics																	
Mine Life	Years	18															
Average Daily Processing Rate	t/d ore milled	2,801	2,882	2,882	2,888	2,882	2,882	2,882	2,888	2,882	2,882	2,882	2,888	2,882	2,882	2,882	-
Mine Cost	$/t ore milled	598.47	88.25	87.79	86.79	86.87	87.78	99.86	103.26	100.19	102.12	95.62	96.09	89.29	84.55	130.86	-
Mill Cost	$/t ore milled	598.35	55.95	58.49	59.92	59.82	59.62	58.80	58.85	58.55	58.56	58.48	58.40	58.43	58.45	58.92	-
Surface Operations Cost	$/t ore milled	526.90	26.75	26.80	26.92	26.87	26.77	26.94	26.94	26.93	26.93	26.92	26.91	26.91	26.91	27.27	-
Environmental Cost	$/t ore milled	14.00	4.00	4.00	3.99	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	-
Administration Cost	$/t ore milled	534.00	33.77	33.81	33.96	34.00	34.04	34.04	34.04	34.04	34.04	34.04	34.04	34.06	34.04	34.04	-
Total Site Operating Costs	$/t ore milled	$194.70	188.73	189.94	187.58	187.56	188.22	201.45	204.88	201.89	203.84	197.07	197.39	190.60	185.93	235.09	-

19.3 Sensitivity Analysis

The Project's after-tax cumulative cash flow discounted at five percent (NPV_5) from the model presented above were analyzed for sensitivity to variations in revenue, operating, and capital cost assumptions.

Positive and negative variations were applied independently to each of the following parameters:

- Metal grades
- Metal recoveries
- Metal prices
- Operating costs
- Capital costs

Table 19-3 shows the sensitivity cases analyzed, which are shown in the chart in Figure 19-1. Because of the Project's 30 year operating history, values for capital and operating costs, metals recoveries, and metal grades are well understood. Therefore, these parameters were flexed over a smaller range compared to metals prices, which are more volatile and were evaluated over a wider range of sensitivity.

Table 19-3: Sensitivity Analysis Summary
Hecla Mining Company – Greens Creek Mine

Variance From Base Case	Head Grade (oz/ton Ag)	NPV at 5% (US$ M)
0.90	10.2	493
0.95	10.7	620
1.00	**11.3**	**747**
1.05	11.9	873
1.10	12.4	992
Variance From Base Case	**Recovery (% Ag)**	**NPV at 5% (US$ M)**
0.90	68.8	493
0.95	72.6	620
1.00	**76.5**	**747**
1.05	80.3	873
1.10	84.1	992
Variance From Base Case	**Metal Prices (US$/oz Ag)**	**NPV at 5% (US$ M)**
0.80	16.80	155
0.90	18.90	454
1.00	**21.00**	**747**
1.10	23.10	1,029
1.20	25.20	1,313
Variance From Base Case	**Operating Costs (US$/t)**	**NPV at 5% (US$ M)**
0.90	175.23	901
0.95	184.96	824
1.00	**194.70**	**747**
1.08	209.30	631
1.15	223.90	515
Variance From Base Case	**Capital Costs (US$ M)**	**NPV at 5% (US$ M)**
0.90	348	775
0.95	368	761
1.00	**387**	**747**
1.08	416	725
1.15	445	704

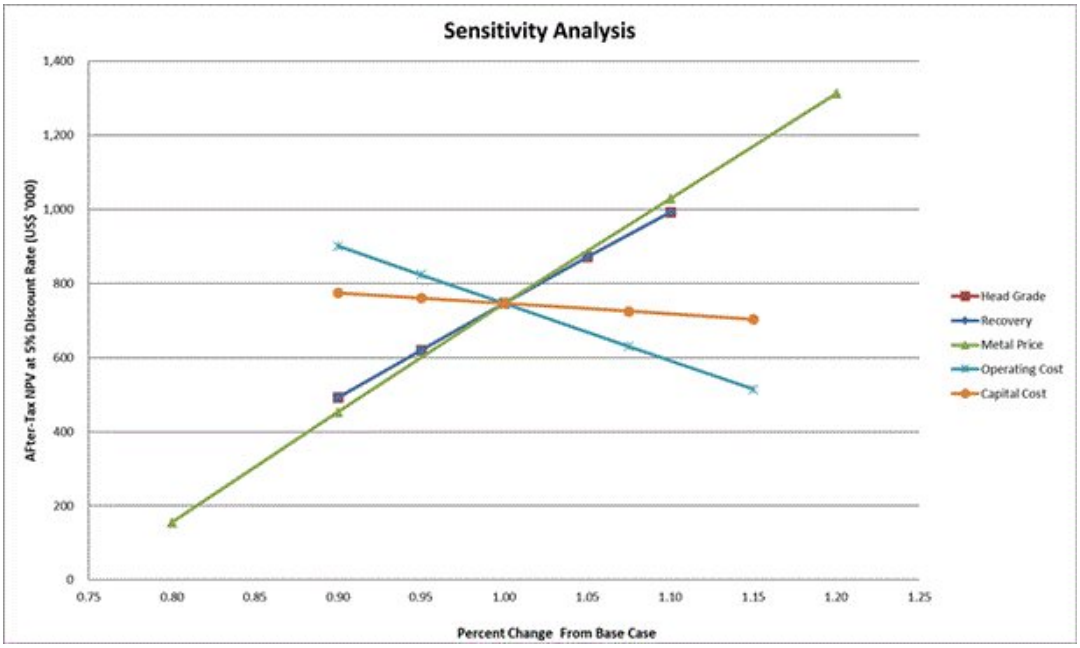


Figure 19-1: After-tax NPV at 5% Sensitivity Analysis

The results of the sensitivity analysis demonstrate that the Mineral Reserve estimates are most sensitive to variations in metals prices, less sensitive to changes in metals grades and recoveries, and least sensitive to fluctuations in operating and capital costs.

20.0 ADJACENT PROPERTIES

The SLR QP has not independently verified this information and this information is not necessarily indicative of the mineralization at the [Project Name].

21.0 OTHER RELEVANT DATA AND INFORMATION

Cautionary Note: *This Section 21 of the Greens Creek TRS contains information that is different than the Economic Analysis provided in Section 19 of the Greens Creek TRS. Section 19 was prepared in accordance with specific SEC rules which require that only Proven and Probable Mineral Reserves (LOM Plan) be used and disallow the inclusion of Inferred Mineral Resources in demonstrating the economic viability in support of a disclosure of a mineral reserve. See Item 1302(e)(6) of SEC Regulation S-K.*

The supplemental information in this Section 21 is not designed to replace the Economic Analysis disclosed in Section 19, but rather to provide additional, supplemental disclosure. This Section 21 supplements the disclosure contained in Section 19's Economic Analysis by inclusion of Inferred Mineral Resources as described below. You are cautioned not to rely on the economic analysis in this Section 21 instead of Section 19, as this supplemental information includes Inferred Mineral Resources that are not Mineral Reserves and do not have demonstrated economic viability. You should not assume that all or any part of Inferred Mineral Resources will ever be converted into Mineral Reserves. Further, Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined legally or economically, and are considered too speculative geologically to have modifying factors applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources may not be considered when assessing the economic viability of a mining project, and may not be converted to a Mineral Reserve. The percentage of the mineral resources used in the LTP cash flow analysis that was classified as Inferred Mineral Resources is approximately 15%.

Supplemental Information: The Company develops Long Term Plans (LTP) to support the strategic direction of its mines. The LTPs are updated annually by the technical teams using the most current geologic information, mine designs, processing parameters, cost and price inputs, regulatory considerations, and financial analyses. The plans include some Inferred resources when those resources, in the judgement of the technical team and based on historical performance, have a reasonable probability of contributing positively to the economic performance of the mines. As such, the valuation of the mines as determined by the Company in its LTP exceeds the valuation determined when only Reserves are analyzed. Experience has shown that the LTPs include in the order of 5% to 10% Inferred Mineral Resources.

An after-tax Cash Flow Projection has been generated from the LTP production schedule and capital and operating cost estimates, and is summarized in Table 21-1 along with the corresponding LOM plan (Mineral Reserves only presented in Section 19) metrics and the variances between the two plans.

Table 21-1: LTP versus LOM Plan
Hecla Mining Company – Greens Creek Mine

Parameter	Long Term Plan Years 1 to 3 (2022 to 2024)	Years 4 to 8 (2025 to 2029)	Remaining LRP (2030 to 2036)	Total LTP
Operations				
Ore Milled (000 ton)	2,500	4,200	6,000	12,700
Metal Produced (000 oz Ag)	23,200	37,200	49,800	110,200
Metal Produced (000 oz Ag)	100	300	400	800
Metal Produced (ton Pb)	53,400	83,900	119,900	257,200
Metal Produced (ton Zinc)	152,700	230,400	351,900	735,000
Financial (in millions)				
Revenue	900	1,400	2,000	4,300
Cost of Goods Sold	650	1,100	1,450	3,200
Gross Profit	250	300	550	1,100
Less: Income Tax	5	10	100	115
Net Income	245	290	450	985
Cash Flow (in millions)				
Net Income	245	290	450	985
Depreciation, Depletion, and Amortization (DDA)	150	300	250	700
Working Capital and other non-cash changes	10	25	10	45
Cash Flow from Operations	405	615	710	1,730
Less: Capital Expenditures	130	150	50	330
Net Cash Flow	275	465	660	1,400
NPV (0%)				1,400
NPV (5%)				1,000

Parameter	Life of Mine Plan Years 1 to 3 (2022 to 2024)	Years 4 to 8 (2025 to 2029)	Remaining RSV (2030 to 2036)	Total RSV
Operations				
Ore Milled (000 ton)	2,500	4,200	4,400	11,100
Metal Produced (000 oz Ag)	23,200	37,200	35,300	95,700
Metal Produced (000 oz Ag)	150	260	280	690
Metal Produced (ton Pb)	53,400	83,900	84,100	221,400
Metal Produced (ton Zinc)	152,700	230,400	242,000	625,100
Financial/Cash Flow (in millions)				
Net Income US$ M	266	309	395	970
Cash Flow from Operations US$M	356	533	523	1,412
Net Cash Flow US$M	244	372	409	1,025
NPV (0%) US$ M				1,025
NPV (5%) US$ M				747

Parameters	Variance (LTP versus LOM Plan) Years 1 to 3 (2022 to 2024)	Years 4 to 8 (2025 to 2029)	Remaining Life (2030 to 2036)	Total Variance
Operations				
Ore Milled (000 ton)	-	-	1,600	1,600
Metal Produced (000 oz Ag)	-	-	14,500	14,500
Metal Produced (000 oz Ag)	(50)	40	120	110
Metal Produced (ton Pb)	-	-	35,800	35,800
Metal Produced (ton Zinc)	-	-	109,900	109,900
Ore Milled	0%	0%	36%	14%
Silver Produced % Variance	0%	0%	41%	15%
Gold Produced % Variance	-33%	15%	43%	16%
Lead Produced % Variance	0%	0%	43%	16%
Zinc Produced % Variance	0%	0%	45%	18%
Net Income % Variance	-8%	-6%	14%	2%
Cash Flow from Operations % Variance	14%	15%	36%	22%
Net Cash Flow % Variance	13%	25%	62%	37%
NPV (0%) % Variance				37%
NPV (5%) % Variance				34%

As the operating cash flow and net cash flow metrics show the impact of the additional Inferred Mineral Resources in the LTP, the LTP's estimate of non-cash charges was based on Hecla book values, while the calculation of income taxes uses an estimate of non-cash charges related to income taxes. In the LOM plan the non-cash charges utilize a separate estimate methodology for income taxes payable calculations in Section 19. Furthermore, when combined with a more detailed income tax model in the LTP, the net effect of these changes is materially no change (2%) in net income compared to the LOM.

22.0 INTERPRETATION AND CONCLUSIONS

SLR offers the following conclusions by area.

22.1 Geology and Mineral Resources

- Exploration activities have been successful in identifying a number of additional massive sulfide lenses at depth beyond the initial mineralization discovered on surface. To date, economic mineralization has been located in nine deposits that are located in spatial proximity to a contact between footwall phyllitic rocks (interpreted as altered mafic volcanic and volcaniclastic rocks) and hanging wall clastic sedimentary units. Large portions of this favorable mine contact have not been fully evaluated by diamond drilling at depth.

- The understanding of the genetic aspects of the Greens Creek mineralization continues to evolve and improve as a result of the academic studies completed to date. The level of knowledge is likely to continue to improve with additional studies.

- The understanding of the complex folding and faulting history of the host rocks and massive sulfide mineralization also continues to improve with further studies and collection of additional drilling information.

- As prepared by Hecla, and reviewed and accepted by SLR, the Greens Creek Indicated Mineral Resources are estimated to total approximately 8.36 Mst at an average grade of approximately 12.8 oz/ton Ag, 0.10 oz/ton Au, 3.0% Pb, and 8.4% Zn. Inferred Mineral Resources are estimated at approximately 2.15 Mst at an average grade of approximately 12.8 oz/ton Ag, 0.08 oz/ton Au, 2.8% Pb, and 6.8% Zn. All Mineral Resources are effective as of December 31, 2021 and are stated exclusive of Mineral Reserves.

- Mineral Resources have been classified in accordance with S-K 1300 definitions for Mineral Resources.

- The geological data and procedures are adequate for the estimation of Mineral Resources and comply with industry standards.

- The “Reasonable Prospects for Economic Extraction” requirement for Mineral Resources as defined in S-K 1300 is satisfied by the application of polygons as reporting criteria for eight of the nine mineralized deposits such that:

    - All blocks >$215 NSR/ton immediately adjacent to the designed Mineral Reserve shapes were enclosed.

    - All blocks >$215 NSR/ton that may be separated from the designed Mineral Reserve shapes were enclosed if the blocks were observed to be continuous in 3D to contain a total of approximately 20,000 tons or more. Where these blocks were only a single block wide (five feet), they were not enclosed.

    - No blocks >$215 NSR/ton immediately adjacent to as-builts were enclosed unless those blocks were determined to be sufficiently continuous and wide enough to support a separate stope.

    - Once blocks were selected in the appropriate model, they were reported without any dilution from neighboring blocks with <$215 NSR/ton values.

- The "Reasonable Prospects for Economic Extraction" requirement for Mineral Resources as defined in S-K 1300 is satisfied for the Gallagher deposit by application of similar criteria, however, using an increased cut-off value of $220 NSR/ton.

22.2 Mining and Mineral Reserves

- Mineral Reserve estimates, as prepared by Hecla and reviewed and accepted by SLR, have been classified in accordance with S-K 1300 definitions for Mineral Reserves. Mineral Reserves as of December 31, 2021 total 11.08 Mst grading 11.3 oz/ton Ag, 0.085 oz/ton Au, 2.6% Pb, and 6.5% Zn and containing 125.2 Moz Ag, 0.946 Moz Au, 282,000 tons Pb and 726,000 tons Zn at an NSR cut-off value of $215 NSR/ton.

- The Mineral Reserves are divided into nine separate zones, each constituting between 3% and 27% of total Mineral Reserve tons. The largest zone is 200S followed by South-West.

- Mineral Reserves are estimated by qualified professionals using modern mine planning software in a manner consistent with industry best practices.

- SLR verified that Hecla's selected metal prices for estimating Mineral Reserves are consistent with independent forecasts from banks and other lenders.

- Mineral Reserve estimates do not include Inferred material which historically have constituted a large portion of ore mined at Greens Creek.

- Greens Creek is a well established mine with many years of operating experience, providing the necessary expertise to extract, safely and economically, the Mineral Reserves.

- Mining at Greens Creek primarily utilizes cut and fill, and drift and fill techniques, supplemented by longhole stoping where orebody geometry permits. The mining methods used are appropriate to the deposit style and employ conventional mining tools and mechanization. All areas are backfilled with either paste or rock fill depending on future confinement and strength requirements.

- Stopes are designed to a minimum mining width governed by mining equipment. Two dilution factors are applied to all mining shapes; 6% to account for overbreak into surrounding rock, and 6% to account for overbreak into adjacent backfill. Background metal grades for waste and tailings are applied, respectively.

- Extraction for all mining methods is assumed to be 100% based on operating experience.

- Greens Creek tends to mine a significant amount of material outside of the Mineral Reserves each year. This is typically Inferred Resources at the margins of Mineral Reserves, and additional reserve grade material not previously identified by the definition diamond drilling program.

- The equipment and infrastructure requirements for LOM operations are well understood. Conventional underground mining equipment is used to support the underground mining activities.

- The underground equipment fleet is standard to the industry and has been proven on site. Numerous crucial units have recently been replaced or overhauled as part of the mobile equipment rebuild/replacement schedule.

- The predicted mine life to 2035 is achievable based on the projected Mineral Reserves estimated. SLR is of the opinion however, that maintaining the planned production rate is optimistic and will be particularly difficult as the number of active mining areas drops toward the end of the LOM.

22.3 Mineral Processing

- The plant is a conventional but complex semi-autogenous grinding (SAG) mill-ball mill grinding and flotation concentrator producing silver, zinc and precious metals (PM) flotation concentrates and gold concentrate using gravity spiral concentrators. The plant is compact and efficient, using particle size monitoring and on-stream analysis for grinding and flotation process control.

- The target grind size for rougher flotation is P_{80} 70 µm to 85 µm and P_{95} 140 µm to 160 µm. A particle size monitor is used to monitor cyclone overflow on a continuous basis.

- A gravity circuit comprising three stages of gravity spiral concentrators treats part of the grinding circuit cyclone underflow producing a precious metals concentrate that is shipped off site for intensive leaching, electrowinning, and doré casting. The gravity concentrates typically recover 15% to 20% of the gold in the mill feed and less than 1% of the silver.

- Naturally floating carbonaceous material is removed from the flotation feed using column flotation cells, improving the performance of the lead flotation cells.

- The first stage of both lead and zinc rougher flotation uses column flotation cells. The concentrate from the lead rougher column is final concentrate and flows directly to the concentrate thickeners. Zinc column concentrates may also be of final concentrate grade and can be pumped to the concentrate thickener.

- The lead and zinc rougher concentrates are reground to P_{80} 20 µm (98% passing 38 µm) using Metso Outotec Vertimills prior to cleaning. A unit flotation cell is installed in the lead Vertimill regrinding circuit circulating load to recover galena, gold and silver from the lead regrind cyclone underflow and to reduce overgrinding. The unit cell concentrates flow by gravity to the silver concentrate thickener.

- Lead and zinc roughing and cleaning circuits are similar using conventional mechanical cells.

- The PM flotation circuit treats the lead and zinc circuit cleaner tailings. The lead cleaner tailings feeds a lead PM rougher and cleaner circuit followed by Woodgrove swing cells before joining the zinc cleaner tailings in the PM rougher column cell feeding the PM flotation circuit.

- Flotation circuit performance is monitored by on-stream analysis of eighteen flotation circuit streams for lead, zinc, copper, silver, iron, and percent solids every 15 minutes using an on-stream analyzer. Mass flow is calculated on each concentrate stream providing an estimated concentrate mass yield for each concentrate.

- On-stream assays for all streams are used with feed tonnage and concentrate mass flow estimates to determine an estimated on-line mass balance. Daily composites of on-stream analysis samples are collected and assayed to monitor and correct OSA calibration.

- The Greens Creek metallurgical department provides flotation grade targets to the operators, which then adjust rougher and cleaner mass yields by manual control of reagent addition.

- Reagents are pumped from the reagent mixing and storage area to head tanks at appropriate locations in the flotation circuit. The head tanks are equipped with computerized solenoid discharge valves for gravity addition of flotation reagents. Flocculants are added by positive displacement pumps and CO_2 is added using customized mixing systems to inject CO_2 into a water stream.

- Tailings filtration is a very important operation at Greens Creek. All filter presses are equipped for diaphragm pressing and cake blowing using regular plant air and are mounted on four load cells to determine cake weight, monitor the degree of slurry filling, degree of completion of diaphragm press and air blow cycles, completeness of cake discharge, and the weight of cake produced on each cycle.

- Tailings filtration is a potential limiting operation in the plant. Tailings filtration is carried out in presses of similar design, with each press yielding four tons to 4.5 tons of filter cake at 11% to 12% moisture every seven to eight minutes. Tailings are sent to the surface batch plant to satisfy the mine's backfilling requirements. Excess tailings filter cake is trucked to the dry stack TDF for placement and compaction according to an engineered design.

- Mill production, ore grades and recoveries are consistent for both the five year and 10 year LOM plan. The average annual production for the period is 950,000 tons of ore with total lead, zinc, silver and gold recoveries of 81%, 89%, 80%, and 69%, respectively. The plant is projected to produce approximately 12 Moz Ag and 83,000 oz Au per year, with most of the precious metals reporting to the silver concentrate, and 18% of the gold reporting to the gravity concentrate. The primary grades of the silver, zinc, and PM concentrates are 27.5% Pb, 47.5% Zn, and 25% Zn, respectively.

22.4 Infrastructure

- Greens Creek has the appropriate infrastructure to support the current LOM plan to 2032.

- Modifications to the plan of operations and engineering are necessary to optimize the waste storage capacity at Site 23.

- Early-stage engineering studies are in progress to determine modifications to the plan of operations to accommodate additional material beyond the current Greens Creek Mineral Reserve life.

- Engineering studies to gain an understanding of options for final disposal of historic waste rock piles, include the potential for impoundment in the TDF or underground disposal.

22.5 Environment

- Hecla maintains a comprehensive environmental management and compliance program. All permits required for the current Greens Creek operations are in place, and mine staff continually monitor permits/regulated conditions and file required reports with the applicable regulatory agencies at the federal, state, and local level.

- Greens Creek represents one of the longest concurrent environmental baseline databases available used in assessing compliance and impact.

- Hecla's EMS follows a 13 element plan-do-check-act approach that ensures continuous improvement around issues including obligation registers, management of change, air quality, water and waste management, energy management, training, and reporting. This system promotes a culture of environmental awareness and innovation throughout the company. The EMS program is benchmarked against ISO-14001 and complements Canada's TSM program. On a related matter, there appears to be good cross-discipline support for the overall environmental program.

- Hecla has sufficiently addressed the environmental impact of the operation, and subsequent closure and remediation. No Notice(s) of Violation were reported during 2021 and Hecla works cooperatively with federal, state, and local agencies regarding permitting, regulatory oversite, and inspections.

- Hecla has developed a reclamation/closure plan to meet internal Hecla and regulatory requirements. The most recent cost estimates to perform this work is $108.2 million (November 2021 ARO). Financial Assurance instruments are in place to ensure closure commitments are guaranteed should Hecla be unable to perform its obligations.

- Hecla reports that community relationships are good, and that it maintains open communication with the public for the purpose of providing information to interested residents and visitors.

23.0 RECOMMENDATIONS

SLR offers the following recommendations by area.

23.1 Geology and Mineral Resources

1. For future Mineral Resource updates apply a metal price deck to the creation of mineralization wireframes that aligns with the prices used to prepare the Mineral Resource statements.

2. Evaluate the impact of treating any unsampled intervals for the non-payable metals (such as barium, calcium, and iron) as null values upon the calculation of the block density values.

23.2 Mining and Mineral Reserves

1. Use a single set of metal prices for Mineral Reserve reporting and LOM planning to maintain cut-off grade consistency.

2. Update backfill metal grades in future LOM plans to reflect expected tailings grades.

3. Evaluate actual extraction (recovery) from longhole stoping areas and consider applying a modifying factor if appropriate.

4. Treat waste material and Inferred material in a similar manner with respect to metal grade assignment.

5. Continue to investigate the resource model accuracy through reconciliation analysis and strive to improve lead and zinc grade estimates.

6. Continue to identify production areas suitable for longhole mining in the LOM plan to take advantage of the production efficiencies gained through bulk mining.

7. Create an LRP with Inferred material removed. Stoping areas and supporting development should be designed to maximize the recovery of Mineral Reserves. These designs can be augmented with additional designs that target the recovery of Inferred material and used to develop a LRP that can be used as a comparison against the LOM plan. SLR is of the opinion that following this methodology will:

    - Result in a more robust LOM plan that is more likely to be achieved.

    - Allow for more accurate reporting of Mineral Reserve grades and tons, and production and development costs.

23.3 Mineral Processing

1. Maintain continuous communication between the plant and the mine to understand the feed materials being delivered to the blending stockpiles at the plant.

2. Prioritize plans to upgrade or replace the existing automated tailings filters. Tailings filtration is a limiting operation in the plant and achieving the throughput rates and cake moistures is dependent on operations and maintenance of the filtration equipment and the material types being processed.

23.4 Environment

1. Track and participate in the development of new environmental and mine permitting regulations that could impact operations.
2. Continue to perform internal and external audits of environmental compliance.
3. Evaluate opportunities for concurrent reclamation to minimize financial obligations at closure.
4. Continue to update reclamation and closure cost estimates on a regular basis.

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25.0 RELIANCE ON INFORMATION PROVIDED BY THE REGISTRANT

This TRS has been prepared by SLR for Hecla. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this TRS.
- Assumptions, conditions, and qualifications as set forth in this TRS.
- Data, reports, and other information supplied by Hecla and other third party sources.

For the purpose of this TRS, SLR has relied on ownership information provided by Hecla and verified by the Senior Property and Contract Coordinator. SLR has not researched property title or mineral rights for Hecla as we consider it reasonable to rely on Hecla's Land Administration personnel who are responsible for maintaining this information.

SLR has relied on Hecla for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from Greens Creek in the Executive Summary and Section 19. As Greens Creek has been in operation for over ten years, Hecla has considerable experience in this area.

The Qualified Persons have taken all appropriate steps, in their professional opinion, to ensure that the above information from Hecla is sound.

Except for the purposes legislated under provincial securities laws, any use of this TRS by any third party is at that party's sole risk.

26.0 DATE AND SIGNATURE PAGE

This report titled “Technical Report Summary on the Greens Creek Mine, Alaska, USA” with an effective date of December 31, 2021 was prepared and signed by:

Signed *SLR International Corporation.*

Dated at Lakewood, CO
February 21, 2022

SLR International Corporation

27.0 APPENDIX 1

27.1 Claims List

A detailed description of the unpatented lode claims and the unpatented mill site claims that form part of the Greens Creek land holdings are presented in Table A1 and Table A2, respectively.

Table A1: Summary of the Unpatented Lode Claims

Hecla Mining Company – Greens Creek Mine

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
	BIG SORE GROUP		
Big Sore 1321	125	423	AA 25819
Big Sore 1322	126	236	AA 25820
Big Sore 1323	126	237	AA 25821
Big Sore 1324	126	238	AA 25822
Big Sore 1421	126	239	AA 25845
Big Sore 1422	126	240	AA 25846
Big Sore 1423	126	241	AA 25847
Big Sore 1424	126	242	AA 25848
Big Sore 1521	125	437	AA 25867
Big Sore 1522	125	438	AA 25868
Big Sore 1523	125	439	AA 25869
Big Sore 1524	125	440	AA 25870
Big Sore 1623	125	448	AA 25888
Big Sore 1624	125	449	AA 25889
Big Sore 1625	125	450	AA 25890
Big Sore 1626	125	451	AA 25891
Big Sore 1627	125	452	AA 25892
Big Sore 1723	125	459	AA 25909
Big Sore 1724	125	460	AA 25910
Big Sore 1725	125	461	AA 25911
Big Sore 1726	125	462	AA 25912
Big Sore 1727	125	463	AA 25913
Big Sore 1728	125	464	AA 25914
Big Sore 1824	125	479	AA 25929

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska Book	Page	BLM Serial Number
Big Sore 1825	125	480	AA 25930
Big Sore 1826	125	481	AA 25931
Big Sore 1827	125	482	AA 25932
	MARIPOSITE GROUP		
Mariposite 1	254	238	AA 55244
Mariposite 2	254	239	AA 55245
Mariposite 3	254	240	AA 55246
Mariposite 4	254	241	AA 55247
Mariposite 5	254	242	AA 55248
Mariposite 6	279	233	AA 55249
Mariposite 7	279	234	AA 55250
Mariposite 8	251	962	AA 55251
Mariposite 9	251	963	AA 55252
Mariposite 10	251	964	AA 55253
Mariposite 11	279	235	AA 55254
Mariposite 12	279	236	AA 55255
Mariposite 13	279	237	AA 55256
Mariposite 14	279	238	AA 55257
Mariposite 15	251	969	AA 55258
Mariposite 16	254	245	AA 55259
Mariposite 17	254	246	AA 55260
Mariposite 18	254	247	AA 55261
Mariposite 19	254	248	AA 55262
Mariposite 20	254	249	AA 55263
Mariposite 21	254	250	AA 55264
Mariposite 22	251	976	AA 55265
Mariposite 23	251	977	AA 55266
Mariposite 24	251	978	AA 55267
Mariposite 25	279	239	AA 55268
Mariposite 26	279	240	AA 55269
Mariposite 27	279	241	AA 55270
Mariposite 28	279	242	AA 55271

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
Mariposite 29	279	243	AA 55272
Mariposite 30	279	244	AA 55273
Mariposite 31	279	245	AA 55274
Mariposite 32	279	246	AA 55275
Mariposite 33	279	247	AA 55276
Mariposite 34	254	256	AA 55277
Mariposite 35	254	257	AA 55278
Mariposite 36	279	248	AA 55279
Mariposite 37	279	249	AA 55280
Mariposite 38	251	992	AA 55281
Mariposite 39	251	993	AA 55282
Mariposite 40	251	994	AA 55283
Mariposite 41	251	995	AA 55284
Mariposite 42	251	996	AA 55285
Mariposite 43	251	997	AA 55286
Mariposite 44	251	998	AA 55287
Mariposite 45	251	999	AA 55288
Mariposite 46	252	1	AA 55289
Mariposite 47	252	2	AA 55290
Mariposite 48	252	3	AA 55291
Mariposite 49	252	4	AA 55292
Mariposite 50	254	258	AA 55293
Mariposite 51	254	259	AA 55294
Mariposite 52	254	260	AA 55295
Mariposite 53	254	261	AA 55296
Mariposite 54	254	262	AA 55297
Mariposite 55	254	263	AA 55298
Mariposite 56	254	264	AA 55299
Mariposite 57	254	265	AA 55300
Mariposite 58	254	266	AA 55301
Mariposite 59	254	267	AA 55302
Mariposite 60	254	268	AA 55303

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
Mariposite 61	252	16	AA 55304
Mariposite 62	252	17	AA 55305
Mariposite 63	252	18	AA 55306
Mariposite 64	252	19	AA 55307
Mariposite 65	252	20	AA 55308
Mariposite 66	252	21	AA 55309
Mariposite 67	254	269	AA 55310
Mariposite 68	254	270	AA 55311
Mariposite 69	254	271	AA 55312
Mariposite 70	254	272	AA 55313
Mariposite 71	252	26	AA 55314
Mariposite 72	252	27	AA 55315
Mariposite 73	254	273	AA 55316
Mariposite 74	254	274	AA 55317
Mariposite 75	254	275	AA 55318
Mariposite 76	254	276	AA 55319
Mariposite 77	252	32	AA 55320
Mariposite 79	254	278	AA 55322
Mariposite 80	254	279	AA 55323
Mariposite 81	252	36	AA 55324
Mariposite 82	254	280	AA 55325
Mariposite 83	254	281	AA 55326
Mariposite 84	254	282	AA 55327
Mariposite 85	254	283	AA 55328
Mariposite 86	254	284	AA 55329
Mariposite 87	292	664	AA 63033
Mariposite 100	320	601	AA 71489
Mariposite 101	320	602	AA 71490
Mariposite 102	320	603	AA 71491
Mariposite 103	320	604	AA 71492
Mariposite 104	320	605	AA 71493
Mariposite 105	320	606	AA 71494

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
Mariposite 106	320	607	AA 71495
Mariposite 107	320	608	AA 71496
Mariposite 108	320	609	AA 71497
Mariposite 109	320	610	AA 71498
Mariposite 110	320	611	AA 71499
Mariposite 111	320	612	AA 71500
Mariposite 112	320	613	AA 71501
Mariposite 113	320	614	AA 71502
Mariposite 114	320	615	AA 71503
	FOWLER GROUP		
Fowler 543	262	546	AA 57281
Fowler 544	262	548	AA 57282
Fowler 545	262	549	AA 57283
Fowler 546	262	550	AA 57284
Fowler 547	262	551	AA 57285
Fowler 548	262	552	AA 57286
Fowler 549	262	553	AA 57287
Fowler 550	262	554	AA 57288
Fowler 551	262	555	AA 57289
Fowler 552	262	556	AA 57290
Fowler 553	262	557	AA 57291
Fowler 554	262	558	AA 57292
Fowler 555	262	559	AA 57293
Fowler 556	262	560	AA 57294
Fowler 557	262	561	AA 57295
Fowler 558	262	562	AA 57296
Fowler 643	262	563	AA 57297
Fowler 644	262	564	AA 57298
Fowler 645	262	565	AA 57299
Fowler 646	262	566	AA 57300
Fowler 647	262	567	AA 57301
Fowler 648	262	568	AA 57302

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
Fowler 649	262	569	AA 57303
Fowler 650	262	570	AA 57304
Fowler 651	262	571	AA 57305
Fowler 652	262	572	AA 57306
Fowler 653	262	573	AA 57307
Fowler 654	262	574	AA 57308
Fowler 655	262	575	AA 57309
Fowler 656	262	576	AA 57310
Fowler 657	262	577	AA 57311
Fowler 658	262	578	AA 57312
Fowler 743	262	579	AA 57313
Fowler 744	262	580	AA 57314
Fowler 745	262	581	AA 57315
Fowler 746	262	582	AA 57316
Fowler 747	262	583	AA 57317
Fowler 748	262	584	AA 57318
Fowler 749	262	585	AA 57319
Fowler 750	262	586	AA 57320
Fowler 751	262	587	AA 57321
Fowler 752	262	588	AA 57322
Fowler 753	262	589	AA 57323
Fowler 754	262	590	AA 57324
Fowler 755	262	591	AA 57325
Fowler 756	262	592	AA 57326
Fowler 757	262	593	AA 57327
Fowler 758	262	594	AA 57328
Fowler 843	262	595	AA 57329
Fowler 844	262	596	AA 57330
Fowler 845	262	597	AA 57331
Fowler 846	262	598	AA 57332
Fowler 847	262	599	AA 57333
Fowler 848	262	600	AA 57334

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
Fowler 849	262	601	AA 57335
Fowler 850	262	602	AA 57336
Fowler 851	262	603	AA 57337
Fowler 852	262	604	AA 57338
Fowler 853	262	605	AA 57339
Fowler 854	262	606	AA 57340
Fowler 855	262	607	AA 57341
Fowler 856	262	608	AA 57342
Fowler 857	262	609	AA 57343
Fowler 858	262	610	AA 57344
Fowler 943	262	611	AA 57345
Fowler 944	262	612	AA 57346
Fowler 945	262	613	AA 57347
Fowler 946	262	614	AA 57348
Fowler 947	262	615	AA 57349
Fowler 948	262	616	AA 57350
Fowler 949	262	617	AA 57351
Fowler 950	262	618	AA 57352
Fowler 951	262	619	AA 57353
Fowler 952	262	620	AA 57354
Fowler 953	262	621	AA 57355
Fowler 954	262	622	AA 57356
Fowler 955	262	623	AA 57357
Fowler 956	262	624	AA 57358
Fowler 957	262	625	AA 57359
Fowler 958	262	626	AA 57360
Fowler 1043	262	627	AA 57361
Fowler 1044	262	628	AA 57362
Fowler 1045	262	629	AA 57363
Fowler 1046	262	630	AA 57364
Fowler 1047	262	631	AA 57365
Fowler 1143	262	632	AA 57366

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
Fowler 1144	262	633	AA 57367
Fowler 1145	262	634	AA 57368
Fowler 1146	262	635	AA 57369
Fowler 1147	262	636	AA 57370
	LIL SORE GROUP		
Lil Sore 41	443	333-335	AA 78220
Lil Sore 42	443	336-338	AA 78221
Lil Sore 43	443	339-341	AA 78222
Lil Sore 44	443	342-344	AA 78223
Lil Sore 45	443	345-347	AA 78224
Lil Sore 46	443	378-350	AA 78225
Lil Sore 47	443	351-353	AA 78226
Lil Sore 48	443	354-356	AA 78227
EAST FOWLER GROUP			
East Fowler 538	443	357-359	AA 78228
East Fowler 539	443	360-362	AA 78229
East Fowler 540	443	363-365	AA 78230
East Fowler 541	443	366-368	AA 78231
East Fowler 542	443	369-371	AA 78232
East Fowler 641	443	372-374	AA 78233
East Fowler 642	443	375-377	AA 78234
East Fowler 741	443	378-380	AA 78235
East Fowler 742	443	381-383	AA 78236
East Fowler 841	443	384-386	AA 78237
East Fowler 842	443	387-389	AA 78238
East Fowler 941	443	390-392	AA 78239
East Fowler 942	443	393-395	AA 78240
East Fowler 1042	443	396-398	AA 78241
	WEST MARIPOSITE GROUP		
West Mariposite 115	443	162-164	AA 78242
West Mariposite 116	443	165-167	AA 78243
West Mariposite 117	443	168-170	AA 78244

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
West Mariposite 118	443	171-173	AA 78245
West Mariposite 119	443	174-176	AA 78246
West Mariposite 120	443	177-179	AA 78247
West Mariposite 121	443	180-182	AA 78248
West Mariposite 122	443	183-185	AA 78249
West Mariposite 123	443	186-188	AA 78250
West Mariposite 128	443	201-203	AA 78255
West Mariposite 129	443	204-206	AA 78256
West Mariposite 130	443	207-209	AA 78257
West Mariposite 131	443	210-212	AA 78258
West Mariposite 132	443	213-215	AA 78259
West Mariposite 133	443	216-218	AA 78260
West Mariposite 134	443	219-221	AA 78261
West Mariposite 135	443	222-224	AA 78262
West Mariposite 136	443	225-227	AA 78263
West Mariposite 137	443	228-230	AA 78264
West Mariposite 138	443	231-233	AA 78265
West Mariposite 139	443	234-236	AA 78266
West Mariposite 140	443	237-239	AA 78267
West Mariposite 141	443	240-242	AA 78268
West Mariposite 142	443	243-245	AA 78269
West Mariposite 143	443	246-248	AA 78270
West Mariposite 144	443	249-251	AA 78271
West Mariposite 145	443	252-254	AA 78272
West Mariposite 146	443	255-257	AA 78273
West Mariposite 147	443	258-260	AA 78274
West Mariposite 148	443	261-263	AA 78275
West Mariposite 149	443	264-266	AA 78276
West Mariposite 150	443	267-269	AA 78277
West Mariposite 151	443	270-272	AA 78278
West Mariposite 152	443	273-275	AA 78279
West Mariposite 153	443	276-278	AA 78280

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
West Mariposite 154	443	279-281	AA 78281
West Mariposite 155	443	282-284	AA 78282
West Mariposite 156	443	285-287	AA 78283
West Mariposite 159	443	294-296	AA 78286
West Mariposite 160	443	297-299	AA 78287
West Mariposite 161	443	300-302	AA 78288
West Mariposite 162	443	303-305	AA 78289
West Mariposite 163	443	306-308	AA 78290
West Mariposite 164	443	309-311	AA 78291
West Mariposite 165	443	312-314	AA 78292
West Mariposite 168	443	321-323	AA 78295
West Mariposite 169	443	324-326	AA 78296
West Mariposite 170	443	327-329	AA 78297
West Mariposite 171	443	330-332	AA 78298
WEST FOWLER GROUP			
West Fowler 559	443	399-401	AA 78299
West Fowler 560	443	402-404	AA 78300
West Fowler 561	443	405-407	AA 78301
West Fowler 659	443	411-413	AA 78303
West Fowler 660	443	414-416	AA 78304
West Fowler 661	443	417-419	AA 78305
West Fowler 662	443	420-422	AA 78306
West Fowler 663	443	423-425	AA 78307
West Fowler 664	443	426-428	AA 78308
West Fowler 759	443	429-431	AA 78309
West Fowler 760	443	432-434	AA 78310
West Fowler 761	443	435-437	AA 78311
West Fowler 762	443	438-440	AA 78312
West Fowler 763	443	444-446	AA 78313
West Fowler 764	443	447-449	AA 78314
West Fowler 765	443	450-452	AA 78315
West Fowler 766	443	453-455	AA 78316

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
West Fowler 767	443	456-458	AA 78317
West Fowler 859	443	462-464	AA 78319
West Fowler 860	443	465-467	AA 78320
West Fowler 861	443	468-470	AA 78321
West Fowler 862	443	471-473	AA 78322
West Fowler 863	443	474-476	AA 78323
West Fowler 864	443	477-479	AA 78324
West Fowler 865	443	480-482	AA 78325
West Fowler 959	443	492-494	AA 78329
West Fowler 960	443	495-497	AA 78330
West Fowler 961	443	498-500	AA 78331
West Fowler 962	443	501-503	AA 78332
West Fowler 963	443	504-506	AA 78333
West Fowler 964	443	507-509	AA 78334
West Fowler 965	443	510-512	AA 78335
West Fowler 966	443	513-515	AA 78336
NORTH FOWLER GROUP			
North Fowler 41	442	882-884	AA 78341
North Fowler 141	442	885-887	AA 78342
North Fowler 142	442	888-890	AA 78343
North Fowler 143	442	891-893	AA 78344
North Fowler 144	442	894-896	AA 78345
North Fowler 226	442	912-914	AA 78351
North Fowler 227	442	915-917	AA 78352
North Fowler 228	442	918-920	AA 78353
North Fowler 229	442	921-923	AA 78354
North Fowler 230	442	924-926	AA 78355
North Fowler 231	442	927-929	AA 78356
North Fowler 232	442	930-932	AA 78357
North Fowler 233	442	933-935	AA 78358
North Fowler 234	442	936-938	AA 78359
North Fowler 235	442	939-941	AA 78360

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
North Fowler 236	442	942-944	AA 78361
North Fowler 237	442	945-947	AA 78362
North Fowler 238	442	948-950	AA 78363
North Fowler 239	442	951-953	AA 78364
North Fowler 240	442	954-956	AA 78365
North Fowler 241	442	957-959	AA 78366
North Fowler 242	442	960-962	AA 78367
North Fowler 243	442	963-965	AA 78368
North Fowler 244	442	966-968	AA 78369
North Fowler 245	442	969-971	AA 78370
North Fowler 246	442	972-974	AA 78371
North Fowler 336	442	990-992	AA 78377
North Fowler 337	442	993-995	AA 78378
North Fowler 338	442	996-998	AA 78379
North Fowler 339	0442/0443	999/001-002	AA 78380
North Fowler 340	443	003-005	AA 78381
North Fowler 341	443	006-008	AA 78382
North Fowler 342	443	009-011	AA 78383
North Fowler 343	443	012-014	AA 78384
North Fowler 344	443	015-017	AA 78385
North Fowler 345	443	018-020	AA 78386
North Fowler 346	443	021-023	AA 78387
North Fowler 347	443	024-026	AA 78388
North Fowler 348	443	027-029	AA 78389
North Fowler 349	443	030-032	AA 78390
North Fowler 350	443	033-035	AA 78391
North Fowler 351	443	036-038	AA 78392
North Fowler 352	443	039-041	AA 78393
North Fowler 353	443	042-044	AA 78394
North Fowler 354	443	045-047	AA 78395
North Fowler 355	443	048-050	AA 78396
North Fowler 356	443	051-053	AA 78397

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska		BLM Serial Number
	Book	Page	
North Fowler 357	443	054-056	AA 78398
North Fowler 358	443	057-059	AA 78399
North Fowler 436	443	075-077	AA 78405
North Fowler 437	443	078-080	AA 78406
North Fowler 438	443	081-083	AA 78407
North Fowler 439	443	084-086	AA 78408
North Fowler 440	443	087-089	AA 78409
North Fowler 441	443	090-092	AA 78410
North Fowler 442	443	093-095	AA 78411
North Fowler 443	443	096-098	AA 78412
North Fowler 444	443	099-101	AA 78413
North Fowler 445	443	102-104	AA 78414
North Fowler 446	443	105-107	AA 78415
North Fowler 447	443	108-110	AA 78416
North Fowler 448	443	111-113	AA 78417
North Fowler 449	443	114-116	AA 78418
North Fowler 450	443	117-119	AA 78419
North Fowler 451	443	120-122	AA 78420
North Fowler 452	443	123-125	AA 78421
North Fowler 453	443	126-128	AA 78422
North Fowler 454	443	129-131	AA 78423
North Fowler 455	443	132-134	AA 78424
North Fowler 456	443	135-137	AA 78425
North Fowler 457	443	138-140	AA 78426
North Fowler 458	443	141-143	AA 78427
North Fowler 459	443	144-146	AA 78428
North Fowler 460	443	147-149	AA 78429
North Fowler 461	443	150-152	AA 78430
	EAST RIDGE GROUP		
East Ridge 1011	2009-007170-0		AA 91926
East Ridge 1012	2009-007171-0		AA 91927
East Ridge 1013	2009-007172-0		AA 91928

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska Book	Page	BLM Serial Number
East Ridge 1014	2009-007173-0		AA 91929
East Ridge 1015	2009-007174-0		AA 91930
East Ridge 1111	2009-007175-0		AA 91931
East Ridge 1112	2009-007176-0		AA 91932
East Ridge 1113	2009-007177-0		AA 91933
East Ridge 1114	2009-007178-0		AA 91934
East Ridge 1115	2009-007179-0		AA 91935
East Ridge 1210	2009-007180-0		AA 91936
East Ridge 1211	2009-007181-0		AA 91937
East Ridge 1212	2009-007182-0		AA 91938
East Ridge 1213	2009-007183-0		AA 91939
East Ridge 1214	2009-007184-0		AA 91940
East Ridge 1215	2009-007185-0		AA 91941
East Ridge 1310	2009-007186-0		AA 91942
East Ridge 1311	2009-007187-0		AA 91943
East Ridge 1312	2009-007188-0		AA 91944
East Ridge 1313	2009-007189-0		AA 91945
East Ridge 1314	2009-007190-0		AA 91946
East Ridge 1315	2009-007191-0		AA 91947
East Ridge 1408	2009-007192-0		AA 91948
East Ridge 1409	2009-007193-0		AA 91949
East Ridge 1410	2009-007194-0		AA 91950
East Ridge 1411	2009-007195-0		AA 91951
East Ridge 1412	2009-007196-0		AA 91952
East Ridge 1413	2009-007197-0		AA 91953
East Ridge 1414	2009-007198-0		AA 91954
East Ridge 1415	2009-007199-0		AA 91955
East Ridge 1416	2009-007200-0		AA 91956
East Ridge 1417	2009-007201-0		AA 91957
East Ridge 1510	2009-007202-0		AA 91958
East Ridge 1511	2009-007203-0		AA 91959

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska Book	Page	BLM Serial Number
East Ridge 1512	2009-007204-0		AA 91960
East Ridge 1513	2009-007205-0		AA 91961
East Ridge 1514	2009-007206-0		AA 91962
East Ridge 1515	2009-007207-0		AA 91963
East Ridge 1611	2009-007208-0		AA 91964
East Ridge 1612	2009-007209-0		AA 91965
East Ridge 1613	2009-007210-0		AA 91966
East Ridge 1614	2009-007211-0		AA 91967
East Ridge 1615	2009-007212-0		AA 91968

Table A2: Summary of the Unpatented Mill Site Claims

Hecla Mining Company – Greens Creek Mine

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska at Book	Page	BLM Serial Number
Big Sore Mill Site No. 900	394	511-512	AA 77046
Big Sore Mill Site No. 901	394	513	AA 77047
Big Sore Mill Site No. 902	394	514	AA 77048
Big Sore Mill Site No. 1001	394	515	AA 77049
Big Sore Mill Site No. 1002	394	516	AA 77050
Big Sore Mill Site No. 1003	394	517	AA 77051
Big Sore Mill Site No. 1108	394	518	AA 77052
Big Sore Mill Site No. 1505	394	519	AA 77053
Big Sore Mill Site No. 1506	394	520	AA 77054
Big Sore Mill Site No. 1507	394	521	AA 77055
Big Sore Mill Site No. 1509	394	522	AA 77056
Big Sore Mill Site No. 1510	394	523	AA 77057
Big Sore Mill Site No. 1516	394	524	AA 77058
Big Sore Mill Site No. 1517	394	525	AA 77059
Big Sore Mill Site No. 1610	394	526	AA 77060
Big Sore Mill Site No. 1611	394	527	AA 77061
Big Sore Mill Site No. 1710	394	528	AA 77062
Big Sore Mill Site No. 1711	394	529	AA 77063

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska at Book	Page	BLM Serial Number
Big Sore Mill Site No. 1712	394	530	AA 77064
Big Sore Mill Site No. 1713	394	531	AA 77065
Big Sore Mill Site No. 1714	394	532	AA 77066
Big Sore Mill Site No. 1715	394	533	AA 77067
Big Sore Mill Site No. 1716	394	534	AA 77068
Big Sore Mill Site No. 1717	394	535	AA 77069
Big Sore Mill Site No. 1718	394	536	AA 77070
Big Sore Mill Site No. 798	2002-005167-0		AA 84088
Big Sore Mill Site No. 802	2002-005168-0		AA 84089
Big Sore Mill Site No. 803	2002-005169-0		AA 84090
Big Sore Mill Site No. 899	2002-005170-0		AA 84091
Big Sore Mill Site No. 904	2002-005171-0		AA 84092
Big Sore Mill Site No. 905	2002-005172-0		AA 84093
Big Sore Mill Site No. 906	2002-005173-0		AA 84094
Big Sore Mill Site No. 907	2002-005174-0		AA 84095
Big Sore Mill Site No. 996	2002-005175-0		AA 84096
Big Sore Mill Site No. 1004	2002-005176-0		AA 84097
Big Sore Mill Site No. 1005	2002-005177-0		AA 84098
Big Sore Mill Site No. 1006	2002-005178-0		AA 84099
Big Sore Mill Site No. 1007	2002-005179-0		AA 84100
Big Sore Mill Site No. 1008	2002-005180-0		AA 84101
Big Sore Mill Site No. 1009	2002-005181-0		AA 84102
Big Sore Mill Site No. 1010	2002-005182-0		AA 84103
Big Sore Mill Site No. 1096	2002-005183-0		AA 84104
Big Sore Mill Site No. 1097	2002-005184-0		AA 84105
Big Sore Mill Site No. 1103	2002-005185-0		AA 84106
Big Sore Mill Site No. 1104	2002-005186-0		AA 84107
Big Sore Mill Site No. 1105	2002-005187-0		AA 84108
Big Sore Mill Site No. 1106	2002-005188-0		AA 84109
Big Sore Mill Site No. 1107	2002-005189-0		AA 84110
Big Sore Mill Site No. 1202	2002-005190-0		AA 84111
Big Sore Mill Site No. 1203	2002-005191-0		AA 84112

Claim Name	Certificate of Location Recorded in Juneau Recording District, State of Alaska at Book	Page	BLM Serial Number
Big Sore Mill Site No. 1204	2002-005192-0		AA 84113
Big Sore Mill Site No. 1205	2002-005193-0		AA 84114
Big Sore Mill Site No. 1508	2002-005194-0		AA 84115
Big Sore Mill Site No. 1511	2002-005195-0		AA 84116
Big Sore Mill Site No. 1514	2002-005196-0		AA 84117
Big Sore Mill Site No. 1612	2002-005197-0		AA 84118
Big Sore Mill Site No. 1613	2002-005198-0		AA 84119
Big Sore Mill Site No. 1614	2002-005199-0		AA 84120



Exhibit 96.2

Technical Report Summary on the Lucky Friday Mine, Idaho, USA S-K 1300 Report

Hecla Mining Company
SLR Project No: 101.00632.00022
February 21, 2022



Technical Report Summary on the Lucky Friday Mine, Idaho, USA

SLR Project No: 101.00632.00022

Prepared by
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for

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Effective Date – December 31, 2021
Signature Date - February 21, 2022

FINAL

Distribution: 1 copy – Hecla Mining Company
1 copy – SLR International Corporation

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1.0 EXECUTIVE SUMMARY

1.1 Summary

SLR International Corporation (SLR) was retained by Hecla Mining Company (Hecla) to prepare an independent Technical Report Summary (TRS) on the Lucky Friday Mine (Lucky Friday or the Property), located in Shoshone County, Idaho, USA. Hecla owns and operates 100% of the Property via ownership through two of its 100% owned subsidiaries.

The purpose of this TRS is to disclose the results of the Mineral Resource and Mineral Reserve estimates for the Property with an effective date of December 31, 2021.

Hecla is listed on the New York Stock Exchange (NYSE) and currently reports Mineral Reserves of lead, zinc, silver, and gold in United States Securities and Exchange Commission (SEC) filings. This TRS conforms to SEC's Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary. SLR visited the Property on October 5 and 6, 2021.

The Property includes the Lucky Friday mine and processing plant (or mill) in the city of Mullan, Idaho. The mine is a deep underground silver, lead, and zinc mine that produces silver and zinc concentrates from ore-bearing fissure veins. The plant is a concentrator facility producing silver and zinc concentrates that has a current operating rate of 1,000 short tons per day (stpd).

The Property commenced operations in 1942 and observed its 75th anniversary in 2017. In 2021, the underground operation mined 315,000 tons of ore and produced 32,000 tons of silver concentrates and 14,000 tons of zinc concentrates. The concentrates were transported 209 miles (mi) to the Teck Metals Ltd. (Teck) lead/zinc smelter in Trail, British Columbia, Canada in highway trucks operated by a contract shipper. This 2021 production profile amounted to 3.6 million ounces (Moz) of silver, 23,100 tons of lead, and 10,000 tons of zinc produced.

1.1.1 Conclusions

SLR offers the following conclusions by area.

1.1.1.1 Geology and Mineral Resources

- As prepared by Hecla and reviewed and accepted by SLR, the Lucky Friday Measured and Indicated Mineral Resources are estimated to total approximately 10.50 million tons (Mst) at an average grade of approximately 7.6 oz/ton Ag, 4.9% Pb, and 2.5% Zn. Inferred Mineral Resources are estimated at approximately 5.38 Mst at an average grade of approximately 7.8 oz/ton Ag, 5.8% Pb, and 2.4% Zn. All Mineral Resources are effective as of December 31, 2021 and are stated exclusive of Mineral Reserves.
- The drilling, core handling, logging, and sampling at Lucky Friday is being conducted according to common industry practice, in a manner appropriate for the deposit type and mineralization style.
- The chip sampling practices at the site are reasonable, appropriate for the mineralization style, and consistent with common industry practice.
- Bulk density estimates are conducted in a reasonable fashion, using an appropriate method.

- Samples are handled and transported securely and only in the custody of Hecla employees or bonded carriers.
- The assay quality assurance and quality control (QA/QC) protocols in place at Lucky Friday are rigorous, and the results to date are satisfactory.
- The sampling is done such that the samples are representative of the mineralized bodies. There are no concerns apparent with the assay results and they are suitable for use in a Mineral Resource estimate.
- The databases are managed in a secure environment, using conventional off-the-shelf software packages that are up-to-date and appropriate for the tasks to which they are applied. The staff are competent, well-trained, and experienced and they have been provided with clear and reasonable protocols to follow.
- The database on which resource estimation is based is properly configured and maintained and is appropriate for use in estimation of Mineral Resources and Mineral Reserves.
- The wireframe models for the veins are reasonable and representative of the host structures. Minor inconsistencies exist but are not considered to be a serious concern, and will be resolved with additional work.
- The sample grade distributions for silver, lead, and zinc are observed to be positively skewed which could result in biases in the block interpolations unless corrective measures are taken. Capping is currently being employed at Lucky Friday and this is viewed as appropriate.
- There is evidence of sub-populations within the grade distributions for several veins. Additional work may be warranted to identify and isolate these sub-populations if possible.
- Compositing of the samples is carried out in a reasonable fashion.
- The block model is configured appropriately and constructed with off-the-shelf software that is commonly used in the industry.
- The grade interpolations were conducted in a reasonable manner consistent with common practice using an appropriate estimation algorithm commonly used within the industry.
- The Mineral Resources are classified according to the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) definitions and, as such, are consistent with the requirements of S-K 1300.
- The method used to apply the classification is broadly consistent with common industry practice, although the resulting categorizations appear somewhat aggressive for Measured.
- The net smelter return (NSR) cut-off value is a reasonable approach which has been applied in an appropriate manner.
- The validation methods used at Lucky Friday are appropriate, although they represent a fairly minimum standard of review.
- The stope optimization and reporting procedures are generally reasonable.
- The Mineral Resource estimate for Lucky Friday has been carried out in a reasonable fashion, consistent with conventional, although somewhat dated, industry practice.

1.1.1.2 Mining and Mineral Reserves

- Mineral Reserve estimates, as prepared by Hecla and reviewed and accepted by SLR, have been classified in accordance with the definitions for Mineral Reserves in S-K 1300. Mineral Reserves as of December 31, 2021 total 5.46 Mst grading 13.7 oz/ton Ag, 8.3% Pb, and 3.3% Zn and containing 74.7 Moz of silver, 452,000 tons of lead and 181,000 tons of zinc at an NSR cut-off value of US$208/ton.

- Measured and Indicated Mineral Resources were converted to Proven and Probable Mineral Reserves, respectively, through the application of modifying factors. Inferred Mineral Resources were not converted to Mineral Reserves.
- The Mineral Reserves are all located within the Gold Hunter deposit in seven separate veins. The 30 Vein is the most significant with 68% of the Mineral Reserve tonnage and 70% of the contained silver.
- Mineral Reserves are estimated by qualified professionals using modern mine planning software in a manner consistent with industry practice.
- Lucky Friday is an old, well established mine with many years of operating experience, providing the necessary expertise to safely and economically extract the Mineral Reserves.
- Mining at Lucky Friday utilizes mechanized underhand cut and fill, and underhand closed benching (UCB) with cemented paste backfill. In this method, the mining progresses downwards in a stope, occurring beneath the cemented paste backfill of the preceding lift. The mining methods used are appropriate to the deposit style, depth and geotechnical conditions and employ a range of modern mining equipment;
- The mine developed the UCB method for bulk mining of the 30 Vein. This method is designed to improve safety through the management of seismic events and to increase productivity. The UCB method is a bulk mining method which utilizes 27 ft deep blastholes with ore mucked in 11.5 ft benches.
- The current Mineral Reserve estimate is based on the use of UCB mining for the majority of the deposit and represents a change from previous mining methods and Mineral Reserve estimates.
- Over the past nine years, the mine production silver grade has been less than the Mineral Reserve grade estimate, indicating a poor correlation with production data.
- Stopes in the mine are relatively narrow with an eleven foot minimum mining width in the 30 Vein above the 7500 level, nine foot minimum width below the 7500 level, and eight foot minimum width in the Intermediate Veins.
- Stopes are diluted to the greater of the ore width or the minimum mining width. This dilution is assigned background metal grades based upon the block model estimates. Subsequently, the stopes are diluted by a further 15% for UCB stopes and 5% for cut and fill stopes with zero grade unplanned dilution.
- SLR is of the opinion that the 15% dilution estimate in the UCB mining is a potentially optimistic estimate considering the short time that the method has been in use, the impact of vein deviation over the 27 ft cut depth, the use of infill drill information as opposed to face by face mapping, changes in the vein along strike and dip, and potential overbreak from blasting.
- The 30 Vein Mineral Reserve includes internal low grade and waste blocks that do not meet the cut-off grade criteria but are included as the material must be mined considering the stope geometry and seismicity.
- The planned use of UCB mining at a nine foot minimum width (30 Vein at depth) is not based upon detailed layouts and represents potential risks related to production capacity and dilution estimates at depth.

- Extraction for all mining methods is assumed to be 100%.
- SLR verified that Hecla's selected metal prices for estimating Mineral Reserves are consistent with independent forecasts from banks and other lenders.
- The mine uses proven, modern trackless mobile equipment with load haul dump (LHD) units up to 3.5 yd^3 capacity.
- The life of mine (LOM) plan has been appropriately developed to maximize mining efficiencies, based on the current knowledge of geotechnical, hydrological, mining, and processing information on the Lucky Friday Mine.
- The equipment and infrastructure requirements for LOM operations are well understood.
- The LOM extends 17 years to 2038, with mine production projected to increase to an annual rate of approximately 425,000 tons. The increased production is based upon projected productivity improvements in mining, increased daily development advance, and higher utilization of the existing mine infrastructure, however, improvements may be difficult to achieve considering the extent of the mine, stope widths, and mining depths.
- Meeting growth requirements of the LOM plan (production and development) is typically a challenge for wide spread narrow vein mines. SLR is of the opinion that meeting the LOM plan will require ongoing effort to optimize the UCB mining method and attain planned increases in productivity.

1.1.1.3 Mineral Processing

- The Lucky Friday mill is a conventional silver and zinc flotation concentrator that has been in operation since 1942 and owned and operated by Hecla since 1958. Concentrates are shipped by highway trucks to the Teck smelter at Trail, British Columbia, Canada. The mill has a compact and efficient design that has been upgraded over the years including the addition of flash flotation in the grinding circuit, column flotation for concentrate cleaning, and on-stream analyzers for process control.
- The concentrator performed very consistently from 2016 through 2021 with steady lead, zinc, and silver head grades, silver and zinc concentrate grades, and recoveries. The mill operated in the 38 tons per hour (stph) to 44 stph range with a reported mill availability of 93%. Low production from 2017 through 2019 was due to labor issues.
- The mine plan includes a 20% increase in mill production from the current 340,000 tons per year (stpa), or 930 stpd, to 425,000 stpa, or 1,164 stpd, each at 92% availability. Work is being done to debottleneck the Plant including slurry pumping capacity to achieve the new targets.
- The target concentrate grade for lead is 60% for the best recovery, though the grade can be increased to 63% to 64% without significant loss of recovery.
- The focus of metallurgical testing is on plant performance including quality improvements and the potential to increase production. A significant metallurgical test program was performed to characterize the Gold Hunter deposit in 2008, including mineralogy, comminution testing, and flotation testing. The ore is very consistent, which benefits plant performance.
- In July 2011, an audit of the Lucky Friday process including detailed circuit sampling was performed to support studies to increase plant production. During the survey, the lead flash cell recovered 60% to 70% of the lead and silver in the plant feed, reducing the load on the lead cleaning circuit. The total silver, lead, and zinc recoveries to silver concentrate were 91.7%, 90%, and 12%, respectively, to a concentrate containing 60% Pb, 130 oz/ton Ag, and 3.5% Zn. Zinc recovery to the zinc concentrate was 81.3% to a concentrate grading 48.6% Zn. Lead recovery to the zinc concentrate was 2.3% and the silver recovery to the zinc concentrate was 3.9%.

1.1.1.4 Infrastructure

- Lucky Friday has all of the infrastructure necessary for the ongoing operations and has plans for refurbishment or repair as necessary within the mine plan.

1.1.1.5 Environment

- Lucky Friday maintains a comprehensive environmental management and compliance program. All permits needed for current Lucky Friday operations are in place, and staff at the Property continually monitors permit/regulated conditions and files required reports with the applicable regulatory agencies at the federal, state, and local level.

- Hecla's Environmental Management System (EMS) follows a 13-element plan-do-check-act approach that ensures continuous improvement around issues including obligation registers, management of change, air quality, water and waste management, energy management, training, and reporting. This system promotes a culture of environmental awareness and innovation throughout the company. The EMS program is benchmarked against ISO-14001 and complements Canada's Towards Sustainable Mining (TSM) program. On a related matter, there appears to be good cross-discipline support for the overall environmental program.

- In previous resource/reserve reporting documents, Lucky Friday reported experiencing a number of alleged permit exceedances for water discharges (National Pollutant Discharge Elimination System (NPDES) and Multi-Sector General Permit (MSGP)) at the Property. Lucky Friday received an Environmental Protection Agency (EPA) Notice of Violation for non-compliance with the NPDES Permit and various discharges exceeding the maximum daily standard for lead (50 µg/L). In all instances, Lucky Friday has worked cooperatively with EPA to resolve these issues.

- Lucky Friday has developed reclamation/closure plan and the most recent cost estimate (2021) to perform this work is US$39.9 million. Reclamation and closure plans have been submitted to the appropriate agencies. Asset Retirement Obligation (ARO) legal obligations are updated regularly and based upon existing site conditions, current laws, regulations and costs to perform the permitted activities. The ARO is to be conducted in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 410.

- Lucky Friday reports that community relationships are excellent, and the company maintains an office in the city of Wallace to maintain a community presence.

1.1.2 Recommendations

SLR offers the following recommendations by area.

1.1.2.1 Geology and Mineral Resources

1. Conduct additional review of the sample grade distributions within the veins to see if coherent groupings of sub-populations can be isolated for interpolation purposes.

2. Modify the resource classification procedures to provide an opportunity for manual adjustments, as opposed to a strictly computer-driven approach. This will allow changes to be made to remove unrealistic artifacts in the classification.

3. Consider an additional level of block model validation, such as comparisons to alternative estimation methods.

1.1.2.2 Mining and Mineral Reserves

4. Continue the use of UCB mining in the 30 Vein and continue to attempt to improve the UCB method.
5. Conduct close monitoring of the stoping performance including regular surveys as the void is exposed and reconciliation of the stope designs to the Mineral Reserve estimates to confirm and, if necessary, refine the Mineral Reserve estimate
6. Calculate NSR values on a fully diluted basis and use these values to determine cut-off values and Mineral Reserve boundaries.
7. Evaluate the internal portions of Mineral Reserve material that fall below cut-off value within the 30 Vein to confirm that they are economically justifiable to mine and develop further cut-off criteria for must take material.
8. Undertake a more detailed dilution and extraction study, including consideration of the existing reconciliation studies, to better quantify the extraction, dilution, and other modifying factors that Hecla is currently applying to all production designs.
9. Use the results of the above noted studies to determine the actions necessary to align mine production grades with the Mineral Reserve estimates.
10. Review mining plans to define definitive actions to attain the planned improvements in mining productivity and daily development advance.
11. Further develop the plans for UCB mining at the planned nine foot minimum mining width.

1.1.2.3 Mineral Processing

1. Continue metallurgical testing to support the plan for increased production.
2. The ability to perform on-site metallurgical testing is limited due to the capabilities of the current laboratory. An upgrade to the laboratory is recommended and has been budgeted for 2024.

1.1.2.4 Infrastructure

1. Continue the upgrades, repairs, and rehabilitation to existing infrastructure to support the LOM plan.

1.1.2.5 Environment

1. Track and participate in the development of new environmental and mine permitting regulations that could impact operations.
2. Continue to perform internal and external audits of environmental compliance.
3. Even though opportunity is limited, investigate opportunities for concurrent reclamation to minimize financial obligation(s) at closure.
4. Continue to update reclamation and closure cost estimates on a regular basis.

1.2 Economic Analysis

1.2.1 Economic Criteria

An after-tax Cash Flow Projection has been generated from the LOM production schedule and capital and operating cost estimates, and is summarized in Table 1-2. A summary of the key criteria is provided below.

1.2.1.1 Physicals

- Total mill feed processed: 5.5 Mst
- Average processing rate: 892 stpd with the following production profile (Table 1-1):

Table 1-1: Production Summary
Hecla Mining Company – Lucky Friday Mine

Commodity	Head Grade	% Recovery	Recovered Metal	Annual Production	Payable Metal
Silver	13.7 oz/ton	96.4	72.0 Moz	4.2 Moz	67.4 Moz
Lead	8.3%	95.7	866 Mlb	51 Mlb	811 Mlb
Zinc	3.3%	93.7	340 Mlb	20 Mlb	251 Mlb

1.2.1.2 Revenue

- Metal prices used in the economic analysis are constant US$21/oz Ag, US$0.95/lb Pb, and US$1.25/lb Zn.
- Revenue is calculated assuming the above metal price forecast and incorporates a $1.8 million hedge gain for lead and zinc over the first three years of cash flow.
- Average LOM concentrate freight cost: $47/wet ton Cost, Insurance, and Freight (CIF) basis to customer's discharge points.
- Average LOM treatment charge: $139/dry metric tonne (dmt) silver concentrate plus $3.90/dmt for antimony penalty, $162/dmt zinc concentrate, and $8.70/dmt for iron and mercury penalties.
- Average LOM refining costs for concentrates: $0.10/dmt.

1.2.1.3 Capital and Operating Costs

- Mine life of 17 years
- LOM sustaining capital costs of $372 million
- LOM site operating cost of $187.81/ton milled (excludes financing and corporate overhead costs)
- LOM closure/reclamation $38.7 million in year after final production

1.2.1.4 Taxation and Royalties

Mining companies doing business in Idaho are primarily subject to U.S. corporate income tax, Idaho State income tax, and Idaho Mining License tax. The State of Idaho levies a mining license tax on mining net income received in connection with mining properties and activities in Idaho, at a rate of 7%. The U.S. corporate income tax rate is 21% and the Idaho state income tax rate is 6.5%.

No income tax is anticipated to be payable through the LOM. Hecla will use a combination of existing and forecasted depreciation expenses, allocation of expenses from other entities within the consolidated tax group, percentage depletion allowances, and existing net operating losses to generate zero annual taxable income through the LOM. However, the Lucky Friday Mine will still incur $4 million for Idaho State mining taxes during the LOM.

The current production zones in the LOM are not subject to any royalty to a third party/previous landowner.

1.2.2 Cash Flow Analysis

SLR has reviewed Hecla's Lucky Friday Mineral Reserves only model and has prepared its own unlevered after-tax LOM cash flow model based on the information contained in this TRS to confirm the physical and economic parameters of the mine.

The Lucky Friday economics have been evaluated using the discounted cash flow method by considering annual processed tonnages and grade of ore. The associated process recovery, metal prices, operating costs, refining and transportation charges, and sustaining capital expenditures were also considered.

The indicative economic analysis results, presented in Table 1-2 with no allowance for inflation, show a pre-tax and after-tax net present value (NPV), using a 5% discount rate, of $557 million and $554 million, respectively. The SLR Qualified Person (QP) is of the opinion that a 5% discount/hurdle rate for after-tax cash flow discounting of long lived precious/base metal operations in a politically stable region is reasonable and appropriate and commonly used. For this cash flow analysis, the internal rate of return (IRR) and payback are not applicable as there is no negative initial cash flow (no initial investment to be recovered) since Lucky Friday has been in operation for a number of years.

Table 1-2: Life of Mine Indicative Economic Results
Hecla Mining Company – Lucky Friday Mine

Description	US$ M
Realized Market Prices	
Ag (US$/oz)	$21.00
Pb (US$/lb)	$0.95
Zn (US$/lb)	$1.25
Payable Metal	
Ag (Moz)	67.4
Pb (Mlb)	811
Zn (Mlb)	251
Total Gross Revenue	**2,502**
Mine Cost	(415)
Mill Cost	(118)
Maintenance Cost	(270)
G & A Cost	(183)
Profit Sharing	(39)
Concentrate Freight Cost	(50)
Offsite Costs	(234)
Total Operating Costs	**(1,308)**
Operating Margin (EBITDA)	**1,194**
Total Tax Payable	(4)

Description	US$M
Operating Cash Flow	**1,190**
Sustaining Capital	(372)
Closure/Reclamation Capital	(39)
Total Capital	**(411)**
Pre-tax Free Cash Flow	783
Pre-tax NPV @ 5%	**557**
After-tax Free Cash Flow	779
After-tax NPV @ 5%	**554**

1.2.3 Sensitivity Analysis

The Property's after-tax cumulative cash flow discounted at 5% from the model presented above were analyzed for sensitivity to variations in revenue, operating, and capital cost assumptions. The results of the sensitivity analysis demonstrate that the Mineral Reserve estimates are most sensitive to variations in metal prices, less sensitive to changes in metal grades and recoveries, and least sensitive to fluctuations in operating and capital costs.

1.3 Technical Summary

1.3.1 Property Description

The Lucky Friday silver-lead-zinc mine and mill complex is located approximately one-half mile east of Mullan in Shoshone County, Idaho, and 55 mi east of Coeur d'Alene, Idaho along Interstate Highway 90. The Property is located in the Coeur d'Alene District, which is one of, if not the most prolific silver mining camps in the world. Current production is from underground using both underhand and overhand mechanized cut and fill methods. Ore is processed using conventional crushing, grinding, and lead-zinc flotation with a current operating rate of 1,000 tpd. The operation currently employs approximately 400 full-time employees.

1.3.2 Land Tenure

The Lucky Friday Expansion Area (formerly known as the Gold Hunter vein system) is owned 81.5% by Hecla Limited and 18.5% by Silver Hunter Mining Company (Silver Hunter). Both companies are subsidiaries of Hecla. There are no encumbrances on the Property, nor are there any royalties payable.

The Lucky Friday vein system is 100% owned by Hecla Limited. The Property comprises approximately 710 acres of patented mining and millsite claims and fee lands, and 535 acres of unpatented mining claims.

1.3.3 History

The Lucky Friday deposit was discovered in 1880, and the Lucky Friday Silver-Lead Mines Company initiated commercial production from Lucky Friday in 1942. Hecla acquired ownership of Lucky Friday in 1964 via a merger with Lucky Friday Silver-Lead Mines Company.

In 1968, Hecla entered a series of agreements with Day Mines Inc., Abot Mining Company, and Independence Lead Mines Company, the owners of the Gold Hunter deposit and surrounding properties. Day Mines was merged in 1981 with a wholly owned subsidiary of Hecla, Hecla-Day Mining Corporation, which was merged into Hecla the following year. In 2001, Abot quit-claimed its interests to Hecla, and in 2007, Hecla acquired the assets of Independence Lead Mines Company through its wholly owned subsidiary, Silver Hunter Mining Company.

The total mine production from the Lucky Friday deposit now exceeds 108 Moz of silver making it the Coeur d'Alene District's fourth largest silver producer. The Gold Hunter deposit is the sixth largest silver producer in the district with 12 Moz mine in the historic workings and just over 45 Moz from more recent operations.

1.3.4 Geological Setting, Mineralization, and Deposit

The deposits of the Coeur d'Alene District, including Lucky Friday, are clastic metasediment hosted vein silver-lead-zinc deposits. They occur as veins in branching and anastomosing steeply dipping shears in metamorphosed sedimentary rocks of the Proterozoic-age Belt Supergroup. Host rocks are primarily quartzites and argillites of the Wallace (Gold Hunter) and Revett (Lucky Friday) Formations. Vein mineralization at Lucky Friday occurs as fracture-fillings, disseminations, and tabular masses of galena and tetrahedrite along with accessory pyrite in a gangue of iron carbonate (siderite), calcite, and quartz. The Lucky Friday zone is a single tabular body that curves from east-northeast to northeast in strike and dips almost vertically. The Gold Hunter system comprises a package of parallel veins striking at approximately 110° and dipping vertically to steeply southwards. There are Mineral Resources estimated on 16 of the Gold Hunter Veins. The most important of these in terms of resources and production is the 30 Vein.

1.3.5 Exploration

Currently, no exploration work is being conducted at Lucky Friday. Underground diamond drilling for Mineral Reserve definition is ongoing.

1.3.6 Mineral Resource Estimates

Mineral Resource estimates have been prepared for the Gold Hunter Veins as well as the Lucky Friday and Ancillary Veins. At Gold Hunter, estimates have been carried out for the 5, 20, 30, 40, 41, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, and 150 Veins.

The Mineral Resources at Gold Hunter are estimated using a block model method, with grades for silver, lead, zinc, and iron interpolated into the blocks by inverse distance squared (ID^2) weighting. The interpolations are constrained by wireframe models of the host veins. Grades are interpolated for silver, lead, zinc, and iron.

Sample data consists of diamond drill core and chip samples. High grades for silver, lead, and zinc are capped at the 95^{th} percentile of the sample distributions for each vein. Capped samples are composited to a nominal three-foot length. Block grade interpolations are conducted in a series of three passes of progressively larger search radii and more liberal composite selection criteria.

Mineral Resources for Lucky Friday are estimated using a polygonal method based on longitudinal projections of the veins.

Tonnage factors are estimated using stoichiometric equations based on the assay values for iron, lead, and zinc. Different equations are used for the Gold Hunter and Lucky Friday deposits owing to differences in vein mineralogy.

The minimum width for the Gold Hunter and Lucky Friday Veins can be between eight feet and 11 ft, depending on the expected mining method. Veins are diluted with zero grade material to achieve the minimum width constraint.

Mineral Resources are classified according to the definitions in S-K 1300, and are reported exclusive of Mineral Reserves. The Mineral Resources, estimated by Hecla and reviewed and accepted by SLR, are reported using an NSR cut-off value of US$173/ton at Gold Hunter and US$207/ton at Lucky Friday. The Lucky Friday Mineral Resource estimate as of December 31, 2021, is presented in Table 1-3.

Table 1-3: Summary of Mineral Resources – December 31, 2021
Hecla Mining Company – Lucky Friday Mine

Zone	Tonnage (000 tons)	Grade			NSR (US$/t)	Contained Metal		
		Ag (oz/ton)	Pb (%)	Zn (%)		Ag (000 oz)	Pb (000 tons)	Zn (000 tons)
Measured	8,650	7.6	4.9	2.5	219	65,800	425	213
Indicated	1,840	7.6	5.1	2.4	224	14,000	93	44
Measured + Indicated	**10,500**	**7.6**	**4.9**	**2.5**	**220**	**79,800**	**518**	**258**
Inferred	5,380	7.8	5.8	2.4	244	41,900	312	130

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves at Gold Hunter, whereas there are no Mineral Reserves currently at Lucky Friday.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Mineral Resources are 100% attributable to Hecla.
6. Bulk density was calculated by block, based on mineralogical content.
7. Mineral Resources are estimated at NSR cut-off grades of US$173/ton for Gold Hunter and US$207/ton for Lucky Friday.
8. NSR values were calculated using long-term metal prices of US$21.00/oz Ag, US$1.15/lb Pb, and US$1.35/lb Zn.
9. Numbers may not add due to rounding.

The SLR QP is of the opinion that with consideration of the recommendations summarized in in this section, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

1.3.7 Mineral Reserve Estimates

Mineral Reserve estimates, prepared by Hecla and reviewed and accepted by SLR, have been classified in accordance with the definitions for Mineral Reserves in S-K 1300 and are estimated to total 5.46 Mst grading 13.7 oz/ton Ag, 8.3% Pb, and 3.3% Zn and summarized in Table 1-4. While resources exist at the Lucky Friday deposit, Mineral Reserves are reported only for the Gold Hunter deposit, as this is the only area in the current LOM plan.

Table 1-4: Summary of Mineral Reserves – December 31, 2021
Hecla Mining Company – Lucky Friday Mine

Category	Tonnage (000 tons)	Grade Ag (oz/ton)	Grade Pb (%)	Grade Zn (%)	Contained Metal Ag (000 oz Ag)	Contained Metal Pb (000 tons)	Contained Metal Zn (000 tons)
Proven	4,691	13.92	8.43	3.40	65,313	395.3	159.4
Probable	765	12.26	7.47	2.83	9,386	57.2	21.7
Total Proven + Probable	**5,456**	**13.69**	**8.29**	**3.32**	**74,699**	**452.4**	**181.0**

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Mineral Reserves were estimated by Hecla and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla.
4. Mineral Reserves are estimated at an NSR cut-off of $208/ton.
5. The NSR values reflect the discrete metallurgical responses for the Mineral Reserve blocks.
6. Mineral Reserves are estimated using an average long-term silver price of US$17.00/oz, lead price of US$0.90/lb and zinc price of US$1.15/lb.
7. A minimum mining width of 11 ft was used for 30 Vein above 7500 level, 9 ft for 30 Vein below 7500 level, and 8 ft for all other veins.
8. A bulk density of 0.086 tons/ft^3 was used for waste material. Mineral Reserve bulk density was calculated by block, based on mineralogical content.
9. Numbers may not add due to rounding.

Measured Mineral Resources were converted to Proven Mineral Reserves, and Indicated Mineral Resources were converted to Probable Mineral Reserves. Inferred Mineral Resources were not converted to Mineral Reserves and are not included in the LOM plan.

Mineral Reserves are estimated in seven veins all in the Gold Hunter deposit. The 30 Vein is the largest vein and contains 68% of the Mineral Reserve tonnage. The Mineral Reserves extend down to the 8100 level. Mineral Resources are converted to Mineral Reserves through the application of minimum mining widths of eight feet to eleven feet, NSR value cut-off grade, and stope optimizer designs followed by the application of external dilution.

1.3.8 Mining Methods

The mine is a shaft access deep mine developed to the 8300 level (feet below surface). Mining is mainly by rubber tired mechanized equipment with the primary mining by underhand stoping with paste backfill.

In 2021, Lucky Friday tested and proved the UCB mining method. The UCB method is a new, productive mining method developed by Hecla for proactive control of fault-slip seismicity in deep, high-stress, narrow-vein mining. The method uses bench drilling and blasting methods to fragment significant vertical and lateral extents of the vein beneath a top cut taken along the strike of the vein and under engineered, cemented backfill. The method is accomplished without the use of drop raises or lower mucking drives which may result in local stress concentrations and increased exposure to seismic events. Large blasts using up to 35,000 lb of pumped emulsion and electronic, programmable detonators fragment up to 350 ft of strike length to a depth of approximately 30 ft. These large blasts proactively induce fault-slip seismicity at the time of the blast and shortly after it. This blasted corridor is then mined underhand for two cuts. As these cuts are mined, little to no blasting is done to advance them. Dilution is controlled by supporting the hanging wall and footwall as the mining progresses through the blasted ore. The entire cycle repeats and stoping advances downdip, under fill, and in a destressed region. The method allows for greater control of fault-slip seismic events significantly improving safety. In conjunction, a notable productivity increase has been achieved by reducing seismic delays and utilizing bulk mining activities. In 2021, 86% of the tons mined were produced through the UCB method.

The mine is serviced by two shafts to surface and an internal shaft. Broken ore is hauled by truck to the shaft and then hoisted to surface. The mine ventilation system includes facilities for mine air cooling.

1.3.9 Processing and Recovery Methods

The Lucky Friday mill is a conventional silver and zinc flotation concentrator. The mill operates at a nominal 42 stph) and can be operated at rates of up to 54 stph for limited periods. Silver concentrate and zinc concentrate are produced. Concentrates are shipped by highway trucks to the Teck smelter at Trail, British Columbia, Canada.

The primary unit operations in the Lucky Friday concentrator include:

- Primary jaw crushing
- Secondary cone crushing
- Tertiary cone crushing
- Triple deck screen closing both secondary and tertiary crushing circuits
- Ball milling
- Lead flash flotation with concentrate reporting to silver concentrate thickener
- Hydrocyclone classification
- Lead rougher and scavenger flotation in conventional cells
- Lead rougher scavenger concentrate to lead rougher feed
- Lead rougher scavenger tailings to zinc conditioners
- Lead rougher concentrate cleaning and recleaning using column flotation cells
- Lead cleaner scavenger flotation of cleaner tailings in conventional cells followed by column cells
- Lead cleaner scavenger and cleaner scavenger column tailings to regrind milling
- Regrind milling closed with hydrocyclones
- Flash flotation, second cleaner column flotation and cleaner scavenger column flotation concentrates to silver concentrate thickener
- Zinc conditioning in mixed reactors
- Zinc flash flotation
- Zinc rougher and scavenger flotation in conventional cells
- Zinc rougher scavenger tailings to final tailings sump feeding sand plant
- Zinc rougher scavenger concentrate to zinc conditioning
- Zinc rougher concentrate cleaning and recleaning using column flotation cells
- Zinc cleaner scavenger flotation of cleaner tailings in conventional cells followed by column cells
- Zinc cleaner scavenger and cleaner scavenger column tailings to zinc rougher flotation

- Flash flotation, second cleaner column flotation and cleaner scavenger column flotation concentrates to silver concentrate thickener
- Lead and zinc concentrate thickening and filtration and concentrate storage
- Flotation tailings hydrocyclone classification, thickening and filtration of coarse sand
- Coarse sand stockpiled and delivered to mine backfill cement plant
- Sand thickener overflow to final tailings thickener
- Tailings thickener overflow to water treatment and process water tank
- Tailings thickener underflow to the tailings storage facility (TSF)

Mine ore discharges from the Silver Shaft skips into two coarse ore bins with a total live capacity of approximately 1,000 tons. Ore is crushed in three stages to 100% passing (P_{100}) 3/8 in. using a primary jaw, secondary cone, and tertiary cone crushers closed by a triple deck vibrating screen.

The ore is ground in a single ball mill and discharges to the flash flotation feed pump box where reagents are added. The slurry is pumped to a flash flotation cell to recover coarse lead and silver from the mill circulating load. Flash cell concentrate is final silver concentrate grade and flash cell underflow is pumped to a cyclone cluster for classification. The cyclone underflow returns to the mill and the cyclone overflow advances to lead rougher flotation.

The lead flotation circuit consists of conventional agitated flotation cells for rougher and rougher scavenger flotation, column flotation cells for lead cleaning, and a combination of conventional and column cells for lead cleaner scavenger flotation. Lead flash flotation, lead second cleaner, and lead cleaner scavenger concentrates report to the silver concentrate thickener. Lead cleaner scavenger tailings are reground and pumped to the lead cleaner scavenger column cell.

Lead rougher scavenger tailings report to the zinc conditioners and then to zinc rougher scavenger flotation. The zinc flotation circuit configuration is similar to the lead circuit, with conventional agitated flotation cells for rougher and rougher scavenger flotation, column flotation cells for zinc cleaning and a combination of conventional and column cells for zinc cleaner scavenger flotation. Zinc second cleaner and zinc cleaner scavenger concentrates report to the zinc concentrate thickener. Zinc rougher scavenger tailings are pumped to the final tailings sump and zinc rougher scavenger concentrate is recycled to the zinc conditioners.

Silver and zinc concentrates are thickened, filtered, and stockpiled in storage bunkers, then loaded into trucks and shipped to a smelter.

The flotation tailings are classified with hydrocyclones. The cyclone underflow slurry reports to the sand thickener and the thickener underflow sands are filtered and transported to the backfill cement plant for underground backfill. Sand thickener overflow is pumped to the tailings thickener. Thickener overflow is pumped to the water treatment plant for recycle as process water or for discharge and the underflow is pumped to a TSF where the solids settle out of the tailings slurry and clear water is treated and discharged.

1.3.10 Infrastructure

The mine infrastructure consists of:

- The Silver Shaft, an 18 ft diameter shaft sunk to 6,205 ft deep, and currently operating to the 5970 level, complete with man and skip hoisting facilities.

- The 5,489 ft deep, three compartment No. 2 Shaft used for man hoisting, supplies, and ventilation. This shaft services the mine to the 4900 level.
- The No. 4 winze is an 18 ft diameter circular concrete lined shaft extending from the 4,860 level and a maximum depth of 8,620 to provide services and rock handling to depth. Ore is hoisted to the 4900 level.
- Mine ventilation fans and ventilation system.
- Paste backfill distribution system.
- Electricity provided by the region's public utility company (Avista Energy) and fed through two separate substations to the mine.
- Offices and mine dry at the Silver Shaft.
- The lead-zinc-silver flotation concentrator with a nominal operating rate of 1,000 stpd.
- Adequate diesel generating equipment to power emergency facilities.
- Tailings storage facility.
- Two water filtration plants, one at the mill and one at the TSF.

1.3.11 Market Studies

The Lucky Friday Mine is an active producer and has been for over 75 years. Lucky Friday produces a silver-silver concentrate and a zinc concentrate which are sold to the Teck lead zinc smelter in Trail, British Columbia, Canada.

1.3.12 Environmental Studies, Permitting and Plans, Negotiations, or Agreements with Local Individuals or Groups

Lucky Friday has obtained the requisite construction and operating permits needed to operate the existing operations. Other than routine (annual renewal) permits, there are now outstanding permitting needs for the current LOM reserves. Environmental monitoring during operations includes surface water, groundwater, air quality, meteorology, aquatics and biological resources for regulatory compliance. These activities will continue after closure to assess reclamation success and release of financial assurance (bonding). Reclamation and closure plans have been submitted to the appropriate agencies. ARO legal obligations are updated regularly and based upon existing site conditions, current laws, regulations and costs to perform the permitted activities. The ARO is to be conducted in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 410.

1.3.13 Capital and Operating Cost Estimates

The Lucky Friday Mine is in operation and there is no pre-production capital. Capital costs over the LOM total $372 million and are summarized in Table 1-5.

Table 1-5: Capital Cost Summary
Hecla Mining Company – Lucky Friday Mine

Year ($ millions)	Total	2022 Year 1	2023 Year 2	2024 Year 3	2025 Year 4	2026 Year 5	27 to 38 (Years 6 to 13)
Drilling	27.0	3.0	3.0	3.0	3.0	2.0	13.0
Major Projects	75.0	24.0	5.0	12.0	7.0	3.0	24.0
Ore processing	13.0	2.0	7.0	3.0	0.0	1.0	0.0
Mobile Equipment	41.0	5.0	8.0	7.0	2.0	2.0	17.0
Mine Development	200.0	14.0	11.0	21.0	23.0	16.0	115.0
Mine Infrastructure	16.0	3.0	6.0	3.0	1.0	2.0	1.0
Total	**372.0**	**51.0**	**40.0**	**49.0**	**36.0**	**26.0**	**170.0**

The forecasted LOM operating costs totaling $187.81/t milled are summarized in Table 1-6.

Table 1-6: Operating Cost Summary
Hecla Mining Company – Lucky Friday Mine

Item	Units	Total	2022	2023	2024	2025	2026 to 2038
Production Costs							
Mining (Underground)	$ millions	415.3	29.3	32.0	29.9	29.2	294.8
Processing	$ millions	117.5	8.7	8.9	8.2	7.8	83.9
Maintenance	$ millions	269.9	20.3	20.6	19.9	18.2	190.9
G&A	$ millions	182.7	13.4	13.1	11.9	11.2	133.2
Profit share	$ millions	39.4	2.9	3.0	2.8	2.7	28.1
Total	**$ millions**	**1,024.7**	**74.5**	**77.6**	**72.7**	**69.0**	**731.0**
Cost per ton milled							
Mining (Underground)	$/ton	76.11	86.11	78.32	74.27	73.57	75.45
Processing	$/ton	21.54	25.44	21.88	20.42	19.63	21.47
Maintenance	$/ton	49.46	59.67	50.39	49.35	45.76	48.86
G&A	$/ton	33.48	39.22	31.94	29.56	28.06	34.10
Profit share	$/ton	7.22	8.42	7.30	6.94	6.68	7.20
Total	**$/ton**	**187.81**	**218.86**	**189.84**	**180.54**	**173.69**	**187.08**

Hecla-forecasted capital and operating costs estimates are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would be classified as Class 1 with an accuracy range of -3% to -10% to +3% to +15%, although with some variances to be expected in near term with the operation coming back to full production after the recent labor strike.

2.0 INTRODUCTION

SLR International Corporation (SLR) was retained by Hecla Mining Company (Hecla) to prepare an independent Technical Report Summary (TRS) on the Lucky Friday Mine (Lucky Friday or the Property), located in Shoshone County, Idaho, USA. Hecla owns and operates 100% of the Property via ownership through two of its 100% owned subsidiaries.

The purpose of this TRS is to disclose the results of the Mineral Resource and Mineral Reserve estimates for the Property with an effective date of December 31, 2021.

Hecla is listed on the New York Stock Exchange (NYSE) and currently reports Mineral Reserves of lead, zinc, silver, and gold in United States Securities and Exchange Commission (SEC) filings. This TRS conforms to SEC's Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary. SLR visited the Property on October 5 and 6, 2021.

The Property includes the Lucky Friday mine and processing plant (or mill) in the city of Mullan, Idaho. The mine is a deep underground silver, lead, and zinc mine that produces silver and zinc concentrates from ore-bearing fissure veins. The plant is a concentrator facility producing silver and zinc concentrates that has a current operating rate of 1,000 short tons per day (stpd).

The Property commenced operations in 1942 and observed its 75th anniversary in 2017. In 2021, the underground operation mined 315,000 tons of ore and produced 32,000 tons of lead-silver and 14,000 tons of zinc concentrates. The concentrates were transported 209 miles (mi) to the Teck Metals Ltd. (Teck) lead/zinc smelter in Trail, British Columbia, Canada in highway trucks operated by a contract shipper. This 2021 production profile amounted to 3.6 million ounces (Moz) of silver, 23,100 tons of lead, and 10,000 tons of zinc produced.

2.1 Site Visits

SLR most recently visited the site on October 5 and 6, 2021. During the most recent site visit, the SLR Qualified Persons (QP) received a project overview by site management with specific activities as follows:

The SLR geology QP toured several stopes underground, inspected the core handling facility, and interviewed key personnel involved in the collection, interpretation, and processing of geological data and preparation of the Mineral Resource estimates.

The SLR mining QP visited production, development, and critical infrastructure areas in the underground mine. Both underhand cut and full and underhand closed bench production areas were visited where discussions were carried out on the mining cycle, productivities, dilution, and recovery. The QP discussed mining methods, mine economics, planning and scheduling activities, ventilation and refrigeration, and geotechnical procedures with relevant subject matter experts.

The SLR processing QP visited the surface infrastructure, including the hoist, emergency generators, warehousing, reagent storage, mechanical and electrical shops, electrical substation, compressor house. The mineral processing facilities were then toured included crushing, grinding, flotation, concentrate filtration and loading, sand filtration, cement addition and pumping, final tailings thickening filtration and pumping, and water treatment. The QP then toured the tailings impoundments, tailings water treatment plant and outfalls. Meetings were then held with the metallurgists to discuss the flowsheet, laboratory and plant metallurgical testing, and operating and maintenance information required for the reports.

The SLR ESG QP visited the surface facilities/operations and interviewed environmental and applicable staff manager(s) for environmental/social management/system(s); permitting/compliance program; reclamation/closure plan; and associated budget(s).

2.2 Sources of Information

During the preparation of this TRS, discussions were held with personnel from Hecla:

- Mr. Keith Blair, Chief Geologist, Hecla
- Mr. Carlos Aguiar, Lucky Friday General Manager, Hecla
- Mr. Ben Chambers, Lucky Friday Resource Geologist, Hecla
- Mr. Nick Furlin, Lucky Friday Chief Geologist, Hecla
- Mr. Andre Goedhals, Lucky Friday Project Manager, Hecla
- Mr. Bob Golden, Lucky Friday Chief Geotechnical Engineer, Hecla
- Mr. Karl Hartman, Lucky Friday Chief Engineer, Hecla
- Mr. Ben Henderson, Lucky Friday Drilling Manager, Hecla
- Mr. Wes Johnson, Lucky Friday Technical Services Manager, Hecla
- Mr. Jake Schuff, Lucky Friday Mill Metallurgist, Hecla
- Mr. Craig Shiner, Lucky Friday Mill Superintendent, Hecla
- Mr. Lance Boylan, Lucky Friday Health Safety and Environmental Manager, Hecla
- Mr. Russell Lawlar, Chief Financial Officer, Hecla

No previous Technical Report Summaries have been filed in respect of the Lucky Friday Mine.

This TRS was prepared by SLR QPs. The documentation reviewed, and other sources of information, are listed in Section 24.0 References.

2.3 List of Abbreviations

Units of measurement used in this TRS conform to the imperial system. All currency in this TRS is US dollars (US$) unless otherwise noted.

µ	micron	kPa	kilopascal
µg	microgram	kVA	kilovolt-amperes
a	annum	kW	kilowatt
A	ampere	kWh	kilowatt-hour
bbl	barrels	L	litre
Btu	British thermal units	lb	pound
°C	degree Celsius	L/s	litres per second
C$	Canadian dollars	m	metre
cal	calorie	M	mega (million); molar
cfm	cubic feet per minute	m^2	square metre
cm	centimetre	m^3	cubic metre
cm^2	square centimetre	MASL	metres above sea level
d	day	m^3/h	cubic metres per hour
dia	diameter	mi	mile
dmt	dry metric tonne	min	minute
dwt	dead-weight ton	µm	micrometre
°F	degree Fahrenheit	mm	millimetre
fasl	feet above sea level	mph	miles per hour
ft	foot	Mst	million short ton
ft^2	square foot	MVA	megavolt-amperes
ft^3	cubic foot	MW	megawatt
ft/s	foot per second	MWh	megawatt-hour
g	gram	oz	Troy ounce (31.1035g)
G	giga (billion)	oz/ton	ounce per short ton
Gal	Imperial gallon	ppb	part per billion
g/L	gram per litre	ppm	part per million
Gpm	Imperial gallons per minute	psia	pound per square inch absolute
g/t	gram per tonne	psig	pound per square inch gauge
gr/ft^3	grain per cubic foot	RL	relative elevation
gr/m^3	grain per cubic metre	s	second
ha	hectare	ton	short ton
hp	horsepower	stpa	short ton per year
hr	hour	stpd	short ton per day
Hz	hertz	stph	short tons per hour
in.	inch	US$	United States dollar
in^2	square inch	Usg	United States gallon
J	joule	USgpm	US gallon per minute
k	kilo (thousand)	V	volt
kcal	kilocalorie	W	watt
kg	kilogram	wt%	weight percent
km	kilometre	yd^3	cubic yard
km^2	square kilometre	yr	year
km/h	kilometre per hour		

3.0 PROPERTY DESCRIPTION

3.1 Location

The Property is located approximately one-half mile east of Mullan in Shoshone County, Idaho, and 55 mi east of Coeur d'Alene, Idaho along Interstate Highway 90 (Figure 3-1). The facility lies just north of the Interstate Highway near exit ramp 69. The Silver Shaft headframe is visible from the highway with the shaft collar approximately 70 ft above the valley floor. The Lucky Friday vein system lies adjacent to the Silver Shaft and the Lucky Friday Expansion Area (Gold Hunter vein system) lies approximately 5,000 ft northwest of the Silver Shaft.

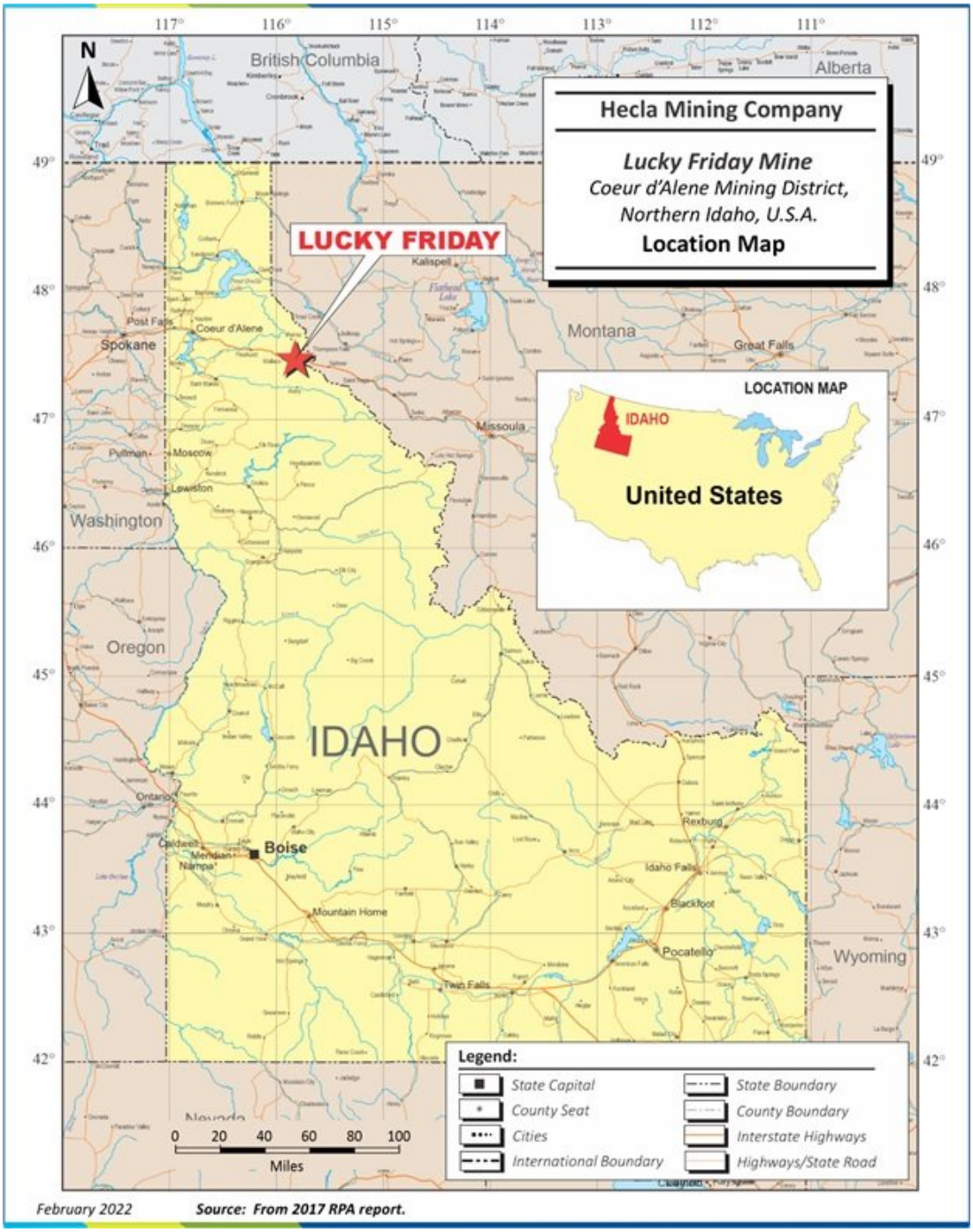


Figure 3-1: Lucky Friday Mine Location Map

3.2 Land Tenure

The Lucky Friday vein system is 100% owned by Hecla Limited. The Lucky Friday Expansion Area (formerly known as the Gold Hunter vein system) is owned 81.5% by Hecla Limited and 18.5% by Silver Hunter Mining Company (Silver Hunter). Both companies are subsidiaries of Hecla. Hecla controls 100% of the Lucky Friday Expansion Area.

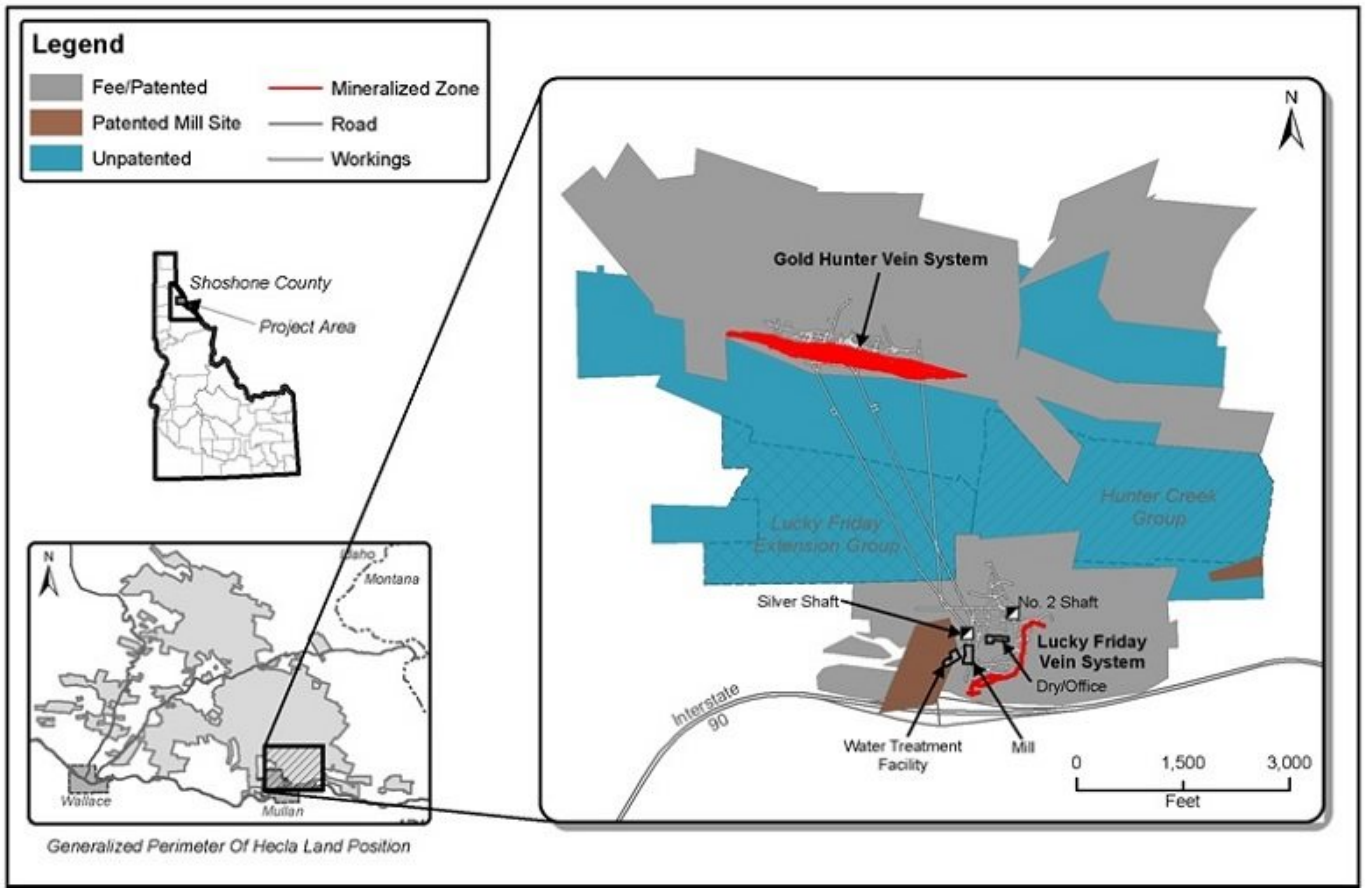
The Property, located in Sections 22, 23, 25, 26, 27, 34, 35, and 36, Township 48 North, Range 5 East, Boise Meridian, Shoshone County, Idaho, comprises approximately 710 acres of patented mining and millsite claims and fee lands, and 535 acres of unpatented mining claims. The Property lies within approximately 28 mi^2 of mineral interests controlled by Hecla and its affiliates, which includes patented mining and millsite claims, fee lands, and unpatented mining claims (Figure 3-2). The maintenance fees required to hold the unpatented mining claims have been paid annually to the U.S. Bureau of Land Management (BLM), and the claims are in good standing. Payment of property taxes on patented claims and fee parcels are current as of the date of this TRS. Lists of the patented and unpatented claims within the Lucky Friday area are provided in Appendix 27.4.

There are no royalties or back-in rights, however, there are intercompany transfers of royalties done between Silver Hunter and Hecla Limited. The surface rights to the patented mining claims are owned by a timber company, but Hecla has reserved rights to utilize the surface for mining-related purposes.

Certain unpatented mining claims are subject to a 1971 operating agreement between Hecla Limited (successor to Day Mines, Inc.) and Lucky Friday Extension Mining Company (LFX). The agreement grants Hecla a perpetual easement to crosscut the Hecla-LFX properties to conduct work in other properties such as the Gold Hunter. The 4050, 4900 and 5900 levels cross through this area. Hecla pays US$165 per claim annual maintenance fees to the BLM and the Shoshone County annual filing fees as required to maintain the unpatented claims in good standing on behalf of the parties. There are no royalties or back-in rights associated with the LFX group.

The Hunter Creek group, comprising nine unpatented mining claims, is subject to a 1971 agreement between Hecla and Hunter Creek Mining Company. Hecla owns a 50% interest in the unpatented claims and pays the US$165 per claim annual maintenance fees to the BLM and the Shoshone County annual filing fees as required to maintain the unpatented claims in good standing on behalf of the parties. There are no royalties or back-in rights associated with the Hunter Creek group.

Other than required annual maintenance fee payments for unpatented claims and tax payments for patented mining and millsite claims and fee lands, there are no additional obligations required to retain the properties. All of the unpatented mining claims are subject to the paramount title of the United States. The surface rights to the patented mining claims are owned by a timber company, but Hecla has reserved the right to use as much of the surface as in the reasonable judgment of Hecla is necessary for access and mining operations. There are no royalties or back-in rights encumbering the Property, and other than as described above, there are no payments or other agreements encumbering the properties.



Source: Hecla, 2021

Figure 3-2: Lucky Friday Complex Claim Map

3.3 Encumbrances

As stated above, there are no encumbrances on the Property.

3.4 Royalties

As stated above, there are no royalties payable.

3.5 Required Permits and Status

Operations at the Property are within the purview of numerous agencies (regulatory and non-regulatory) that require oversight, registration, and/or notification prior to initiating or significantly modifying facilities and operations at the Property. The Property has been in operation prior to inception of many regulatory programs, creation of certain regulatory agencies, and/or delegation of authority from the Federal government to the state agency.

The Property has obtained and maintains all the necessary registrations, authorizations, and permits necessary for operations to date and to continue operation of this facility well into the future (Table 3-1). Although some permits have expired or are set to expire, renewal applications were filed with the appropriate agency in each case or other measures were taken, as necessary, to administratively extend the prior conditions until such time as a renewed permit or additional authorization to utilize is issued.

Table 3-1: Environmental Authorizations, Operating Permits, and Registrations
Hecla Mining Company – Lucky Friday Mine

Type of Approval/Certificate	File Number	Agency	Purpose	Date of Approval
Certificate of Authorization	IDR05C290	USEPA	Authorization to utilize Nationwide MSGP	9/29/2008
Authorization to Discharge	ID-000017-5	USEPA	NPDES Wastewater Discharge permit for Outfalls 001, 002, & 003	9/14/2003
Permit to Construct/Operate	P-2010.0111	IDEQ	Permit to construct and operate portable air contaminant source (Concrete batch plant)	10/20/2010
DOT HazMat Registration	052912002005U	USDOT	Registration with DOT as Category E material shipper	5/30/2012
General Registration	GLTS-A-705715	NRC	Annual registration of on-site generally Iicensed devices.	2/13/2013 2014 Ackn. Pending
General Registration	ID00390	IDWR/USACOE	ID used to identify MTIS#3 in National Dam inventory Total Surety value $239,542 approved by IDWR 94- xx20.	N/A
General Registration	ID00728	IDWR/USACOE	ID used to identify MTIS#4 in National Dam inventory. Total Surety value $214,900 approved by IDWR for 94- xx25.	N/A

Type of Approval/Certificate	File Number	Agency	Purpose	Date of Approval
Certificate of Approval	94-xx25	IDWR	IDWR issued Cert. of Approval to impound water and tails at MTIS #4.	11/6/2013
PWS ID No.	1400028	IDEQ	IDEQ designation of PWS system operation.	2/6/1995
Operating Permit	731-10-000113	Idaho Fish & Game	Permit issued by Idaho Fish and Game to Operate Private Fish Pond.	6/21/2010
Waste Generator's Status	IDD009424862	USEPA	Majority of time Lucky Friday is a CESQG, however, periodic projects trigger status as SQG.	N/A

3.6 Other Significant Factors and Risks

SLR is not aware of any environmental liabilities on the Property. Hecla has all required permits to conduct the proposed work on the Property. SLR is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the Property.

4.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

4.1 Accessibility

The Property is accessed from Coeur d'Alene on Interstate 90 eastwards to exit 69, which leads to Atlas Road. Travel north on Atlas Road for approximately 500 ft then right onto Friday Avenue. The mine security office is located approximately 1,200 ft east of the intersection of Atlas Road and Friday Avenue.

The nearest town is Mullan (pop. 692), which borders the western boundary of the mine and mill facilities. Spokane International is the nearest airport, located 94 mi west of the Property on Interstate 90. Spokane International is serviced by several major carriers with daily flights to a wide range of major cities.

4.2 Climate

The climate of the Coeur d'Alene district is strongly seasonal with warm summers and harsh winters. The mean temperature for Mullan is 44.7°F with average monthly minimums of 27.1°F in December and average monthly maximums of 63.0°F in July and August. Mean precipitation is 35.24 in. (expressed in inches of water), with November having the highest average precipitation and July the least. This is well above the mean precipitation for Idaho which records an average of 18.9 in. annually. Precipitation is observed an average of 158 days a year. An average annual snowfall for Mullan is 111.9 in., with December experiencing the most at an average of 27.3 in. No snow is recorded between June and September. These data are based on records from 1975 to 1997 (Western Regional Climate Centre, 2009).

The mine is typically able to operate throughout the full year without any hindrance due to inclement or seasonal weather.

4.3 Local Resources and Infrastructure

The Property is located in the Silver Valley District of Idaho. This is an area with a long mining history and there is ready access to mining suppliers and skilled trades. The Property is immediately north of Interstate 90 at exit no. 69 and is easily accessible by automobile throughout the year on Idaho state maintained surfaced roadways. The project infrastructure and the infrastructure layout at the mine site are discussed in Section 15.0 of this TRS. There is sufficient suitable land available within the mineral tenure held by Hecla for tailings disposal, mine waste disposal, and installations such as the process plant and related mine infrastructure. All necessary infrastructure has been built and is sufficient for the projected life of mine (LOM) plan.

4.4 Physiography

The Coeur d'Alene District lies within the Bitterroot Mountains, a part of the Northern Rocky Mountain Region. The area is characterized by rugged terrain and high relief with abundant vegetation. Originally consisting of conifer forests, forest fires have diminished those trees in favor of second growth stands and brush. Principal conifers that remain are located in deep ravines and consist of pine, fir, hemlock, larch, cedar and spruce. Deciduous trees, mainly willow, alder and black cottonwood are found on the valley flats and along streams. Some aspen inhabit the high, open slopes, and willow and alder can be found on ridge slopes.

The Property is situated in an area of narrow valleys and wooded mountains. There is limited flat space in the mine area due to valley flats being restricted to the main stream and the lower reaches of some major tributaries. In only a few places do the flats exceed half a mile in width. Ridge crests range in altitude from 6,000 fasl to 7,000 fasl. The maximum relief between valley floors and adjacent ridge crests and peaks ranges from 3,000 ft to 4,000 ft.

5.0 HISTORY

5.1 Introduction and Previous Ownership

The Lucky Friday deposit was discovered in 1880 by J. F. Ingalis. Staking was initiated in 1889 by the Lucky Friday Group, and by 1906 the Property consisted of six claims. Gold Hunter mining production began in 1885, from a large surface gossan containing significant silver enrichment. In 1893, Gold Hunter Mining and Smelting Company (later changed to Gold Hunter Mines, Inc.) was incorporated to conduct mining activities on the Property.

The Lucky Friday Mining Company was incorporated in 1906 in the State of Washington and in Idaho in 1913. Some limited tunneling and trenching work was conducted. In 1938, John Sekulic acquired a lease and option to purchase the six claims and the following year formed the Lucky Friday Silver-Lead Mines Company to work the Property. A shaft was sunk to the 600 ft level and in 1942 the first commercial shipment of ore was made. Hecla began acquiring stock in Lucky Friday Silver-Lead Mines Company in 1958, with the purchase of a 38% interest and eventually, in 1964, the two companies merged.

Claims around the Gold Hunter had multiple ownerships until 1968. Day Mines, Inc. (Day Mines) acquired a majority interest in Gold Hunter Mines, Inc. in the 1950s. In 1955, the assets of Gold Hunter Mines, Inc. were conveyed by deed to a newly incorporated Gold Hunter Mining Company, and Gold Hunter Mines, Inc. was dissolved. The assets of Gold Hunter Mining Company were acquired by Day Mines in 1962, and the Gold Hunter Mining Company was dissolved.

The claims adjacent to the Gold Hunter deposit were owned by Abot Mining Company (Abot) and Independence Lead Mines Company. In 1968, Day Mines, Abot, and Independence Lead Mines Company (collectively referred to as DIA) entered into a series of agreements which allowed Hecla, as operator, to explore and develop the consolidated properties, including the Gold Hunter deposit. Day Mines was merged in 1981 with a wholly owned subsidiary of Hecla, Hecla-Day Mining Corporation, which was merged into Hecla the following year. In 2001, Abot quit-claimed its DIA property interests to Hecla. Hecla acquired the assets of Independence Lead Mines Company, including the DIA properties, in 2007 through its wholly owned subsidiary, Silver Hunter Mining Company.

Historical production for the Lucky Friday Mine to the end of 2020 was 165.7 Moz silver, 1.04 MT lead, and 210 KT zinc (Hecla, 2020) making it the Coeur d'Alene District's fourth largest silver producer.

5.2 Exploration and Development of the Lucky Friday Vein System

Exploration work spans a very broad time period and primarily consists of step-outs and progressively deeper investigations along known structures. There is a link between exploration and definition work, and often times the two general categories overlap.

A summary of early exploration on the Lucky Friday deposit is provided in Table 5-1. This area of the Property is currently inactive.

Table 5-1: Summary of Lucky Friday Vein Exploration by Elevation and Year
Hecla Mining Company – Lucky Friday Mine

Levels/Sublevels	Year	Description of Exploration Work Done
1400 level	1940	South drift on South Control Fault (SCF) outlined weak mineralization 500 ft west of the main Lucky Friday vein system.
		Development driven 500 ft to the Hunter Creek vein system north of the North Control Fault (NCF) with minor drifting on the South Star Fault (SSF) projection.
		The east split drift advanced from the Hunter Creek drift to test the eastern projection of the SSF. Found minor mineralization between the SSF and Whiteledge Fault (WLF).
2000 level	Late 1940s to 1951	Exploration hole from No. 1 shaft station to projection of SSF. No core was recovered from the fault zone.
		A northeast trending drift exposed veining between the NCF and SSF. Three drill holes on SSF and Hunter Creek targets were unsuccessful in discovering economic mineralization.
2800 level	1965 to 1967	The 1,250 ft Hunter Ranch drift driven west of intersection of the SCF and Lucky Friday Vein.
		Six holes drilled from the Hunter Ranch drift; three north and three south. One hole to the south intersected a 0.1 ft wide pyrite-chalcopyrite-quartz stringer; one of the holes to the north returned a sludge sample grading 0.7 oz/t Ag, 3.1% Pb, 0.1% Zn.
3050 level	1963 to 1966, 1988	Jutila Drift developed 3,500 ft east of Lucky Friday/NCF intersection. Fourteen diamond drill holes tested north and south of drift. No significant mineralization found except for where SSF crossed drift.
	1988	Jutila Drift drilled again to test downward projection of a mineralized zone exposed during surface construction.
4050 level	1973 to 1978, 1991 to 1993	The DMI drift west of Lucky Friday No. 2 shaft driven 1,300 ft. Two drill holes tested SCF projection with no success.
		Development confirmed the mineralization in the Silver Vein.
4250 level	late 1970s	Drifting and drilling on 40 Vein and on a link vein between NCF and SSF.
		Drifting to the southeast encountered mineralization 100 ft along the SCF.
4450 level	1989-1990	950 ft of SCF development encountered weak tetrahedrite and minor gold mineralization in a sub-economic “split vein”. Defined continuation of SCF mineralized zone to over 1,200 ft.
5100 level	1985-1994	Allied Silver tested 2,500 ft west of Lucky Friday system between the NCF and SCF. Eight diamond drill holes were drilled to the north and south.
		East and west projections of Silver Vein tested; low-grade disseminations 500 ft east and west of known mineralization.

Levels/Sublevels	Year	Description of Exploration Work Done
		The Tuesday Vein discovered in 1988 by extending the 5100 level 104 crosscut (hanging wall vein access).
		Development of the 40 Vein to the southeast near the 5100 level 112-development drift encountered mineralization that remains in resource.
		Weak mineralization and disseminated tetrahedrite encountered by hole 51-18 to test the SCF.
5300 level	1985 to 1994	Drilling to test the east, west and south projections of the Silver Vein zone intersected the 85 Vein southeast of the Silver Vein. Drilling also confirmed disseminated tetrahedrite mineralization in wall rock previously seen in 5100 level drilling.
		Testing of the far east projection of the SCF resulting in a tetrahedrite intersection. This was followed by the 4450 level South Control Fault Project.
		Drilling the east projection of the 40 Vein encountered weak mineralization confirming the downward projection of the Tuesday Vein. This drilling also suggested a "Link Vein" between the NCF and SSF.
5570 Sublevel	1994 to present	Drilling to test the Silver Vein yielded mixed results.
		Mineralization in the "Link Vein" between the NCF and SSF was confirmed but is currently subeconomic. More exploration is recommended.
Below 5570	1995 to present	Deep vein projections tested. Still open-ended to depth. Definition and exploration diamond drilling continuing on both the 30 and Intermediate Veins.

5.3 Exploration and Development of the Lucky Friday Expansion Area (Gold Hunter)

A summary of historical exploration on the Gold Hunter deposit is provided in Table 5-2.

Table 5-2: Summary of Gold Hunter Vein Exploration by Elevation and Year
Hecla Mining Company – Lucky Friday Mine

Levels/Sublevels	Year	Description of Exploration
4050 level	1974-1978	DIA drift advanced 3,700 ft north from LF No. 2 shaft to the down dip projection of the Gold Hunter Vein. Started in 1974, completed in 1977. An additional 390 ft of drifting to the west and seven drill holes were completed. Mineralization persisted for 800 ft of strike length but was subeconomic. The Gold Hunter zone was discovered in the Wallace Formation, 2,500 ft below Gold Hunter's surface expression.
	1991-1993	The west exploration program tested the down rake projection of the Gold Hunter in 1991. Two holes were drilled and a 4 ft, 50 oz/ton Ag vein was intersected. This led to two years of exploration drilling that defined the 4050 level but was insufficient for a production decision. This prompted a re-evaluation of the deposit model.

Levels/Sublevels	Year	Description of Exploration
		A geological study was completed that defined Gold Hunter as a vein deposit and recommended deeper exploration and development.
	2007-2008	Hole GH29-01, drilled in 2007 from 4050 level to test the Gold Hunter zone 900 ft above 4050, yielded encouraging results.
		In 2008, surface drilling comprising seven holes tested the Gold Hunter Gap between the historic production and the mineralization on the 4050 level and confirmed the continuity of mineralization.
		Also in 2008, drift rehab, 700 ft of development, and 850 ft of drifting for drill stations were completed. Seven holes were drilled to target the zones above the 4050 level. The program was successful, but the project was suspended to focus on deeper resources.
	2010	Diamond drilling resumed in the fourth quarter of 2010 from station No. 4 to test above the 4050 level development and stoping conducted during 1991-1993. Four 3900 level holes were completed and one 3700 level hole was abandoned due to core recovery problems. Vein locations and grades were confirmed but only one intercept of economic tenor was returned. The target from this station switched late in the quarter to definition drill testing below the level, with four holes completed by year end.
	2011	Nine holes were drilled from station No. 4 on the east side of 4050 level, and four holes from station No. 1 on the west. Drilling resulted in small increment to the Intermediate Vein resources and upgrades to the 30 Vein resource. Recoveries were poor due to constraints regarding the drilling additives, and drilling was suspended.
4900 level	1995 to 2001	In 1995, the Gold Hunter tunnel drive began and yielded economic mineralization that resulted in a positive production decision in 1997. Full production was reached in 1998 and the area was mined, at full capacity, until 2001.
		Gold Hunter production was reduced from 2001 to Q1 2005 when the 5900 level drive reached mineralization.
		Far east projection drilling began in 2005 confirming the mineralized zone projected at least 1,400 ft east of the 15 stope economic limit at the 5800 level.
		Minor mineralization to the far east was confirmed by drilling in 2006 approximately 2,000 ft beyond the 4900 level economic limit.
5900 level	2004 to present	Access drive started in 2004, completed by mid-2006. Mineralization was encountered in vein characterization drilling.
		The 6400 level deep drill program confirmed deep mineralization in 2005.
		During 2006, Gold Hunter deep potential was successfully tested to the 7500 level confirming 1,000 ft of strike length. One hole returned an economic intersection below the 8000 level.

Levels/Sublevels	Year	Description of Exploration
		During 2006, the west Gold Hunter projection was tested but yielded equivocal results. In 2007, the deep west 6900 level was tested and resources were confirmed below the 7000 level. Faulting is thought to offset or terminate the deep west projection of Gold Hunter.
		Full production from the 5900 level reached in Q4 2006.
		Deep targets along the projected west 6900 level were tested during 2007 resulting in resource confirmation to depths below 7000 level. Far-west diamond drill holes indicate existence of a fault (Silver Fault?) that either offsets or terminates the west projection of the deep Gold Hunter resource. East exploration drifting in 2006 defined potential for Intermediate and 30 Vein mineralization below the 5900 level.
		East exploration work was completed on the Intermediate Veins during 2008, which resulted in expansion of the resource at the 5700 and 6100 levels.
		Two long exploration holes were drilled in 2008, one testing 1,800 ft north of the 5900 level Gold Hunter system on the east, and the second testing 2,975 ft north of the system on the west side. No significant mineralization was encountered in either hole. The west side hole, abandoned due to intersection with a water-charged fault, was cemented.
		Exploration to the east below the 5900 level continued during 2008 with testing reaching to the 6300 elevation. One hole reached the 7400 level and encountered good grade mineralization over a one foot horizontal width, approximately 600 ft east of the known economic boundary.
		Exploration to the west testing the Silver Fault offset was completed in late 2008 and confirmed the existence of another large fault that terminates or offsets mineralization.
		Late in 2008, Deep Gold Hunter exploration began and confirmed improved 30 and 40 Vein grades below 6300 level.
		Deep Gold Hunter exploration completed in late 2009, drilled the central and eastern areas with the deepest hole reaching the 7850 elevation. Drilling yielded generally positive results. A conditional simulation study was conducted late in 2009, which indicated that drill spacing was sufficient for characterization of the resource down to 7900 level.
		East exploration between the 6100 and 6400 levels confirmed narrow mineralization beyond the 2008 resource boundary. Evidence was found for increasing widths and grades with depth, to the east between the 6500 and 7900 levels.
		West exploration testing for a north offset on the Silver Fault was completed late in 2009, encountering local alteration and minor mineral occurrences along a fault. A large target area was defined between the Silver Fault and the Elk Fault east of the Star Mine.

Levels/Sublevels	Year	Description of Exploration
		During 2010, east deep exploration drilling confirmed Gold Hunter resource expansion and added approximately 400 ft to the strike of the east resource below the 6900 level. Intermediate Vein intercepts north of the deep projections of the 30-Vein returned economic widths and grades. East deep drill testing from the 5900 wash bay was completed late in the fourth quarter. Continued success with the deep drilling during 2010 program improved the confidence of deep resource projections to the 8300 level.
		Nine holes were collared from the 5900 No. 4 shaft station, and four additional holes were wedged from these. Drilling extended into the Silver Fault Zone; only six of the thirteen attempted holes penetrated the entire mineralized package. Dips of the deep west mineralization appeared to reverse from steeply south to steeply north; the economic vein assemblage that was encountered appeared to consist of two to four economic veins.
Mine-Based Exploration of GH Surface Veins	2007	A total of seven diamond drill holes were completed during 2007, testing targets beyond the western limits of the historic near-surface mining operations along the Gold Hunter System.
		The Gold Hunter, Yolande, and the American Commander areas were tested. The deepest hole extended from surface down to the 600 tunnel level at 2,770 ft MSL. No significant intercepts were encountered.

5.4 Historical Resource Estimates

The most recent Mineral Resource and Mineral Reserve estimates were disclosed on the Hecla web site (Hecla, 2020). The estimates were prepared by Hecla and are summarized in Table 5-3 and Table 5-4, respectively. The effective date, as stated on the web site, was December 31, 2020.

Table 5-3: Previous Mineral Resource Estimate – December 31, 2020
Hecla Mining Company – Lucky Friday Mine

Category	Tons	Grades			Contained Metal		
	(ton)	(oz/ton Ag)	(% Pb)	(% Zn)	(oz Ag)	(ton Pb)	(ton Zn)
Measured	9,007,000	7.6	4.8	2.4	68,543,000	430,950	218,740
Indicated	2,275,000	7.8	5.3	2.2	17,844,000	120,390	50,970
Total M+I	11,282,000	7.7	4.9	2.4	86,386,000	551,340	269,710
Inferred	3,069,000	8.3	6.3	2.7	25,359,000	192,200	83,350

Notes:

1. In situ Measured, Indicated, and Inferred Resources from Gold Hunter and Lucky Friday vein systems are diluted for expected mining recovery.
2. The net smelter return (NSR) cut-off grades are US$170.18/ton for the 30 Vein, US$184.97/ton for the Intermediate Veins, and US$207.15/ton for the Lucky Friday Vein.
3. Metal prices used were US$21/oz Ag, US$1.15/lb Pb, and US$1.35/lb Zn.
4. Totals may not agree due to rounding.

Table 5-4: Previous Mineral Reserve Estimate – December 31, 2020
Hecla Mining Company – Lucky Friday Mine

Category	Tons (ton)	Grades (oz/ton Ag)	(% Pb)	(% Zn)	Contained Metal (oz Ag)	(ton Pb)	(ton Zn)
Proven	4,393,000	14.2	8.8	4.1	62,290,000	386,210	180,060
Probable	1,372,000	10.7	7.2	3.9	14,702,000	99,170	53,190
Total P + P	5,764,000	13.4	8.4	4.0	76,992,000	485,380	233,250

Notes:

1. The NSR cut-off grades are US$216.19/ton for the 30 Vein and US$230.98/ton for the Intermediate Veins.
2. Metal prices used were US$16/oz Ag, US$0.90/lb Pb, and US$1.15/lb Zn.
3. Totals may not agree due to rounding.

The December 31, 2020 Mineral Resource and Mineral Reserve estimates are superseded by the estimates reported in Section 11.0 of this TRS.

5.5 Past Production

As stated above, historical production for the Lucky Friday Mine to the end of 2020 was 165.7 Moz silver, 1.04 MT lead, and 210 KT zinc (Hecla, 2020).

6.0 GEOLOGICAL SETTING, MINERALIZATION, AND DEPOSIT

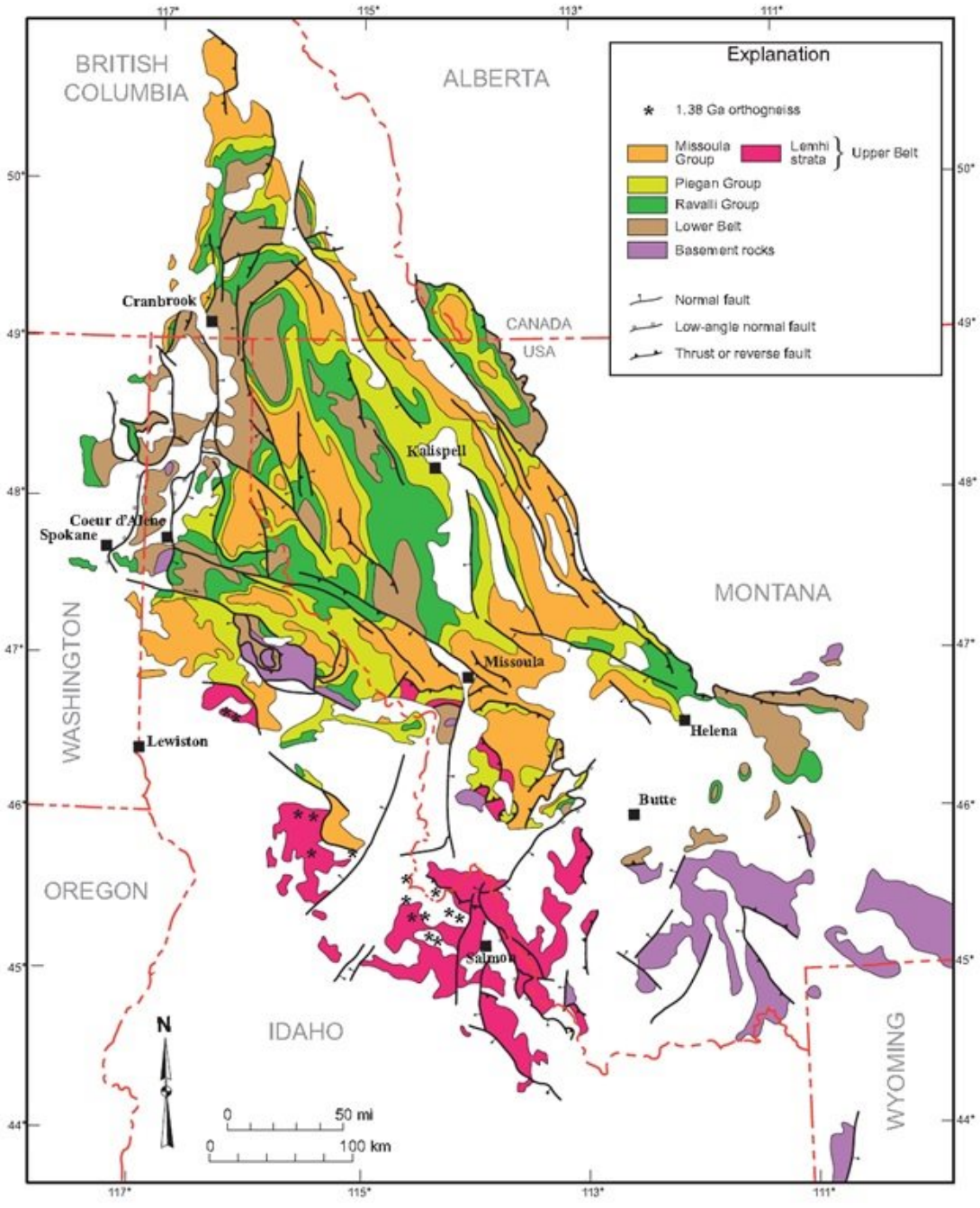
6.1 Regional Geology

The Coeur d'Alene Mining District is predominantly underlain by Middle Proterozoic (ca. 1.45 Ga to 1.40 Ga) meta-sedimentary and mafic intrusive rocks of the Belt Supergroup (Figure 6-1). The Belt consists of a thick sequence of variably metamorphosed marine, lacustrine, and sub-aerially derived quartzites and argillites with scattered carbonaceous horizons (Hobbs et al., 1965). The sequence is only rarely interrupted by magmatic events. The Belt Supergroup lies unconformably on top of Archean and Proterozoic crystalline basement.

These rocks correlate with the Purcell Supergroup in southern British Columbia and Alberta, and together, the Belt-Purcell comprises an enormous sedimentary basin which extends southwards to central Idaho and laterally from the Washington border to almost midway into Montana. It is thought to be a fault-bounded rift basin, which for most of its existence was remarkably stable as no unconformities have been found throughout its entire vertical extent (Lonn et al., 2020). The Belt Supergroup is estimated to be at least 15 km thick (Hobbs et al., 1965), possibly over 18 km thick (Jones et al., 2015), and subtends an area of greater than 200,000 km^2 (Lonn et al., 2020).

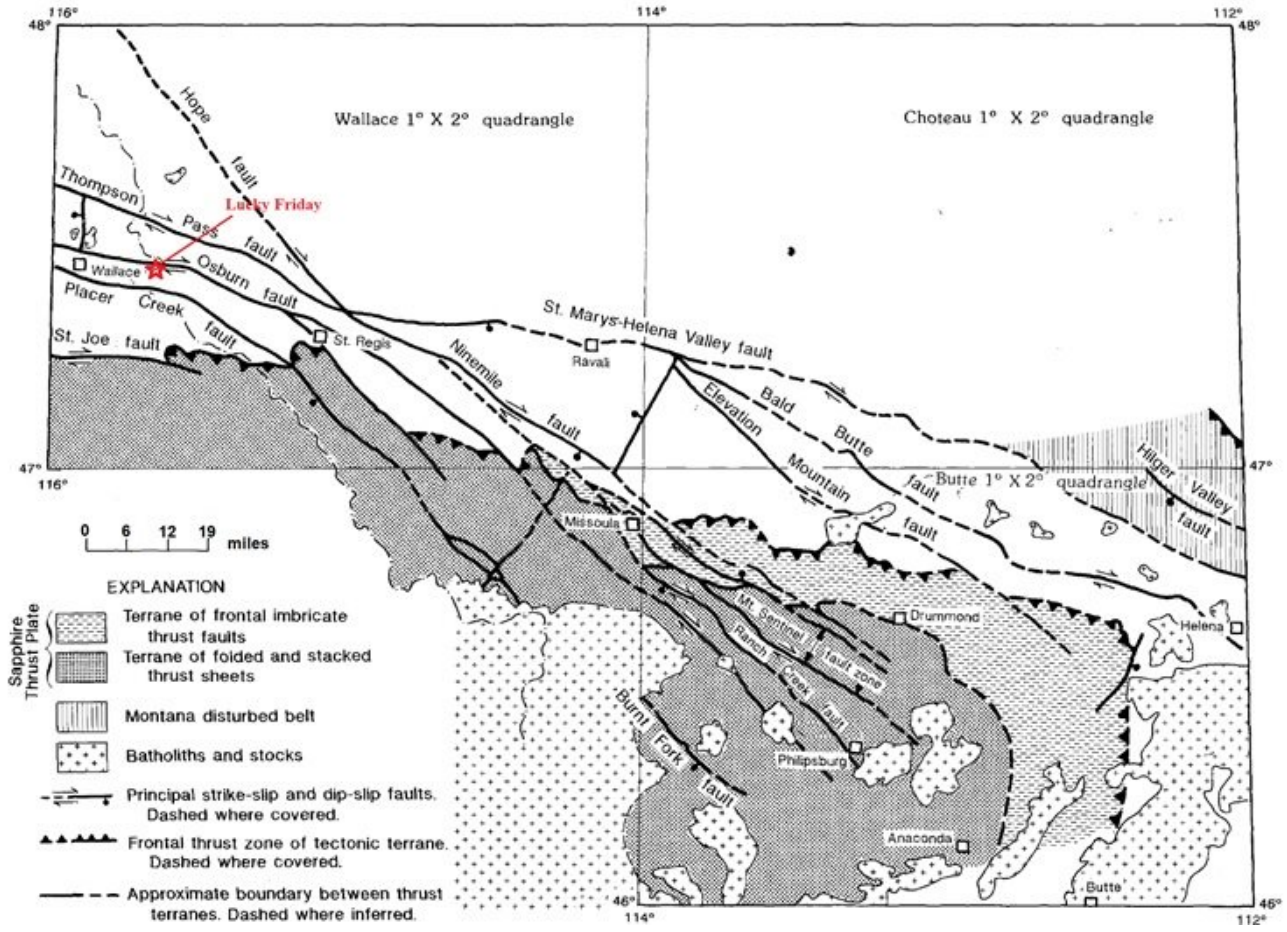
The Belt Purcell Supergroup was deposited near the margin of the North American craton within the Columbia supercontinent between 1.54 Ga and 1.30 Ga (Jones et al., 2015; Perelló et al., 2021). Deformation of the Belt is thought to have commenced at about 1.45 Ga with rifting and the detachment of the Australian and Antarctic cratons from the North American Craton. The region has undergone several episodes of deformation and metamorphism including the East Kootenay (1.38 to 1.325 Ga), Grenville (1.20 to 1.00 Ga), and Goat River (900 to 800 Ma) orogenies (Perelló et al., 2021). Most recently, deformation and faulting has occurred during Cordilleran tectonism (Jones et al., 2015) taking place from the Jurassic (ca 160 Ma) and extending into the Eocene (ca 50 Ma).

This prolonged tectonism has resulted in a complex series of synclines and anticlines that are often overturned. In the mine area, the primary structural feature is the Lewis and Clark Line (Figure 6-2), a crustal-scale shear corridor measuring 400 km long and up to 80 km wide trending west-northwest from Montana across the Idaho Panhandle (Wallace et al., 1990). The most recent displacement event likely took place in the Late Cretaceous and is estimated to have resulted in between 11 km and 28 km of right-lateral strike slip movement.



Source: Lonn et al., 2020

Figure 6-1: Regional Geology



Source: Wallace et al., 1990

Figure 6-2: Lewis and Clark Line

6.2 Local and Property Geology

The Belt Supergroup has been subdivided into four groups: the Lower Belt, Ravalli, Middle Belt, and the Missoula Groups (Harrison, 1972). In the Coeur d'Alene Mining District, Belt Supergroup rocks are further subdivided into six formations listed below (oldest to youngest):

- Prichard Formation (Lower Belt Group); Dark grey to black argillite with two quartzite horizons;
- Burke Formation (Ravalli Group); Grey argillaceous quartzite, including some characteristic beds of purple quartzite;
- Revett Formation (Ravalli Group); Competent, thick-bedded, white and grey quartzite, with some green-grey argillaceous quartzite beds;
- St. Regis Formation (Ravalli Group); Purplish-grey quartzite and argillite;
- Wallace Formation (Middle Belt Group); Light grey quartzite, limestone, and argillite;
- Striped Peak Formation (Missoula Group); Purplish-grey and greenish grey quartzite, and thinly laminated purplish-grey argillite.

These rock units are depicted in a stratigraphic column in Figure 6-4.

In the immediate mine area Belt Supergroup stratigraphy comprises the Revett, St. Regis, and Wallace Formations (Figure 6-3). The lowermost is the Revett Formation which is predominantly shallow marine quartzite, with local argillaceous lenses. It is immediately overlain by St. Regis Formation shallow marine shales and sandstones which are, in turn, overlain by the Wallace Formation. The Wallace Formation is primarily composed of fine-grained, thin-bedded calcareous or dolomitic sericitic slate, banded argillite, ferruginous and dolomitic limestone, and calcareous quartzite that grade into one another.

Cretaceous monzonitic intrusions, referred to as the Gem stocks, cut the stratigraphy approximately two miles northwest of the Star-Morning deposit. The Gem stocks are distributed along a northeast trend that is bounded to the southwest by the Dobson Pass Fault. Metamorphism associated with these intrusions, as well as an alteration facies locally described as "bleaching", obscures contact relationships. Younger dikes of dioritic composition also transect the area.

As stated above, these rocks are intensely folded into a complex series of synclines and anticlines that are often overturned. Faulting is also complex, with an older north-northwest-trending set of axial plane faults offset by later west-northwest right-lateral strike-slip faults. Structures related to this later strike-slip movement host most of the orebodies discovered in the district. Later, extensional faulting overprints these ore hosting structures. These structures are the principal control to ore formation in the district.

The Osburn Fault (OBF), which represents the largest fault in the district, passes just south of the mine (Figure 6-3). This is a major regional structure which divides the entire district into north and south sections. The fault strikes N80W and has undergone right lateral displacement in the order of 12 mi to 16 mi, depending on dip-slip movement. Subsidiary subparallel faults splay off of the main structure on both the north and south. To the north, the structural trend swings more to a north to north-northwest orientation. Other major producers of the district including the Bunker Hill and Sunshine mines are located on the south side of the OBF, but displaced westward. South of the OBF folds and faults trend east-west, whilst north of the OBF the larger folds trend northwest and the larger faults have a west to northwest strike.

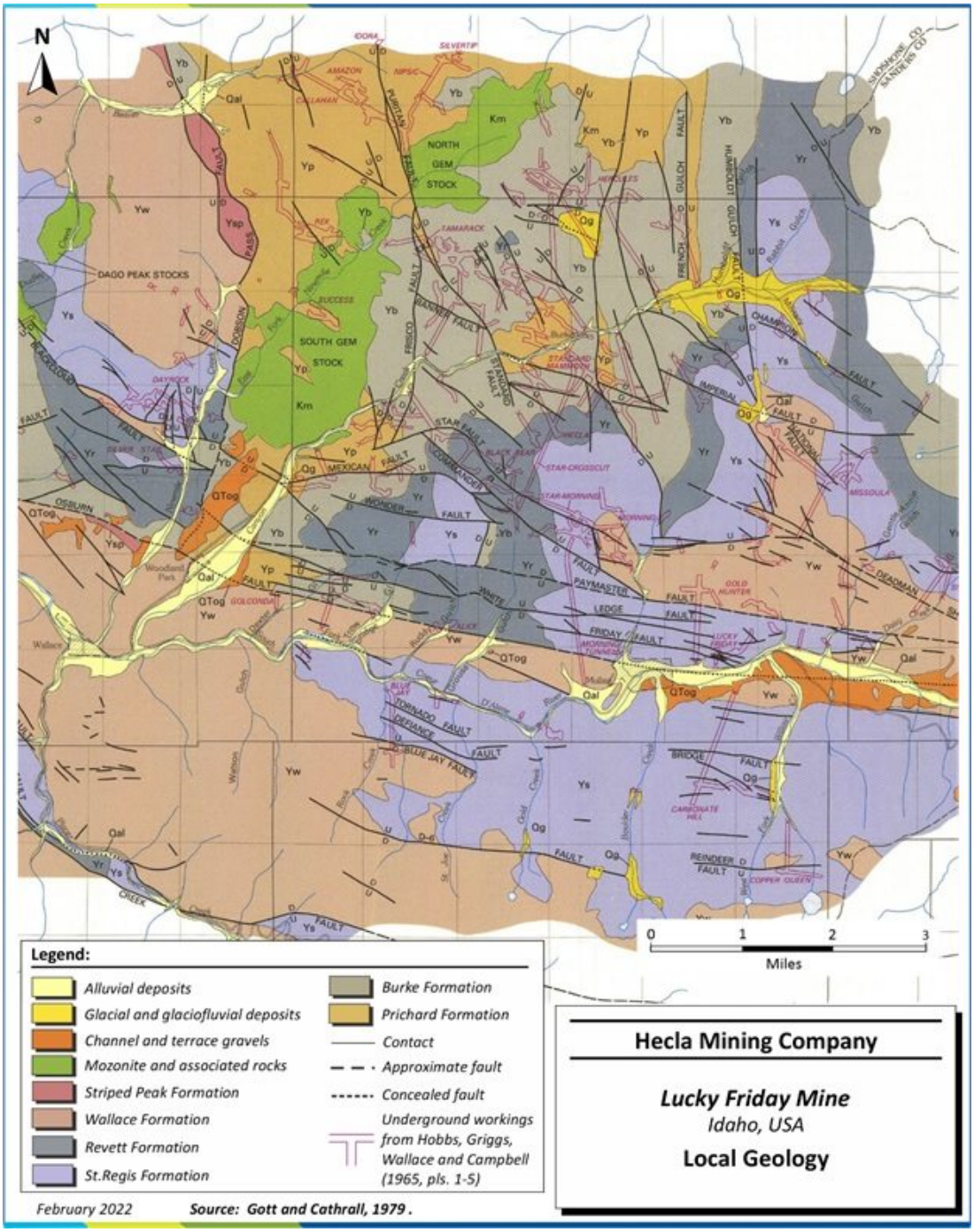
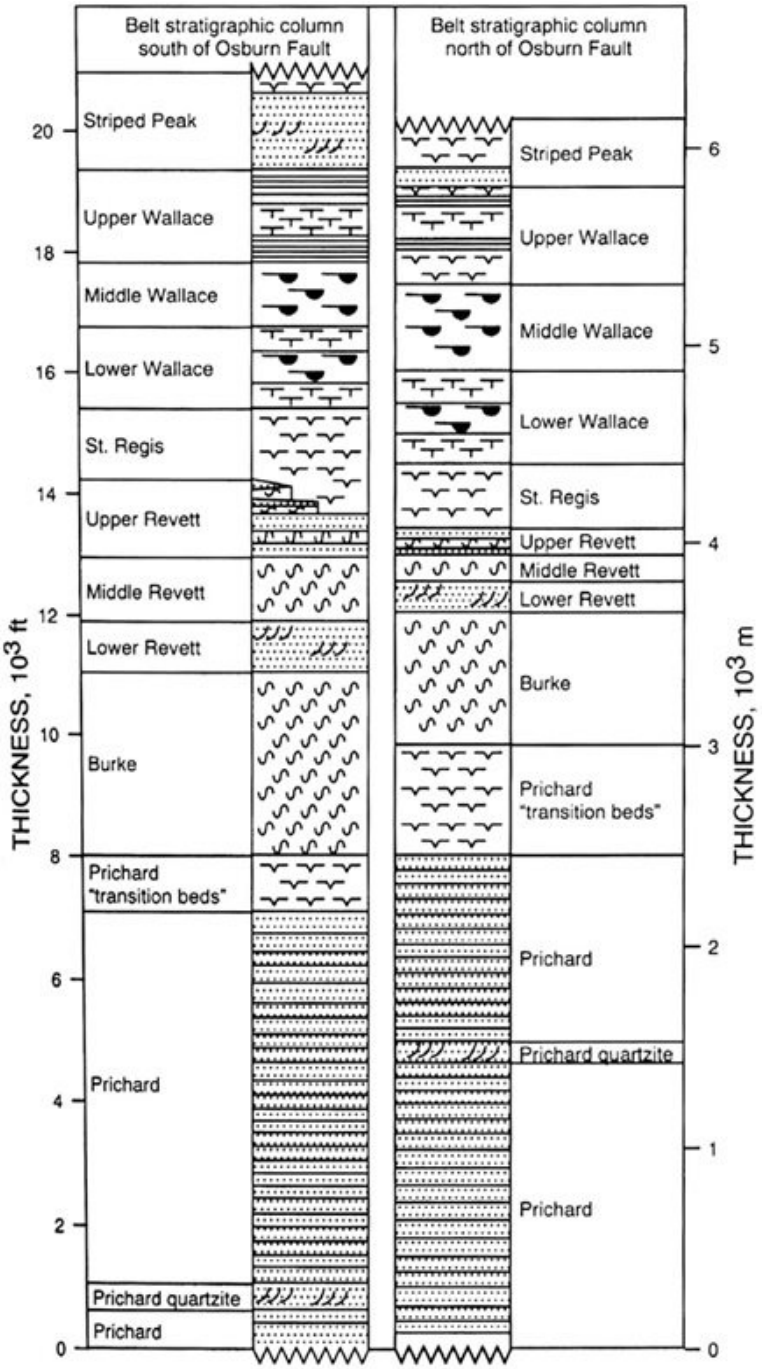


Figure 6-3: Local Geology



Source: Mitchell et al., 2021

Figure 6-4: Stratigraphic Column

The Dobson Pass Fault represents a major discontinuity that juxtaposes the Wallace and Prichard formations. All rocks, including the major silver-bearing veins and the Gem stocks, are cut by north-northwest striking lamprophyre dikes that are interpreted to be Tertiary in age (Hobbs et al., 1965).

The Lucky Friday deposits are fissure-hosted silver-lead-zinc veins typical of the Coeur d'Alene District. Principal vein systems are the Lucky Friday and Gold Hunter Veins (Figure 6-5). Economic mineralization consists of silver-bearing galena and tetrahedrite, with relatively minor amounts of sphalerite and chalcopyrite. These minerals occur in veins, fracture-fillings, and disseminations along with accessory pyrite and a gangue of iron carbonate (siderite), calcite, and quartz. Mineralization is strongly structurally controlled with a significant influence from the competency of the wall rocks. Ore bodies are best developed where faults and fractures intersect more siliceous and competent lithologies, and are less likely to occur in the comparatively incompetent argillites.

The Lucky Friday ore zone is a single tabular body that curves from east-northeast to northeast in strike and dips almost vertically. The host structure is a shear couple tensional feature, bounded by two major west-northwest-trending faults associated with the Osburn Fault (located 1,000 ft to the south). These bounding faults are termed the North and South Control Faults (NCF and SCF, respectively). Between these two structures, the vein and host stratigraphy are folded into a southwest-trending steeply plunging antiform called the Hook Anticline. The fracture hosting the Lucky Friday vein has undergone up to 200 ft of reverse movement.

Horizontal vein widths are in the order of five feet to six feet. The strongest mineralization occurs in the quartzitic rocks of the Revett Formation. Near surface, where the Lucky Friday vein traverses St. Regis Formation argillites, the mineralization is weak and discontinuous. Below the 1200 level, where the vein walls transition to Revett, vein widths and mineralization are much more robust.

Vein mineralization consists of very fine- to coarse-grained argentiferous galena, sphalerite, and local tetrahedrite. Gangue minerals are quartz and siderite with accessory pyrite and arsenopyrite. Gangue minerals often display cataclastic textures such as rounding and quartz or siderite "eyes" owing to post-ore movement of the faults. The wall rocks are generally weakly altered, with siderite proximal to the vein, grading to siderite with calcite distally, up a distance of 300 ft from the veins.

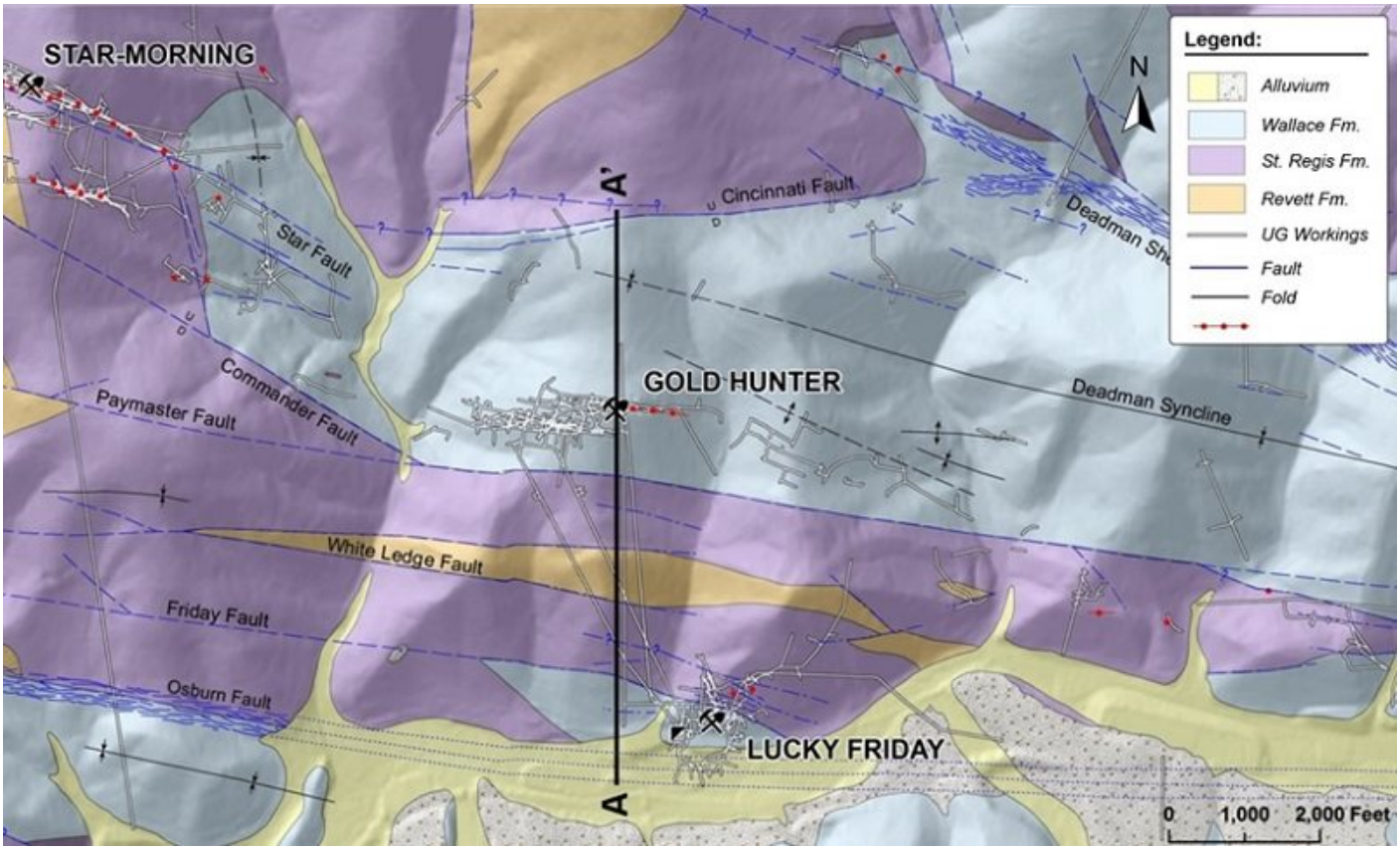
The Gold Hunter Vein system is located approximately 4,000 ft northwest of the Lucky Friday deposit (Figure 6-5 and Figure 6-6). The system comprises several closely spaced individual veins in a broad zone measuring approximately 200 ft wide and striking in a west-northwest direction. The present resource estimate includes material from 16 individual veins. Vein orientations are generally parallel, although they do intersect in places, and dips are near-vertical (Figure 6-7). The 30 Vein is the most important economically, both from a reserve and production point of view. The 30 Vein has been mined along a strike length of just over 2,200 ft on the 5900 level and slightly more at depth. The known vertical extent of mineralization on this structure is nearly 4,700 ft and is open-ended. Horizontal mining widths are typically in the order of five to seven feet but have been known to extend as far as 15 ft. Ore bodies on the other veins (termed "Intermediate Veins") have tended to be smaller, so far measuring in the hundreds of feet in strike and dip extent, and are somewhat narrower, generally in the 2.5 ft to 4.0 ft range.

The Gold Hunter veins are hosted in sheared argillites of the Wallace Formation and, at depth, the St. Regis Formation, which were at one time considered to be less prospective owing to their lower competence. The host unit is a 200 ft thick siliceous and relatively more brittle lens in the argillites. The Wallace Formation lithology consists of thinly bedded argillites, argillites alternating with silt caps, and local siltites. The more typical Wallace Formation dolomitic argillites and siltites are found distal to mineralization. Argillites proximal to mineralization are green to grey, becoming purple-coloured and hematitic further away from the mineralization. Fissility in the Wallace Formation is reduced in the vicinity of the Gold Hunter deposit, owing to an envelope of silica and siderite associated with the mineralization. It is believed this alteration hardened the host rock and made it more amenable to fracturing and development of sulphide orebodies.

The wall rocks at Gold Hunter have a metamorphic shear lineation that trends N83W and plunges to the west at 74° to 82°, roughly parallel to the ore bodies. This fabric has been observed at the surface discovery and is also noted at depth as sericite mineralization along bedding and cleavage surfaces. The Wallace Formation is folded to a nearly vertical orientation with a strike in the order of N80-85W and dipping 80-90S. Gold Hunter appears to be within the south limb of a faulted N80-85W-trending antiform.

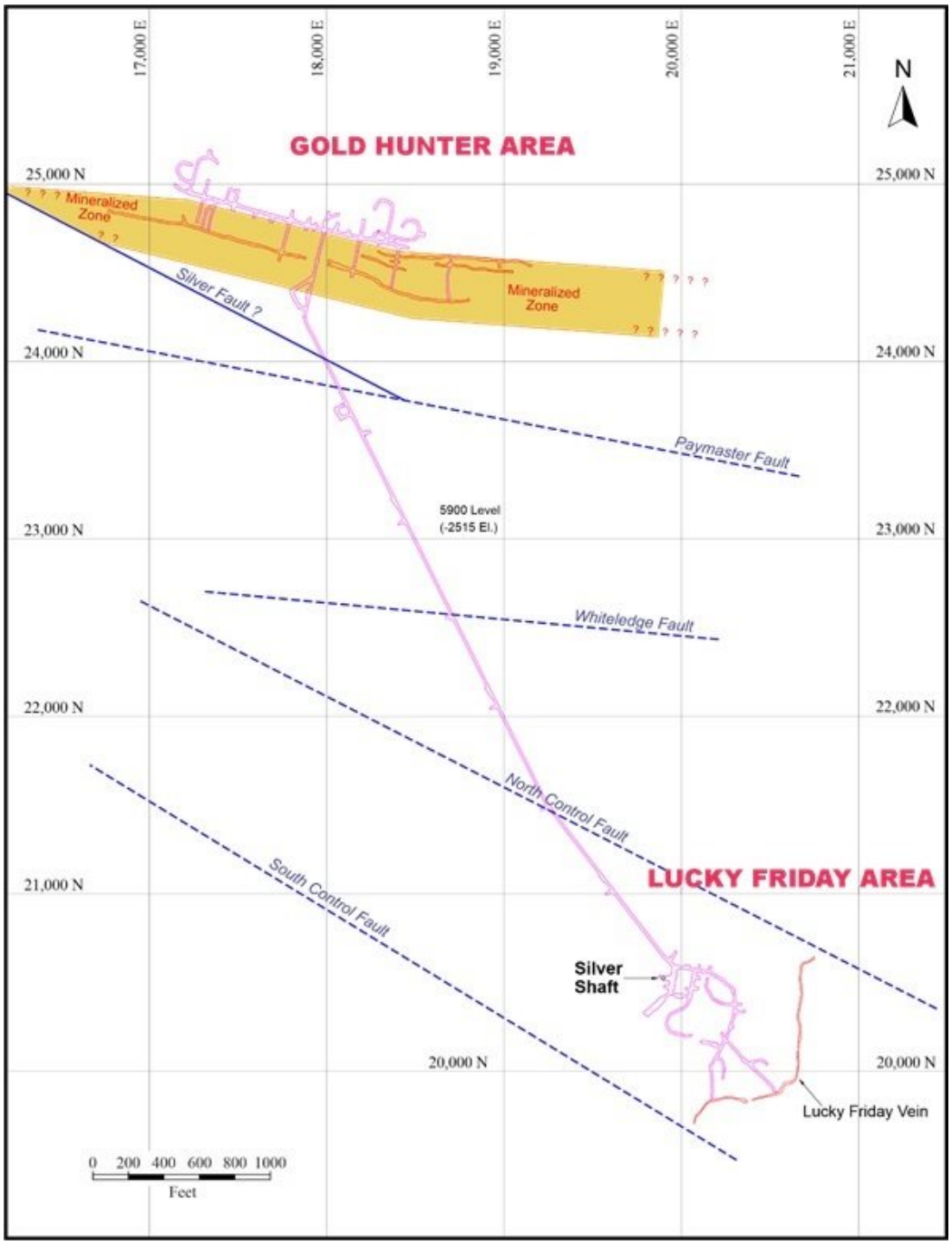
There is little carbonate locally in the Wallace Formation around the deposit. Proximal to the Gold Hunter deposit, carbonate takes the form of siderite that grades outward to low-iron siderite, to ankerite, and to calcite/dolomite distally. The carbonate alteration is closely related to the mineralization and is considered a key diagnostic indicator.

The Gold Hunter vein system lies between two west-northwest trending district fault structures. The faults lie approximately 1,500 ft apart and define the Star-Gold Hunter trend. To the north is the N80-85W striking and 80S dipping Independence Fault and to the south is the N80W-striking and 80S-dipping Paymaster Fault (Figure 6-5,Figure 6-6, and Figure 6-7).



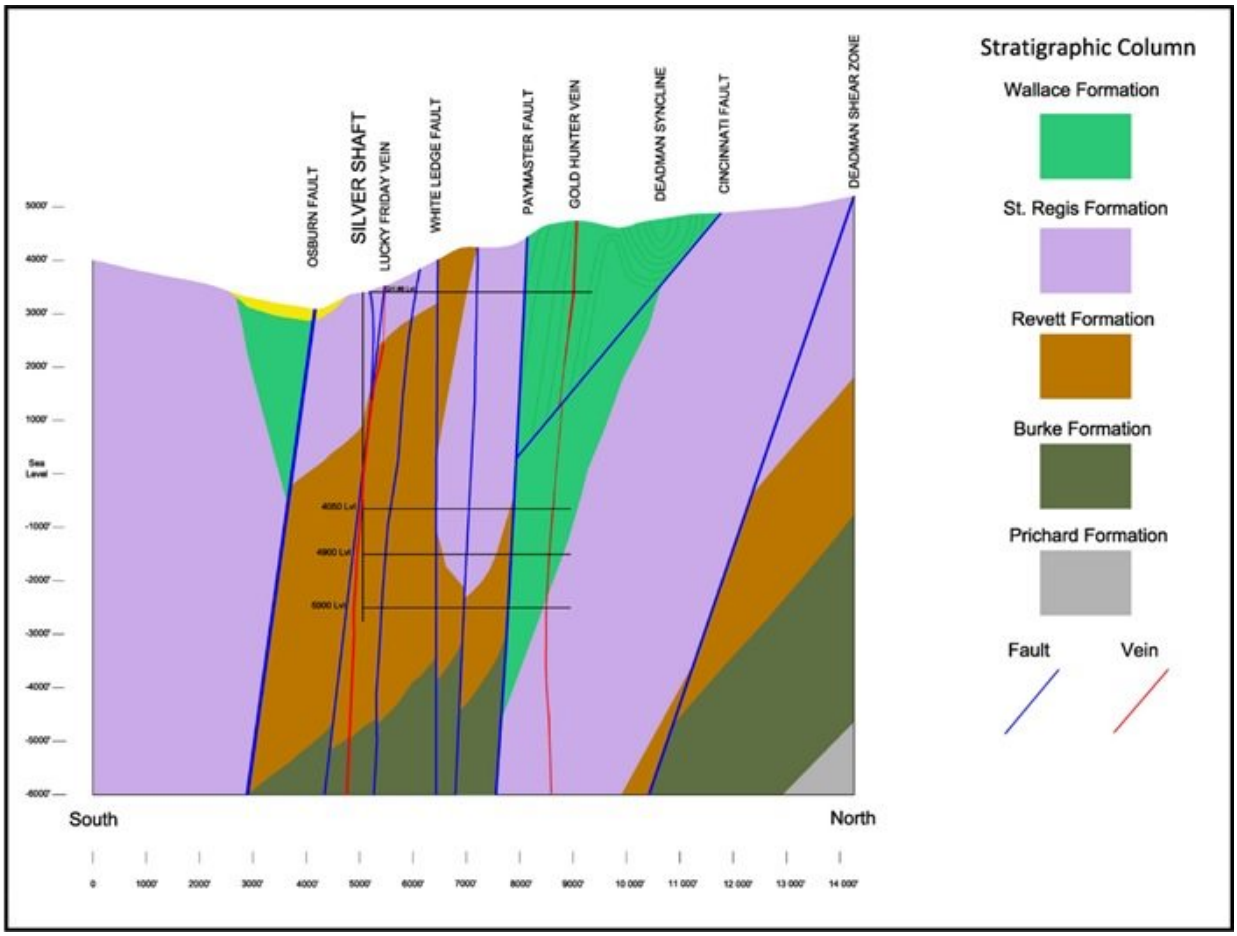
Source: RPA, 2017 (Digitized from Hobbs et al., 1965)

Figure 6-5: Property Geology



Source: RPA, 2017

Figure 6-6: Geological Plan 5900 Level



Source: RPA, 2017 (Digitized from Hobbs et al., 1965)

Figure 6-7: Cross Section

6.3 Mineralization

6.3.1 Lucky Friday Vein

Wall rock alteration consists of a weak carbonate zonation. Calcite dominates in areas distal to the mineralization that gives way to ankerite as the vein is approached and then is altered to siderite closer to the vein system. The geometry of this alteration depends upon wall rock porosity and permeability. Iron and magnesium in fluids flowing out from the vein systems altered the original calcite. Some host rocks contain dolomite, which compromises the alteration pattern. This alteration can be seen for distances of more than 300 ft from vein systems depending upon bedding orientations to the vein source. Additionally, disseminations of sulfide extend some distance into host stratigraphy. This sulfide material usually consists of galena, sphalerite, and tetrahedrite.

The Lucky Friday Vein has an economic strike length of up to 1,500 ft. The vein is a high angle south-southeast dipping vein that varies from inches to as much as 20 ft in width. The average varies from four to six ft over the full economic length.

The source for this mineralization is current unclear. The Lucky Friday Vein is connected with the NCF and SCF, which are mineralized locally. These may have been the major structural controls, enabling mineralizing fluids to flow into the host fissure, which eventually became the vein.

The vein consists of both gangue and sulfide mineralization. It contains quartz and siderite with lesser amounts of pyrite and arsenopyrite. Ore minerals include argentiferous galena, sphalerite, and local tetrahedrite.

Mineral textures vary. Gangue minerals are often cataclastic for quartz and siderite with milling evidenced by rounded mineral grains. Quartz and siderite “eyes” are common in Lucky Friday ores. Sulfide textures vary from very fine-grained to coarse-crystalline.

A simplified paragenesis begins with early quartz carbonate, plus or minus sericite and pyrite, followed by sphalerite, and then by tetrahedrite and argentiferous galena.

6.3.2 Gold Hunter Vein System

Gold Hunter historic mining extending from the surface at +4,700 ft MSL elevation to the 4900 level at -1,510 ft MSL elevation demonstrates grade trends and variability. The vein zones are stacked and parallel to sub-parallel with often ill-defined mineralized lenses. The historic surface mining had bulk resource grades of 4.1 oz/ton Ag and 3.9% Pb in three main lenses. On the 4050 level at the -675 ft MSL elevation there were five lenses at a bulk grade of 9.1 oz/ton Ag, 4.1% Pb, and 1.3% Zn. At 4900 level (-1,510 MSL) there are ten lenses at a bulk grade of 9.6 oz/ton Ag, 5.4% Pb, and 2.3% Zn.

Mine geologists report that silver, lead, and zinc bulk grades generally increase with depth. Lead and zinc content increases slightly relative to silver.

There are currently 101 definable, parallel veins identified in the Gold Hunter system. These vary in width and grade with the most productive being the 30-Vein. This vein has the greatest value, width, and economic length when compared to the other Gold Hunter veins. The 30-Vein averages more than four ft in width as a composite of closely spaced veins and veinlets. It strikes N83W and dips 80°S to vertically. The economic vein length is approximately 2,300 ft. This vein has yielded a significant percentage of total Lucky Friday Unit production since 1997 and has been largely mined out down to approximately 6000 level. The other “Intermediate” veins have shorter strike lengths and generally narrower widths. The distribution of silver, lead, and zinc varies randomly for each vein. Production from Intermediate veins is in the LOM plan and is anticipated to contribute proportionally more to the overall mill feed as time progresses.

The 5900 level development was completed and full production was reached at the end of 2006. It had been expected that overall grade trends would yield lower values at the 5900. Subsequent drilling and development indicated that the expected grade fall-off trends were not as dramatic as had been anticipated. The overall grade for 5900 level was lower, however, the mineable strike length increased by 600 ft relative to the 4900 level. Much of the composite grade decrease was due to the inclusion of more mineable strike length. The eastern side of the deposit is actually higher grade than expected and the western side a little narrower and lower than expected with the increase in length. Deep drilling results from 2008 to 2010 suggest improving grades below the 6500 level. Lucky Friday mine staff are of the opinion that reserve and resource estimates to the 7000 level have a very high level of confidence with appropriate drill grid spacing. There are also a number of drill intercepts from deep-seated drilling that extend resource estimates to the 8300 level.

As with Lucky Friday, the source of the Gold Hunter mineralization is not fully understood. The Gold Hunter zone's downward projection eventually reaches an intersection with the Independence Fault, which hosted the Star Mine mineralization. Lucky Friday geologists consider that this fault may be the source structure for the Gold Hunter mineralization, forming a conduit whereby fluids moved along reactivated axial plane cleavage to form the deposit.

Individual vein constituents vary but a typical vein contains quartz and siderite with lesser amounts of pyrite and barite. Ore minerals include argentiferous galena, sphalerite, and local tetrahedrite. There are also minor amounts of other sulfosalts, including pyrargyrite (ruby silver), bournonite, and boulangerite.

Mineral textures vary. Gangue mineral textures are often cataclastic for siderite and local quartz. Sulfide textures vary from locally coarse crystalline galena to fine grained steel galena. Very fine grained sheared galena is observed to be more silver-rich that coarser grained variants. Sphalerite textures range from medium crystalline to fine-grained and is generally lower in iron content relative to the Lucky Friday Mine sphalerite.

A simplified paragenesis for the Gold Hunter begins with early quartz/carbonate/ sericite/pyrite, followed by sphalerite, then tetrahedrite/argentiferous galena, and lastly late stage cooling and development of additional sulfosalts minerals. It is currently believed that some of these sulfosalts may have formed as silver was released from argentiferous galena during deposit cooling.

6.4 Deposit Types

The deposits of the Coeur d'Alene District, including Lucky Friday, are classified by Beaudoin and Sangster (1996) as clastic metasediment-hosted vein silver-lead-zinc deposits. In addition to Coeur d'Alene, the world's most prolific silver district, this deposit type embraces a number of historical mining localities including the Harz Mountains and Freiberg in Germany, Keno Hill and Kokanee Range in Canada, and Příbram in the Czech Republic. They are typified by the following general characteristics:

- Hosted in thick, monotonous sequences of fine- to medium-grained clastic sedimentary rocks transected by deep-seated regional-scale faulting
- Sedimentary basins occur in a wide range of tectonic environments, but all have been subject to deformation, intrusion, and regional metamorphism, typically greenschist facies

- Economic minerals are predominantly galena and sphalerite with minor accessory pyrite and a wide range of sulphosalt minerals including tetrahedrite, pyrargyrite, stephanite, bournonite, acanthite, and native silver.
- Gangue minerals typically comprise siderite and quartz with lesser amounts of dolomite or calcite
- Comparatively low gold content
- Temperature of sulphide mineral deposition in the range of 250°C to 300°C
- Hydrothermal alteration constrained to a few metres of the veins and characterized by sericite, silicification, and pyrite.

The signature for all economic deposits discovered within the Coeur d'Alene District is vein-like morphology hosted within the meta-sediments of the Belt Super Group. In the Lucky Friday Complex, as well as other sub-districts in the Coeur d'Alene District, veins occur as branching fissures that cross-cut or invade the sedimentary bedding or host rocks. Previous studies have indicated the veins are mesothermal origin (Leach, 1982). The vein structures are known to branch, split or bifurcate, forming duplexing and anastomosing geometries. The majority of veins strike west-northwest, are steeply- dipping, elongated down-dip and can have strike lengths over 4,000 ft and dip lengths over 8,000 ft (Hobbs et al., 1965).

It is generally accepted that the veins of the Coeur d'Alene District were formed during the Cretaceous to early Tertiary. Genesis of the ore bodies may have been a result of regional-scale metamorphism and the development of hydrothermal systems associated with the emplacement of the Idaho Batholith pluton and concurrent deformation. Metamorphic hydrothermal fluids most likely scavenged syngenetic metals (silver, lead, zinc, and copper) from Proterozoic Belt Supergroup strata and emplaced these metals within pre-existing or concurrent structural features (Fleck et al., 2002).

7.0 EXPLORATION

7.1 Exploration

Exploration work on the Property ceased in 2017 and has not resumed.

7.2 Drilling

7.2.1 Drilling Procedures

Historically, drilling at the mine was divided into two general categories: exploration and definition drilling. Holes that are drilled more distant from the active workings, typically to test specific geological targets, were termed exploration. As stated above, exploration drilling is not currently done, and hasn't for several years. Definition drilling, however, is currently being carried out in the immediate vicinity of the mine workings with the purpose of upgrading the confidence level of the Mineral Resources.

Diamond drilling for the Gold Hunter veins is primarily conducted from underground. The holes are fanned from purpose-built openings and targeted to intersect the 30 Vein on a 50 ft x 50 ft pattern. Although the target in the 30 Vein, several of the Intermediate Veins are captured as well. The holes are usually in the order of 350 ft long, with one hole in five extended to capture more veins, and for rock geochemical studies.

Drilling is carried out under contract by Dynamic Drilling of Osburn, Idaho, using a Sandvik DE130 (formerly Hagby 1000) machine. The drilling crew schedule is dependent on drill station availability and averages five day/week crew staffing to meet the planning horizons. Core size is NQ2 (1.99 in. diameter).

Figure 7-1 is a plan view showing the general distribution of diamond drill holes at Gold Hunter.

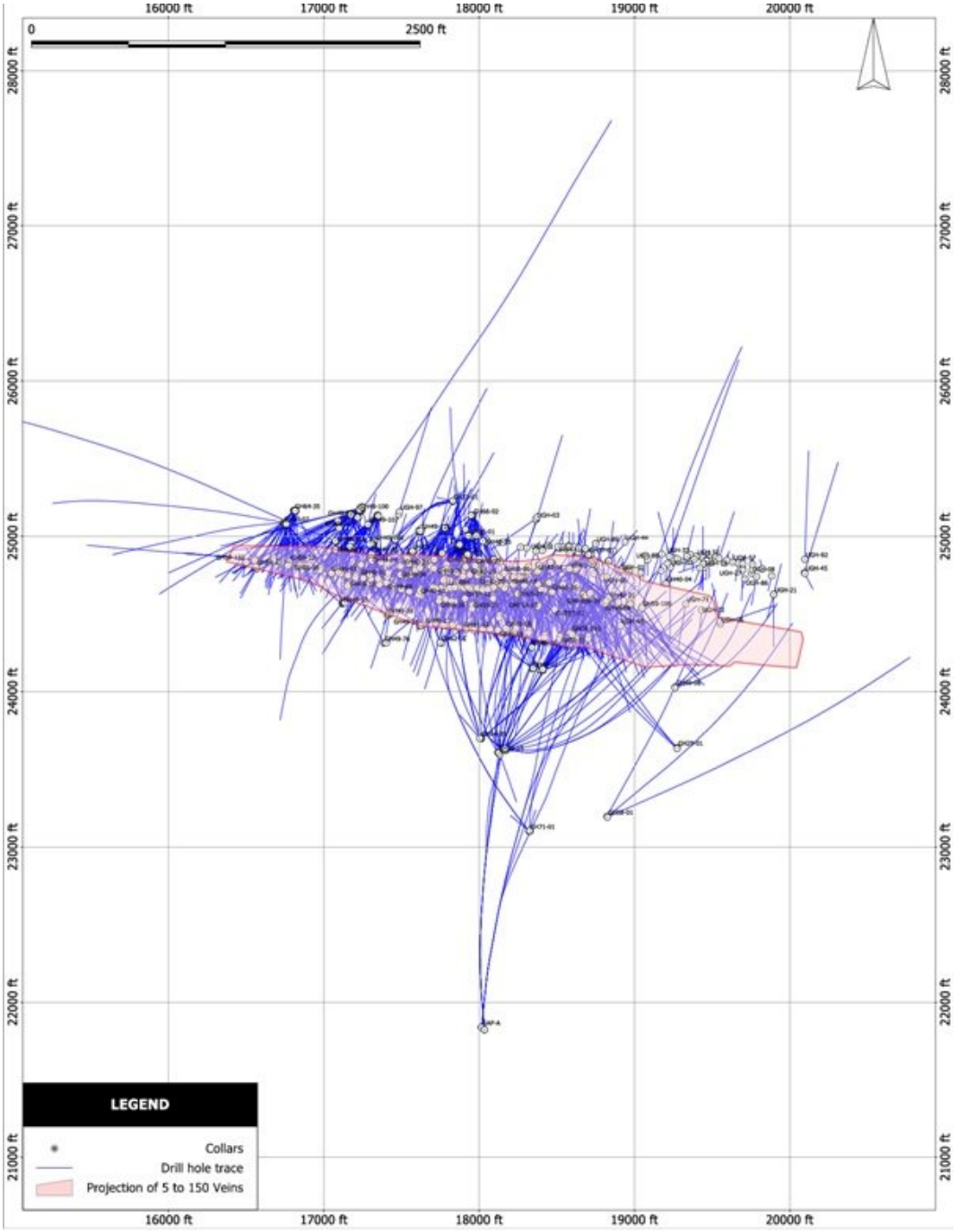
All holes are cemented for their entire length following completion.

The drillers place the core in waxed cardboard boxes which are then enclosed and taped shut prior to transport to the shaft station on the 5900 level. They are then placed in steel containers to be collected by mine staff and conveyed to the logging facility which is located near the mine offices.

The core logging facility has recently been completely reconfigured. Benches have been replaced with a series of roller-equipped racks that allow the boxes to be easily pushed with no lifting from station to station during the logging and sampling process. New lighting has been installed along with a water supply system with spray hoses, as well as cushioned flooring.

Upon receipt of the core at the logging facility, the boxes are laid out in order on the rollers. They are then examined to ensure correct block footages and core orientation. Zones of core loss are noted, and geotechnical logging is conducted. This includes measurement of recovery, rock quality designation (RQD), and recording the presence of "disking" (ie the separation of the core along closely spaced parting planes). Disking typically occurs in fault zones and is therefore important to note for ground control purposes.

Logging is conducted by a contract geologist supplied by Tamarack Geological Services of Osburn, Idaho. Data is digitally captured on notebook computers using GeoSequel, a commercially available software package.



Source: SLR, 2021

Figure 7-1: Gold Hunter Diamond Drill Plan

The core is then logged for lithology and mineralogy, as well as sedimentary structures, veins, faults, and other structural features. Following this, a third logging pass is made noting type, style, and intensity of alteration. During the logging process, features of note are marked with crayon so as to be visible in the core photos.

The core is then wetted and photographed using a purpose-built camera and lighting enclosure which provides uniform digital images. In addition to the notations on the core for geological information, the sample boundaries and numbers are also marked to allow for easier validation of the assay results using the imagery.

Specimens from each vein are measured for specific gravity (SG) using a water immersion method on unsealed core. This SG data is currently not being used for tonnage estimates.

7.2.2 Surveys

Hole locations and orientations are marked for the drillers by the supervising geologist. Once the hole has advanced for 50 ft, it is stopped, and the orientation checked with a Reflex EZ-Shot downhole survey instrument. If the orientation is within 3° of planned, the drillers are allowed to proceed. On reaching the target depth the drillers stop the hole and survey the entire length with the EZ-Shot. Surveys are made at the end of the hole progressing back upwards at 100 ft intervals to the 50 ft mark.

The EZ-Shot azimuth measurements are based on magnetics, and susceptible to interference from steel objects. Taking a reading 50 ft down the hole reduces the chance that the instrument will be influenced by any iron objects in the drift. The EZ-Shot instrument also records the magnetic field strength which is used to derive an average field strength for help in assessing individual orientation readings. If an obviously spurious measurement is recorded, it is discarded and replaced with an average of adjacent readings.

The hole collar locations are picked up by the mine surveyors, as are any breakthroughs noted in the drifts. This is to provide a means for gauging the accuracy of the downhole surveys, and to note any general trends in hole deviation.

The survey data is recorded on paper and forwarded to the supervising geologist for capture using the GeoSequel software. The surveyed holes are checked on screen in 3D to confirm that they were oriented as planned and in the correct location.

7.2.3 Drill Sampling

On completion of the logging, the core is marked for sampling. Samples range in length from a minimum of 0.5 ft to a maximum of four ft with breaks made based on lithological contacts or changes in estimated grade or mineralization style. Tags are placed in the boxes for each sample. Only the veins are sampled.

The core is not split, but rather sampled in its entirety. This is done primarily for efficiency and also because the mine has operated for so long there is no longer any need to retain the core for reference. It should be noted also that whole core provides a better sample owing to the additional volume of sample material. The core photographs are also of such high quality that it is possible to check the core in detail after it has been discarded.

Sample tag books are filled out with hole ID, location, from and to information, and a tag is placed in the sample bag. The sampled intervals are captured in GeoSequel and then checked using a validation routine to confirm that there are no overlaps or accidental gaps.

Assay Quality Assurance/Quality Control (QA/QC) samples consisting of either a blank, standard, reject duplicate, or pulp duplicate are entered into the sample stream at a rate of one in 20 samples. These are also recorded in the database.

Samples are placed in cloth bags which are then collected into reusable plastic shipping boxes ("tote"). The shipping list is generated in GeoSequel and place in the tote. A separate tote is used for each hole. The totes are shipped via commercial carrier to the ALS Global (ALS) laboratory in Reno, Nevada.

In the QP's opinion, the drilling, core handling, logging, and sampling at Lucky Friday is being conducted according to common industry practice, in a manner appropriate for the deposit type and mineralization style.

7.2.4 Chip Sampling

Cut and fill stopes and development headings are visited on a regular basis by mine technical staff, and every second face is sampled and mapped. Stope and drift faces at Gold Hunter are mapped and photographed, then chip sampled from rib to rib. Samples are chipped into cloth bags using a rock hammer. Samples are oriented horizontally across the face from north to south, with breaks at structures, vein boundaries, and changes in mineralization style or other noticeable features. Sample lengths are constrained to a minimum of 0.5 ft and a maximum of 4.0 ft. Sample boundaries are painted on the face before a photograph is taken for verification purposes.

Mapping and sampling is done five feet above the drift floor. The sampling geologists create their own control for the mapping, which is then tied in by the survey department. The samplers make note of the vein orientations as well as the horizontal width of the veins, and the actual horizontal width of the opening. The recording of these parameters provides the ability to more accurately estimate the dilution occurring in the stopes, and assists in reconciliation.

Data collected includes stope name, cut height, date of sample, planned mining width, actual mining width, and distance from reference point. Material is also coded as waste dilution, required material, vein, or internal dilution.

The chip samples are located by means of measurement from the nearest survey station or control point and the surveyed drift wall. Sample tickets and face maps are stored in paper files, one for each stope cut. The face maps are scanned and stored on the server along with the face photographs. On receipt of the assay data, the assays are copied to both the paper file and the digital database. Site geologists are responsible for location of the samples and with keypunching the sample information into the GeoSequel database.

The samples are stored as drill hole records, with the "collar" always located on the north side of the working face, five feet above the average stope floor. The sample strings are oriented at an azimuth of 186°. After the stope has been completed and the sampling reconciled with the final survey, the chip sample data are exported to CSV files for import to Leapfrog and Surpac.

In the SLR QP's opinion, the chip sampling practices at the site are reasonable, appropriate for the mineralization style, and consistent with common industry practice.

7.3 Hydrogeology Data

Hydrogeology data is not currently collected from the Lucky Friday drill holes.

7.4 Geotechnical Data

As stated above in the section of Drilling Procedures, geotechnical data in the form of core recovery, RQD, and presence of disking are recorded in the logging process.

8.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

8.1 Sample Preparation and Analysis

8.1.1 Core Samples

The core samples are shipped to ALS in Reno, Nevada for analysis. ALS is an independent commercial analytical company that is well known in the industry. The Reno laboratory has ISO/IEC 17025:2017 accreditation. There are two broad categories of analyses that are performed on these samples: one for the geochemistry holes and another for the rest of the definition holes. All samples are prepared with the following ALS protocol:

- Oven dried
- Crush to 70% minus 2 mm
- Split by rotary splitter to a 250 g sub-sample
- Pulverize to 85% passing 75 µ

All samples are run using aqua regia digestion of a 0.4 g sub-sample and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) finish for silver, lead, zinc, and iron. Overlimits for these assays (ie greater than 1,500 ppm Ag, 20% Pb, or 30% Zn) are rerun using the following protocols:

- Silver – fire assay (FA) of a 30 g aliquot with gravimetric finish
- Lead and zinc – digestion of a one g sub-sample and analysis by titration

The overlimit re-assays also include copper. The copper assays are used for characterization of tailings for monitoring purposes and are not relevant to the resource estimation.

Geochemistry samples are also analyzed for a suite of 48 elements via four-acid digestion of a 0.25 g sub-sample with an ICP-MS finish. Overlimits for the geochemistry holes are rerun with ICP-MS but with a larger, 0.40 g, sub-sample. The upper detection limits for the ICP-MS are 100 ppm Ag, and 10,000 ppm for lean, zinc, and copper.

Assay results are returned via email or can be downloaded from the ALS Webtrieve web portal. The data comes in csv format which can be uploaded to directly to Maxgeo for validation and processing.

8.1.2 Chip Samples

Hecla has its own assay laboratory, located in the town of Gem, Idaho, ten miles from the mine (Gem). The laboratory comprises a sample preparation area, with atomic absorption (AA), wet assay, and FA capabilities.

Samples are picked up from the mine site five days per week, with most sample results returned within one day. Assay reports are posted up to the network as spreadsheet files, which can be retrieved by the geology department as they become available. The spreadsheets are created by the geology staff at the time the samples are collected, and the laboratory staff manually fill in the assay results.

Analytical protocols are the same for drill and chip samples, and are outlined below:

- Dry in sample ovens for 12-18 hr
- Coarse-crush in a jaw crusher to -1/2 in.

- Pass coarse material through a Jones riffle splitter to obtain a 250 g subsample
- Reduce the subsample to minus 100 mesh with a ring pulverizer
- Collect a 0.2 g aliquot for AA and collect the remainder of subsample pulp for storage; pulps are stored for at least six months
- Digestion by boiling for 15 minutes in 10 mil nitric acid plus 20 mil hydrochloric acid
- Add water to reach 200 mL volume
- Determine silver, lead, and zinc assay with AA
- Transfer results to the sample spreadsheet on the server
- Rerun over-limit assays as requested by the geology department

Samples grading higher than 50 g/t Ag are rerun using FA, and are also assayed for copper. Those grading greater than 12% Zn or 20% Pb are rerun using wet titration methods.

8.2 Bulk Density

Specific gravities (SG) are estimated from metal contents by means of a stoichiometric equation taking into account the most common minerals in the ore. The principal constituent minerals of the ore are assumed to be galena (PbS) and sphalerite (ZnS) in a gangue containing siderite ($FeCO_3$) and pyrite (FeS_2) along with silicates. The relative abundance of iron species is assumed to be 75% siderite and 25% pyrite.

The SG equation is as follows:

$$Density = 100 / ((Gangue\%/2.76) + (Galena\%/7.50) + (Sphalerite\%/4.00) + (Siderite\%/3.94) + (Pyrite\%/5.02)$$

Where:

- Galena% = Pb% / 0.866
- Sphalerite% = Zn% / 0.670
- Siderite% = (Fe% x 0.75) / 0.482
- Pyrite% = (Fe% x 0.25) / 0.466
- Gangue% = 100 – (Galena% + Sphalerite% + Siderite% + Pyrite%)

The SG calculation results have been checked in past years by means of comparison with analytical measurements taken by mine staff and by an outside laboratory. In 2011, a suite of 40 hand specimens were selected and sent to McClelland Laboratories, Inc., in Sparks, Nevada, where they were measured for bulk density and assayed by ICP. The measured bulk densities were compared to values calculated from the grades determined at the GEM Lab. The calculated density values were found to be generally higher than the measured values, particularly at lower grades.

In 2014, 94 bulk density determinations were made on core specimens using the water immersion method. The results of these measurements were compared with the calculated SG's and found to be positively biased (ie. Comparatively higher) at lower densities and negatively biased at the upper end. Overall, the measured SG's were 4.1% lower than the calculated values, however, reconciliations at that time indicated that the resource models were reporting less tons than recorded at the mill. This contradicts any assumption that the calculated densities might be positively biased in some way.

As stated in the previous section of this report, SG measurements are currently being made on core specimens from each vein intercept. This is a relatively recent addition to the core handling protocols and data has not been applied in estimation of tonnages but it is hoped that they can be used to check the SG equation shown above.

In the SLR QP's opinion, there is no indication of a large or systemic problem with the bulk density determinations, and this procedure is considered to be acceptable for use in resource estimation. The collection of SG measurements is viewed as a useful endeavour that may provide opportunities for fine-tuning the bulk density estimates in future.

8.3 Quality Assurance and Quality Control

Assay QA/QC samples are placed into the stream at a rate of one standard, pulp duplicate, and reject duplicate for every 20 samples for core and one in 25 for chips. These QA/QC samples comprise the following four types:

- Blank material
- Standard
- Reject duplicate
- Pulp duplicate

The blanks and standards consist of pulverized materials that are submitted to the laboratory in packets. Lucky Friday staff report that there is a plan in place to switch to coarse blank material once the current inventory has been used up. Five standards and the blank were prepared in 2010 by CDN Laboratories of Langley, British Columbia from materials provided by the mine. They were independently certified by Smee & Associates Consulting Ltd., of Vancouver, British Columbia. Table 8-1 shows the certified grades and two-standard deviation (2 SD) confidence limits of these standards. Standard F is the blank.

Duplicates can be either a second split of the crushed material (sometimes referred to as a Prep Duplicate) or a split of the pulp.

Table 8-1: Standards Grades
Hecla Mining Company – Lucky Friday Mine

Standard	Ag (g/t)		Pb (%)		Zn (%)		Fe (%)	
	Grade	± 2 SD	Grade	± 2 SD	Grade	± 2 SD	Grade	± 2 SD
A	17.1	1.7	0.69	0.05	0.44	0.03	12.54	0.43
B	97.1	4.2	2.69	0.12	0.77	0.04	13.54	0.51
C	208	19	6.07	0.27	3.18	0.23	22.58	1.25
D	398	35	10.98	0.89	4.96	0.37	23.62	0.63
E	863	36	19.08	1.86	7.26	0.38	20.24	1.46
F	1.1	N/A	0.01	n/a	0.01	n/a	6.02	0.60

The results of the QA/QC sampling are captured in Maxgeo along with the rest of the sample data. Utilities within the software are used to collate and plot the QA/QC results on control diagrams for reporting purposes. The day-to-day validation process consists of a review by the supervising geologist of individual standards results as the assay reports are downloaded. Results that are out-of-spec (OOS) trigger a review and re-assay of all samples from the last acceptable control sample in stream to the next acceptable value (ie all samples surrounding the failure). The assay report will not be posted to the database until QA/QC issues are resolved.

8.4 SLR Review of QA/QC Results

SLR reviewed the sample QA/QC results as tabulated by Lucky Friday personnel for the period since restart of the mine in 2019 until July 25, 2020. The data provided consisted of standards control charts for both the ALS and Gem laboratories.

8.4.1 Blanks

Results for blanks (ie Standard F) are reviewed as they are received and stored as spreadsheets. The SLR QP compiled 458 blanks results from the assay certificates and found several instances of blanks assays that were more than ten times the DL. Results for lead were worst with 73 OOS assays. Zinc returned 29 OOS, while for iron and silver it was just one. These results were all from the ALS laboratory and were ICP analyses. In the SLR QP's opinion, these blanks results are not a cause for serious concern, however, the comparatively high number of OOS results for lead suggests that there may be a problem with the blank material itself. It is recommended that this be reviewed and corrected if necessary.

8.4.2 Duplicates

Duplicates results were plotted on scatter diagrams to look for evidence of bias or unusual dispersion. Example plots of these values are provided in Figure 8-1 and Figure 8-2. The SLR QP reviewed the pulp and reject duplicates results for silver, lead, zinc, and iron and did not find any concerns.

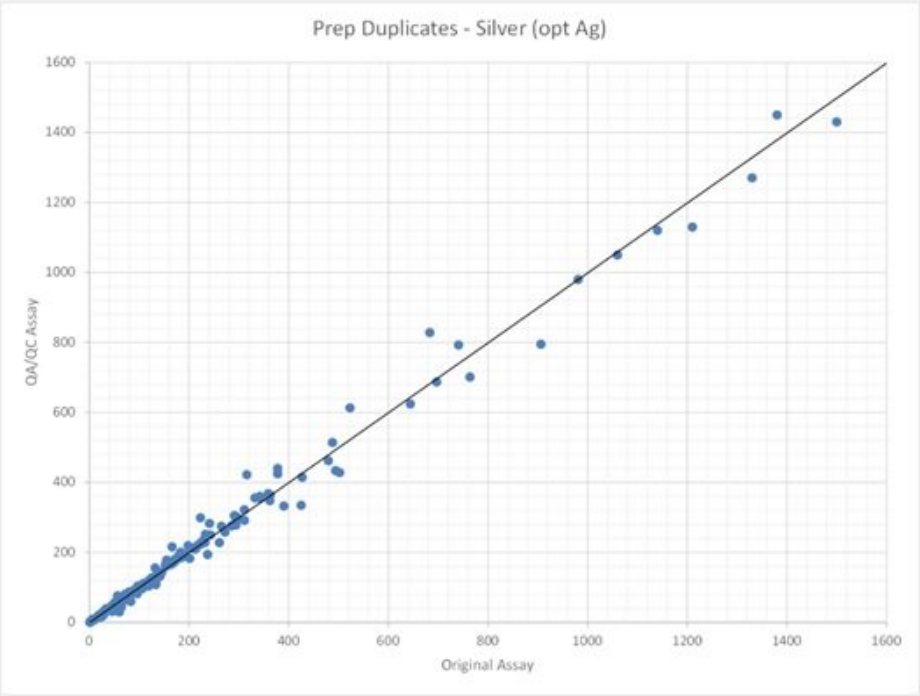


Figure 8-1: Prep Duplicates – Silver

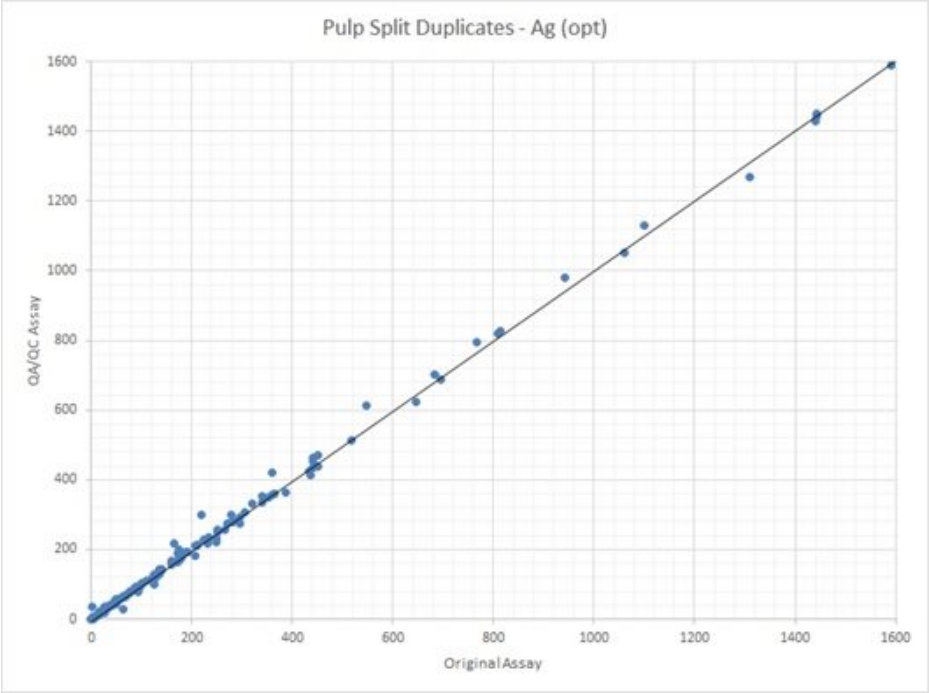


Figure 8-2: Pulp Split Duplicates – Silver

8.4.3 Standards

8.4.3.1 ALS Laboratory

The QA/QC assays for iron in all standards were routinely below the certified value (CV), generally below the 2 SD limit, often less than 3 SD. Slightly better performance was seen for Standards A and C, with the worst results for Standard D.

Silver results were observed to be satisfactory for Standards A and B. Standards C, D, and E, however, yielded assays that initially suggested there was a possible issue with the certified reference materials. Figure 8-3 and Figure 8-4 show the control chart for silver and zinc, respectively, in Standard C. The majority of the assays are within the acceptable range of ±2 SD from the CV. There are several, however, that plot within a relatively narrow range between 170 g/t Ag and 180 g/t Ag (Figure 8-3) and at approximately 4.25% Zn (Figure 8-4). Similar patterns occur for silver in Standards C, D, and E, lead in Standards B, C, D, and E, and for zinc in Standards C, D, and E. This pattern of failures does not appear in the results for iron, only silver, lead, and zinc.

On further review, it was found that the control plots were capturing preliminary assays that had been run using methods not appropriate for the grade of the standards. The "failed" standards had actually all been rerun using the proper protocols which were found to have returned acceptable results.

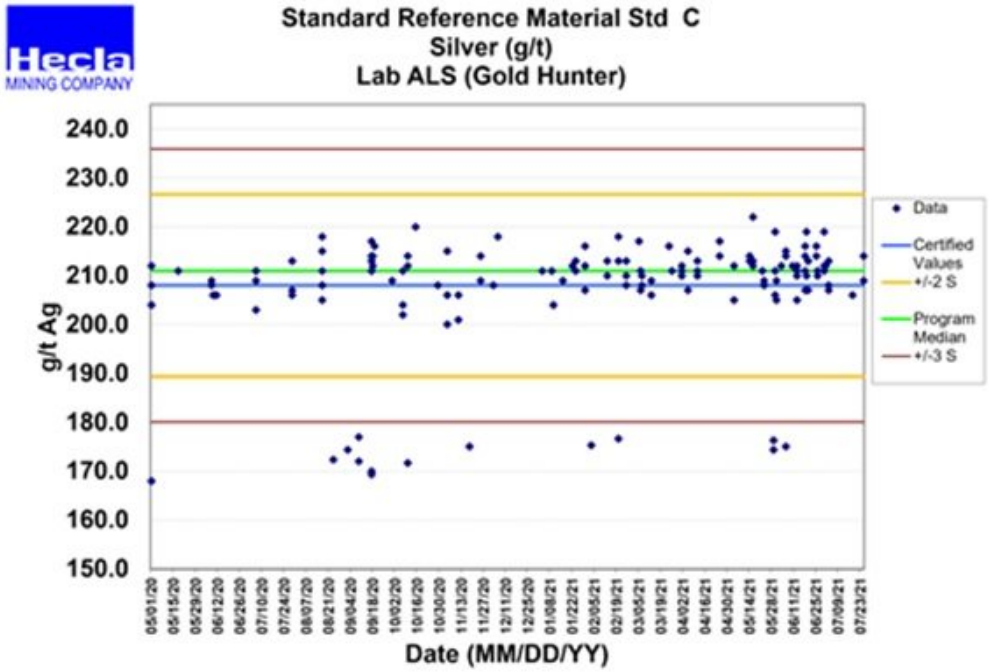


Figure 8-3: Example Control Chart for Silver – Standard C (ALS)

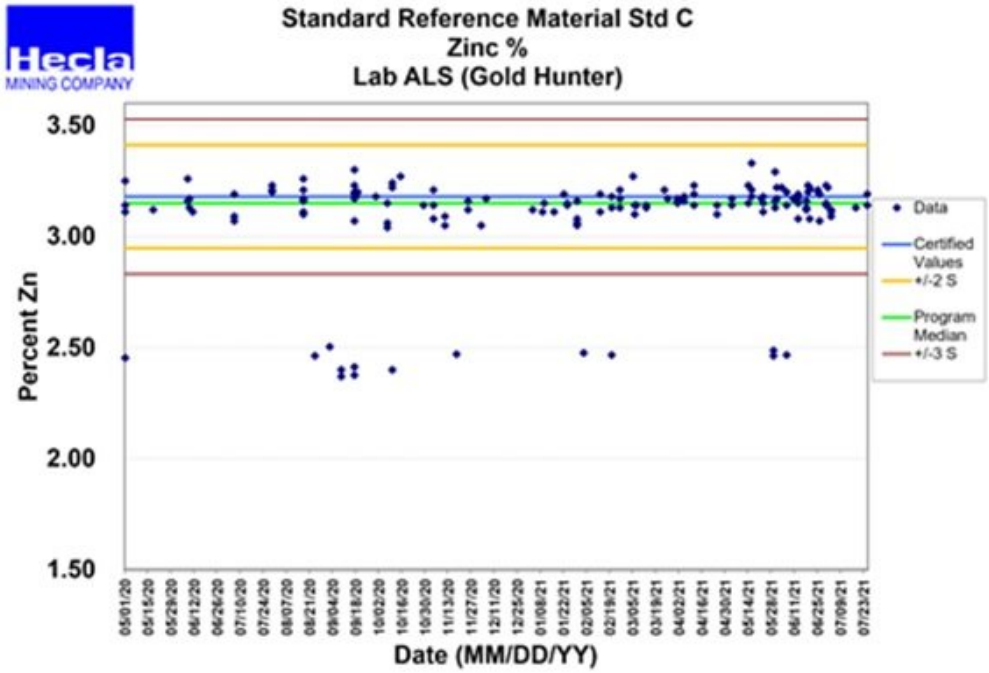


Figure 8-4: Example Control Chart for Zinc – Standard C (ALS)

8.4.3.2 Gem Laboratory

Control charts for Standards A, B, C, and D were made available for review. Standard E was not used for the channel sampling.

The results for iron were very similar to those for the ALS laboratory in that the assays were uniformly lower than the CV and often below the 2 SD failure limit. Performance for Standards B and C was best of the four, with the majority of samples assaying just within the tolerance limits. Results for Standards A and D were routinely below the 2 SD limit with most below 3 SD.

Silver and zinc performance was very good for Standards A and B, while for C and D, showed similar patterns of repetitive failure as those seen for the ALS results. Each showed several failures spaced over time with grades that clustered in the same ranges as those seen from ALS.

There were no results for lead for Standard A. Results for Standards B and C were somewhat low, but generally acceptable, with a protracted period of fairly recent failures occurring for Standard C. Standard D yielded a similar pattern to that seen for ALS, with generally good results and sporadic failures, all within a narrow grade range. An example of the control plot for lead in Standard D is provided in Figure 8-5 below.

Again, the reason for the "failed" standards was found to be due to an improper selection of preliminary assays by the control plotting utility.

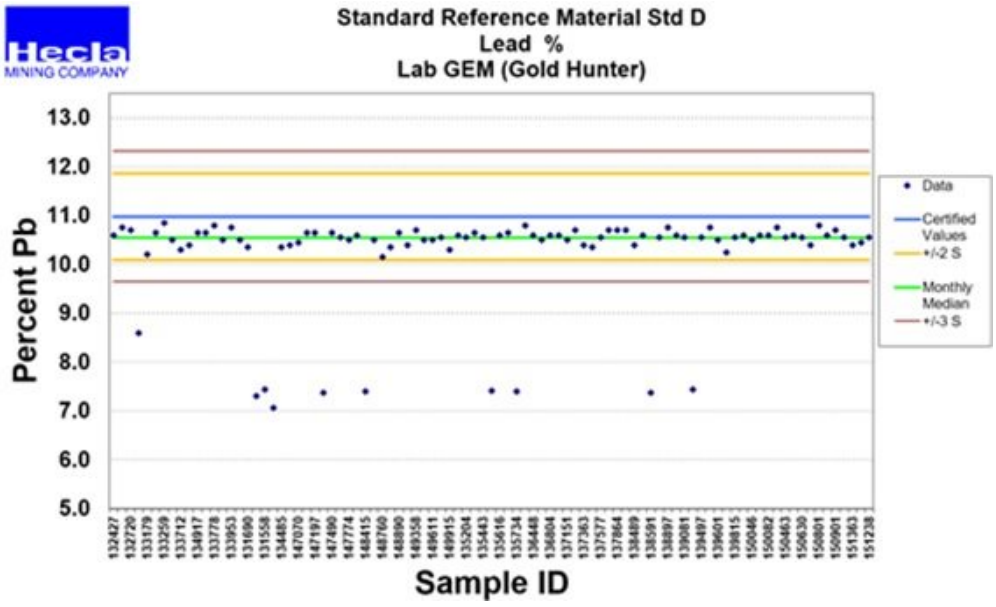


Figure 8-5: Example Control Chart For Lead – Standard D (Gem)

8.5 Sample Security

As stated in the previous section of this report, the core and chip samples are collected and transported by either Lucky Friday company staff or contractors and bonded commercial freight carriers. The site is secure and access is restricted to these authorized personnel.

8.6 QP Comments

In the SLR QP's opinion, the sample preparation and analysis are carried out using conventional methods commonly used in the industry. The security procedures at Lucky Friday are reasonable and consistent with standard practice.

In the SLR QP's opinion, the QA/QC program as designed and implemented is quite rigorous, with a fairly high rate of control sampling for an operation as mature as Lucky Friday. There is a persistent low bias for iron shown in results for both the ALS and Gem laboratories. This does not affect the economic grades of the resource but could have an impact on tonnage estimates insofar as iron grades are used in the stoichiometric calculation for estimating SG. The fact that both laboratories yield similar results leads to the conclusion that there may be some issue with the standard materials or the certification.

The pattern of observed failures for silver, lead, and zinc has been found to be due to a plotting error. Preliminary assays have been captured and plotted on the control diagrams instead of the final assay results. There is no real concern with any of the standards assays for silver, lead, or zinc. SLR's QP does recommend, however, that the reporting protocol be amended to ensure that the proper assays are selected from the database for plotting.

In the SLR QP's opinion, the QA/QC protocols in place at Lucky Friday are rigorous, and the results are satisfactory. There are no concerns apparent with the assay results and they are suitable for use in a Mineral Resource estimate.

9.0 DATA VERIFICATION

9.1 Database Procedures

Drilling and chip sampling data are captured and stored in a database managed with Maxgeo software. As stated above, the core logging information is captured using GeoSequel. Photographic information is stored digitally and is manipulated using Imago. Geological interpretation and wireframe construction is done using Leapfrog. Surpac is used for surveyed openings, block modeling, and estimation of Mineral Resources and Mineral Reserves.

On completion of a downhole survey, the data are input to GeoSequel and the hole is reviewed in 3D on screen to check for obvious inconsistencies. The downhole data includes magnetic susceptibility measurement which can flag areas of high magnetite and potential for compromised results. In extreme cases, a re-survey is carried out but more typically a suspect reading is simply discarded and replaced with an average of the adjacent measurements.

Core assay results are sent from the lab as comma-delimited (CSV) text files which can be imported directly into the Maxgeo database. Results can also be downloaded via the ALS Webtrieve web portal. Once imported, the assay QA/QC results are checked and any concerns resolved with the laboratory.

The results are also checked against the core photographs and logs to check for unusual or perhaps spurious data. The Imago core photo utility is linked to Leapfrog so that individual sections of core can be retrieved by selecting them on screen, which greatly expedites this process.

The mine workings are surveyed, and then wireframe models are created of the stopes and development headings. These wireframes are exported to other downstream software packages for use by both the geology and engineering staff. Chip samples are corrected to agree with the surveyed drift outlines.

On receipt of the assay results, the data are input and checked against the face photographs for any inconsistencies. Validation utilities included with GeoSequel and Maxgeo are run to flag errors in data capture such as missing or overlapping intervals. The GeoSequel interface also includes templates that limit the allowable data entries to acceptable values.

When the drilling and chip sampling data has been validated and all concerns resolved, it is cleared for use in geological interpretation and resource modelling.

The data is stored on the mine site server, and backed up to the corporate office in Coeur d'Alene on a quarterly basis. Access to the site network is limited to authorized users only.

9.2 SLR Validation Procedures

9.2.1 Previous Audits

SLR, previously Roscoe Postle Associates Inc. (RPA), which is now part of SLR, and its predecessor Scott Wilson RPA, have conducted audits of the Mineral Resource and Mineral Reserve estimates at Lucky Friday on three previous occasions, in 2006, 2009-2010, and 2013. For each of these audits, spot checks were made of portions of the database. In 2017, RPA conducted a review of the Mineral Resource and Mineral Reserve estimates but not a full audit.

For the 2006 audit, checks were made of approximately 47% of the assays from holes drilled from 2004 and 2005, along with 5% of the chip samples taken in the same period. No errors were found.

During the 2009 site visit, checks were conducted of the complete dataset for 26 of the 228 holes drilled since 2006. The digital logs and sample data were exported from the database and compared to the paper logs filed in the geology office. The assays, lithology, collar coordinates, and downhole surveys were compared with the original hard-copy data. Several minor inconsistencies were noted, most due to survey errors that had been corrected in the digital database but not in the logs. No other errors were found.

The chip samples were loaded into Gemcom (now called GEMS) software and inspected in plan and 3D views to check for gross location errors. None were found. SLR also ran the Gemcom validation utilities to check for overlapping sample intervals, etc., and again, no errors were found.

The sample composites for the 50 and 90 veins were regenerated in Gemcom and compared to the ones created by the proprietary composite compiler then in use at Lucky Friday. No inconsistencies were found.

In 2013, SLR inspected approximately 200 chip sample file records and compared them to the database. Fifteen sampled intervals were found for which the assay data had not been entered.

The drill and channel information was compiled into GEMS and tested using the database validation utility. No errors were found. Inspections were made of the data on-screen in section and plan views and it was noted that some vein intercepts were not sampled. On further review, it was found that there were 117 cases of intercepts without samples, most of which were known to Lucky Friday staff. Some were found to have poor recovery, and in others the vein was so narrow that it was hard to recognize. There were some that should have been sampled and were not, and these were addressed. In the SLR QP's opinion, these missing intercepts would not have affected the Mineral Resource estimates.

SLR compared chip sample results to the laboratory report spreadsheet for 17,943 samples in the database. The comparison focused on data collected since 2009, and comprised 22% of the entire chip sample database of 81,541 records. There were 104 samples for which the stored results differed in some way from the laboratory report. SLR's QP concluded that although they could possibly be errors, they were more likely deliberate changes made to accommodate re-assays, and that in any case, an error rate of 104 in 17,943 was considered acceptable.

9.2.2 Current Audit Validation

For the current audit, the SLR QP was provided with all of the ALS assay reports from the mine restart in 2020 to September 23, 2021. These reports included assay results for a total of 12,779 drill samples consisting of 1,329 from the geochemistry holes (ICP results) and the balance of 11,450 from the conventional definition drilling. The data was captured in an Access database and compared to the samples currently in the Surpac database. Approximately 15% or 2,027 of the samples were for assay QA/QC and were not included in the Surpac database for use in resource modeling. These samples were excluded in the validation exercise although they were reviewed in the course of an overall inspection of QA/QC results (see Section 8.0 of this TRS). A total of 10,752 samples in the database were checked against the assay certificates.

For the definition holes there were 9,617 samples matched to the assay table in Surpac, and of these, there were a total of seven discrepancies found. All were noted to be of low severity and comprised assays apparently posted to the wrong sample interval, in all cases to adjacent samples in the assay table. They have since been corrected. In the SLR QP's opinion, had these discrepancies not been caught, they could have contributed to minor local errors in the interpolated grades in the block model. The overall consequence to the resource estimate would likely have been trivial. The overall error rate of seven in 9,610 samples, or 0.07%, is considered to be well within an acceptable error rate.

The check of the samples from the geochemistry holes yielded 21 discrepancies between the certificates and the values stored in the database. All of these discrepancies were in the lead and zinc fields and comprised slight differences between the reported values and the stored ones. Further investigation found that there were a number of re-assays conducted that yielded slightly different results from those in the original analyses. As such, there were no errors in the data for the geochemistry holes.

In addition to the checks described above, the SLR QP confirmed that the conversion from ppm Ag to oz/ton Ag was correct for all of the samples captured in the validation exercise. SLR also confirmed that the SG calculations for the samples were conducted correctly.

The entire database, comprising records for 30,014 drill holes and channels, was imported into GEMS and scanned for FROM-TO errors. Out of 177,502 sampled intervals, there were seven instances of overlapping samples in the assay table for an implied error rate of 0.0039%. These were reviewed and it was found that all but one were channel samples located in areas of the mine that have been mined out. The remaining instance was in a drill hole, at a location not within any known vein occurrence. In the SLR QP's opinion, these errors are very small in number and will not have any effect on the Mineral Resource estimates.

The SLR QP conducted a visual inspection of the wireframes for the 20, 30, and 40 Veins, comparing them to the drill intercepts and the chip samples. In general, the wireframe models appeared to honor the drill holes and chip sample vein coding but there were a number of places where they did not agree. Some of these apparent discrepancies appeared to be due to a lag in updates to the vein assignments in the database following addition of addition drilling. This should be resolved for the next block model interpolation.

There were no cases of unusual hole orientations, obviously incorrect collar locations, or implausible hole traces observed.

9.3 Validation Limitations and SLR QP Comments

In the SLR QP's opinion, while it is not possible to completely validate every element of a database as large and complex as that for Lucky Friday, there is nothing to date to suggest that there are serious or systemic concerns. The databases are managed in a secure environment, using conventional off-the-shelf software packages that are up-to-date and appropriate for the tasks to which they are applied. The staff are competent, well-trained, and experienced and they have been provided with clear and reasonable protocols to follow. Over time, these protocols have been updated to incorporate modernized work practices and tools as well as the evolving demands of the operation. Independent spot checks conducted by SLR over a broad span of years indicate that the data capture and validation protocols have been rigorously observed. As such, the database is properly configured and maintained and is appropriate for use in estimation of Mineral Resources and Mineral Reserves.

10.0 MINERAL PROCESSING AND METALLURGICAL TESTING

The Lucky Friday mill has been operating for more than 70 years. Testing and evaluations are routinely performed to improve recoveries and efficiencies in the concentration processes. Historical metallurgical studies are summarized in the following sections. Some of these studies were investigative in nature and did not result, or have not yet resulted, in direct modifications to the process or facilities. Action was taken as required or applicable.

10.1 Metallurgical Testing of Gold Hunter Ore by Dawson Metallurgical Laboratories-2008

In 2008 a significant test program was conducted at Dawson Metallurgical Laboratories (DML). The DML reports issued for the test program are noted below.

- Comminution and Flotation Test Work on Gold Hunter Ore and Intermediate Vein Samples. By DML, Salt Lake City, Utah. April 2008.
- Additional Test Work Conducted on Lucky Friday Ore Samples. By DML, Salt Lake City, Utah. June 2008.

10.1.1 Sample Composites Tested

Samples tested were from the 30 Vein of the Gold Hunter zone and the 20, 50, 60, 70, 80, 90, and 110 veins from the Intermediate Vein zone. A sample of hard ore, a composite that was 60% Gold Hunter and 40% Intermediate Vein material, and a wall rock dilution sample were available for testing. The wall rock sample was prepared from NQ-drill core from the eastern portion of the Intermediate Vein between the 4900 and 5900 level of Gold Hunter. The hard ore sample was from the 30-Vein stope hoisted from the 5900 pocket. The sample was a hand-picked grab sample from the crusher belt. The third sample consisted of a 60% Gold Hunter ore with 40% Intermediate Vein material. The Gold Hunter and Intermediate Vein samples, representing nine veins, were taken from 13 active stopes from the 4900 and 5900 levels.

Head analysis of the Gold Hunter composite and each of the Intermediate Veins were run. Results shown in Table 10-1 indicate most samples to be similar and suitable for processing through the exiting operation. Vein 110 is anomalous in silver, copper, arsenic, and antimony and would probably require additional work to determine a viable process.

Table 10-1: DML Head Analysis Summary
Hecla Mining Company – Lucky Friday Mine

Sample Description		Ag (oz/ton)	Pb (%)	Zn (%)	Fe(t) (%)	$Fe(CO_3)$ (%)	Cu (%)	S(t) (%)	S= (%)	As (%)	Sb (%)
Gold Hunter (GH) Composite		18.75	12.6	4.42	21.1	19.8	0.082	5.06	5.03	0.017	0.146
Intermediate Vein (IV) Samples											
Vein	20	10.27	9.41	1.99	13.10	12.90	0.032	2.97	2.97	0.010	0.067
Vein	50	7.09	3.99	4.82	22.00	18.10	0.039	9.58	2.58	0.077	0.157

Sample Description		Ag (oz/ton)	Pb (%)	Zn (%)	Fe(t) (%)	$Fe(CO_3)$ (%)	Cu (%)	S(t) (%)	S= (%)	As (%)	Sb (%)
Vein	60	8.66	5.50	4.74	23.20	19.40	0.032	8.67	8.67	0.048	0.134
Vein	70	36.17	11.30	5.78	12.90	10.90	0.198	7.95	7.89	0.038	0.271
Vein	80	18.73	11.40	2.52	14.90	14.10	0.090	3.80	3.73	0.015	0.122
Vein	90	14.85	11.10	1.44	11.80	11.50	0.058	3.11	3.11	0.006	0.087
Vein	110	62.71	6.38	7.92	13.80	10.10	6.110	9.87	9.79	0.500	2.590
IV Compo	Wt. Ave.	23.39	8.38	4.31	16.13	13.92	0.992	6.78	6.75	0.105	0.515
IV Compo	Assay	22.37	8.27	4.25	15.70	13.70	0.986	6.59	6.54	0.114	0.501
Wall Rock (dilution)		0.058	0.048	0.051	7.13	5.51	0.006	0.51	N/A	N/A	N/A

10.1.2 Comminution Summary

Comminution test results are summarized in Table 10-2. Results indicate the Gold Hunter-Intermediate Vein composite is relatively soft and non-abrasive. The wall rock is slightly harder than the Gold Hunter-Intermediate Vein composite.

Table 10-2: DML Grinding Test Results Summary
Hecla Mining Company – Lucky Friday Mine

Sample	Abrasion Index, (g)	Crusher Work Index (kWh/ton)	Rod Mill Work Index (kWh/ton)	Ball Mill Work Index (kWh/ton)	SAG Product Work Index (kWh/ton)
Hard Ore, 100%	0.061	4.1	7.5	9.8	10.8
Composite Blend 60% GH; 40% IV	0.13	4.9	10.7	11.4	11.9
Wall Rock, 100%	0.093	4.7	15	12.2	12.9

10.1.3 Semi-Autogenous Grinding Modelling Study

Semi-autogenous grinding mill (SAG) design test results from the DML were submitted to Starkey and Associates for analysis. Starkey evaluated various scenarios to increase the throughput capacity from 38 to 44 short tons per hour (stph) for the existing three stage crushing and 9.5 ft diameter x 12 ft long single stage ball mill grinding circuit to 66 stph, 90 stph, and 225 stph. The expansion to 66 stph and 90 stph made use of the existing ball mill.

Grinding capacity was increased by eliminating the existing crushing circuit and adding an 1,800 hp or 2,500 hp autogenous grinding (AG) or SAG mill depending on the desired tonnage. For the expansion to 225 stph a 4,800 hp single stage SAG mill was recommended by Starkey. In this scenario, the existing ball mill was not needed.

10.1.4 Flotation Test Summary

Scoping flotation kinetic tests to evaluate the response of the Gold Hunter and each Intermediate vein were run at standard conditions. Results indicated that silver and lead recovery to the lead rougher concentrate averaged over 95% and 93%, respectively, for all samples. Zinc rougher recovery averaged 72.8%.

Rougher kinetic tests evaluating Gold Hunter to Intermediate vein blends ranging from 100% Gold Hunter to 100% Intermediate Vein in 25% increments were run to evaluate the effect of the blend. Results for silver and lead were very similar for all blends. Zinc recovery declined by approximately 4% as the percentage of IV was increased from zero to 100%.

Rougher kinetic tests to evaluate the effect of plant water on flotation kinetics and metal recovery were run on water blends from 100% fresh water to 100% plant water in 20% increments. Results indicate that water had no effect on ultimate metal recovery, but may reduce lead and silver flotation kinetics.

Rougher kinetic tests were also run to evaluate the effects of wall rock dilution on the IV composite. Results indicated lead and silver recovery was not affected by dilution of one part ore to three parts wall rock. Zinc recovery was affected by dilution falling from 77% to 47% at this dilution level.

Batch cleaning tests indicated that lab results for the zinc final concentrate was lower grade than achieved in the Plant. The effect of mechanical cells used in the lab compared to column cells used in the Plant was suspected as the problem. Several stages of mechanical cleaners were added to the lab procedure in an attempt to more closely simulate plant results concerning zinc final concentrate grade.

A seven cycle locked cycle test was then conducted on the 60% GH 40% IV composite. Results summarized in Table 10-3 indicate that the lead circuit performed as expected.

Lead and silver recovery to the combined silver concentrate and final concentrate grade were good. Results for zinc indicated good recovery to the final concentrate, but at a much lower than expected concentrate grade. At the time it was believed this was due to the difference between lab mechanical and plant column cells.

Table 10-3: Dawson Locked Cycle Test Summary, Cycles 5 to 7
Hecla Mining Company – Lucky Friday Mine

Product	Cycle	Wt%	Assay				Distribution, %			
			Ag oz/ton	Pb%	Zn%	Fe%	Ag	Pb	Zn	Fe
Comb. Pb Final Conc.	5,6,7	13.74	122.9	61.4	3.7	6.4	88.2	91.7	13.7	4.6
Zn No. 4 Cleaner Conc.	5,6,7	8.57	7.5	2.1	34.6	17.1	3.3	2	81	7.7
Zn Scavenger Tail	5,6,7	77.69	2.1	0.75	0.25	21.5	8.5	6.3	5.3	87.7
Head (calc.)		100	19.2	9.2	3.66	19.0	100	100	100	100
Head (assay)			20.2	10.87	4.35	18.9				

Notes:

1. TEST No. 33 Cycle 5-7
2. Primary Grind =144 Microns with 60% Hecla Tailings Recycle Water and 40% Hecla Site Fresh Water

10.1.5 QEMSCAN Analysis and Additional Studies

Follow-up work on the locked cycle test products was also conducted by DML and reported in June of 2008.

In the follow-up work, the zinc scavenger tailing from the locked cycle test noted above was screened. Results indicated that the 80% passing (P_{80}) size was approximately 173 microns compared to the target P_{80} of approximately 150 microns. It was concluded that the coarser grind contributed to the relatively low zinc concentrate grade.

Additional follow-up work at DML indicated that exposing a sample to the atmosphere for one month did not affect the silver flotation response, but the lead rougher recovery was reduced by approximately 4%. The lead that did not report to the silver concentrate was activated and did report to the zinc concentrate. Zinc recovery to the rougher was lower after the exposure to the air by approximately 3%.

Samples of plant lead rougher circuit feed and tailing were collected, screened, and the screen fractions were assayed. Results indicated the silver and lead lost to the tailing are concentrated in the minus 325 mesh fraction. This fraction contains approximately 50% of the weight, 60% of the silver, and 70% of the lead.

Estimates of the silver and lead recovery by size fraction were made. Results of this analysis indicate that the silver recovery was relatively constant for all size fractions, but the lead recovery in the coarse fractions was approximately 10% lower than the lead recovery in the fine fraction.

The locked cycle test final lead and zinc concentrates were submitted to SGS Lakefield (SGS) for chemical, mineralogical, and quantitative evaluation of minerals by scanning electron microscope (QEMSCAN) analysis. Good agreement between the SGS and DML chemical analysis was noted.

QEMSCAN analysis of the concentrate indicated the silver concentrate was primarily galena (66%) with some pyrite (7%), sphalerite (5.5%), tetrahedrite (5%), and lower concentrations of copper sulfides, siderite, and quartz. The galena and pyrite in the silver concentrate were primarily free or liberated but the sphalerite, tetrahedrite, and gangue reporting to the silver final concentrate had higher percentage of middling material. Similar analysis indicated the zinc concentrate was primarily sphalerite (60%) with pyrite (26.5%) and siderite (6.3%) and lower concentrations of galena and quartz. The sphalerite and pyrite in the zinc concentrate were primarily free or liberated but the galena, siderite, and quartz reporting to the zinc final concentrate had higher percentage of middling or locked material.

SGS QEMSCAN liberation analysis of the locked cycle test silver concentrate indicated that finer grinding to 106 microns would improve lead liberation and improve recovery and grade. It is noted that the locked cycle grind was coarser than desired and coarser than achieved in the Plant operation, so this recommendation should be confirmed on plant samples.

SGS QEMSCAN liberation analysis of the locked cycle test zinc concentrate indicated that finer grinding to 106 microns would improve zinc liberation and that pyrite was activated during the zinc activation process. It is noted that the locked cycle grind was coarser than desired and coarser than achieved in the Plant operation, so this recommendation should be confirmed on plant samples.

The locked cycle test lead and zinc concentrates were submitted for ICP analysis. Results are summarized in Table 10-4.

Tailing from the DML work were not characterized for acid forming potential.

Table 10-4: Locked Cycle Test Flotation Concentrate ICP Scan Results
Hecla Mining Company – Lucky Friday Mine

Element	Units	Pb Concentrate	Zn Concentrate
Ag	oz/ton	> 29.2	5.64
Al	%	0.1	0.15
As	ppm	1,710	2,920
Ba	ppm	190	160
Be	ppm	<0.5	<0.5
Bi	ppm	5.5	0.6
Ca	%	0.18	0.11
Cd	ppm	451	3,590
Ce	ppm	3.5	6.5
Co	ppm	43	101
Cr	ppm	30	50
Cs	ppm	0.5	0.8
Cu	%	3.00	0.14
Fe	%	6.7	15.95
Ga	ppm	1.0	4.2
Ge	ppm	<0.5	0.5
Hf	ppm	<1	<1
In	ppm	0.47	3.97
K	%	0.04	0.06
La	ppm	<5	<5
Li	ppm	2.0	3.0
Mg	%	0.05	0.06
Mn	%	0.26	0.36
Mo	ppm	9.2	7.3
Na	%	<0.02	<0.02
Nb	ppm	<1	<1
Ni	ppm	50.0	108.0
P	%	>10	2.53
Rb	ppm	2.0	4.0
Re	ppm	0.03	0.02
S	%	19.2	34.6
Sb	%	1.00	0.027
Sc	ppm	<1	1

Element	Units	Pb Concentrate	Zn Concentrate
Se	ppm	<10	30
Sn	ppm	5	2
Sr	ppm	15	10
Ta	ppm	<0.5	<0.5
Te	ppm	<0.5	<0.5
Th	ppm	<2	<2
Ti	%	0.01	0.01
Tl	ppm	6	19.40
U	ppm	<1	1.00
V	ppm	<5	<5
W	ppm	<1	1
Y	ppm	1	3
Zn	%	4.29	>10
Zr	ppm	<5	7

10.2 Lucky Friday Mill Audit Report by Blue Coast Metallurgy Ltd. – 2011

In July of 2011, Blue Coast Metallurgy (Blue Coast) was retained to perform an audit of the Lucky Friday process operation to support studies to increase plant production.

Forty three process streams were sampled every 10 to 15 minutes during a two hour period on two consecutive days. The results during the two surveys were in line with plant trends during the period so the audit results were considered valid. During the survey, the lead flash cell recovered 60% to 70% of the lead and silver in the plant feed. This reduced the load on the Pb cleaning circuit. The total silver, lead, and zinc recovery to the silver concentrate were 91.7%, 90%, and 12%, respectively, to a concentrate containing 60% Pb, 130 oz/ton Ag, and 3.5% Zn. Zinc recovery to the zinc concentrate was 81.3% to a concentrate grading 48.6% Zn. Lead recovery to the zinc concentrate was 2.3% and the silver recovery to the zinc concentrate was 3.9%.

11.0 MINERAL RESOURCE ESTIMATES

11.1 Summary

Table 11-1 lists the Mineral Resource estimate for the Lucky Friday Mine, prepared by Hecla and audited by SLR. Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300.

Table 11-1: Summary of Mineral Resources – December 31, 2021
Hecla Mining Company – Lucky Friday Mine

Zone	Tonnage (ton)	Grade Ag (oz/ton)	Grade Pb (%)	Grade Zn (%)	NSR (US$/t)	Contained Metal Ag (oz)	Contained Metal Pb (tons)	Contained Metal Zn (tons)
Measured								
Gold Hunter	8,230,000	7.4	4.6	2.5	207	60,600,000	379,000	207,000
Lucky Friday	393,000	12.2	11.4	1.5	459	4,790,000	44,700	5,910
Silver Vein	8,030	15.9	1.0	0.2	293	128,000	82	15
Ancillary Veins	19,800	14.0	6.7	1.9	403	277,000	1,320	376
Total	**8,650,000**	**7.6**	**4.9**	**2.5**	**219**	**65,800,000**	**425,000**	**213,000**
Indicated								
Gold Hunter	1,660,000	7.4	4.6	2.3	204	12,300,000	76,000	38,600
Lucky Friday	139,000	9.5	11.0	3.7	446	1,320,000	15,300	5,080
Silver Vein	10,000	13.3	1.0	0.2	248	133,000	100	20
Ancillary Veins	28,600	9.0	6.0	1.4	297	258,000	1,710	409
Total	**1,840,000**	**7.6**	**5.1**	**2.4**	**224**	**14,000,000**	**93,100**	**44,100**
Total Measured and Indicated								
Total	**10,500,000**	**7.6**	**4.9**	**2.5**	**220**	**79,800,000**	**518,000**	**258,000**
Inferred								
Gold Hunter	4,900,000	7.6	5.3	2.3	229	37,400,000	261,000	111,000
Lucky Friday	449,000	9.2	10.9	4.1	404	4,110,000	48,900	18,500
Silver Vein	10,000	13.3	1.0	0.2	248	133,000	100	20
Ancillary Veins	21,800	10.2	9.0	2.5	397	222,000	1,980	548
Total	**5,380,000**	**7.8**	**5.8**	**2.4**	**244**	**41,900,000**	**312,000**	**130,000**

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.

2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves at Gold Hunter, whereas there are no Mineral Reserves currently at Lucky Friday.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Mineral Resources are 100% attributable to Hecla.
6. Bulk density was calculated by block, based on mineralogical content.
7. Mineral Resources are estimated at NSR cut-off grades of US$173/ton for Gold Hunter and US$207/ton for Lucky Friday.
8. NSR values were calculated using long-term metal prices of US$21.00/oz Ag, US$1.15/lb Pb, and US$1.35/lb Zn.
9. Numbers may not add due to rounding.

The SLR QP is of the opinion that with consideration of the recommendations summarized in Sections 1.0 and 23.0 of this TRS, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

11.2 Gold Hunter

11.2.1 General Approach

The Mineral Resources are estimated using a block model method, with grades for silver, lead, zinc, and iron interpolated into the blocks by inverse distance squared (ID^2) weighting. The interpolations are constrained by wireframe models of the host veins to prevent smearing of grades out into the wall rocks. The wireframe models are created using implicit modeling in Leapfrog based on vein codes assigned by the mine geologists to the sample intervals. These wireframes are then exported to Surpac, where the block models and grade interpolations are generated. Both Leapfrog and Surpac are off-the-shelf mining software packages that are in common use in the industry.

The block models are diluted with zero grade material out to the minimum widths for the expected mining method. Polylines are drawn in longitudinal views of the veins to encompass coherent volumes of above cut-off grade material such that small clusters of resource-grade blocks that are too isolated to pursue are eliminated from the Mineral Resources. The resource blocks are then evaluated for inclusion of Mineral Reserves, and parsed out into stope blocks. The remaining material that meets the resource cut-off grade criterion is reported as Mineral Resources.

The Mineral Resources reported in Table 11-1 are derived from block model estimates made in December 2021. This block model was an updated version of one completed at mid-year 2021, and has not changed very much from that time. Much of the audit work was conducted on the mid-year model.

Mineral Resources are reported exclusive of Mineral Reserves.

11.2.2 Resource Database

The database has been compiled in Access and includes a total of 1,101 drill holes and 28,974 channels, encompassing 184,098 sampled intervals. Sample types are predominately chips and core, although nine samples, coded as Vein 5, were identified in the database as “cuttings”. A summary of this database is provided in Table 11-2 and Table 11-3.

The channel samples are stored as pseudo-drill holes, with a common orientation defined by the sampling protocols. The start point of a channel (or “collar”) is always on the north side of a drift face and channels are oriented as horizontal lines with azimuth 186.28°.

The Longhole and Geo Tech hole types do not have sampling.

The assay table contains fields for, among others, from, to, hole ID, sample ID, certificate number, sample type, and hole type. Assay values for silver, lead, zinc, iron, and copper are stored along with calculated values for SG and NSR. Samples within identified veins are coded with an integer value pertaining to the structure name (e.g., 30 for 30 Vein).

The cut-off date for the database used in the Mineral Resource estimate was November 30, 2021.

Table 11-2: Summary of Holes – Gold Hunter
Hecla Mining Company – Lucky Friday Mine

Type	Number	Length (ft)
Channel	28,974	272,332
	Diamond Drill	
Definition	301	192,131
Exploration	187	174,829
Mine	13	611
Unspecified	522	228,224
PFS	49	27,046
Pre-Production	170	53,680
	Non-Resource	
GeoTech	29	10,335
Total	30,075	905,507

Table 11-3: Summary of Samples – Gold Hunter
Hecla Mining Company – Lucky Friday Mine

Hole Type	Number of Samples	Length (ft)
Channel	113,058	262,513
Definition	23,667	33,853
Exploration	15,236	21,110
Mine	47	176
Not Specified	21,987	44,153
PFS	4,440	12,411
Total	178,435	374,216

11.2.3 Geological Modelling

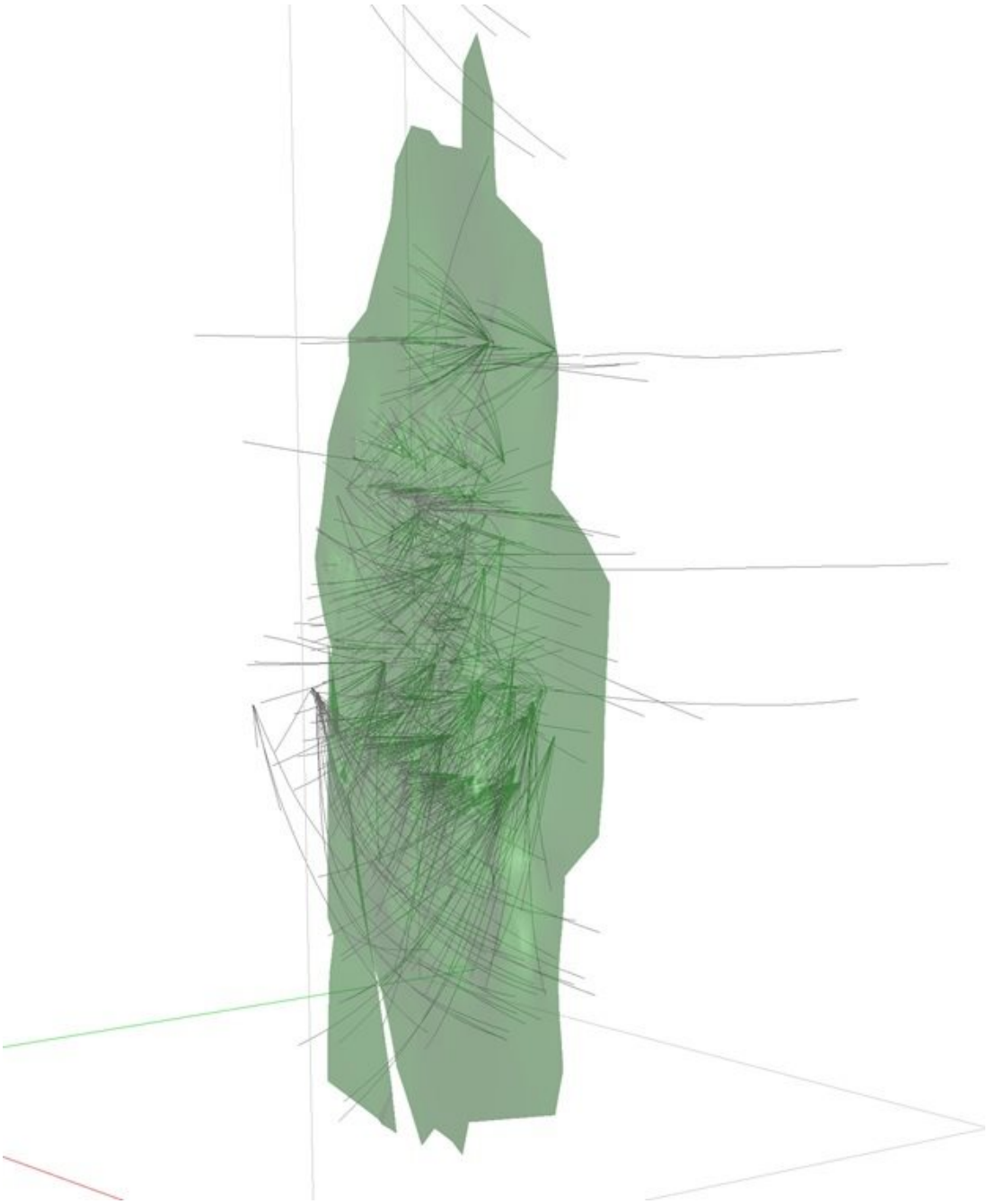
The Gold Hunter veins are narrow near-vertical structures that are generally tabular in aspect and parallel to one another, with occasional bifurcations. There are codes within the database for 101 individual veins, although some may not be fully interpreted, and may actually be parts of other known structures. Mineral Reserves are reported for eight of the Gold Hunter veins: 20, 30, 50, 60, 70, 80, 90, and 110. Mineral Resources have been estimated for those eight veins plus an additional eight: the 5, 40, 41, 100, 120, 130, 140, and 150 veins.

Wireframe models of these 16 structures were constructed using Leapfrog and exported to Surpac for use in block modeling. Drill hole and chip samples were assigned codes according to vein number and composited from hanging wall (north) to footwall (south). The start and end points for each composite were used to create surfaces representing the vein contacts. Leapfrog's implicit modeling utility was then applied to generate the wireframe models of the veins. Where appropriate, the wireframe models were truncated against known faults. An example of this would be the western end of the 30 Vein. Typically, in the absence of a known geological limit, the wireframes are constrained to a nominal distance of 300 ft from exterior drill holes.

The effective minimum width for the wireframe models was the composite lengths, which can be as short as 0.1 ft. For resource reporting purposes, dilution is added at zero grade to bring the vein to the expected minimum mining width. This mining width will vary from eight to eleven feet depending on the planned mining method.

A 3D view of the 30 Vein is shown in Figure 11-1.

The SLR QP inspected the wireframe models for the veins and compared them to the chip samples and diamond drill holes. While, in general, they were found to be reasonably representative of the vein contacts, there were instances of improperly selected intervals. This resulted in exclusion of some samples that were coded as in a vein, and inclusion of others that were either not coded or coded as another vein. It was also apparent in some cases where the veins intersected one another there appeared to be ambiguities in the sample vein code assignments. These occurrences are not considered to materially affect the resource estimates, but in the SLR QP's opinion, it would be best to correct them as required.



NOT TO SCALE

Source: SLR, 2021

Figure 11-1: 30 Vein 3D View Looking Northwest

11.2.4 Exploratory Data Analysis

Only the chip and core samples are used in resource estimation.

Of the 177,502 samples in the database, 98,849 were tagged with codes for the 16 veins on which resources were estimated. Length-weighted, non-declustered statistics for silver, iron, lead, and zinc in these samples are provided in Appendix 1. The analyses were carried out on non-declustered data in order to provide a preliminary overview of the data set and confirm some of the assumptions used in preparing the resource estimates. In addition to the statistics, histograms and probability plots were generated for each domain. Examples of these plots for silver in the 30 Vein are provided in Figure 11-2.

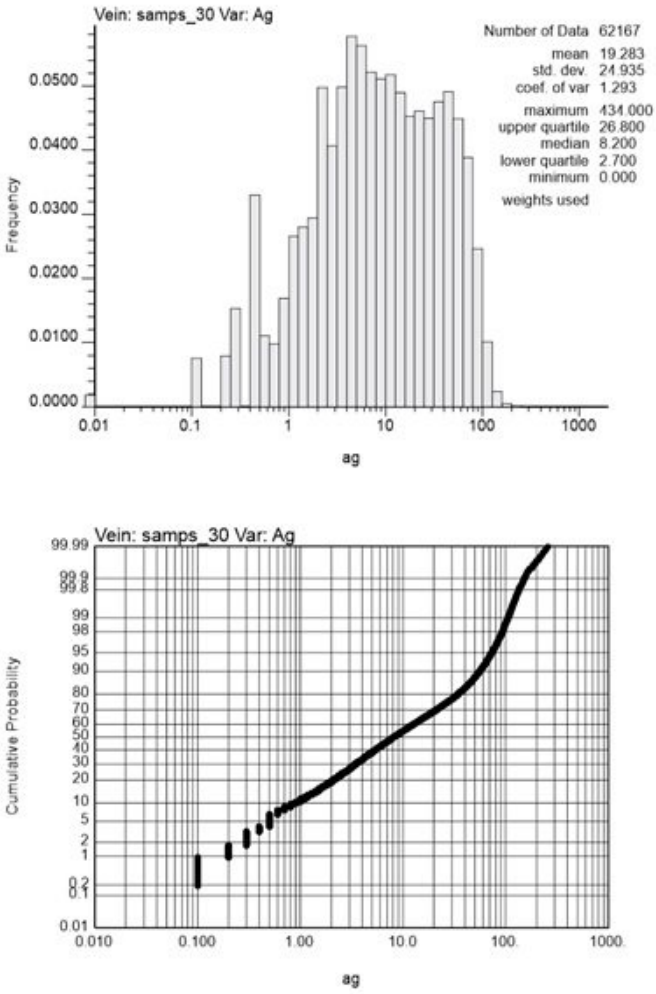


Figure 11-2: Log Histogram and Probability Plot For Silver – 30 Vein

The SLR QP notes that the statistical analyses show a complex mix of different distributions and properties. There is one consistent characteristic in that the grade distributions for silver, lead, and zinc are positively skewed. This is observed to be particularly severe in 5 Vein, for silver in the 100 to 150 Veins, inclusive, and zinc in the 80 to 150 Veins, inclusive. Coefficients of variation (CV) for these veins are observed to be higher than 1.5, and occasionally greater than 2.0 or even 3.0. The positive skewness and high CV's indicate that the samples are not normally distributed, and may be prone to bias from the upper tail of the distributions.

Many populations, such as silver and lead in the 80 Vein; lead in the 50 Vein; and lead, zinc, and silver in the 30 Vein (see Figure 11-2) appear to be combinations of two or more log normal distributions. The sample distributions are also observed to have comparatively low CVs, more in line with normal populations.

It is further noted that in most of the 5 and 100 to 150 domains listed above there are significant numbers of very low grade and zero grade samples, which could contribute to higher CV's and skewness. Typically, 5% to 10% of the silver, lead, and zinc samples in these domains have zero grades. Zinc and lead in 120 and 130 Veins have 20% zero grades. By contrast, for silver in 30 Vein, only 0.2% of samples are zeros (see Figure 11-3). This may be due in part to the fact that 30 Vein has, by far, the greatest degree of mining and the highest number of chip samples. It is reasonable to expect that these chip samples would have a higher probability of being mineralized relative to the core samples.

The iron samples are distinct from the other elements in that they do not display the same distributions and degree of skewness. They often appear to normally distributed, with some displaying bi- or multi-modal distributions. The CV's for iron are uniformly low in all domains.

In the SLR QP's opinion, positively skewed sample distributions of the type displayed by silver, lead, and zinc indicate that there is a risk of over-estimation of block grades due to the disproportionately large influence of the highest grade sample in the distribution. A common industry practice to address this risk is to cap or cut the highest grade samples to a predetermined level prior to grade interpolation. It is noted that this practice is employed at Lucky Friday, and is described in the next section of this report.

It is best practice to constrain grade interpolations within domains of like geostatistical and statistical characteristics. If the mean, the local variance, and the variance of differences between pairs of samples throughout the domain are constant, then the data set is said to be stationary. Stationarity is considered essential to allow meaningful geostatistical inference and modeling.

The complexity and multi-modal characteristics observed in the domains for Gold Hunter suggest that there may be sub-domains within some veins (ie high and/or low grade zones). If clusters of high or low grade samples exist within a vein, it would be appropriate to separate these into separate zones. If it hasn't already been tried, the SLR QP recommends that a study be undertaken to find and isolate sub-domains within the veins. This not viewed as a serious concern but merely an opportunity to fine-tune the estimates.

11.2.5 Treatment of High Grade Assays

As stated in the section entitled Exploratory Data Analysis, the sample grade distributions for most domains are positively skewed, with a tail of high grade samples. In order to limit the disproportionate effect that these high grade samples can impose on the average grade for the domains, top cuts have been applied to silver, lead, and zinc. Iron is not capped. The top cuts are nominally set at the 95th percentile of the distributions, and applied to the samples prior to compositing.

Table 11-4 lists the cap values as recorded in the Surpac macro (Surpac) used to apply the caps in the database prior to compositing. These were checked against 95th percentiles as determined by an analysis conducted by Lucky Friday personnel in December 2020 (2020 analysis) as well as an analysis conducted by the SLR on the mid-year resource estimate database (SLR analysis). The analysis was conducted on samples greater than 0.05 oz/ton for silver or 0.05% for lead and zinc, as this was the constraint used in the 2020 analysis.

It was found that the cap values used in the Surpac macro were very similar but not exactly identical to those derived in the 2020 analysis in all but two cases. For lead in 150 Vein, a top cut of 25.5% Pb was derived in 2020, while in the macro it appears as though a value of 19.5% Pb was used. In the 30 Vein, according to the macro, zinc was capped at 32.9% Zn, compared the 11.9% Zn derived in 2020. For all other domains and elements, the differences between the macro values and the 2020 analysis were very small and resulted in little or no change to the capped average grades of the samples.

The SLR analysis found that the top cuts used in the macro tended to be higher than the 95th percentile, and instead were generally in the range of the 95th to the 97th percentile. The reason for this may be due to additional samples added to the database since the 2020 analysis. During the analysis, the SLR QP evaluated each top cut and found that they appeared to be somewhat conservative. Metal loss for some domains was often observed to be in excess of 10%, and at times more than 20%. The highest metal loss typically occurred for silver and zinc in domains 5, 90, 100, 110, 120, 130, 140, and 150, which were identified in the statistical analyses as most vulnerable to bias.

In the SLR QP's opinion, in spite of this apparent discrepancy between reported and actual top cuts used, the top cut values were uniformly within an acceptable range, with the possible exception of zinc in the 30 Vein. The top cut of 32.9% Zn seems somewhat high, and is observed to have affected only 15 out of 62,212 samples. For all intents, zinc in 30 Vein is uncapped, however, 30 Vein appears to be a domain that is not particularly vulnerable to bias, and may not require much capping.

Table 11-4: Top Cuts
Hecla Mining Company – Lucky Friday Mine

Vein	Silver				Lead				Zinc			
	Uncapped (oz/ton)	Top Cut (oz/ton)	Capped (oz/ton)	Percent Change	Uncapped (%)	Top Cut (%)	Capped (%)	Percent Change	Uncapped (%)	Top Cut (%)	Capped (%)	Percent Change
5	12.37	72.0	10.45	-15.6%	3.00	21.0	2.75	-8.5%	0.87	9.2	0.75	-13.6%
20	12.03	54.8	10.49	-12.8%	5.96	23.8	5.71	-4.1%	4.01	15.0	3.84	-4.1%
30	19.28	81.5	18.58	-3.6%	11.67	41.8	11.48	-1.7%	3.22	32.9	3.22	0.0%
40	7.44	30.9	6.87	-7.6%	5.68	22.9	5.40	-5.0%	5.68	16.8	5.51	-2.9%
41	7.52	31.4	6.84	-9.0%	6.04	25.5	5.71	-5.5%	5.33	15.9	5.14	-3.5%
50	6.69	32.7	6.12	-8.6%	4.82	21.4	4.54	-5.9%	3.72	15.5	3.47	-6.6%
60	15.06	62.4	14.07	-6.6%	7.16	25.3	6.89	-3.8%	5.70	20.2	5.53	-2.9%
70	14.50	83.2	13.53	-6.7%	6.64	27.5	6.38	-3.8%	3.77	19.4	3.62	-4.0%
80	13.53	58.5	12.78	-5.5%	10.49	42.0	10.16	-3.1%	2.25	13.7	2.01	-10.6%
90	12.50	55.3	11.43	-8.6%	9.57	40.4	9.17	-4.1%	1.86	12.1	1.58	-15.1%
100	12.34	69.9	10.06	-18.4%	3.43	19.8	3.21	-6.5%	1.63	11.9	1.43	-12.1%
110	21.35	125.1	18.40	-13.8%	2.85	14.1	2.60	-8.9%	2.38	14.7	2.22	-6.5%
120	7.25	44.1	5.40	-25.4%	3.10	19.0	2.88	-7.1%	1.56	12.1	1.42	-8.9%
130	10.44	51.0	8.72	-16.5%	5.63	26.9	5.20	-7.6%	2.25	14.2	1.85	-17.6%
140	5.32	39.7	4.36	-18.2%	2.81	18.8	2.67	-5.1%	2.30	13.3	1.96	-14.9%
150	5.13	28.3	4.47	-12.8%	4.03	21.4	3.75	-7.0%	1.44	7.0	0.73	-49.7%

11.2.6 Compositing

Due to the variation in lengths of the samples, it is necessary to composite them to ensure consistency in the sample support for grade interpolation. Sample lengths are observed to range from a minimum of 0.1 ft to a maximum of 17.6 ft. Although the protocol is for samples to be between 0.5 ft and 4.0 ft, there are a number of samples collected before the current limits were in place. In addition, there are cases where core loss resulted in samples exceeding the proscribed limits. These instances comprise a relatively small proportion of the database, and will most likely occur in portions of the deposit that have been mined out. Figure 11-3 is a probability plot of sample lengths, demonstrating that 90% of the samples fall between 0.5 ft and 4.0 ft.

The veins at Gold Hunter are comparatively narrow, and so a base composite length of 3.0 ft is used. Composites are generated in Surpac using the "best fit" utility, which attempts to fit as many 3.0 ft composites as possible within a given vein intercept. Since the vein intercepts are rarely an even multiple of three in length, there is often a smaller composite left on the margin of the interval. For narrow veins where only one 3.0 ft composite can be fit, smaller composites between 0.1 ft and 1.5 ft in length are appended to that 3.0 ft composite. In wider sections, smaller composites are retained and treated as a full-length composite in the grade interpolations. The resulting composites range in length from 0.1 ft to 4.5 ft, with approximately 75% falling between 2.5 ft and 3.5 ft.

The SLR QP notes that the base composite length is less than the maximum allowable sample length of 4.0 ft, which will likely result in breaking of samples during the compositing. Breaking samples can artificially lower the sample variance and co-variance which can lead to incorrect geostatistical inference. However, it is further noted that approximately 83% of samples are 3.0 ft or less in length which suggests the impact of this practice will be relatively minor. In the SLR QP's opinion, the compositing procedure used at Gold Hunter is a reasonable compromise between honoring the vein widths and preserving sample lengths.

Non-declustered statistics for the composite grades weighted by length x SG are provided in Appendix 2. The SLR QP notes that capping and compositing the samples (or just compositing in the case of iron) resulted in significant moderation in the CV's for all four elements in virtually all domains.

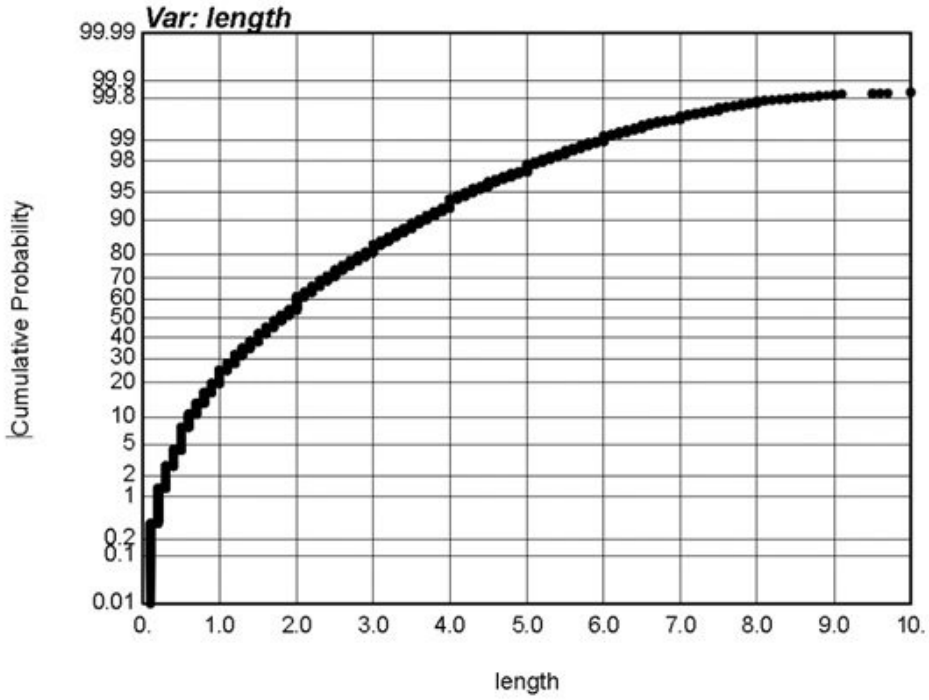


Figure 11-3: Probability Plot of Sample Lengths

11.2.7 Geostatistics

For many years, the search parameters at Gold Hunter have been based on geostatistical analyses conducted for the 30 Vein. Only the 30 Vein was included in the geostatistical analyses because by far most of the data comes from that vein. The same search parameters derived from the 30 Vein were applied to the Intermediate Veins, except that the ranges were reduced by a factor of 75%.

The interpreted variogram models were "forced" into an orientation which matched a vertical best-fit plane through the 30 Vein. The ellipsoids projected onto this plane were generally consistently oriented with the major axis plunging at -75° towards the west, which is parallel to the observed plunge of the mineralization. The SLR QP notes also that this is consistent with variogram results dating back through several years.

For the current model the geostatistical analysis was not redone, primarily because there is very little change in the results year on year. As a check, however, the SLR QP carried out an analysis on the 30 Vein using GEMS software. The analyses were run in true 3D and not constrained to a plane as had been done previously. Only non-zero composites were included in the analyses. The covariance values were normalized to the population variance, which means the ideal sill for all elements was 1.0. It is noted, however, that many of the experimental variograms failed to reach this sill. For interpretive purposes, the variogram models were forced to fit the 1.0 sill, however, it is recognized this may not be an optimal approach.

Table 11-5 lists the parameters of the interpreted variogram models. All models are exponential and comprise two structures. The models along with the experimental variogram results are shown in Appendix 3.

Table 11-5: Variogram Models
Hecla Mining Company – Lucky Friday Mine

Element	Structure	Gamma	Orientations (Az/Plunge)			Ranges (ft)		
			Major	Semi-Major	Minor	Major	Semi-Major	Minor
Ag	C0	0.308						
	C1	0.420	254.9/-77.9	108.8/-10.1	197.7/6.6	12.0	9.7	1.1
	C2	0.272				208.9	169.6	19.2
Fe	C0	0.261						
	C1	0.285	237.2/-82.9	106.1/-4.7	195.7/5.4	16.7	14.8	1.8
	C2	0.454				337.6	299.0	36.7
Pb	C0	0.372						
	C1	0.445	252.7/-78.3	107.3/-9.6	196.2/6.5	18.9	14.9	2.9
	C2	0.183				233.5	183.9	36.3
Zn	C0	0.274						
	C1	0.298	259.0/-76.7	99.2/-12.5	188.2/4.4	30.1	19.8	2.2
	C2	0.428				995.9	653.5	72.4

The analysis tended to yield consistent results for all metals in terms of orientations. The major and semi-major axes were all broadly oriented within a plane striking 100° dipping 85° to the south-southwest. This is the general strike and dip of the Gold Hunter Veins and is an expected result. The major axes all plunge at approximately 78° toward the west, which is consistent with previous geostatistical models. There is only a comparatively subtle anisotropy within the plane of the vein (ie between the major and semi-major axes). Nugget effects range between 26% and 37% of the total sill.

All experimental variograms for the major and semi-major axes were coherent and easily interpreted. Downhole variograms did not yield interpretable curves, and so the nugget effects were estimated from the experimental variograms. The reason for the incoherence of the downhole variograms is not known.

Total ranges along the major and semi-major axes for most elements tended to be in the order of 170 ft to 300 ft. An exception to this was zinc, which had a major axis range of just under 1,000 ft (see Table 11-5). The experimental variograms all showed a relatively steep rise in covariance to approximately 50% to 60% of the total sill for the first structure (C1), and noticeably flattening for the second structure (C2).

11.2.8 Block Model Geometry

The block model was created in Geovia Surpac, which is an off-the-shelf mining software package, commonly used in the industry. The model comprises an array of blocks rotated about the Z-axis by 12° such that they are aligned with the average strike of the veins. Parent block size is 16 ft (X) x 16 ft (Y) x 20 ft (Z), with sub-blocks down to 8 ft (X) x 0.5 ft (Y) x 10 ft (Z).

Block model geometry is summarized in Table 11-6. The variables stored in the model are listed in Table 11-7.

Table 11-6: Block Model Geometry
Hecla Mining Company – Lucky Friday Mine

Parameter		Value
Origin:	X:	15,600
	Y:	24,100
	Z:	-5,600
Rotation:		12°
Extents:		
(ft)	X:	4,720.0
	Y:	1,300.0
	Z:	6,700.0

Table 11-7: Block Model Variables
Hecla Mining Company – Lucky Friday Mine

Variable	Number	Minimum	Maximum	Description
X	5,131,166	16,390.40	20,086.26	Block centroid easting
Y	5,131,166	24,121.51	24,935.60	Block centroid northing
Z	5,131,166	-5,305.00	1,055.00	Block centroid elevation
classification	5,131,166	1	1	Internal use
size_X	5,131,166	8	16	Block size easting
size_Y	5,131,166	0.5	16	Block size northing
size_Z	5,131,166	10	20	Block size elevation
aniso_dist	5,131,166	12.236	2736.805	Anisotropic distance to nearest composite
class	5,131,166	1	3	Classification (1 = Measured, 2 = Indicated, 3 = Inferred)
comp_num	5,131,166	3	16	Number of composites used
dh_num	5,131,166	2	16	Number of drill holes used

Variable	Number	Minimum	Maximum	Description
id2_ag_opt	5,131,166	0.00	110.69	ID2 silver grade
id2_fe_pct	5,131,166	0.53	42.28	ID2 iron grade
id2_pb_pct	5,131,166	0.00	41.12	ID2 lead grade
id2_zn_pct	5,131,166	0.0000	22.3000	ID2 zinc grade
id2_sg	5,131,166	2.78	5.32	Specific gravity (calculated from ID2 grades)
id2_tf	5,131,166	0.09	0.17	Tonnage factor (calculated from ID2 grades)
mined_heading	5,131,166	n/a	n/a	String variable to described mined status
mined_status	5,131,166	n/a	n/a	String variable to describe stoped status
nsr_lrp	5,131,166	0	1956.49	Estimated NSR for Long Range Plan
nsr_reserve	5,131,166	0	1738.06	Estimated NSR for Reserves
nsr_resource	5,131,166	0	2223.74	Estimated NSR for Resources
true_dist	5,131,166	5.782	2197.704	True distance to nearest composite
vein_code	5,131,166	5	5000	Vein descriptor

In the SLR QP's opinion, the block model is configured appropriately in a manner consistent with industry practice. The sub-blocking is somewhat unconventional in that it has produced some very narrow blocks, however, this is deemed necessary in order to honor the vein wireframes.

11.2.9 Search and Interpolation Parameters

Grades for silver, lead, zinc, and iron are estimated into the blocks using ID2 weighting. The grade interpolations are conducted in three passes of progressively increasing search ranges. Search ellipsoids are oriented in vertical planes parallel to overall vein strike with the major axis plunging at 75° to the west. Search parameters are listed in Table 11-8.

Search ranges for Measured and Indicated in the Intermediate Veins were 75% of those for 30 Vein, which is consistent with historical practice at Lucky Friday. The reduced ranges have traditionally been applied in the Intermediate Veins owing to the fact that there is less data informing the estimates for these zones and so a more conservative approach was deemed warranted.

In the SLR QP's opinion, the search ranges and orientations are broadly supported by the variography, and are appropriate. The very long ranges for Pass 3 are used to ensure all blocks within the vein wireframe models are filled. The constraints applied in constructing these wireframes ensure that the interpolations are not allowed to extend too far. Currently these Pass 3 blocks are only classified as Inferred Mineral Resources.

Table 11-8: Search Parameters
Hecla Mining Company – Lucky Friday Mine

Vein	Metal	Pass	Number of Composites		Major Axis Orientation				Anisotropy Ratios	
			Min	Max	Dist (ft)	Azim	Dip	Plunge	Semi-Major	Minor
30 Vein	Ag	1	4	16	155	282	90	-75	1.56	3.2
		2	3	16	230	282	90	-75	1.56	3.2
		3	2	16	5000	282	90	-75	1.56	3.2
	Pb	1	4	16	155	282	90	-75	1.57	5.49
		2	3	16	235	282	90	-75	1.57	5.49
		3	2	16	5000	282	90	-75	1.57	5.49
	Zn	1	4	16	700	282	90	-75	2.21	27.8
		2	3	16	1045	282	90	-75	2.21	27.8
		3	2	16	5000	282	90	-75	2.21	27.8
	Fe	1	4	16	315	282	90	-75	2.11	21.3
		2	3	16	475	282	90	-75	2.11	21.3
		3	2	16	5000	282	90	-75	2.11	21.3
Interm.	Ag	1	4	16	115	282	90	-75	1.56	3.2
		2	3	16	170	282	90	-75	1.56	3.2
		3	2	16	5000	282	90	-75	1.56	3.2
	Pb	1	4	16	115	282	90	-75	1.57	5.49
		2	3	16	175	282	90	-75	1.57	5.49
		3	2	16	5000	282	90	-75	1.57	5.49
	Zn	1	4	16	525	282	90	-75	2.21	27.8
		2	3	16	785	282	90	-75	2.21	27.8
		3	2	16	5000	282	90	-75	2.21	27.8
	Fe	1	4	16	235	282	90	-75	2.11	21.3
		2	3	16	355	282	90	-75	2.11	21.3
		3	2	16	5000	282	90	-75	2.11	21.3

Blocks were assigned integer codes for the veins according to their centroid locations (ie. The centroid must be inside of a wireframe to receive a code). The wireframe models were configured as “hard” boundaries with respect to the grade interpolations. This meant that only composites coded for a particular vein could be used to estimate blocks within that vein.

In the SLR QP’s opinion, the grade interpolations were conducted in a reasonable manner consistent with common practice using an appropriate estimation algorithm commonly used within the industry.

11.2.10 Bulk Density and Tonnage Factors

As discussed in the section of this report entitled Sample Preparation, Analyses, and Security, SG is estimated from metal contents by means of a stoichiometric equation taking into account the most common minerals in the ore. The equations and description of the process is repeated here.

The principal constituent minerals of the ore are assumed to be galena (PbS) and sphalerite (ZnS) in a gangue containing siderite ($FeCO_3$) and pyrite (FeS_2) along with silicates. The relative abundance of iron species is assumed to be 75% siderite and 25% pyrite.

The SG equation is as follows:

$$Density = 100 / ((Gangue\%/2.76) + (Galena\%/7.50) + (Sphalerite\%/4.00) + (Siderite\%/3.94) + (Pyrite\%/5.02)$$

Where:

- Galena% = Pb% / 0.866
- Sphalerite% = Zn% / 0.670
- Siderite% = (Fe% x 0.75) / 0.482
- Pyrite% = (Fe% x 0.25) / 0.466
- Gangue% = 100 – (Galena% + Sphalerite% + Siderite% + Pyrite%)

These SG values are then used to derive tonnage factors (TF) for each block, and which are then used in estimation of block tonnages. The TF equation is as follows:

$$TF = 1 / (2,000 / (62.4 \times SG))$$

The SLR QP conducted checks of both the SG and TF calculations to confirm that they had been correctly done. In the SLR QP's opinion, the estimations of SG and TF have been done in a reasonable fashion.

11.2.11 Classification

Under S-K 1300, Mineral Resources and Mineral Reserves must be classified according to the definitions of the Committee For Mineral Reserves International Reporting Standards (CRIRSCO). Relevant aspects are summarized below:

Mineral Resource: A concentration or occurrence of material of economic interest in or on the Earth's crust in such form, grade/quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade/quality, continuity and other geological characteristics of a Mineral Resource are known, estimated, or interpreted from specific geological evidence and knowledge, including sampling.

Inferred Mineral Resource: That part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade/quality continuity.

An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

Indicated Mineral Resource: That part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade/quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

Measured Mineral Resource: That part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade/quality continuity between points of observation.

A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Mineral Reserve or to a Probable Mineral Reserve.

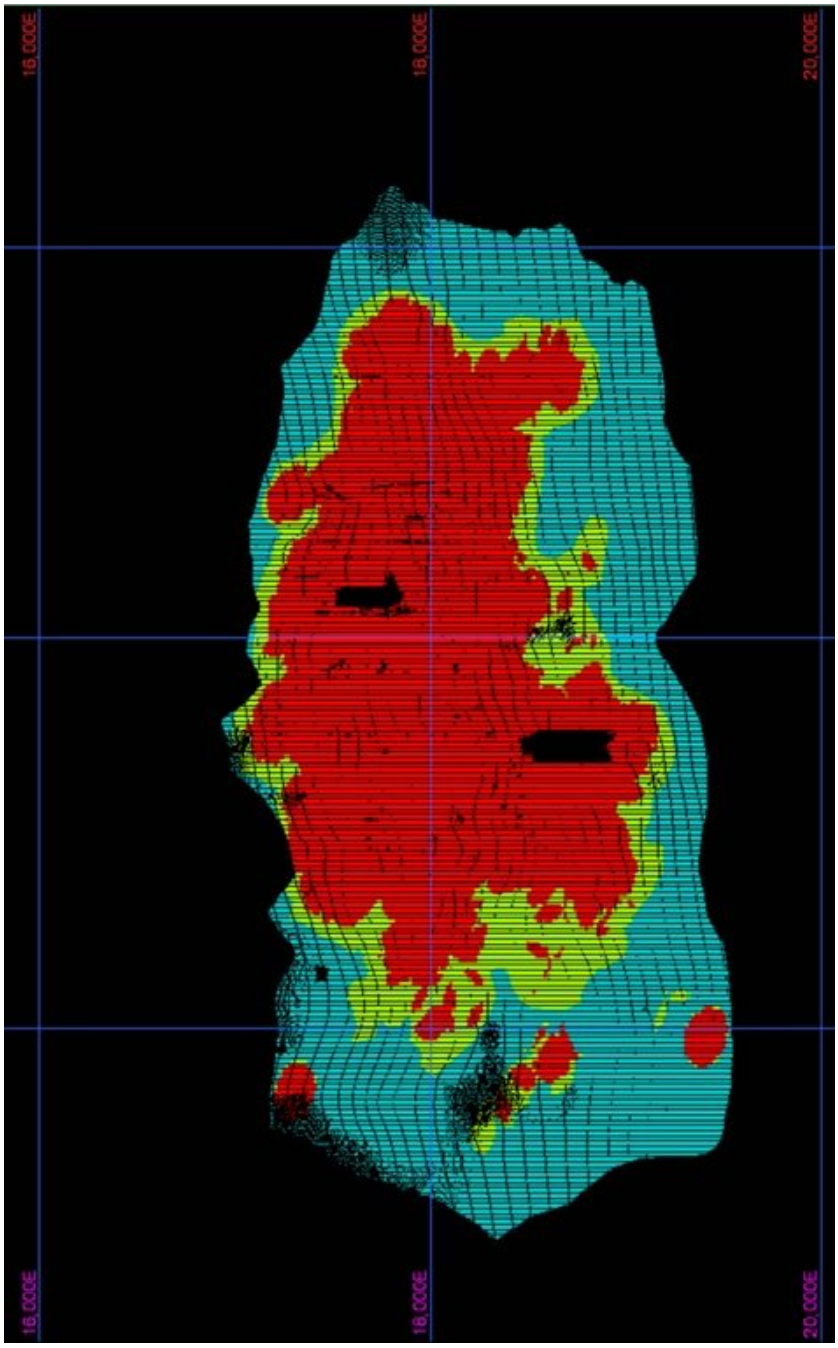
Modifying Factors: Are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors.

At the time of interpolation, the blocks are coded with a preliminary classification according to Pass number. Pass 1 is coded as Measured, Pass 2 Indicated, and Pass 3 Inferred. The dilution rind blocks, which are not captured in the grade interpolation, are coded according to the adjacent blocks within the vein wireframe.

The classification coding is based the silver search ellipsoids (see Table 11-8). So for Measured Mineral Resources, the blocks will be within a 155 ft x 99 ft ellipsoid of a sample in the 30 Vein, and 115 ft x 74 ft for the Intermediate Veins. Search distances for Indicated are 230 ft x 147 ft in the 30 Vein, and 170 ft x 109 ft in the Intermediate Veins. The Inferred class is assigned to blocks up to a distance of 5,000 ft x 3,205 ft from a sample point.

The SLR QP notes that these distance criteria, particularly for Measured, appear to be somewhat aggressive based on the variograms. This, coupled with the minimum composites constraint applied for Pass 1, means that a Measured block could be informed by as few as four sample points. Conceivably, those four composites could even come from a single drill hole, however, the narrow nature of the veins makes this unlikely. The overall result is that there is quite a high proportion of the resources that have been classed as Measured whereas it might be more appropriate to class some of this material as Indicated.

Figure 11-4 is a longitudinal view of the 90 Vein depicting the resource classification as red for Measured, green for Indicated, and cyan for Inferred. As expected, there is a fairly broad area of Inferred on the periphery owing to the liberal search criteria used to apply this classification. The Measured also appears to be quite widespread, even though there are comparatively few areas informed by close-spaced sampling. There appears to be only a thin veneer of Indicated or even Inferred surrounding the Measured which, in the SLR QP's opinion, is unusual and somewhat unrealistic.



Source: SLR, 2021

Note: Inferred blocks are cyan, Indicated green, and Measured red.

Figure 11-4: 90 Vein Classification

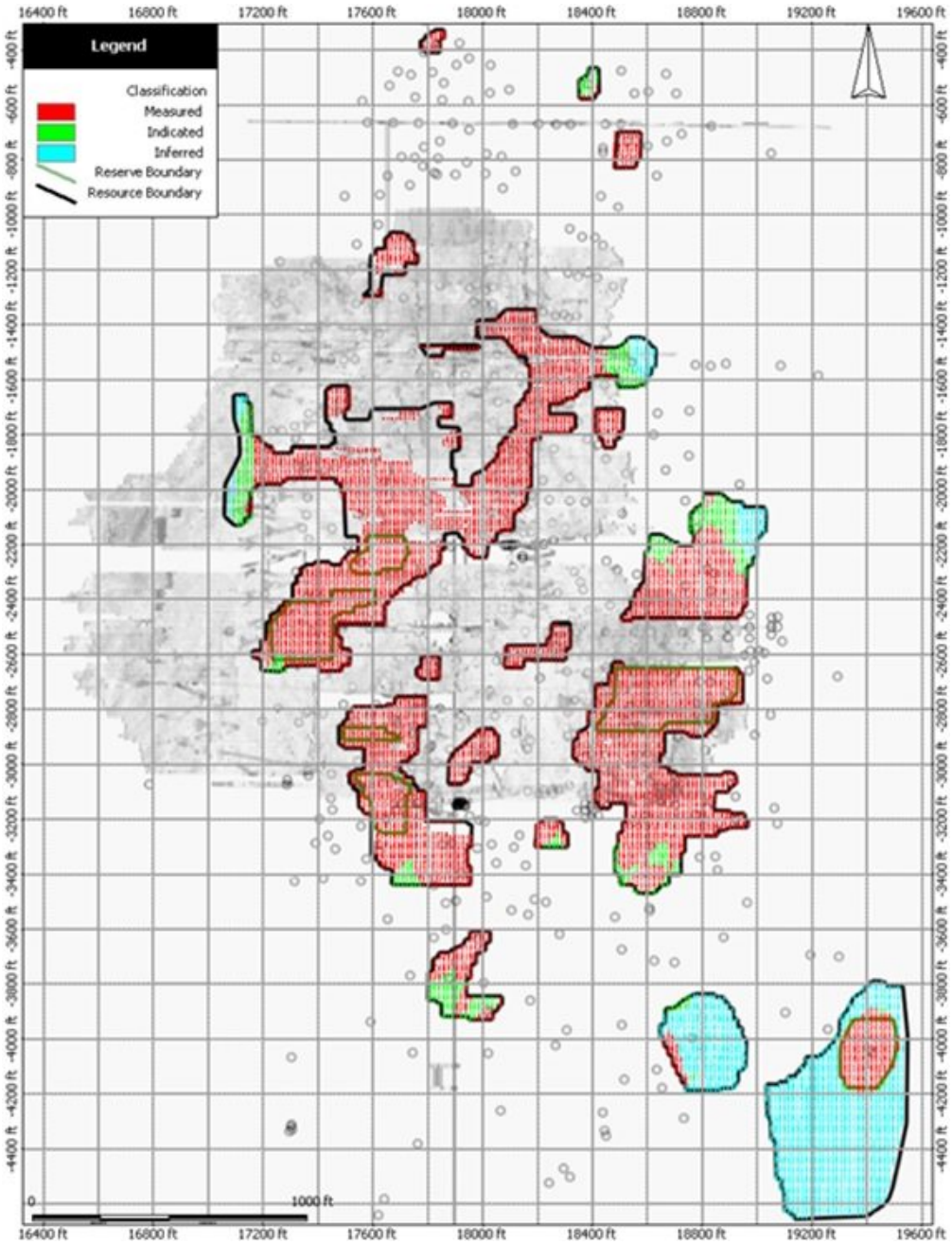
There are also small bodies of Measured that are completely isolated and surrounded by Indicated. In the SLR QP's opinion, these isolated pockets of Measured should be downgraded to Indicated.

Figure 11-5 is also a longitudinal projection of the 90 Vein on which just the reserve and resource blocks have been plotted, again color-coded according to classification. Drill hole pierce-points appear as circles. In the lower right corner of the diagram are two areas of predominantly Inferred material. In the eastern-most area, there is an oval-shaped zone of Measured surrounded by Inferred with no buffer of Indicated. Further inspection shows that this area of blocks is largely informed by only two drill hole pierce-points inside and possibly one or two outside of what has been outlined as resource.

In the western-most area of Inferred there is a thin sliver of Measured along the western margin of the resource boundary which is also juxtaposed against Inferred material. There appear to be no drill holes piercing this Measured material, although there are several holes in the surrounding area which likely informed these blocks. Comparison to Figure 11-4 suggests that this resource boundary just clipped a bit of the Measured from a nearby zone.

In the SLR QP's opinion, it is unusual to have Measured and Inferred blocks in contact with one another without Indicated between them. This is likely a result of the classification method being purely driven by the computer without much user intervention. The Measured blocks in these two cases should have been manually downgraded to Indicated, at best.

It is recommended that the classification procedures be enhanced to allow for a greater level of inspection and manual revision before further processing and reporting. It may be preferable to derive a classification method that is independent of the estimation passes in order to fine-tune the process without interfering with the interpolations.



Source: SLR, 2021

Figure 11-5: 90 Vein Classification

The SLR QP further notes, that a significant volume of Inferred Mineral Resources have been added since the previous estimate. The reason for this is that large portions of many veins, which had been previously excluded from eligibility for classification, were allowed to be included. The SLR QP inspected these additions for all veins and concludes that they are appropriate for consideration for Inferred Mineral Resources. For the most part they represent comparatively small gaps between drilled areas, or extensions of known structures. They all are included within the interpreted vein wireframe models, and generally extend for a distance of 200 ft to 400 ft from the nearest sample, occasionally as far as 600 ft. In the SLR QP's opinion, it is reasonable to include these sections of the veins for potential classification as Inferred Mineral Resources.

In the SLR QP's opinion, the Mineral Resources are classified according to the CRIRSCO definitions and, as such, are consistent with the requirements of SK 1300. The method used to apply the classification is broadly consistent with common industry practice. Some of the distance criteria appear somewhat aggressive, although it is observed they are more restrictive than historical practice. Prior to 2019, for example, the search ellipsoid for Measured in the 30 Vein was 195 ft x 90 ft compared to the current 155 ft x 99 ft. This is partially offset by the fact that, due to the new mining methods introduced, more reliance is now placed on drill holes than more closely-spaced and numerous chip samples.

The classification parameters are considered to be appropriate given the long mining history,XXXiltiter, as outlined above, there are opportunities for improvement. It is unlikely that the changes proposed here will significantly impact the total reserve base except possibly for an increase in Probable Mineral Reserves (or Indicated Mineral Resources) at the expense of Proven (Measured).

11.2.12 NSR Cut-Off Grades

The NSR value is used as the primary cut-off grade for the blocks. This value is derived from the interpolated metal contents using metal prices which have been discounted for metallurgical recovery, transport, and smelter terms. For Mineral Resources, metal prices used as the basis of this calculation were US$21.00/oz Ag, US$1.15/lb Pb, and US$1.35/lb Zn. After application of provisions for recovery, sales, transportation, payables, and smelter charges, the NSR multipliers for each metal were as follows:

- Ag:US$16.86 per oz/ton
- Pb:US$19.77 per percent of lead
- Zn:US$18.64 per percent of zinc

For Mineral Resources, the cut-off NSR value used was the approximately equivalent to the sum of 2016 mining, milling, maintenance, and G&A costs, which was US$173/ton.

In the SLR QP's opinion, the NSR cut-off is a reasonable approach which has been applied in an appropriate manner. The application of the stope optimizer is also appropriate and consistent with industry best practice.

11.2.13 Validation

The block models were validated by the following methods:

- Visual inspection and comparison of block and composite grades in cross section views
- Comparison to the previous year's estimates

Visual inspection is a good way to determine if the block grade interpolations are honoring the composite grades. Hecla personnel report that there is good agreement between composite and block grades. The SLR QP conducted a brief inspection of several veins to confirm this.

Comparison to the previous year's estimates is the principal validation method employed. For some years, there has been relatively little change to the block grade estimates and so any estimation errors are usually fairly obvious.

In the SLR QP's opinion, while the validation methods used at Lucky Friday are appropriate, they represent a fairly minimum standard of review. There are other techniques that could and should be applied to confirm that the grade interpolations are reasonable and unbiased. Examples of other validation methods include:

- Comparison of global composite and block means
- Comparison with block grades generated using an alternative interpolation method (ie ordinary kriging or nearest neighbor)
- Drift analysis.

11.2.13.1 Comparison of Mean Composite and Block Grades

The SLR QP carried out a comparison of density-length-weighted mean composite grades to tonnage-weighted block grades for the Measured and Indicated blocks. The results of this comparison are shown in Table 11-9.

Table 11-9: Comparison of Global Block and Composite Grades
Hecla Mining Company – Lucky Friday Mine

Composites SgxLength-Weighted Mean Grades					Measured and Indicated Blocks Tonnage-Weighted Mean Grades					Percent Difference				
Vein	Ag (oz/ton)	Fe (%)	Pb (%)	Zn (%)	Vein	Ag (oz/ton)	Fe (%)	Pb (%)	Zn (%)	Vein	Ag (oz/ton)	Fe (%)	Pb (%)	Zn (%)
5	11.08	12.33	3.06	0.84	5	9.20	13.24	2.96	0.80	5	-16.9%	7.4%	-3.2%	-5.1%
20	11.32	19.48	6.23	4.24	20	8.95	16.73	4.94	2.76	20	-20.9%	-14.1%	-20.7%	-34.9%
30	20.74	20.06	12.76	3.38	30	18.73	19.43	11.66	3.87	30	-9.7%	-3.1%	-8.6%	14.3%
40	7.20	25.69	5.66	5.70	40	4.76	25.09	3.88	4.43	40	-33.9%	-2.3%	-31.4%	-22.3%
41	7.09	24.07	6.00	5.33	41	5.64	22.89	4.68	3.90	41	-20.5%	-4.9%	-22.1%	-26.8%
50	6.46	21.90	4.83	3.76	50	5.87	20.20	4.54	3.03	50	-9.1%	-7.7%	-5.9%	-19.4%
60	15.58	14.47	7.56	6.07	60	8.16	14.72	5.59	3.04	60	-47.6%	1.7%	-26.0%	-49.9%
70	15.07	12.24	7.06	4.02	70	8.44	13.01	5.99	2.48	70	-44.0%	6.3%	-15.1%	-38.4%
80	14.41	11.45	11.55	2.17	80	9.67	12.31	7.58	2.18	80	-32.9%	7.5%	-34.4%	0.4%
90	12.97	12.54	10.51	1.71	90	9.04	13.42	7.46	1.90	90	-30.3%	7.0%	-29.0%	11.3%
100	10.45	14.16	3.51	1.58	100	5.83	13.60	3.82	1.57	100	-44.2%	-4.0%	8.8%	-0.7%
110	19.12	16.34	2.82	2.42	110	12.80	14.47	3.29	2.44	110	-33.1%	-11.5%	16.8%	0.7%

Composites SgxLength-Weighted Mean Grades					Measured and Indicated Blocks Tonnage-Weighted Mean Grades					Percent Difference				
Vein	Ag (oz/ton)	Fe (%)	Pb (%)	Zn (%)	Vein	Ag (oz/ton)	Fe (%)	Pb (%)	Zn (%)	Vein	Ag (oz/ton)	Fe (%)	Pb (%)	Zn (%)
120	5.72	13.33	3.20	1.57	120	5.89	13.64	3.57	1.89	120	2.9%	2.3%	11.5%	20.7%
130	9.68	12.45	5.94	2.03	130	7.16	11.83	4.28	1.99	130	-26.0%	-5.0%	-28.0%	-2.0%
140	4.65	9.92	2.90	2.14	140	5.12	9.53	3.38	2.00	140	10.2%	-3.9%	16.7%	-6.5%
150	4.75	9.40	4.09	0.78	150	4.28	7.25	3.36	0.75	150	-9.9%	-22.9%	-17.9%	-4.4%

The estimated block grades for silver, lead, and zinc in the Intermediate Veins are observed to be generally lower than the composite grades, and in some cases, significantly so. In the SLR QP's opinion, the block grade estimates for the Intermediate Veins appear to be conservative for silver and zinc. Lead shows both positive and negative variances suggesting that the global estimate may be unbiased or nearly so. The block iron grades for all zones are generally within 10% of the composites, as are the block grades for all metals in the 30 Vein.

It is recommended that an attempt should be made to resolve the apparent biases in the grade interpolations, perhaps by adjusting the capping strategy, domain assignments, and/or interpolation strategies. This is not viewed as a fatal flaw in the estimate but merely as an opportunity for improvement of the local vein grade estimates that may then be reflected in the global estimates.

11.2.13.2 Drift Analysis

The SLR QP carried drift analyses (also known as swath plots) for the X and Z direction of all the veins. Composite grades were weighted by length x sg, and the blocks were weighted by tonnage. Individual swaths were generated at widths of twice the parent block size, which was 16 ft in the X direction and 20 ft in the Z direction, not accounting for the 12° rotation of the block model. As such, the swaths in the X direction are not coincident with the block columns, however, this is inconsequential to the result as the analysis is based on block centroid coordinates.

In general, the swath plots displayed good agreement between composites and blocks although there were several instances of localized biases for silver, lead, and zinc in some domains. Overall, the 30 Vein, which contains the highest proportion for any domain of the Mineral Reserves and Mineral Resources, showed excellent agreement. Block and composite iron grades were found to agree quite well for all domains.

Figure 11-6 shows example swath plots in the Z direction for silver and lead in the 30 Vein, both of which indicate good agreement between blocks and composites. It is quite evident in these diagrams that there is significantly more variability of composite grades in the upper and lower extremities of the vein. These areas are sampled predominantly by drill holes, as opposed to the central section, which is informed by closely-spaced chip sampling.

Figure 11-7 shows similar diagrams for silver and zinc in the 60 Vein. There is reasonably good agreement between the composite and block grades except in the area between approximately -1,200 ft and -2,000 ft in elevation. In this are the block grades appear to be somewhat muted relative to the composites, and this might explain the difference in global mean grades observed in Table 11-9. The reason for this apparent localized bias is not known, but it was observed in several veins.

As stated above, the SLR QP is of the opinion that refinements to the interpolation and search parameters may yield improvements to the local block grade interpolations. Again, this is not viewed as a fatal flaw in the estimate but merely as an opportunity for improvement.

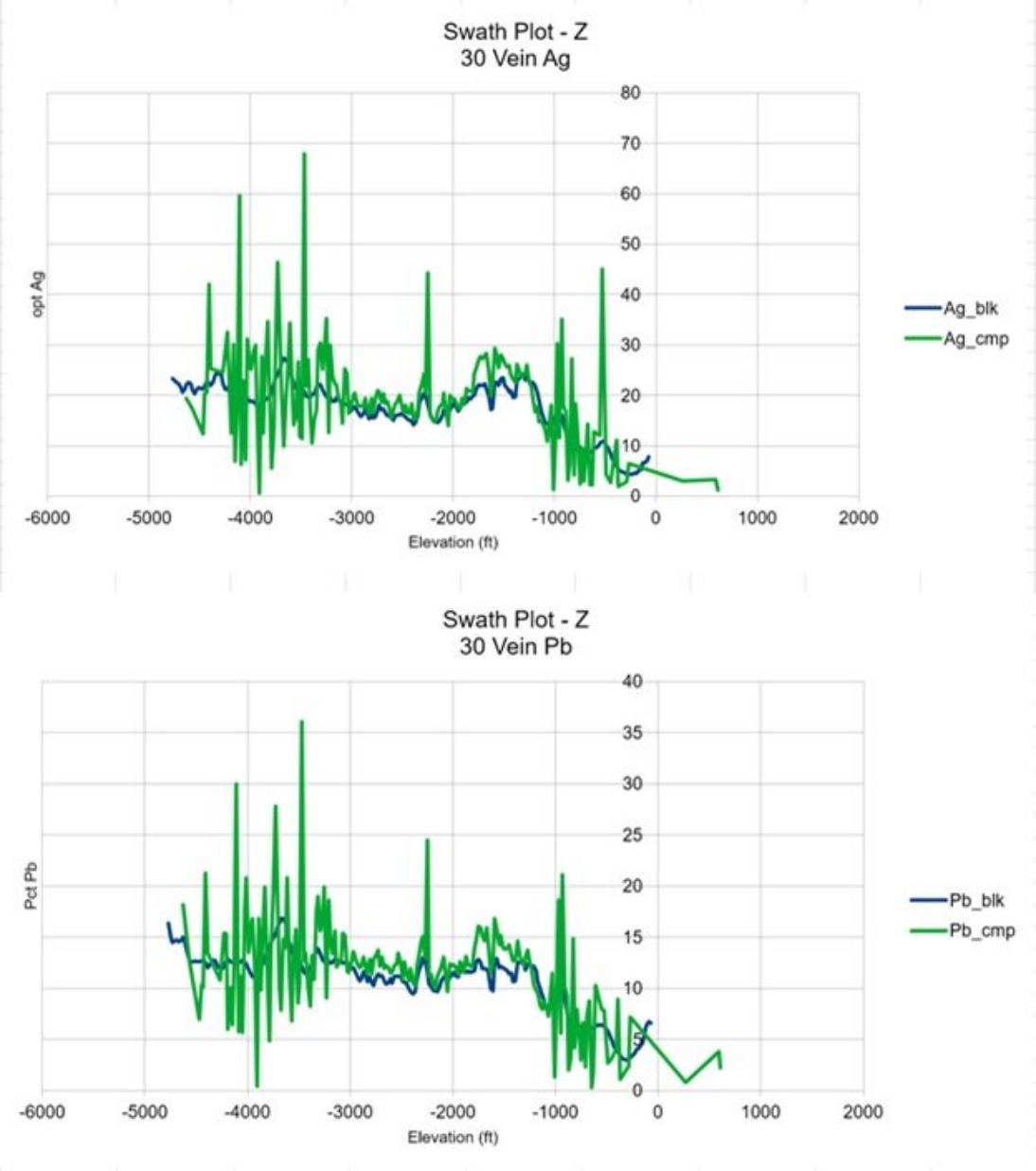


Figure 11-6: Drift Analyses – 30 Vein

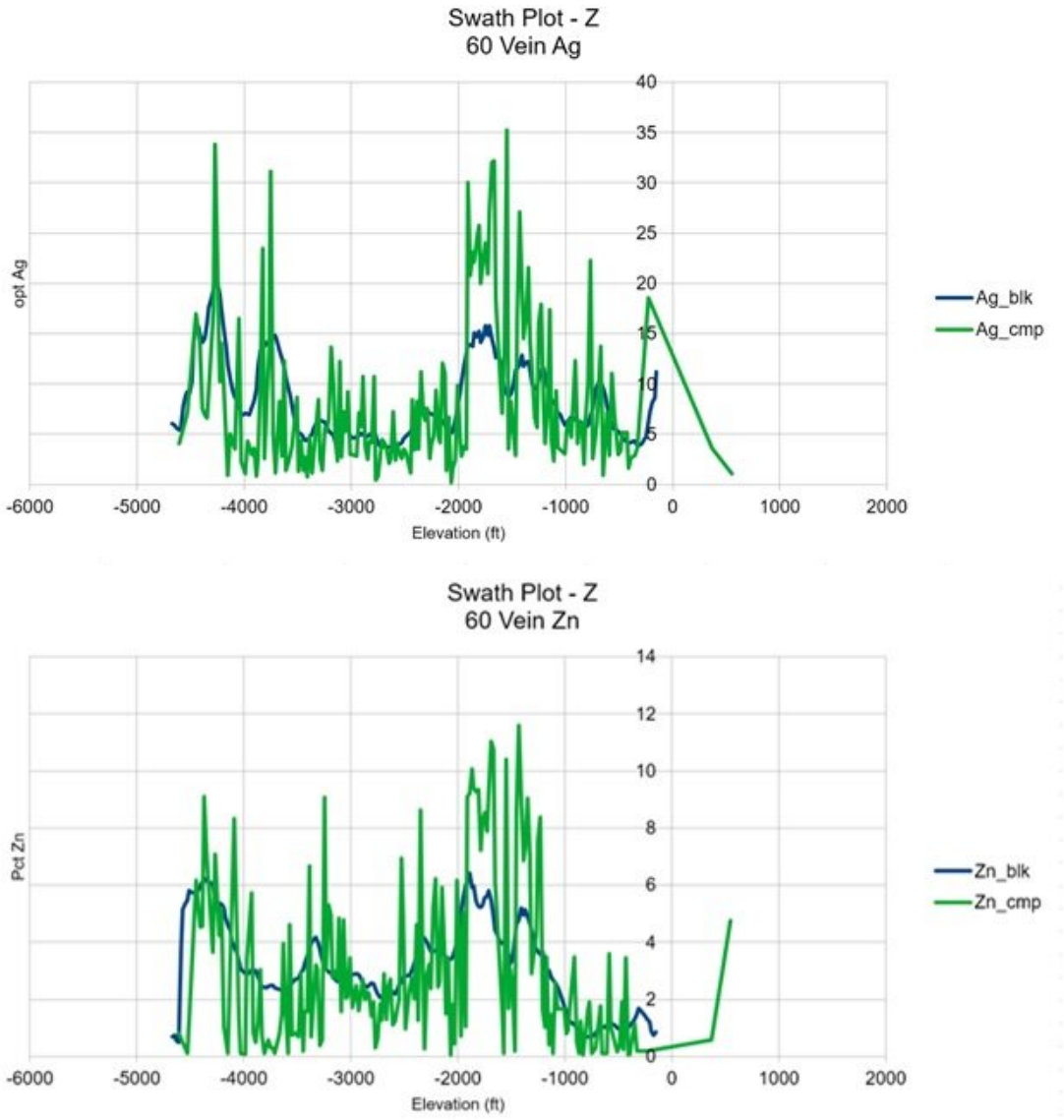


Figure 11-7: Drift Analyses – 60 Vein

11.2.13.3 Estimation Using an Alternative Method

As a further check, the SLR QP conducted block model estimates for the 30 Vein and 110 Vein using ordinary kriging (OK) and nearest neighbor (NN) methods. The estimates were carried out using Geovia GEMS software, and employed the same composites and wireframe models as were used by Hecla for the current models (ID^2). Calculation methodologies for the tonnage factors and block NSR values were identical to those used for the ID^2 models. The variogram models described in subection 11.2.7 of this TRS were used for the interpolations. Search parameters were also the same as those used in the ID^2 models. The block size was 10 ft x 2.5 ft x 10 ft, and a percent model was used instead of sub-blocking.

Figure 11-8 shows tonnage and grade curves for the two veins using the NSR cut-off. For both veins, there was good agreement between the OK and ID^2 models across a wide range of NSR cut-off grades. The NN model tended to yield markedly lower tons at a higher grade than the other two methods.

Table 11-10 shows the tonnage and grade for each of the 30 and 110 Veins at a US$200/t NSR cut-off grade. Note that these volumes are for unclassified blocks within the entire vein structure, without provision for mining depletion. They should not be considered estimates of Mineral Resources, and are shown here for comparative purposes only.

Table 11-10: Comparison of Block Models at the US$200/t Cut-Off
Hecla Mining Company – Lucky Friday Mine

Method	Tons	Grade				NSR	Contained Metal		
	(ton)	(oz/ton Ag)	(% Pb)	(% Zn)	(% Fe)	(US$/t)	(oz Ag)	(Units Pb)	(Units Zn)
					30 Vein				
NN	5,575,185	23.35	14.30	4.54	19.49	761.14	130,180,570	79,725,146	25,311,340
OK	6,927,032	18.95	11.90	3.86	19.29	626.78	131,267,256	82,431,681	26,738,344
ID^2	7,009,295	19.69	12.07	3.87	19.08	642.68	138,013,019	84,602,191	27,125,972
					110 Vein				
NN	1,267,086	14.87	5.37	4.19	14.52	434.83	18,841,569	6,804,252	5,309,090
OK	1,754,015	11.29	4.13	3.12	14.38	330.13	19,802,829	7,244,082	5,472,527
ID^2	1,719,604	12.99	4.11	3.39	14.32	363.46	22,337,656	7,067,572	5,829,458

Note: One Unit = 20 lbs

The ID^2 model results appear to be the least conservative of the three in that it tends to yield marginally higher grades and metal contents than either OK or NN. In the SLR QP's opinion, the results of this comparison indicate a reasonable agreement between methods and do not indicate that there are any concerns with the current block model.

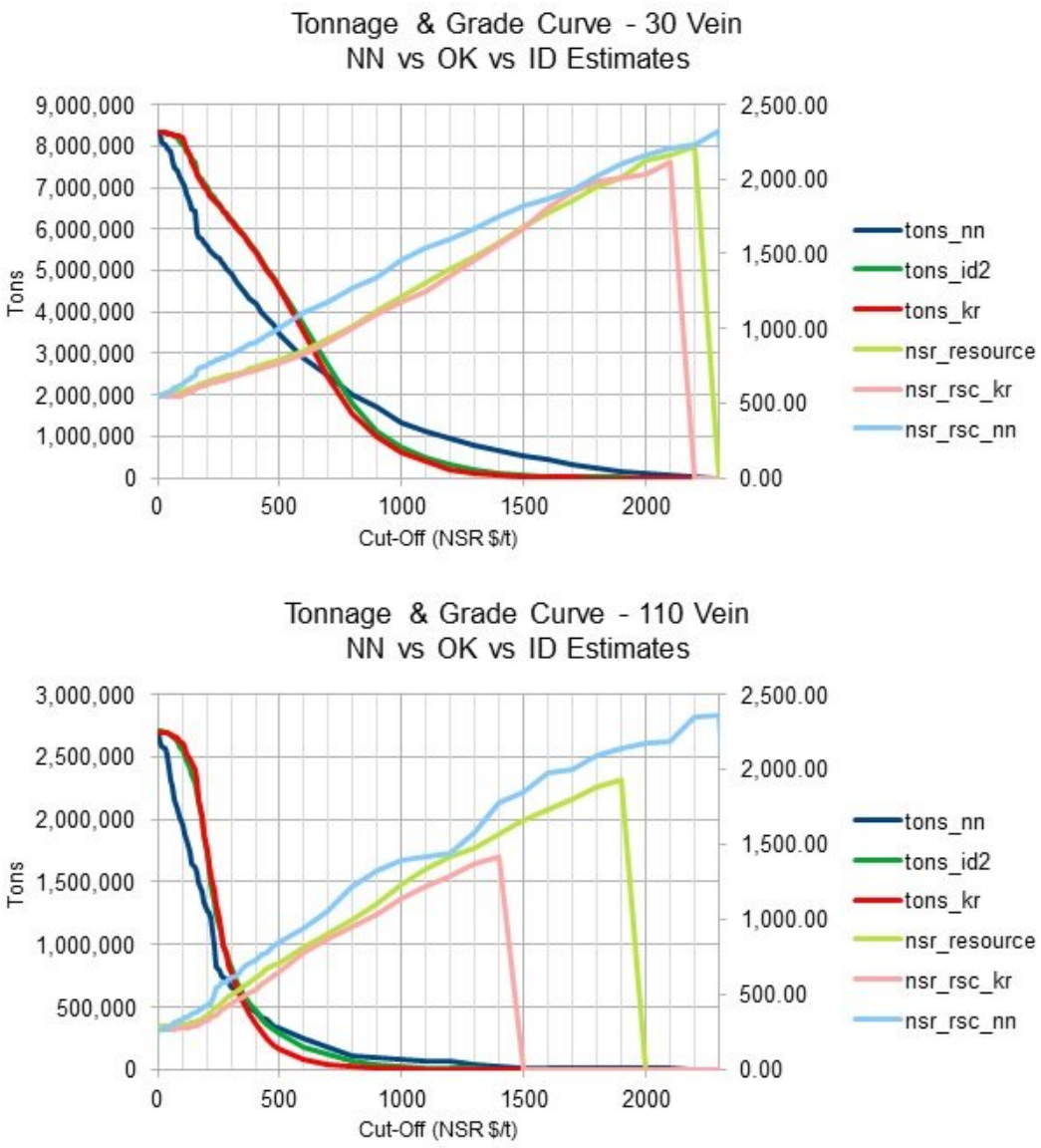


Figure 11-8: Tonnage and Grade Curves

11.2.14 Reconciliation

Reconciliation is discussed in Section 13.0 of this TRS.

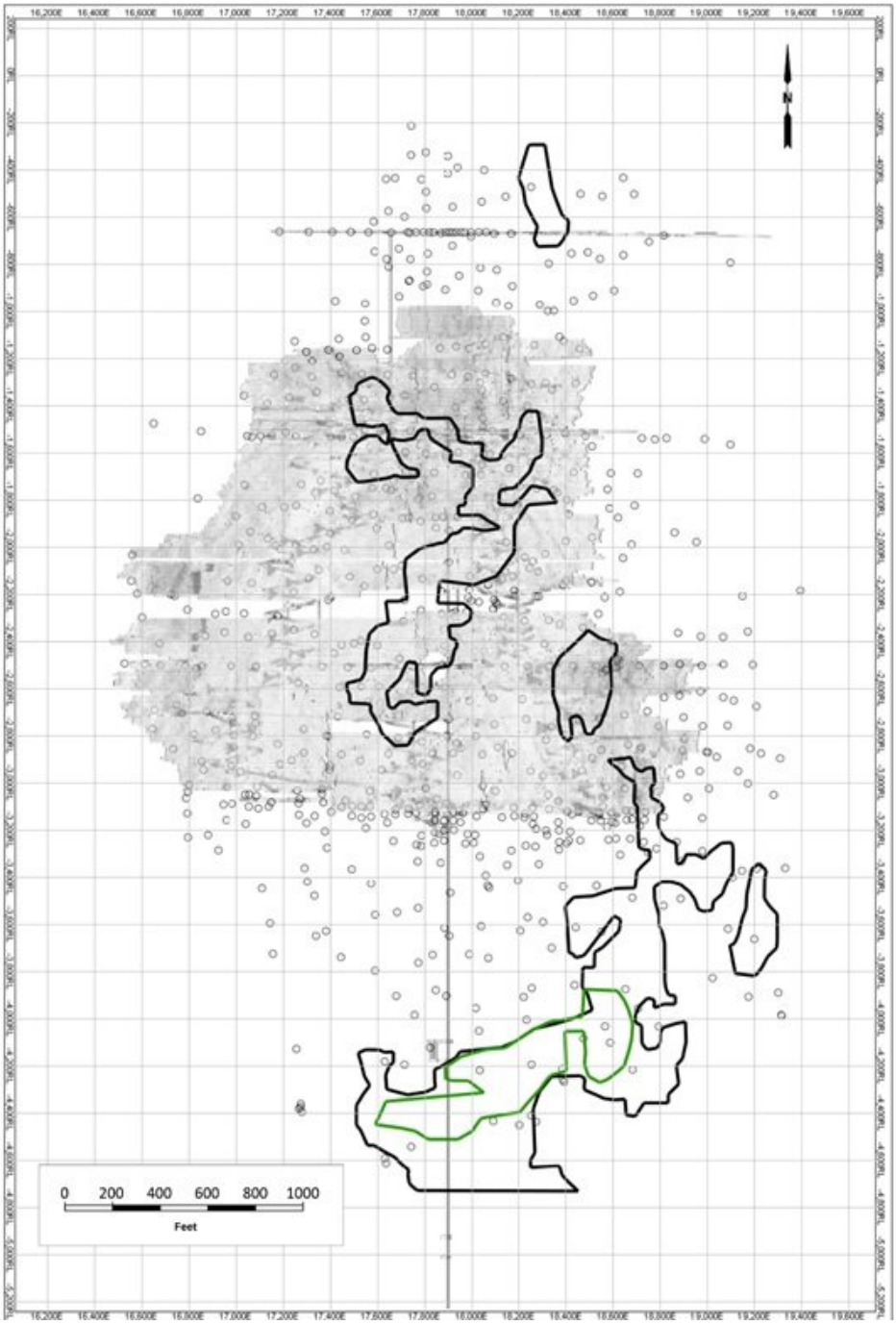
11.2.15 Reserve and Resource Designation and Reporting

The resource model is passed along to the engineering team for processing with the stope optimizer utility in Deswik. Deswik is a commercially available software package that is widely used within the industry. The optimizer agglomerates blocks of similar grade characteristics into coherent volumes that are appropriate for use in stope design. The process is constrained by user-assigned values for NSR values, resource classification, tonnage factors, minimum widths, and stope dimensions, among other things. Zero grade diluting material is added where necessary to achieve a minimum width of eight feet for Mineral Resources or 11 ft for Mineral Reserves. The diluted vein material, tagged by stope names, is inspected on longitudinal projections and polyline boundaries are drawn around reserve and resource volumes. Examples of these longitudinal projections are provided in Figure 11-9 for the 50 Vein and Figure 11-10 for the 30 Vein. Note that the grey hatched area represents the projection of the 30 Vein stoping in order to provide a location reference.

Blocks captured within the reserve boundaries that meet the NSR cut-off and classification criteria are evaluated and tagged in the block model (green outline in Figure 11-9). Blocks which meet the resource NSR cut-off grade and are outside of the reserve boundaries or disqualified from inclusion as reserves for some other reason are tagged as resource (black outline in Figure 11-9). Blocks that fail to meet the criteria for either reserve or resource are tagged for exclusion. The processed blocks are captured in spreadsheets for addition of “unplanned dilution” and summing by vein and category. Blocks are captured and summed following which the unplanned dilution is added (15% for reserves, 5% for resources. Material tagged as reserves are reported as Mineral Reserves. Blocks outside the reserve outlines are reported as Mineral Resources exclusive of Mineral Reserves.

Figure 11-10 depicts the 30 Vein with the blocks colored to show the classification.

In the SLR QP’s opinion, the stope optimization and reporting procedures are reasonable, and are being executed in an appropriate manner. As such, the Mineral Resources have been tabulated in a fashion consistent with industry best practice.



Source: Hecla, 2021

Figure 11-9: Longitudinal Projection – 50 Vein

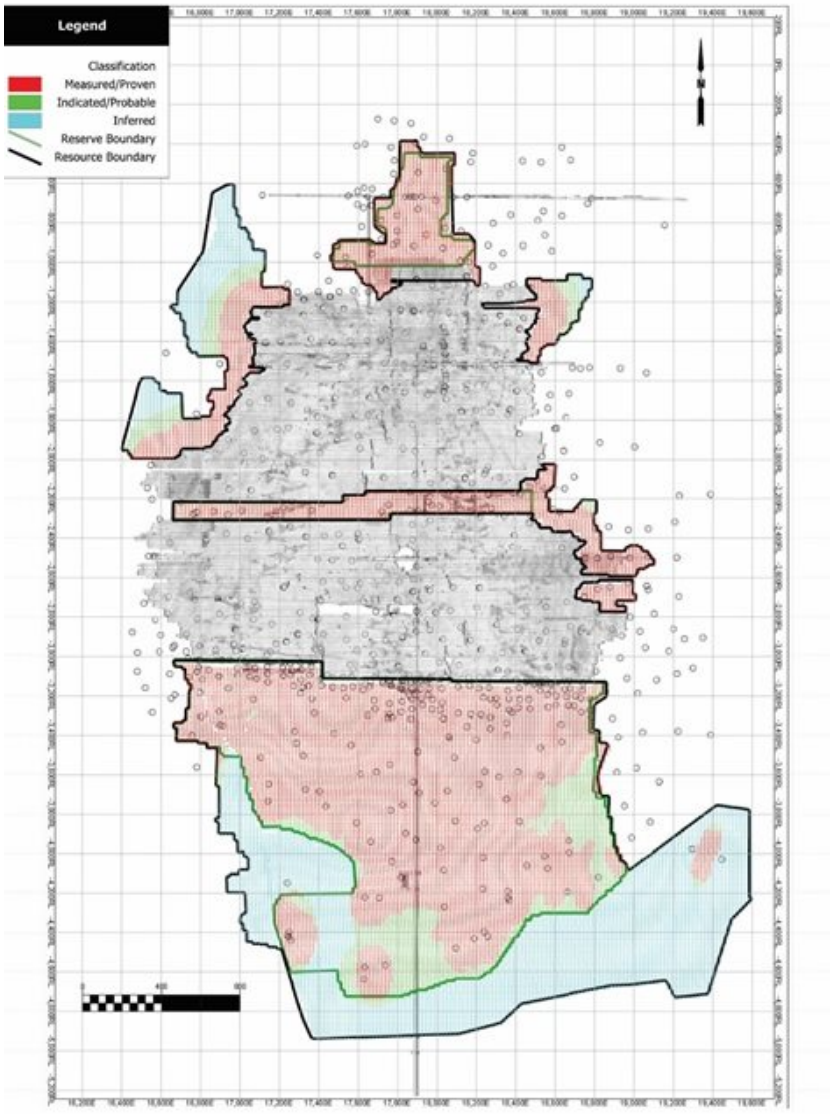


Figure 11-10: Longitudinal Projection – 30 Vein

11.2.16 Gold Hunter Mineral Resource Statement

The Gold Hunter Mineral Resources, exclusive of Mineral Reserves and sorted by vein to December 31, 2021 are summarized in Table 11-11.

Table 11-11: Gold Hunter Mineral Resources to December 31, 2021
Hecla Mining Company – Lucky Friday Mine

Vein	Tons	Ag (oz/ton)	Pb (%)	Zn (%)	NSR ($/t)	Silver (oz)	Lead (Tons)	Zinc (Tons)
				Measured				
5	267,000	11.6	2.3	0.6	252	3,080,000	6,160	1,640
20	764,000	7.7	4.4	3.0	273	5,900,000	33,400	23,100
30	390,000	10.2	5.9	0.9	305	3,960,000	23,000	3,600
40	861,000	5.0	3.9	4.9	254	4,270,000	33,800	42,600
41	1,020,000	5.9	4.8	3.9	265	5,970,000	48,500	39,200
50	690,000	6.4	4.5	3.0	254	4,420,000	31,000	21,000
60	675,000	7.2	4.1	2.6	251	4,860,000	27,900	17,400
70	658,000	8.0	4.4	1.8	256	5,240,000	29,200	12,100
80	1,120,000	7.2	5.6	1.4	258	8,110,000	62,500	15,900
90	846,000	7.0	6.0	1.6	267	5,930,000	51,000	13,400
100	215,000	7.7	3.6	1.7	233	1,650,000	7,730	3,730
110	528,000	10.4	2.5	1.8	258	5,510,000	13,100	9,410
120	63,700	6.4	4.7	2.0	238	407,000	3,010	1,260
130	111,000	10.2	6.9	2.0	345	1,130,000	7,670	2,250
140	21,600	4.7	3.9	3.0	212	102,000	836	640
150	1,970	4.9	4.8	0.4	185	9,660	95	8
Total	**8,230,000**	**7.4**	**4.6**	**2.5**	**262**	**60,600,000**	**379,000**	**207,000**
				Indicated				
5	74,800	10.4	2.7	0.7	242	777,000	2,040	521
20	171,000	7.3	3.9	2.5	249	1,260,000	6,720	4,350
30	100,000	11.9	6.7	0.8	350	1,200,000	6,750	854
40	53,900	6.0	4.4	3.3	251	325,000	2,390	1,800
41	270,000	6.6	5.6	4.5	305	1,780,000	15,000	12,200
50	156,000	5.7	4.3	2.9	235	893,000	6,690	4,470
60	111,000	6.7	4.1	1.8	226	743,000	4,530	1,980

Vein	Tons	Ag (oz/ton)	Pb (%)	Zn (%)	NSR ($/t)	Silver (oz)	Lead (Tons)	Zinc (Tons)
70	77,300	6.4	4.5	1.2	217	492,000	3,450	892
80	159,000	6.5	4.5	1.6	228	1,030,000	7,110	2,570
90	110,000	8.0	6.4	1.1	281	877,000	6,990	1,240
100	47,400	7.1	3.0	1.3	203	337,000	1,420	617
110	182,000	9.0	3.0	2.4	254	1,630,000	5,360	4,280
120	20,000	5.9	3.8	1.6	204	117,000	751	322
130	46,600	7.0	6.2	2.3	282	327,000	2,870	1,050
140	52,400	5.4	3.6	2.5	209	282,000	1,890	1,330
150	30,900	7.4	6.6	0.6	267	229,000	2,050	188
Total	**1,660,000**	**7.4**	**4.6**	**2.3**	**258**	**12,300,000**	**76,000**	**38,600**
				Measured and Indicated				
5	341,000	11.3	2.4	0.6	250	3,860,000	8,200	2,160
20	935,000	7.7	4.3	2.9	269	7,160,000	40,200	27,400
30	491,000	10.5	6.1	0.9	314	5,160,000	29,800	4,460
40	915,000	5.0	4.0	4.9	253	4,600,000	36,200	44,400
41	1,290,000	6.0	4.9	4.0	274	7,750,000	63,500	51,300
50	846,000	6.3	4.5	3.0	250	5,310,000	37,700	25,500
60	786,000	7.1	4.1	2.5	248	5,610,000	32,400	19,400
70	735,000	7.8	4.4	1.8	252	5,740,000	32,600	13,000
80	1,280,000	7.1	5.4	1.4	254	9,140,000	69,600	18,500
90	956,000	7.1	6.1	1.5	269	6,810,000	58,000	14,600
100	262,000	7.6	3.5	1.7	227	1,980,000	9,150	4,340
110	710,000	10.1	2.6	1.9	257	7,140,000	18,500	13,700
120	83,700	6.3	4.5	1.9	230	525,000	3,760	1,580
130	158,000	9.2	6.7	2.1	327	1,460,000	10,500	3,300
140	74,000	5.2	3.7	2.7	210	384,000	2,730	1,970
150	32,800	7.3	6.5	0.6	263	239,000	2,140	196
Total	**9,890,000**	**7.4**	**4.6**	**2.5**	**261**	**72,900,000**	**455,000**	**246,000**

Vein	Tons	Ag (oz/ton)	Pb (%)	Zn (%)	NSR ($/t)	Silver (oz)	Lead (Tons)	Zinc (Tons)
				Inferred				
5	8,700	5.8	3.4	0.8	189	50,000	297	69
20	218,000	4.9	4.0	4.2	252	1,070,000	8,640	9,220
30	1,330,000	10.8	6.4	1.9	361	14,400,000	84,900	25,800
40	124,000	6.1	4.1	3.6	266	757,000	5,120	4,520
41	200,000	6.0	4.6	3.6	273	1,190,000	9,170	7,290
50	225,000	5.4	4.5	3.0	247	1,210,000	10,200	6,680
60	578,000	7.0	5.5	2.7	289	4,030,000	31,600	15,300
70	445,000	7.7	6.1	2.3	306	3,420,000	27,000	10,100
80	598,000	6.2	5.2	1.4	247	3,720,000	31,400	8,570
90	313,000	8.0	6.1	0.7	282	2,500,000	19,100	2,160
100	17,700	4.3	3.7	1.8	186	75,400	651	309
110	460,000	6.3	3.4	3.4	249	2,880,000	15,800	15,700
120	28,900	4.8	3.9	1.2	187	138,000	1,140	333
130	137,000	7.1	4.8	1.1	248	973,000	6,590	1,540
140	47,200	4.2	3.9	2.7	209	200,000	1,840	1,290
150	164,000	5.1	4.5	1.0	204	832,000	7,410	1,680
Total	**4,900,000**	**7.6**	**5.3**	**2.3**	**290**	**37,400,000**	**261,000**	**111,000**

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Mineral Resources are 100% attributable to Hecla.
6. Bulk density was calculated by block, according to mineralogical content.
7. Mineral Resources are estimated at an NSR cut-off grade of US$173/t.
8. NSR values were calculated using long-term metal prices of US$21.00/oz Ag, US$1.15/lb Pb, and US$1.35/lb Zn.
9. Numbers may not add due to rounding.

11.3 Lucky Friday Mine

The Lucky Friday Unit encompasses the Lucky Friday Vein proper, as well as the Silver vein, and nearby related structures termed the Ancillary Veins. No Mineral Reserves have been estimated for Lucky Friday because the area has been dormant for some years and there is no LOM plan for this mining area. As such, there are only Mineral Resources at Lucky Friday. The estimation procedures have been largely unchanged and there has been no additional data added since cessation of mining. The only changes that have been incurred over the years were due to variations in costs and metal prices, which in turn, changed the NSR cut-off criteria applied to the blocks.

Mineral Resources are estimated by means of a polygonal method compiled within Excel spreadsheets. The database for the estimate consists of chip/channel samples. Drill results are used as a guide to confirm continuity, but are not generally included in the grade estimates. Mean sample grades are calculated from assay results for silver, lead, and zinc. Iron was not routinely assayed and so it is an estimated value.

Specific gravity is estimated using a formula similar to that used for Gold Hunter. This formula differs somewhat, however, due to the lower siderite content at Lucky Friday. The formula is as follows:

$$Density = 100 / ((Gangue\%/2.7) + (Galena\%/7.5) + (Sphalerite\%/4.0) + (Iron\%/7.8)$$

Where:

- Galena% = Pb% / 0.866
- Sphalerite% = Zn% / 0.670
- Gangue% = 100 – (Galena% + Sphalerite% + Iron%)
- Iron% = 10.5 if Pb%>8.0, else 7.0

The polygons are drawn on longitudinal projections of the veins using the outlines of the development and stoping as constraints, along with any bounding faults. The veins are broadly folded and so the orientations of longitudinal projections for different vein areas changes to align with the average vein strike. Where a block is extrapolated downwards from a single heading, the down-dip limits are defined as follows:

- Measured – 100 ft from drift or stope level
- Indicated – 100 ft from the boundary of the Measured resource limit
- Inferred – extends downwards to the elevation limit of the mine (-3104 ft elevation).

An example longitudinal projection showing the block dimensions along with vein stoping and development is provided in Figure 11-11.

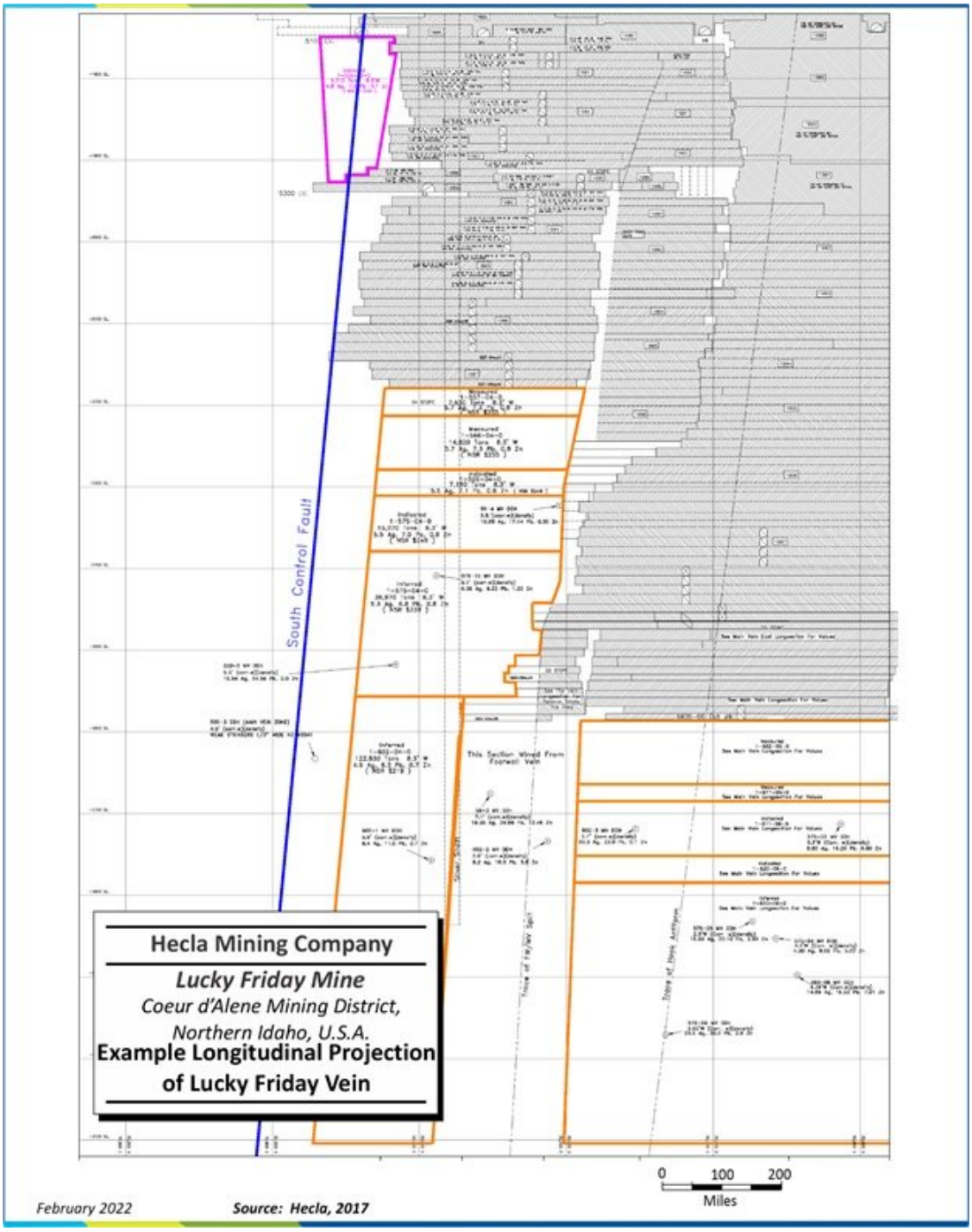


Figure 11-11: Example Longitudinal Projection of Lucky Friday Vein

For a given block, the samples are listed in a spreadsheet in the order that they were taken along the drift or stope, along with their widths, grades, and distance from the nearest survey station. Each sample is assigned a strike length interval based on limits place at half the distance to the adjacent samples. A sample volume weighting factor per vertical foot is calculated by multiplying the length interval by the sample width. The metal content per vertical foot is derived for each of the samples using the following formula:

$$Metal\ Content\ per\ Vertical\ Foot = L \times W \times G \times TF$$

Where:

- L = sample strike length interval
- W = sample width
- G = assayed grade
- TF = tonnage factor

The volume-weighted mean grade would then be:

$$Average\ Grade = \sum Metal\ Contents / \sum (L \times W \times TF)$$

Where:

- L = sample strike length interval
- W = sample width
- TF = tonnage factor

The volume is estimated by multiplying the aggregate area of influence for the samples by the vertical dimension of the block. In the case of a block bounded on top and bottom by development, that vertical dimension would be half the distance between the levels. For blocks extrapolated downwards, the block height would be as listed above in the classification parameters. Tonnage is estimated by multiplying the volume by the estimated tonnage factor.

The veins at Lucky Friday tend to be discrete structures with little or no value in the walls. The chip sampling was done across the vein only, as opposed to Gold Hunter, where the sampling transects the entire face. The resource grade calculations are done using three different methods in order to derive estimates for the following scenarios:

- the vein only
- the ideal mining width (“mineable”)
- the actual mined width.

The resource grade spreadsheets are configured to allow the calculation of the average grade for each of these scenarios. The calculation for the vein only is done using the vein widths as recorded during the sampling. To estimate the grades and volumes for the mineable case, the vein widths are diluted to a minimum mining width, which is either eight or ten feet depending on expected mining method. The dilution is incorporated in the calculation by adding zero grade material to the sample widths using the following rules:

If the in-situ vein is less than the minimum, the sample width is increased with zero grade material to achieve that minimum.

If the vein is wider than the minimum, one foot of dilution of zero grade material is added on both walls (total of two feet).

For the “actual mined” calculation, the widths are increased to the stope (or drift) widths measured at each sample location. As is the case for the other two scenarios, the diluting material is considered to be zero grade.

Drilling results indicate that the grades in the Lucky Friday system diminish gradually with depth. To account for this observed trend, the average stope chip/channel grades are reduced for blocks which extend downwards below the lower limits of development. The degree of this reduction increases with depth according to the values listed in Table 11-12.

Table 11-12: Depth Reduction Factors
Hecla Mining Company – Lucky Friday Mine

Distance to Block Mid-Point (ft)	Reduction Factor
<100	1.0000
100	0.9785
125	0.9730
150	0.9680
175	0.9620
200	0.9570
225	0.9520
250	0.9460
275	0.9410
300	0.9350
325	0.9300
350	0.9250
375	0.9190
400	0.9140
425	0.9090
450	0.9030

An NSR cut-off grade, similar to that used at Gold Hunter, is applied to the blocks and the tons and grade summed in each classification category. The NSR cut-off grade applied at Lucky Friday was US$207/t. For the current estimate the NSR multipliers were updated with the values listed in subsection 11.2.12 of this TRS. These multipliers were as follows:

- Ag:US$16.86 per oz/ton
- Pb:US$19.77 per percent of lead
- Zn:US$18.64 per percent of zinc

The NSR cut-off grade is higher than the $173/ton used at Gold Hunter to reflect different mining costs.

During an earlier audit, the SLR QP reviewed several of the block estimate spreadsheets and confirmed that the calculations were correct. In addition, the longitudinal projections of the Lucky Friday Vein were inspected to confirm that the block outlines were reasonable. A cursory review of the spreadsheets and longitudinal sections were made for this audit to confirm that there were no major changes. In the SLR QP's opinion, the Mineral Resource estimate for Lucky Friday has been carried out in a reasonable fashion, consistent with conventional, although somewhat dated, industry practice.

11.3.1 Lucky Friday Mineral Resource Statement

The Mineral Resources estimate to December 31, 2021 for the Lucky Friday area is summarized in Table 11-13.

Table 11-13: Lucky Friday Mineral Resources – December 31, 2021
Hecla Mining Company – Lucky Friday Mine

		Grade				Contained Metal		
Area	Tonnage (ton)	Ag (oz/ton)	Pb (%)	Zn (%)	NSR (US$/t)	Ag (oz)	Pb (tons)	Zn (tons)
Measured								
Lucky Friday	393,000	12.2	11.4	1.5	459	4,790,000	44,700	5,910
Silver	8,030	15.9	1.0	0.2	293	128,000	82	15
Ancillary	19,800	14.0	6.7	1.9	403	277,000	1,320	376
Total	**421,000**	**12.4**	**11.0**	**1.5**	**453**	**5,200,000**	**46,100**	**6,310**
Indicated								
Lucky Friday	139,000	9.5	11.0	3.7	446	1,320,000	15,300	5,080
Silver	10,000	13.3	1.0	0.2	248	133,000	100	20
Ancillary	28,600	9.0	6.0	1.4	240	258,000	1,710	409
Total	**178,000**	**9.6**	**9.6**	**3.1**	**402**	**1,710,000**	**17,100**	**5,510**
Total Measured and Indicated								
Total	**598,000**	**11.5**	**10.6**	**2.0**	**438**	**6,910,000**	**63,200**	**11,800**
Inferred								
Lucky Friday	449,000	9.2	10.9	4.1	404	4,110,000	48,900	18,500
Silver	10,000	13.3	1.0	0.2	248	133,000	100	20
Ancillary	21,800	10.2	9.0	2.5	311	222,000	1,980	548
Total	**480,000**	**9.3**	**10.6**	**3.9**	**397**	**4,460,000**	**50,900**	**19,000**

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves.
4. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
5. Mineral Resources are 100% attributable to Hecla.
6. Bulk density was calculated according to mineralogical content.
7. Mineral Resources are estimated at an NSR cut-off grade of US$207/t.
8. NSR values were calculated using long-term metal prices of US$21.00/oz Ag, US$1.15/lb Pb, and US$1.35/lb Zn.
9. Numbers may not add due to rounding.

12.0 MINERAL RESERVE ESTIMATES

12.1 Summary

The current Mineral Reserve estimates, as prepared by Hecla and reviewed and accepted by SLR, reported as of December 31, 2021 are summarized in Table 12-1. While resources exist at the Lucky Friday deposit, Mineral Reserves are reported only for the Gold Hunter deposit, as this is the only area included in the current LOM plan.

The Lucky Friday Veins have been inactive since 2005 when operation in the Lucky Friday Veins were curtailed due to low metal prices, seismicity concerns, development cost, and metallurgical performance issues. Increased metal prices may render the Lucky Friday resource economic at some future date. Work on re-evaluating the remaining Lucky Friday resource will be undertaken as time permits, with the intent of its possible inclusion in future LOM plans.

Table 12-1: Summary of Mineral Reserves – December 31, 2021
Hecla Mining Company – Lucky Friday Mine

Category	Tonnage (000 tons)	Grade			Contained Metal		
		Ag (oz/ton)	Pb (%)	Zn (%)	Ag (000 oz Ag)	Pb (000 tons)	Zn (000 tons)
Proven	4,691	13.92	8.43	3.40	65,313	395.3	159.4
Probable	765	12.26	7.47	2.83	9,386	57.2	21.7
Total Proven + Probable	**5,456**	**13.69**	**8.29**	**3.32**	**74,699**	**452.4**	**181.0**

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Mineral Reserves were estimated by Hecla and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla.
4. Mineral Reserves are estimated at an NSR cut-off value of $208/ton.
5. The NSR values reflect the discrete metallurgical responses for the Mineral Reserve blocks.
6. Mineral Reserves are estimated using an average long-term silver price of US$17.00/oz, lead price of US$0.90/lb, and zinc price of US$1.15/lb.
7. A minimum mining width of 11 ft was used for 30 Vein above 7500 level, 9 ft for 30 Vein below 7500 level, and 8 ft for all other veins.
8. A bulk density of 0.086 tons/ft^3 was used for waste material. Mineral Reserve bulk density was calculated by block, based on mineralogical content.
9. Numbers may not add due to rounding.

Mineral Reserves by vein are presented in Table 12-2.

Table 12-2: Mineral Reserves by Vein – December 31, 2021
Hecla Mining Company – Lucky Friday Mine

Vein	Tonnage (000 tons)	Grade			Contained Metal		
		Ag (oz/ton)	Pb (%)	Zn (%)	Ag (000 oz Ag)	Pb (000 t)	Zn (000 t)
30	3,731	14.21	8.98	3.68	53,007	335.2	137.4
50	218	9.36	6.95	5.34	2,037	15.1	11.6
60	234	14.94	8.39	3.16	3,500	19.6	7.4
70	245	10.44	6.34	1.62	2,560	15.5	4.0
80	463	11.23	8.14	2.16	5,201	37.7	10.0
90	244	12.05	9.27	1.11	2,941	22.6	2.7
110	321	17.01	2.05	2.47	5,453	6.6	7.9
Total	**5,456**	**13.69**	**8.29**	**3.32**	**74,699**	**452.4**	**181.0**

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Mineral Reserves were estimated by Hecla and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla.
4. Mineral Reserves are estimated at an NSR cut-off value of $208/ton.
5. The NSR values reflect the discrete metallurgical responses for the Mineral Reserve blocks.
6. Mineral Reserves are estimated using an average long-term silver price of US$17.00/oz, lead price of US$0.90/lb, and zinc price of US$1.15/lb.
7. A minimum mining width of 11 ft was used for 30 Vein above 7500 level, 9 ft for 30 Vein below 7500 level, and 8 ft for all other veins.
8. A bulk density of 0.086 t/ft^3 was used for waste material. Mineral Reserve bulk density was calculated by block, based on mineralogical content.
9. Numbers may not add due to rounding.

The SLR QP is not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

12.2 Conversion to Mineral Reserves

Mining methods used in this Mineral Reserve estimate include underhand closed benching (UCB), and overhand or underhand mechanized cut and fill (LFUL). Minimum mining dimensions vary by mining method and are discussed in section 12.4.

To permit more precision in defining reserve extents the block model is sub-blocked around the vein solids that were created for Mineral Resource estimation. The sub-blocked model is used for all Mineral Reserve and planning estimates.

The mining method for a given area is determined based on vein thickness, desired production rate, and seismic risks. Production designs are created based on the geometries relevant to the selected mining method which are discussed in subsection 13.1.3. Mineral Reserve outlines are created around the production locations that meet the NSR cut-off threshold, while also ensuring that adverse pillar geometries are not created that could become seismically active, and that mining does not cease near a problematic structure. Production locations outside the Mineral Reserve outlines are not included in Mineral Reserves. Once designs are completed, access ramps and other supporting infrastructure are designed to facilitate production mining.

The production design wireframes are evaluated against the sub-blocked model to generate tons and grade for each location. An unplanned dilution factor is then applied that accounts for rock overbreak and backfill dilution both of which are treated as having zero metal grade.

Internal portions of the 30 Vein which did not meet the block cut-off grade value were included in the stopes and in the Mineral Reserves as the material will have to be mined to avoid the generation of stress inducing geometry. SLR reviewed the material and concurs with its inclusion as Mineral Reserves.

Only Measured and Indicated Mineral Resources were converted to Mineral Reserves. Any Inferred Mineral Resources included within the Mineral Reserve designs are carried at zero grade.

12.3 Cut-Off Grade

The cut-off grade (COG) for Mineral Reserves is calculated and expressed in terms of NSR value per ton. The COG NSR value used for stope design of all mining methods is $208.00/ton, as presented in Table 12-3. This COG reflects the property-wide operating costs and sustaining capital costs distributed on a per-ton basis. Operating costs from 2021 were used as the basis for cut-off grade calculations. From 2017 to January 2020, operations were on care and maintenance due to a strike.

Table 12-3: NSR Cut-off Values (US$/ton)
Hecla Mining Company – Lucky Friday Mine

Description	Mining	Maintenance	Mill	G&A	Sustaining Capital	Total
Operating Costs (US$/ton)	64.84	33.25	15.43	59.72	34.75	208.00

Net smelter return is calculated on a unit metal value basis using actual smelter contract terms, freight costs, and forecast metal prices. Metal prices and metallurgical recoveries used to calculate NSR are as follows:

- Silver: US$17.00/oz, 96.9%.
- Lead: US$0.90/lb, 94.7%.
- Zinc: US$1.15/lb, 91.2%.

Standard industry terms for payability, treatment and refining charges, and shipping were applied to calculate the NSR formula. The NSR value is calculated and applied to every block in the block model allowing for NSR values to then be calculated and assigned to individual stopes after planned dilution has been applied. The NSR calculation formula by unit metal value is as follows:

$$NSR = (13.22 * [Ag\ oz/ton]) + (15.29 * [Pb\ \%] * 100) + (15.78 * [Zn\ (\%)] * 100)$$

SLR independently verified the NSR estimation methodology. Variances were noted in the application of concentrate freight costs, however this constitutes a relatively minor impact to NSR values. SLR recommends that the mine review the unit metal value calculations for future estimates.

SLR notes that an unplanned dilution factor, discussed in subsection 12.4, is applied to all designs after the NSR calculation has been completed. Realized NSR values should thus be expected to be lower than estimated due to unplanned dilution. SLR estimated the impact of this change would be a reduction in Mineral Reserve totals of approximately 90,000 t, or 2%, of total Mineral Reserves. SLR does not consider the difference to be material and SLR recommends that Hecla change this methodology for future Mineral Reserve estimates and complete NSR calculations and Mineral Reserve compilation on fully diluted material.

12.4 Dilution

Planned and unplanned dilution is applied to all Mineral Reserves. Planned dilution is added to the stope designs which expands the designs up to a minimum mining thickness. Unplanned dilution is applied as a mass percentage on undiluted Mineral Reserves. A schematic showing the application of dilution to the vein model is shown in Figure 12-1.

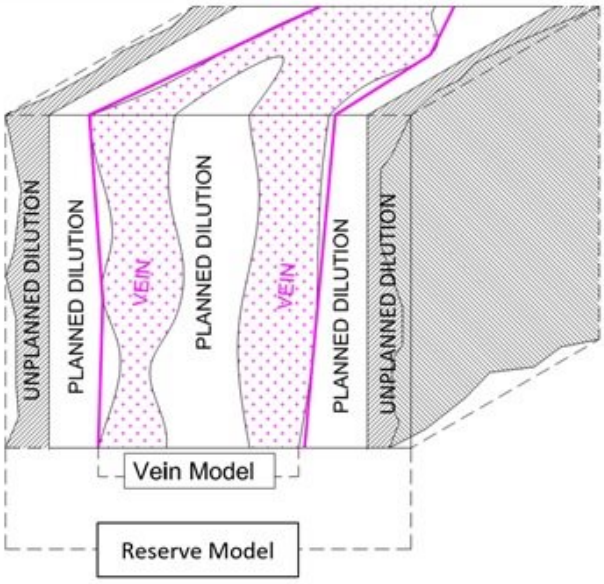


Figure 12-1: Dilution Schematic

The minimum mining width depends on the maximum size of equipment that will be used to mine the vein and is varied by location depending on the level of productivity required and dilution deemed acceptable within each vein. Three minimum mining widths are currently used in the LOM which are applied as follows:

- 8.0 ft – all Intermediate Veins
- 11.0 ft – 30 Vein above 7500 level
- 9.0 ft – 30 Vein below 7500 level

Stopes are designed using a stope optimizer tool that first divides the vein solid along strike length based on anticipated development round lengths. The vein width is interrogated and if the resulting width is less than the minimum mining width specified for that area, additional dilution is added to the stope until the stope width is equal to the minimum mining width specified. Maximum mining width is also defined for all mining methods 20 ft. No areas in reserve met the 20 ft maximum width.

After stope solids are increased to the minimum mining thickness, an unplanned dilution factor is applied. This factor accounts for small scale variations in vein location, limits of mine equipment selectivity, unplanned overbreak, and rehandle dilution. For areas mined by underhand cut and fill the unplanned dilution factor is 5% based on observed performance. For areas mined by UCB, the unplanned dilution factor is 15% reflecting the lower selectivity inherent to the method. Planned dilution tons are given background metal grades in the block model. Unplanned dilution is assigned zero metal grade.

SLR is of the opinion that the 15% dilution estimate in the UCB mining is potentially optimistic and requires further validation, considering the short time that the method has been in use, the impact of vein deviation over the 23 ft cut depth, the use of infill drill information as opposed to face by face mapping and potential overbreak in longhole blasting due to factors such as blast hole misalignment. SLR recommends close monitoring of the stoping performance including regular surveys as the void is exposed and reconciliation to the stope designs and to the Mineral Reserve estimates to confirm and refine the dilution estimate.

12.5 Extraction

Extraction for all mining methods is assumed to be 100% based on experience. SLR considers this assumption to be reasonable as any material left in a stope on a given cut does become available when the subsequent lower cut is mined. The assumption does not include any allowance for losses due to potential “frozen” section in the UCB blasts. SLR recommends this assumption be reviewed within the above recommended reconciliation work to refine future estimates.

12.6 Comparison to Previous Estimates

The 2021 Mineral Reserve estimate represents a change from the 2020 Mineral Reserve estimate as the estimation for the 30 Vein, the largest single vein in the estimate, has been changed to reflect the change to the UCB mining method. Mineral Reserves decreased by 308,000 tons, 2.3 Moz of silver, 33,000 tons lead, and 52,000 tons zinc, due to:

- 2021 production,
- Removal of the low grade 40 Vein material,
- Increase tons but decrease grade of the 30 Vein due to dilution of the UCB method,
- An increase in tons but decrease in the grade of all the other veins. A summary of gains and losses and the variance is shown in Table 12-4.

Table 12-4: Mineral Reserve Comparison 2020 to 2021
Hecla Mining Company – Lucky Friday Mine

Vein	Tons (000)	Ag (oz/ton)	Pb (%)	Zn (%)	Oz Ag (000)	Tons Pb (000)	Tons Zn (000)
December 31, 2021 Proven & Probable Mineral Reserve Estimate							
30	3,731	14.21	8.98	3.68	53,007	335.2	137.4
40	0				-	-	-
50	218	9.36	6.95	5.34	2,037	15.1	11.6
60	234	14.94	8.39	3.16	3,500	19.6	7.4
70	245	10.44	6.34	1.62	2,560	15.5	4.0
80	463	11.23	8.14	2.16	5,201	37.7	10.0
90	244	12.05	9.27	1.11	2,941	22.6	2.7
110	321	17.01	2.05	2.47	5,453	6.6	7.9
Totals	**5,456**	**13.69**	**8.29**	**3.32**	**74,699**	**452.4**	**181.0**
December 31, 2020 Proven & Probable Mineral Reserve Estimate							
30	3,287	16.72	10.70	4.22	54,953	351.6	138.7
40	1,371	4.53	3.78	4.98	6,213	51.8	68.3
50	166	10.15	7.39	4.13	1,681	12.3	6.8
60	171	15.18	8.65	3.54	2,602	14.8	6.1
70	169	12.77	7.30	1.63	2,165	12.4	2.8
80	246	11.95	9.91	2.30	2,940	24.4	5.7
90	137	13.76	10.77	0.77	1,890	14.8	1.1
110	216	21.03	1.56	1.79	4,547	3.4	3.9
Totals	**5,764**	**13.36**	**8.42**	**4.05**	**76,992**	**485.4**	**233.3**

	Mineral Reserve Percent Variance 2020 to 2021						
	Tons	**Ag Grade**	**Pb Grade**	**Zn Grade**	**Ag Oz**	**Tons Pb**	**Tons Zn**
30	14%	-15%	-16%	-13%	-4%	-5%	-1%
40	-100%	-100%	-100%	-100%	-100%	-100%	-100%
50	31%	-8%	-6%	29%	21%	24%	70%
60	37%	-2%	-3%	-11%	34%	33%	22%
70	45%	-18%	-13%	-1%	18%	26%	43%
80	88%	-6%	-18%	-6%	77%	55%	77%
90	78%	-12%	-14%	43%	56%	53%	154%
110	48%	-19%	31%	38%	20%	94%	105%
Totals	**-5%**	**3%**	**-2%**	**-18%**	**-3%**	**-7%**	**-22%**

A more detailed breakdown of the change in Mineral Reserves from 2020 to 2021 is shown in Table 12-5.

Table 12-5: Mineral Reserve Change 2020 to 2021 After Production
Hecla Mining Company – Lucky Friday Mine

December 31, 2021 Proven & Probable Mineral Reserve Estimate							
Item	**Tons (000)**	**Ag (oz/ton)**	**Pb (%)**	**Zn (%)**	**Oz Ag (000)**	**Tons Pb (000)**	**Tons Zn (000)**
2020 Reserve	5,764	13.4	8.4	4.0	76,992	485.4	233.3
2021 Mining	322	11.6	7.6	3.4	3,733	24.5	10.9
2020 Depleted	5,443	13.5	8.5	4.1	73,258	460.9	222.3
Other Changes	14	0.3	(0.2)	(0.8)	1,441	(8.5)	(41.3)
2021 Reserve	5,456	13.7	8.3	3.3	74,699	452.4	181.0

The mine production grades fell short of the Mineral Reserve grades in 2021. Over the period 2013 to 2021 the annual production grades for silver and lead have been less than the average Mineral Reserve grades at the end of the period. The silver production grades have been 69% to 88% of the Mineral Reserve grades while the lead grades have been 70% to 89% of the Mineral Reserve grades. The zinc production grades have generally exceeded the plan ranging from 97% to 123% of the average Mineral Reserve grades. This is an overall view and includes the period of reduced operations through a long strike and it does not look forward to potential high grade areas ahead of the present mining. SLR considers the historical grade reconciliation to show that further refinements to the Mineral Reserve estimation process, notably in the areas of dilution, should be reviewed and if necessary changes to the estimation process should be implemented.

12.7 Mineral Reserve Reconciliation

SLR has reviewed the Mineral Reserve reconciliation and recognizes that the 2021 Mineral Reserve estimate includes a significant revision to the mining method with the use of UCB in the 30 Vein and that the historical accuracy of the Mineral Reserve estimate may not be representative of future performance. SLR is of the opinion that reconciliation should be an implicit part of the mining process, and reconciliation targets should be a key performance indicator for operations. The reconciliation between the block models and production remains an important validation tool in evaluation of the performance of the block models. SLR is of the opinion that monthly reconciliation analyses should be completed and that the results of those analyses should be applied to modify practices and to refine the estimation parameters for the Mineral Reserve estimation process.

The mine completes regular analyses between the mine and mill production data and the Mineral Reserve estimates on a stope by stope basis and considering total production.

The reconciliation analysis follows Parker (2013) which uses three factors:

The F1 factor usually relates short term (ore control) model tonnages, grades and metal content to ore Mineral Reserves depleted. The F1 factor may be used to check and calibrate the selectivity of mineral resource models and/or planned dilution assumed in transfer from mineral resources to ore Mineral Reserves. The F1 factor is the grade control prediction divided by the ore Mineral Reserve.

The F2 factor relates received at mill (measured by the mill) tonnages, grades and metal content to delivered to mill production tonnages, grade and metal content. The F2 factor enables a check on unplanned dilution entering the ore stream between ore control and the mill. The F2 factor is the mill production divided by the grade control prediction.

The F3 factor is F1×F2 (mill production divided by Mineral Reserve estimate) and enables a comparison of a mine's (measured by mine) ability to recover the tonnage, grade and metal content estimated in Mineral Reserves.

SLR is of the opinion that reconciliation variances of 10% or less are indicative of a well run mine and good Mineral Reserve estimate. Variations between 10% and 20% are indicative of problems in the mining/ore control systems and Mineral Reserve estimation parameters and investigation of the potential issues is warranted. Variations in excess of 25% are considered significant and actions to improve the controls and estimates are required.

12.7.1 Previous Reconciliation Reviews

SLR has previously reviewed the mine reconciliation analyses in the course of Mineral Reserve reviews for the mine. SLR considers the information to be relevant and provides a summary of the past results and comments.

There are several factors that can cause the tonnage variance:

- More dilution in mining than is included than in the model, which may come from the backfill (although the backfill is cemented) and more likely from overbreak from the stope walls.)
- Bulk density estimation.
- Survey changes between the initial and final surveys
- The reconciliation does not account for material in the ore and waste passes, bins or tied up in inventory on the stope floor

SLR noted that the higher mill tonnage indicate that some misclassification of ore and waste has occurred resulting in waste being sent to the mill. In 2017, the Lucky Friday technical personnel identified the potential concerns with both dilution and ore-waste classification. At that time SLR recommended that studies of all aspects of the estimation and quantification of dilution, grade control procedures, communication between the geology department and mine personnel, and the implementation of systems to better measure the tonnage delivered to the mill be continued.

12.7.2 2021 September YTD Reconciliation

The mine provided reconciliation data for the period Q1 through Q3 of 2021. The QP's analysis of the reconciliation data is shown below. The actual production, forecast production, and Mineral Reserve estimates are presented in Table 12-6.

Table 12-6: Q1 to Q3 2021 Reconciliation Data
Hecla Mining Company – Lucky Friday Mine

Stope	Tonnage (tons)	Ag (oz/ton)	Pb (%)	Zn (%)	Ag (oz)	Pb (tons)	Zn (tons)
Adjusted Actuals Q1 to Q3 2021							
12 stope	70,881	11.6	8.4	3.1	819,178	5,971	2,199
15 stope	67,782	8.0	5.8	4.2	545,314	3,919	2,851
16 stope	63,488	15.0	8.7	4.7	954,672	5,504	2,992
19 stope	33,086	10.8	6.5	0.5	356,683	2,150	182
Inventory	6,503	9.9	6.4	2.9	64,286	4,183	191
YTD:	241,739	11.3	7.4	3.5	2,740,133	17,962	8,416
Forecast							
12 stope	51,519	12.2	9.9	3.1	630,158	5,103	1,622
15 stope	63,869	8.3	6.5	4.0	530,371	4,128	2,556
16 stope	53,649	19.7	10.3	5.8	1,057,462	5,501	3,128
19 stope	33,907	15.3	8.1	0.7	519,369	2,748	238
YTD:	202,944	13.5	8.6	3.7	2,737,360	17,480	7,544
Adjusted Model							
12 stope	49,539	14.9	11.7	3.4	737,849	5,773	1,685
15 stope	45,049	10.0	7.4	4.6	451,983	3,351	2,081
16 stope	46,407	22.3	12.8	5.7	1,037,136	5,950	2,665
19 stope	24,641	11.8	6.1	0.5	289,955	1,514	114
Swell	10,785	13.3	6.8	4.1	143,418	737	442
YTD:	176,421	15.1	9.8	4.0	2,660,341	17,323	6,987

The F1, F2 and F3 factors for the Q1 to Q3 2021 data are shown in Table 12-7.

Table 12-7: Q1 to Q3 2021 Reconciliation Results
Hecla Mining Company – Lucky Friday Mine

Stope	Tonnage (tons)	Ag (oz/ton)	Pb (%)	Zn (%)	Ag (oz)	Pb (tons)	Zn (tons)
			F 1 Factor				
12 stope	104%	82%	85%	93%	85%	88%	96%
15 stope	142%	83%	87%	87%	117%	123%	123%
16 stope	116%	88%	80%	102%	102%	92%	117%
19 stope	138%	130%	132%	152%	179%	182%	209%
Total	123%	89%	86%	94%	109%	105%	115%
			F 2 Factor				
12 stope	138%	94%	85%	99%	130%	117%	136%
15 stope	106%	97%	89%	105%	103%	95%	112%
16 stope	118%	76%	85%	81%	90%	100%	96%
19 stope	98%	70%	80%	78%	69%	78%	76%
Total	119%	84%	86%	94%	100%	103%	112%
			F3 Factor				
12 stope	143%	78%	72%	91%	111%	103%	131%
15 stope	150%	80%	78%	91%	121%	117%	137%
16 stope	137%	67%	68%	82%	92%	93%	112%
19 stope	134%	92%	106%	119%	123%	142%	159%
Inv/Swell	60%	74%	94%	72%	45%	57%	43%
Total (adjusted)	137%	75%	76%	88%	103%	104%	120%

SLR considers the F3 factor to be the most important in the analysis of the Mineral Reserve estimate. In this case the analysis shows that for all of the stopes the tonnage milled exceeds the Mineral Reserve estimate and the metal grades fall short of the Mineral Reserve estimates for all but lead and zinc in the 19 stope. The total metal content exceeds the calculated Mineral Reserve estimate metal content but SLR notes that for the period under review the 65,318 tons of extra production had grades of 1.2 oz/ton Ag, 1.0% Pb, and 2.2% Zn. At these grades the extra tonnage had an NSR value of approximately $66/ton. The material potentially represents dilution which was not included in the model estimates and while metal targets may have been met extra tons had to be mined and processed to meet that goal.

SLR is of the opinion that dilution in excess of the Mineral Reserve estimate, whether in the stope or in mixing or misclassification in the material handling systems, may be a factor in the poor tonnage and grade reconciliation. The large variation in the tonnage reconciliation may also mask issues in the estimation of the metal grades.

12.7.3 2021 UCB Mining Reconciliation

The mine provided reconciliation data for 2021. This data provides a baseline for expectations of the UCB mining method and support of the Mineral Reserves statement. Lucky Friday has not previously used the UCB mining method for reserve reporting. In 2020 and through 2021, design parameters and dilution factors were developed to support the Mineral Reserve statement. The mine's analysis of the reconciliation data is presented in Table 12-8.

Table 12-8: 2021 Reconciliation Data
Hecla Mining Company – Lucky Friday Mine

Stope	Tonnage (tons)	Ag (oz/ton)	Pb (%)	Zn (%)	Ag (oz)	Pb (tons)	Zn (tons)
			Milled				
12 stope	92,673	11.7	8.6	3.2	1,084,522	7,996	2,945
15 stope	90,174	7.9	5.6	4.0	713,411	5,088	3,610
16 stope	88,914	16.0	9.1	4.6	1422855	8,096	4,132
19+21 stope	43,629	10.7	6.7	0.5	465782	2,919	223
2021	315,391	11.7	7.6	3.5	3,686,570	24,099	10,910
			Forecast				
12 stope	78,091	12.8	10.1	3.0	997,907	7,851	2,372
15 stope	88,837	7.6	5.6	3.4	673,278	4,983	3,063
16 stope	82,569	17.3	10.0	4.6	1,425,352	8,294	3,803
19+21 stope	45,089	10.3	5.7	0.4	466,474	2,549	173
2021	294,586	12.1	8.0	3.2	3,563,011	23,677	9,411

The F2 factors for the 2021 data are shown in Table 12-9. Since no reserve was issued for UCB in 2021 the F1 and F3 factors cannot be compared.

Table 12-9: 2021 Reconciliation Results
Hecla Mining Company – Lucky Friday Mine

Stope	Tonnage (tons)	Ag (oz/ton)	Pb (%)	Zn (%)	Ag (oz)	Pb (tons)	Zn (tons)
			F2 Factor				
12 stope	119%	92%	86%	105%	109%	102%	124%
15 stope	102%	104%	101%	116%	106%	102%	118%
16 stope	108%	93%	91%	101%	100%	98%	109%
19+21 stope	97%	103%	118%	133%	100%	115%	129%
Total	107%	97%	95%	108%	103%	102%	116%

SLR notes that the mine's analysis of the short term forecast versus actual production shows a good correlation. The 30 Vein average production grades for 2021 are lower than the Mineral Reserve estimates.

SLR recommends that:

- Reconciliation analyses be continued.
- Dilution estimates for the mining be reviewed and amended as necessary to reflect the experience with the mining method and equipment in use.
- The ore handling systems be reviewed to address the potential for the mixing of ore and waste and/or the misdirection of ore and waste throughout the material handling systems.
- The material accounting methods and systems, from the stope to the mill, be reviewed to determine if changes or additional controls are required to improve the material accounting.
- Future Mineral Reserve estimates be modified to incorporate the results of reconciliation studies.

13.0 MINING METHODS

The Lucky Friday operation is a deep, narrow vein, mine which commenced operations in 1942. Operations were on care and maintenance due to a strike from 2017 to January 2020, at which time operations resumed. The operation produces silver contained in silver and zinc concentrates.

Mining methods used at Lucky Friday include underhand closed benching (UCB), and overhand or underhand mechanized cut and fill (LFUF) using mechanized mining equipment. Stopes are back filled with cemented paste fill from the process plant tailings. Mine operations are currently close to 6,500 ft below surface and the mine will continue to below the 8,000 ft level in the current long-range plan. Mine production for the period from 2016 to 2021 is summarized in Table 13-1.

Table 13-1: Lucky Friday Mine Production Summary
Hecla Mining Company – Lucky Friday Mine

Year		2016	2017	2018	2019	2020	2021
Ore Milled	tons	293,875	70,718	17,309	57,091	179,201	321,837
Grade							
Ag	oz/ton	12.69	12.38	10.78	11.83	11.85	11.6
Pb	%	7.78	7.10	7.19	7.86	7.49	7.6
Zn	%	3.92	4.01	4.20	4.25	3.88	3.4
Recovery to Concentrate							
Ag Recovery	%	96.4%	95.8%	90.6%	93.7%	95.6%	95.5%
Pb Recovery	%	95.7%	94.3%	90.9%	91.4%	94.8%	94.6%
Zn Recovery	%	93.7%	90.4%	92.7%	84.5%	90.6%	91.1%
Silver concentrate	tons	36,420	8,238	1,790	6,378	20,806	37,768
Zinc concentrate	tons	17,530	4,121	1,016	3,467	10,960	16,638
Ag in Silver Concentrate	oz/ton	98.74	101.80	94.42	99.24	97.66	94.4
Pb in Silver Concentrate	%	60.1%	57.5%	63.2%	64.3%	61.2%	61.2%

13.1 Mine Operations

13.1.1 Underground Mine Access and Layout

The Lucky Friday mine operation has been designed and constructed to target two broad vein systems: the Lucky Friday and Gold Hunter Veins. The Lucky Friday Vein was actively mined until 2001, is now inactive, and contains infrastructure critical to the active Gold Hunter area. Mining is underway or planned in the 30, 50, 60, 70, 80, 90, and 110 Veins of the Gold Hunter deposit. The 30 Vein is the largest single vein and the source of the majority of the production.

Access to all underground workings is via the 6,205 ft deep Silver Shaft. The Silver Shaft is near the idle Lucky Friday vein system and 5,000 ft south-southeast of the Gold Hunter system (Figure 13-1). The 18 ft diameter, concrete lined, circular, two-compartment shaft has a hoisting capacity of 12 tons per skip. Shaft stations are developed on 200 ft centers beginning on the 4900 level. Broken material reports to the Silver Shaft through level pockets and transfers to the 5370 and 5970 loading pockets.

The No. 2 shaft is the 5,489 ft deep, three compartment (four compartment at lower levels) shaft used for man hoisting, supplies, and ventilation.

Access to Gold Hunter is through the 4900 and 5900 level main haulage levels and 4050 access level. Two interlevel ramps connect the 4900 level and 5900 level and three ramps are being developed between the 5900 level and the 6500 level. Below the 6500 level, only two ramps will continue to the 7500 level.

The No. 4 Shaft is a 4,800 ft winze with hoistroom located at the 4760 level and bottom at 8620 level. The No. 4 Shaft provides access to deep-seated portions of the Gold Hunter vein system. Construction commenced in 2010 and was completed in 2016.

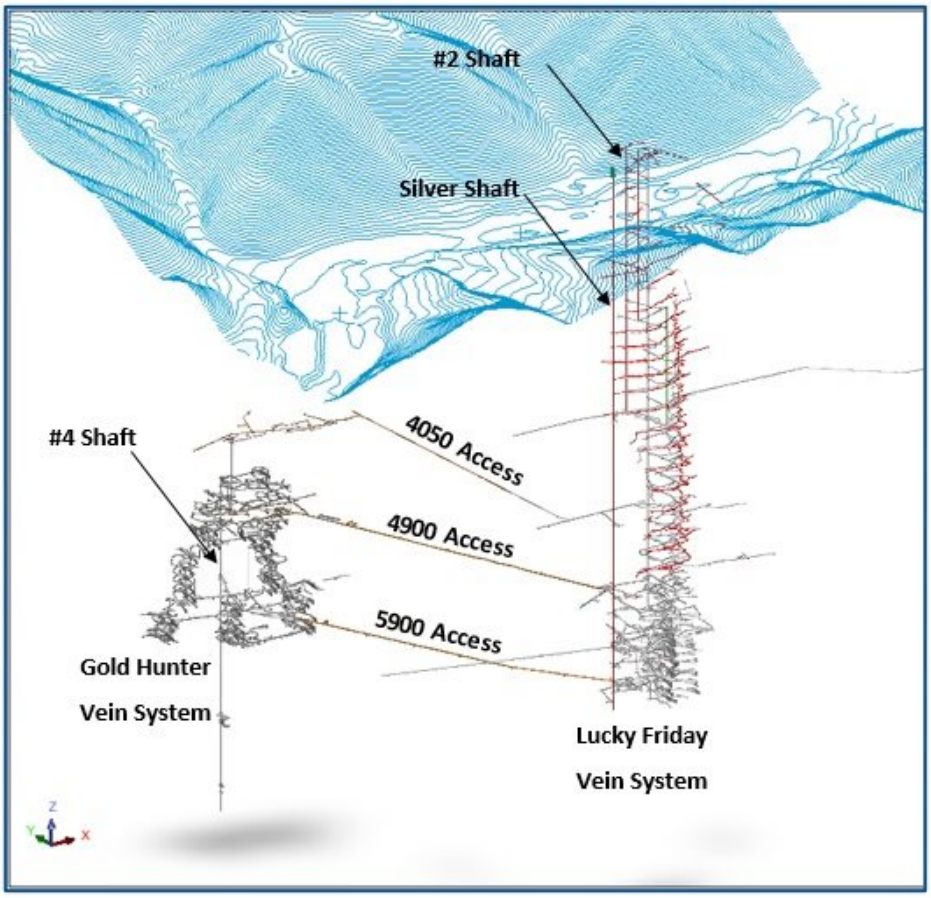


Figure 13-1: Isometric View of As-built Lucky Friday Workings

13.1.2 Mine Development

All mine development is completed using conventional drill and blast mining techniques. Ramps and sublevels are driven at nominally 12 ft wide by 14 ft high and drilled using single boom or two boom jumbos. Ramps are typically located in the footwall with swinging-ramp crosscuts driven into the vein to access the ore. Level spacing depends on vein size and geometry, but typically four to five stope cuts are taken from each sublevel.

13.1.3 Production Mining

In the late 1980s Lucky Friday LFUL mining was implemented in some areas of the mine to control seismic risk and create a safter working environment. Today underhand techniques continue to be the primary method used, with overhand employed in areas with no seismic risk.

In 2020, an adaptation to UCB mining was developed by Lucky Friday. This change was made to control the release of mining induced seismic events and to improve seismic exposure thereby improving the safety conditions in the mine. The UCB method is applied in the 30 Vein.

13.1.3.1 Underhand Cut and Fill (LFUL)

In cut and fill mining, levels are typically spaced at 50 ft vertical centres. The vein is accessed through a single slot drive driven roughly perpendicular to the vein strike. Once the slot drive is driven across the vein an ore drive is driven in both directions along the vein until either backfill from an adjacent stope is encountered or the vein becomes uneconomic.

Cut and fill drives are developed using conventional drill and blast techniques, with single boom jumbos drilling 8 ft rounds. Material is removed with loaders to muck bays and eventually to trucks to report to shaft pockets. Ground support is installed after each round according to standards in the ground control management plan. Each stope round is mapped and sampled by the geology department, and a projection- map is developed from the collected data and used to guide the next cut's extraction.

In the overhand cut and fill technique the slot drive and first cut commence on the bottom and progress upward, such that equipment and personnel work on top of backfill. Conversely, in the more commonly used underhand technique, mining progresses downwards, such that equipment and personnel work on unbroken rock, and cemented backfill and the previous cut horizon is overhead. Typically, five cuts are taking from a single sublevel.

All cuts are backfilled with cemented paste fill. Prior to paste backfilling a 1.5 ft bed of broken ore material is emplaced to prevent the backfill from being damaged during blasting of the subsequent lift below. Additionally, vertical rebar bolts are placed in the bedded material in a regular pattern such that plates and nuts can be attached to the bolt ends when exposed during the next development sequence. In this manner the backfill exposed overhead is always fully supported.

The overhand and underhand stoping methods are shown schematically in Figure 13-2.

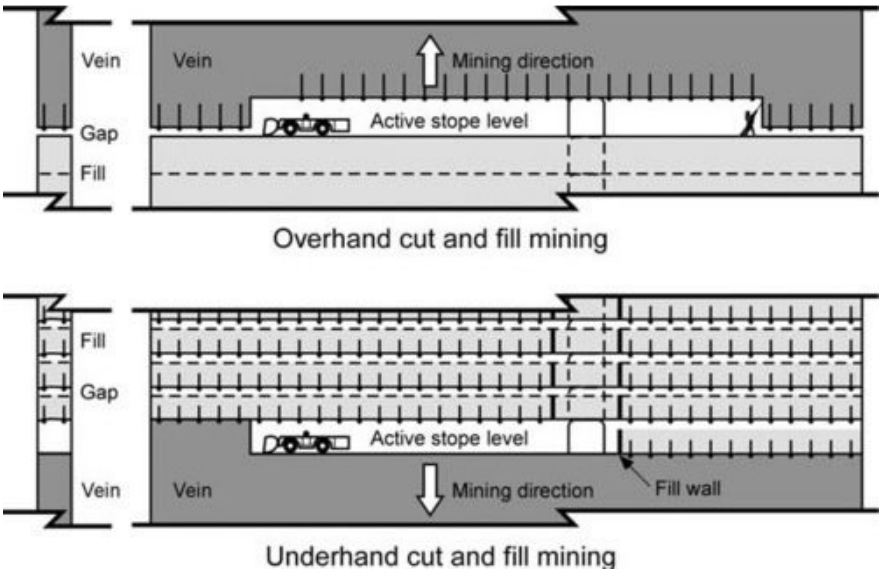


Figure 13-2: Mechanized Overhand and Underhand Stoping

The geometry and thickness of the vein being mined, as well as equipment being used, dictates the cut and fill stope widths. The Intermediate Veins are typically narrow and mined with 1 yd^3 loaders and single boom jumbos, which can effectively mine to a minimum mining thickness of 6.5 ft. In thicker veins where 2 yd^3 loaders are used the minimum mining thickness is 8.0 ft.

13.1.3.2 Underhand Closed Bench

The UCB method is an adaptation of underhand cut and fill mining developed by Lucky Friday for use in high stress mining environments where seismic events are anticipated. It was first used in 2020 and is in full use in the 30 Vein stopes. Work continues to refine the method. A summary of the UCB mining method cycle follows and corresponds to the five steps shown in Figure 13-3.

In Step 1 the open stope (termed "Cut 0") has a minimum stope opening height of 13 ft (to accommodate the size of the longhole drill) and is 11 ft wide to accommodate a 3 yd^3 capacity LHD. The mined height is 11.5 ft high, with the additional 1.5 ft achieved by placing rock on the floor of the previous cut before backfilling. When the cut is excavated the loose rock falls out leaving a 13 ft high opening. The orebody in the floor of the stope is drilled with a series of vertical blasthole rings to a depth of 27 ft and blasted with emulsion explosive that is initiated with programmable, electronic detonators. The 27 ft hole length permits for an overall vertical blast advance of 23 ft with an allowance for 4' of subdrill. The result of this blast is that the fragmented ore will swell vertically up into the Cut 0 open stope void.

In Step 2, the swell in Cut 0 is extracted to the original Cut 0 floor-line using load-haul-dump (LHD) After mucking of the swell, there are two, 11.5 ft high cuts of fragmented ore beneath the open stope as shown in Step 3.

In Step 4, Cut 0 is backfilled with engineered paste fill and Cut 1 (the first fragmented cut below Cut 0) is accessed from the footwall crosscut by slabbing out the floor and intersecting the orebody. Since the ore has been fragmented by the blast, LHDs are used (little or no additional blasting required) to muck out Cut 1 below the cured paste. The mucking advances along the strike of the orebody to the end of the blasted section. As the mucking advances, the stope back and walls are supported with wire mesh and rockbolts.

In Step 5, Cut 1 is backfilled with engineered paste and allowed to cure for approximately three days followed by mucking out the final fragmented Cut 2.

At the completion of Step 5, all the ore fragmented by the blast has been extracted, resulting in a solid un-blasted floor, and the UCB process starts over again with drilling and blasting of the solid floor. This process repeats for the extraction of 23 ft of ore in two downward-progressing stope cuts.

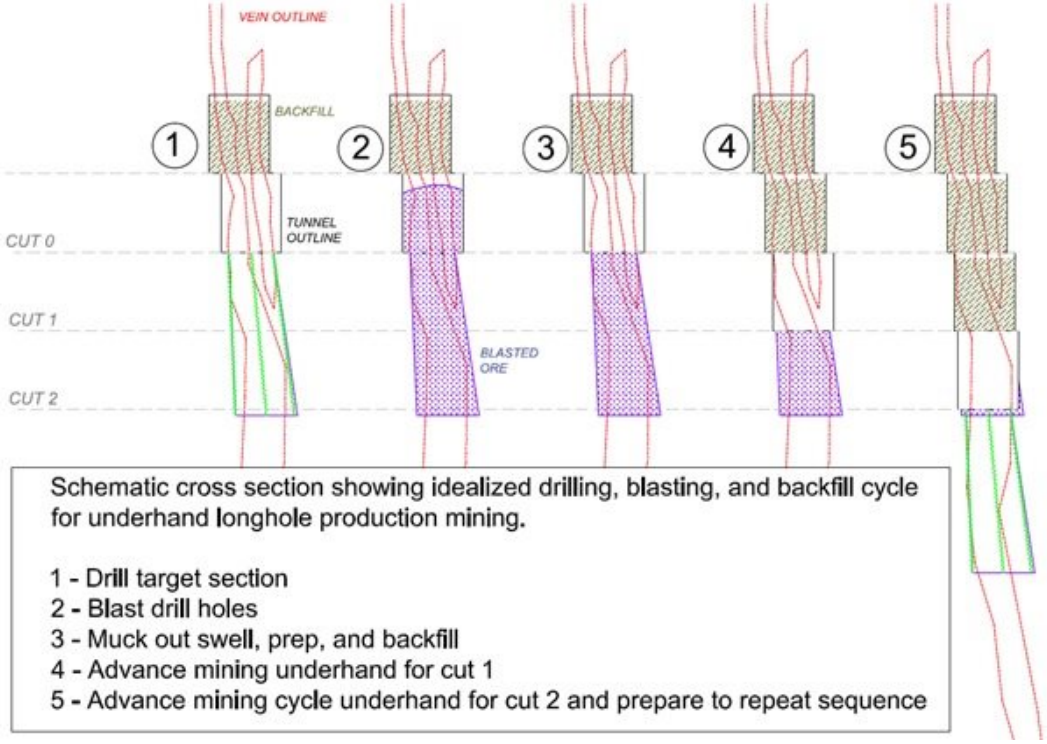


Figure 13-3: Underhand Closed Bench Mining Method Schematic

The UCB method was developed specifically for improvement in the safety of mining personnel in seismically active rock masses. In particular, the method is designed to proactively trigger fault-slip seismicity by blasting at a time of choosing of the mine operations when personnel can be restricted from the affected area. The exact location of faults is generally unknown until they are intercepted in mining, thus presenting a seismic hazard. In typical cut and fill mining, unstable slip on these faults can occur at any time as a result of stress redistribution around the small, excavated stope which is slowly and incrementally advanced horizontally beneath the engineered fill as described earlier. In addition to fragmenting the ore in the floor of the stope, the stress wave induced by the blast transmits down through the orebody and surrounding wall rock causing both stress disruption and deformation on any near-stope fault surface that it encounters. If the fault is critically-stressed the dynamic disruption to clamping and shear stress-induced by the stress wave will cause slip to occur with subsequent energy release as a seismic event. The large amount of explosive detonated in the UCB blast (up to 37,000 lb as opposed to 150 lb in typical cut and fill face blast) facilitates triggering of the fault slip at the time of the blast, thus relieving stored energy and allowing resumption of personnel access within a short time thereafter. This concept is illustrated in Figure 13-4.

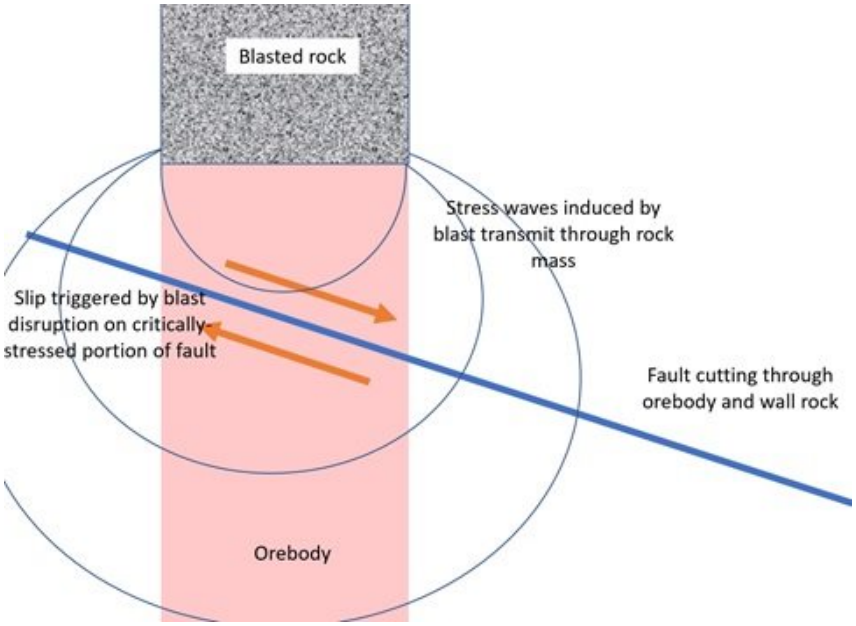


Figure 13-4: Conceptual Fault-Slip in UCB Cross Section

The drilling and blasting techniques were changed in 2021 to use three inch diameter blast holes with ring burden on 4.5 ft and four to five holes across the stope. Blasthole design targets a corridor of 10 ft to 11 ft wide for the bench. Hole toe spacing is kept to no wider than four feet and is commonly less than four feet. SLR notes that the stated 4.5 ft spacing and four holes represents a minimum blasting width of 13.5 ft assuming the perimeter holes are located on the stope limit. This configuration may lead to overbreak and extra tonnage beyond the Mineral Reserve limits. The stope is opened with a 27 ft deep burn cut using nine four inch diameter holes in a two foot square and nine three inch diameter blast holes for a five foot square cut.

Management indicate that experience to date has shown that mining productivities are better than in LFUL. The productivity improvement is from less seismic delays and the ability to increase working areas on the 30 Vein. The improved seismic control allowed a fourth stope to be developed on the 30 Vein increasing working faces by 133%. Management is of the opinion that the combination of reduced seismic delays and increased working areas is estimated to improve 30 Vein productivity by greater than 150%. Benching with vertical blastholes does not permit as much selectivity compared to LFUL and thus unplanned dilution in UCB mining is estimated by Hecla to be 15%. Continuous improvement studies are ongoing with focus being on improving productivities, reducing cycle times, and reducing dilution.

UCB is currently being used to mine all bottom 30 Vein stopes and is planned for use in lower 30 Vein for the remainder of the mine life.

SLR visited the UCB stope on October 5, 2021 and based upon that visit and its review of the technical information SLR concurs with the use of UCB as a safer, more productive, mechanized option for underhand stoping. SLR offers the following observations:

- Despite the use of the method since 2020 there was not a reconciliation records between actual production and Mineral Reserve estimates;
- The use of a 27 ft deep burn cut to open the stope presents a potential risk as the long cut may freeze or fragment poorly leading to either a loss of ore, or difficult mucking of larger material, or the existing requirement to drill into a frozen muckpile with a jumbo
- The 15% dilution added to the stopes amounts to a total of 1.6 ft of stope width at the minimum 11 ft mining width. SLR considers this to be insufficient to account for potential drill hole misalignment, variations (pinches and swells) in vein size both along strike and down dip, and the usual tendency for stope width to expand in the face of the plan to increase production tonnage.
- The dilution risk will increase at depth in the 30 Vein where the minimum mining width has been reduced to 9 ft.
- Continued closely spaced infill drilling information will be necessary for stope planning as there is no opportunity for face mapping after the mining moves beneath the initial undercut elevation.

13.1.3.3 Conventional Mining

Although the current LOM plan does not include any conventional mining blocks, this method, using hand held drills and scrapers, has been used in the past and may be used again at some time in the future.

13.1.4 Ore and Waste Handling

LHD's are used to move broken rock from the headings to haul trucks or ore passes. The LHD fleet consists of 1 yd^3, 2 yd^3, and 3.5 yd^3. Ore and waste haulage is accomplished using 20 ton trucks.

Rock is either hoisted in No. 4 shaft to the 4900 level and trucked to the 4900 Silver Shaft bins or trucked on internal ramps to the 4900 or 5900 level Silver Shaft bins. From there rock is hoisted to coarse bins on surface.

13.1.5 Backfill

All production stopes are backfilled with paste fill produced from a mixture of tailings sand and binder. Binder content varies between 6% and 10% by weight depending on the strength requirement with binder consisting of 75% ground granulated blast furnace slag (GGBF) and 25% cement. Between 0.4 tons to 0.6 tons of backfill are required per ton of ore mined to achieve the targeted fill height of within 1.5 ft of the back. There is a net surplus of tailings as 0.5 tons to 0.7 tons of tailings are produced per ton of ore mined.

Prior to filling the stope the fill area is prepped by spreading a 1.5 ft thick layer of prep muck across the floor. Six foot long dywidags are then stood in the preparation muck on a 4 ft by 4 ft pattern to provide a measure of concrete reinforcement and securing of the back during the next cut. Pour lengths are limited to approximately 150 ft to ensure uniform paste flow and minimization of cold joints.

Quality testing of the fill is performed for the pour from the first stope cut of any given slot. Four samples are collected and UCS tests conducted at three, seven, 14, and 28 days. The data for testing is reported to the mine engineering department. The fill typically develops 200 psi (1.38 MPa) or greater UCS after seven days. This is used as a design criterion for fill mat strength. Mining cannot take place beneath paste fill until a UCS of at least of 200 psi (1.38 MPa) is achieved. If the fill does not develop this strength, it is reported to mine management who alert the underground staff that the fill should be observed for settlement and that extra support beneath the wider span stope entry area may be required.

A sand storage facility is located on surface beside the process plant with a capacity of 5,000 tons. Sandfill is sent underground through a slickline installed in the Silver Shaft with branches to the Gold Hunter side installed on the 4900 level and the 5900 level. The backfill system capacity is 110 stph. A schematic of the backfill distribution system is presented in Figure 13-5.

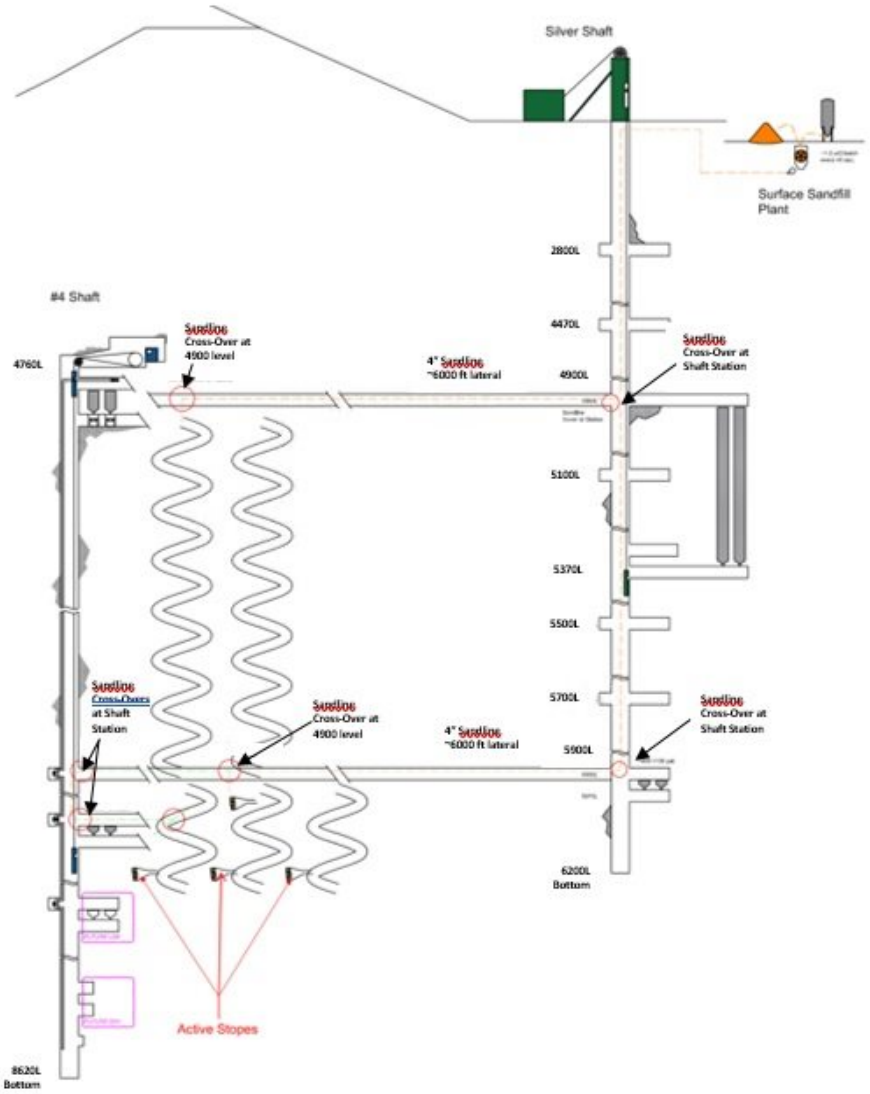


Figure 13-5: Backfill Schematic

13.2 Ground Conditions

The Gold Hunter deposit is located in the Wallace formation which is folded to subvertical with stratigraphy striking N80 to 85W and dipping 80° to 90°S. The Gold Hunter zone lies between two significant west-northwest trending district-scale fault structures. To the north is the Independence fault trending N80 to 85W dipping 80°S. The Paymaster fault lies to the south at N80W dipping 85°S. These faults are separated by approximately 1,500 ft around the mine and define the trend of the Star-Gold Hunter mineral belt.

The rockmass is primarily composed of thinly-bedded argillites, argillite alternating with silt caps, and local siltites. The bedding spacing ranges from several inches to feet, surfaces often coated with talcy, slickensided material and highly irregular in shape. The bedding thus results in significant anisotropy with respect to mechanical response to stress. Drifts driven perpendicular to bedding tend to be quite stable, whereas drifts driven parallel to bedding typically show buckling or high deflection of the wall beds.

The rock mass quality and material properties of the Gold Hunter Veins and wall rock materials were determined from geotechnical logging and laboratory testing of exploration boreholes drilled from the footwall ramp across the orebody and into the hangingwall at approximately the 6100 level. Geotechnical logging is not typically completed on new diamond drill holes.

RQD in the vein package is often over 80%. The wall rocks grade from silty argillites to stronger siltites that are sometimes cut by low-angle fault planes. The wall rocks exhibit anisotropy via cleavage that is oriented parallel to the orebody. The 30/40 vein package consists of ore minerals (sphalerite and galena with some pyrite) in a matrix of siderite, quartzite, and siltite gangue.

The mean UCS for the footwall rocks is 15,300 psi +/- 7,000 psi (106 MPa +/- 48 MPa) and 15,700 psi +/- 5,800 psi (108 MPa +/- 40 MPa) for the vein package rocks.

The measurements indicate a primary stress direction of approximately N40W and a ratio of horizontal to vertical stress ration of between 1.5 and 2.

13.2.1 Ground Support

Ground support standards have been designed for standard excavation types based on the purpose of the excavation and excavation size. The standards are a minimum support requirement that can be increased where conditions warrant as determined by miners or underground supervisors. Active faces are inspected by supervisors every shift and mapped by a geologist after each blast. If hazards are identified they are communicated to mine operations management and engineering so that remedial action can be taken.

Development headings are typically driven with an arched back and supported in the walls with 4 ft long splitsets installed on a 3 ft by 3 ft pattern to within three feet of the floor. In the back 4 ft long splits are installed on a 3 ft (radial) by 4 ft (longitudinal pattern), and 6 ft dywidag bolts on a 4 ft by 8 ft pattern. Eight foot dywidags are used when the drift span exceeds 14 ft wide. Galvanized wire mesh is installed in all bolted areas.

In underhand production headings the walls are supported with 4 ft long splits sets installed on a 3 ft by 3 ft pattern to within 3 ft of the floor. The back is secured by plating the protruding dywidags that were installed in the backfill pour above and installing 3 ft split sets on a five-spot pattern between the existing dywidags. Galvanized wire mesh is installed in all bolted areas.

Variations of the above support regimes exist for different development and production opening sizes and functions.

Where required, shotcrete is applied to the rock surface to prevent rockmass unravelling or shearing along bedding. This is specified on an as-needed basis as recommended by mine supervision or the engineering department. Shotcrete is produced on surface using a local supplier, in 5 yd^3 batches and sent underground via slickline. The shotcrete is a wet-mix design with a nominal compressive strength of 4,500 psi. A minimum thickness of two inches is applied to the rock surface through screen or welded wire mesh.

Rock bolts are regularly pull tested to check both bolt and bond strength. Bolts are loaded to 50% of the anchorage capacity of the fixture as defined by the manufacturer.

13.2.2 Seismic Monitoring

There are two basic seismic source mechanisms operating at the Gold Hunter: pillar-type/strain bursting, and slip along geologic structure. Pillar-type rockbursts occur when brittle rock in pillars or exposed faces is stressed beyond its strength limits, typically near a free face. The host rock mass at the Gold Hunter is composed of thinly-bedded argillites and more thickly-bedded siltites or quartzites. These rocks typically fail via anisotropic plastic yielding due to non-violent shearing on bedding and cleavage surfaces. Deformation is particularly pronounced when driving drifts parallel to bedding which allows buckling of the thin beds into the drift. The orebody and gangue materials may contain more brittle rocks, including quartzite, siderite and quartz.

Structural-slip events involve unstable slip-on geologic structures such as faults and bedding planes. At the Gold Hunter, observations of movement on north-dipping fault structures at the east end of the orebody below 5300 level appear to be associated with some of the larger events.

Both the Lucky Friday and Gold Hunter areas are monitored for seismicity using an ESG underground, mine-wide microseismic system. The ESG system was installed in late 2011. A schematic showing the seismic monitoring systems including location of geophones is show in Figure 13-6.

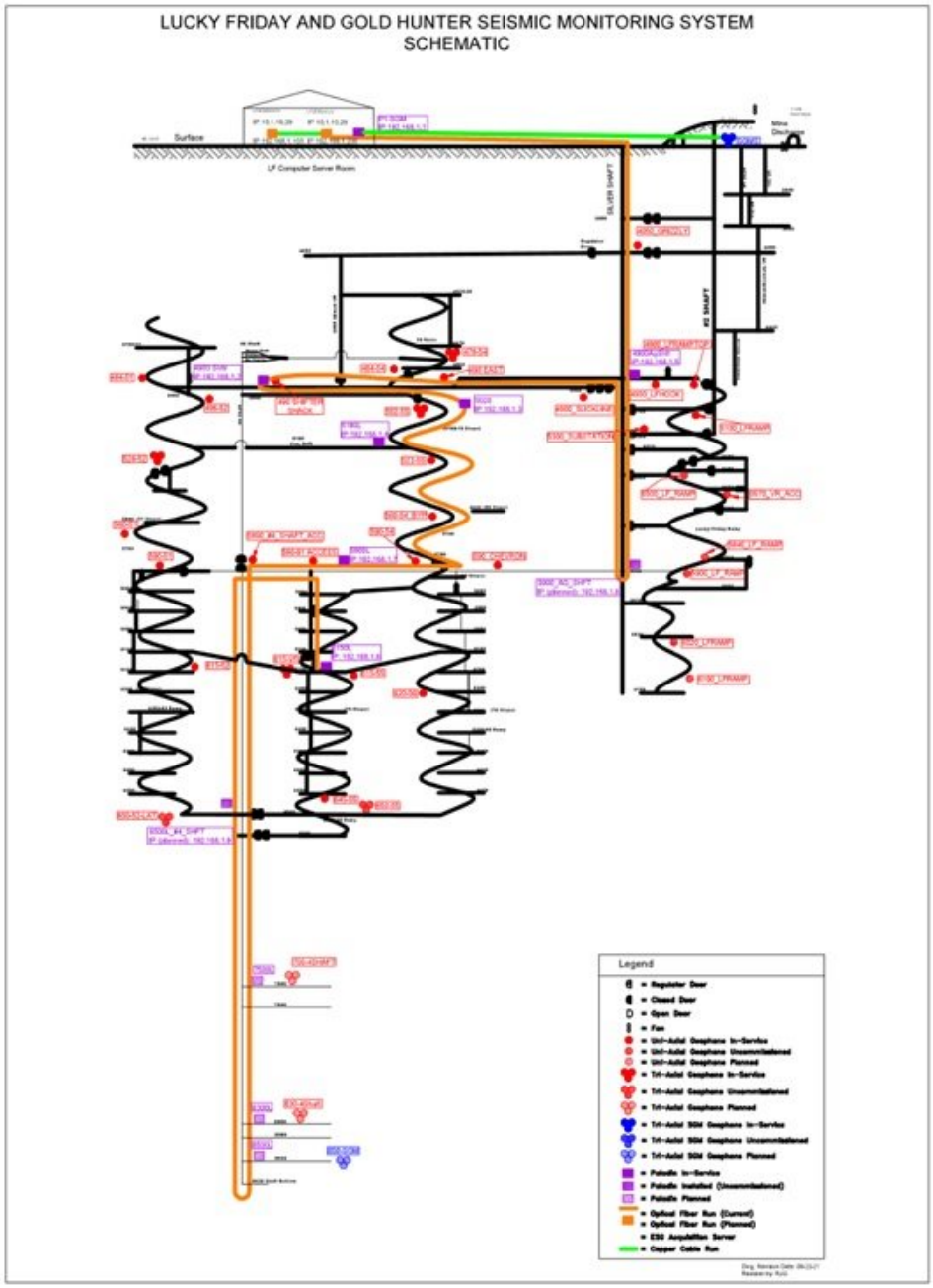


Figure 13-6: Lucky Friday ESG Seismic Monitoring System Schematic

The timing of seismic events with respect to blasting is of critical importance in planning a mitigation strategy for the mine since blasting tends to trigger a large portion of the seismicity. Approximately 65% of all recorded events (regardless of size) occur with blasting, and that the blasting-related events decay to the background rate within approximately half an hour to one hour of the blasting window.

The key principles used by Lucky Friday to limit seismic risk can be summarized as follows:

- Integration of geotechnical information into mine planning processes to ensure geotechnical assessment informs planning and scheduled decisions.
- Restriction of stope blasting to the end of shift when miners are at prescribed, safe locations, as well as development of personnel exclusion and re-entry protocols for all production areas.
- Development of ground support standards that include use of dynamic ground support methods to limit damage potential in areas of possible seismic impact.
- Use of modern monitoring technology to determine areas of increased seismic risk, and use collected information to assist in improving our understanding of evolving seismic issues.
- Education of the work force in recognition and reporting of geotechnical hazards to mine management.
- Conversion to the UCB method in the 30 Vein.
- Mining sequence and not creating unfavorable geometries

13.2.3 Hydrological Investigation

Lucky Friday does not have hydrological issues and no hydrological investigation is completed.

13.3 Mine Equipment and Personnel

In 2022, the long-range plan has 296 hourly and 101 salary employees. Headcount is expected to be remain relatively static through mine life, with hourly employees increasing to 302 by 2026. It is expected that overall staffing numbers will decrease toward the end of the mine life.

The current mobile equipment fleet at Lucky Friday is presented in Table 13-2. Forecast retirement dates for each piece of equipment have been calculated and replacement costs allocated accordingly in the budget. Some larger LHDs, and mechanized bolters, and additional longhole drills will be purchased to support the change to UCB mining method and production and safety continuous improvements initiatives. Current longhole drilling is done by a contracted buggy mounted long hole drill.

Hecla plans to purchase two Cat R1600 loaders for development starting in 2022.

Table 13-2: Lucky Friday Mobile Equipment Fleet
Hecla Mining Company – Lucky Friday Mine

Equipment Type	Unit Make	Quantity
LHD, 1 & 1-1/4 yard	Joy, JCI	6
LHD, 2 yard	Atlas Copco ST-2G & Wagner ST-2D	8
LHD, 3.5 yard	CAT R1300G	5 (8 by 2023)
Haul Truck, 20 ton	Atlas Copco / Epiroc MT-2010	7
Cement Truck	Normet, Marcotte M35	3
Shotcrete Sprayer	Normet Spraymec	1

Equipment Type	Unit Make	Quantity
Development Drill	Secoma	4
Development Drill	Sandvik DD210V	4
Development Drill	Epiroc S2	1
Bolter	Sandvik DS310	1
Bolter	Epiroc Boltec S	1

13.4 Mine Infrastructure

13.4.1 Shafts

There are two shafts and one winze at Lucky Friday.

The Silver Shaft is a 6,205 ft deep, 18 ft diameter concrete lined circular shaft. It provides fresh air to the mine, is used to transport personnel and material, and is used to hoist muck with an 12 ton skip.

No. 2 Shaft is 5,489 ft deep, three compartment (four compartment at the lower levels) timbered shaft that is used as an exhaust and secondary egress. The shaft has a hoist that is capable of hoisting personnel and materials.

No. 4 Shaft is a 18 ft diameter winze located in the Gold Hunter area with hoistroom at 4760 level and bottom at 8620 level. It is used to skip ore and waste to the 4900 level. The shaft was completed in 2016.

13.4.2 Ventilation

The Silver Shaft is the primary ventilation intake. A minor intake split crosses from the Silver Shaft to the Gold Hunter on the 4050 level, providing fresh air to the No. 4 Shaft plant above the 4900 level. The 5900 level delivers fresh air to the lower Gold Hunter workings. Exhaust crosses back to the Lucky Friday side on 4900 level where a pair of 400 hp exhaust booster fans direct exhaust to surface via the No. 2 Shaft and a network of airways consisting of boreholes, Alimak raises, and the old No. 1 Shaft. There are two 250 hp exhaust fans at No. 2 shaft on surface.

The ventilation system is currently moving 225,000 cfm of air through the mine. The ventilation network total pressure is approximately 19 in. of water gauge.

Auxiliary fans ventilate development headings and stopes. Stopes require a minimum of 30,000 cfm of ventilation during operation to permit equipment access. Other small auxiliary fans provide ventilation for various underground infrastructure such as shops, pump rooms, refrigeration stations, and the like.

13.4.3 Refrigeration

Temperature underground are a concern due to a limited ventilation capacity, high thermal rock gradient, and deep workings. Lucky Friday strives to maintain wet bulb temperatures below 85°. A key component of this control is the underground refrigeration system. The cooling strategy includes bulk air cooling (BAC) for development in the two main ramps, and supplemental spot cooling for stopes, because they intake air from development ramp exhaust.

The central refrigeration plant (CRP) on 4900L currently has four closed-loop chillers that supply chilled water to BAC locations on the 5900 level and the 6500 level. A fifth and sixth chiller will be installed on the 4900 level in 2022 and 2023 that will allow for one plant to be offline for maintenance. The addition of these will also permit the construction of a new BAC location on the 7500 level necessary for mining at greater depth.

On the 5900 level two open-loop chillers provides spot cooling to stope spray chambers. This will be moved and expanded through the mine life as the main mining fronts advances. The mine currently has eight 50 ton spray chambers that provide spot cooling to stoping areas on various sublevels.

As the mine does not make much ground water, most pumping duties are related to the refrigeration plant's heat rejection processes.

A cooling system schematic is presented in Figure 13-7.

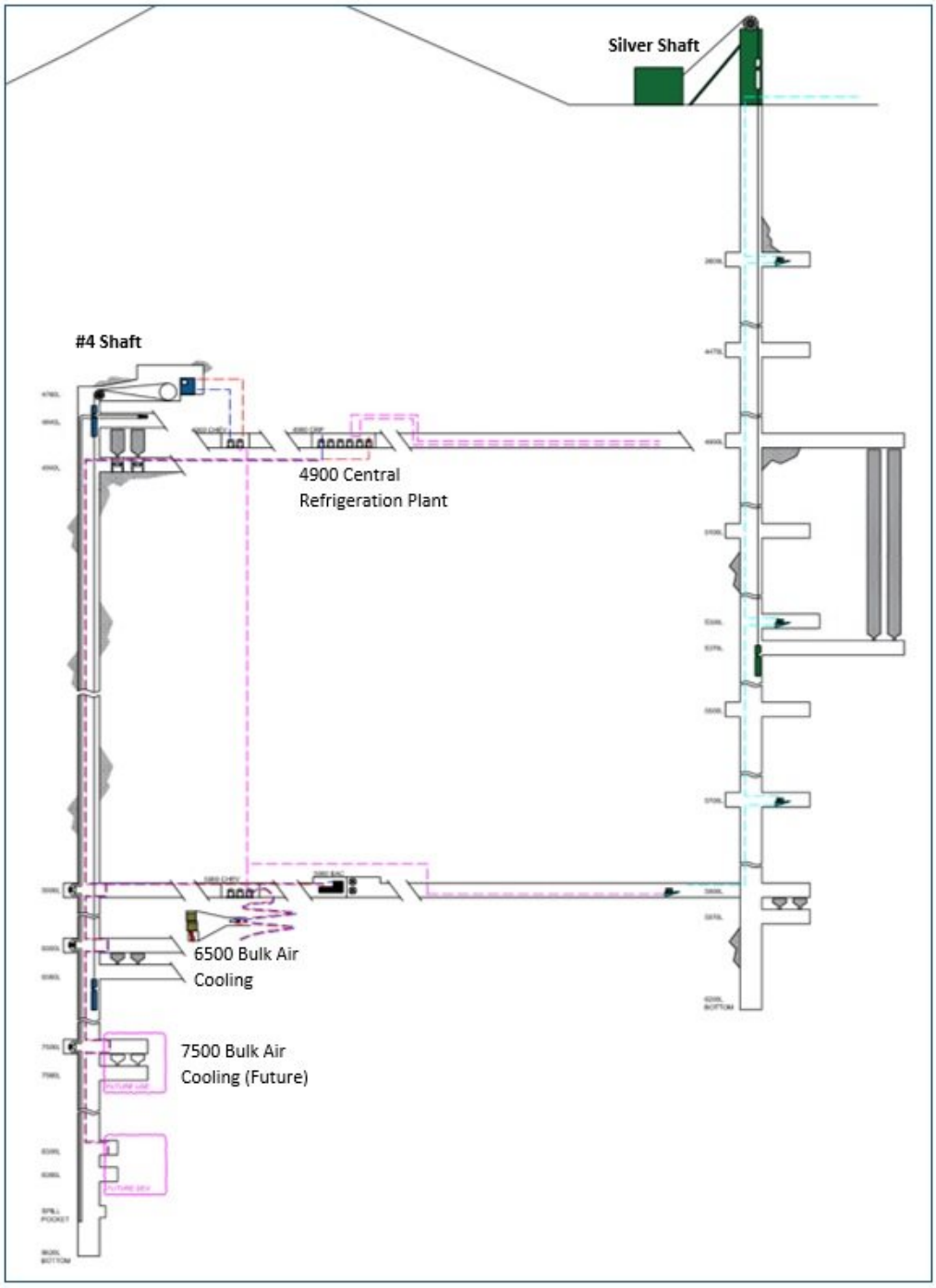


Figure 13-7: Mine Cooling System Schematic

13.4.4 Other Underground Infrastructure

In addition to the infrastructure discussed above, the following key facilities are located underground:

- 1,000 gpm pumping facilities – three stations along Silver Shaft
- 13.8kV power feed down the Silver Shaft
- Paste backfill slickline in the Silver Shaft, and reticulation piping on the main levels
- Concrete/shotcrete borehole and mixer truck loading station on 4900 level
- Mine communications – land-line telephone, mine phones, leaky feeder, and fiber-optic data,
- Emergency facilities – refuge chambers in strategic locations

13.5 Mine Plan

13.5.1 Ore Scheduling Criteria

The 30 Vein accounts for 80% to 90% of annual ore production from 2022 to 2028. The proportion of total production from 30 Vein begins to decline in 2029 until being fully depleted in 2034. Until recently, 30 Vein was split into three stopes that were mined independently. To increase production potential Lucky Friday has transitioned to mining 30 Vein in four stopes by using UCB and an additional access ramp and plans to continue this practice through to 2031 when the first of these stopes is exhausted at depth. The increased number of active faces is planned to provide higher crew productivities and greater flexibility to improve stope cycles and to respond to upset conditions in the mining cycle. A long section of the 30 Vein stoping plan is presented in Figure 13-8.

Mining of the Intermediate Gold Hunter Veins make up the balance of ore production. Through the mine life between one and three Intermediate Vein stopes are mined each year depending on vein size and location.

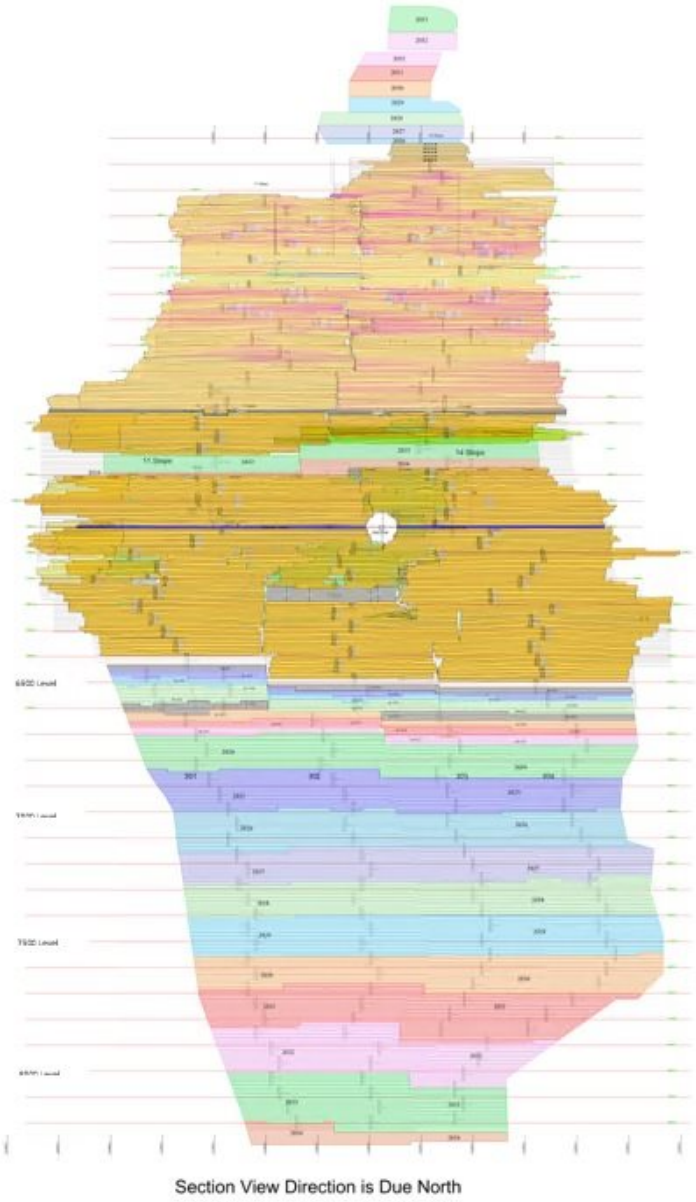


Figure 13-8: 30 Vein Stoping Plan

13.5.2 Mine Plan Overview

The 30 Vein is currently being mined near the 6500 level and is planned to be mined downwards, in a flat front, at a rate of approximately 100 ft per year. Two spiral ramps will be driven ahead of the production front such that infrastructure such as ventilation, refrigeration, and ore and waste handling facilities can be constructed ahead of time.

Primary service levels containing major infrastructure include 6500 level – scheduled for completion in 2022, 4050 level – scheduled in 2025, and 7500 level – scheduled in 2026.

Production totals through the LOM are presented by year in Table 13-3.

Table 13-3: Annual LOM Production
Hecla Mining Company – Lucky Friday Mine

	Tons	Tons per Day	Ag (oz/ton)	Pb (%)	Zn (%)
2022	378,744	1,038	13.3	9.1%	3.8%
2023	422,331	1,157	14.4	9.2%	3.4%
2024	418,173	1,146	13.8	8.5%	3.8%
2025	397,393	1,089	13.3	8.3%	4.0%
2026	383,085	1,050	16.2	10.4%	3.8%
2027	378,808	1,038	17.0	11.3%	3.8%
2028	378,770	1,038	13.6	9.0%	4.1%
2029	402,026	1,101	11.6	7.8%	3.0%
2030	307,780	843	12.6	7.5%	2.9%
2031	347,613	952	14.4	7.5%	2.6%
2032	364,645	999	13.5	7.2%	2.2%
2033	411,522	1,127	13.3	7.4%	2.8%
2034	295,909	811	12.7	6.0%	2.7%
2035	200,684	550	13.2	5.2%	3.4%
2036	179,682	492	12.4	6.1%	3.3%
2037	120,322	330	11.4	8.8%	2.9%
2038	68,681	188	11.6	10.7%	3.7%
Total	**5,456,168**		**13.7**	**8.3%**	**3.3%**

The planned production areas color coded by NSR value are shown to the end of the mine life, alongside the current mine as-built, in Figure 13-9 and Figure 13-10.

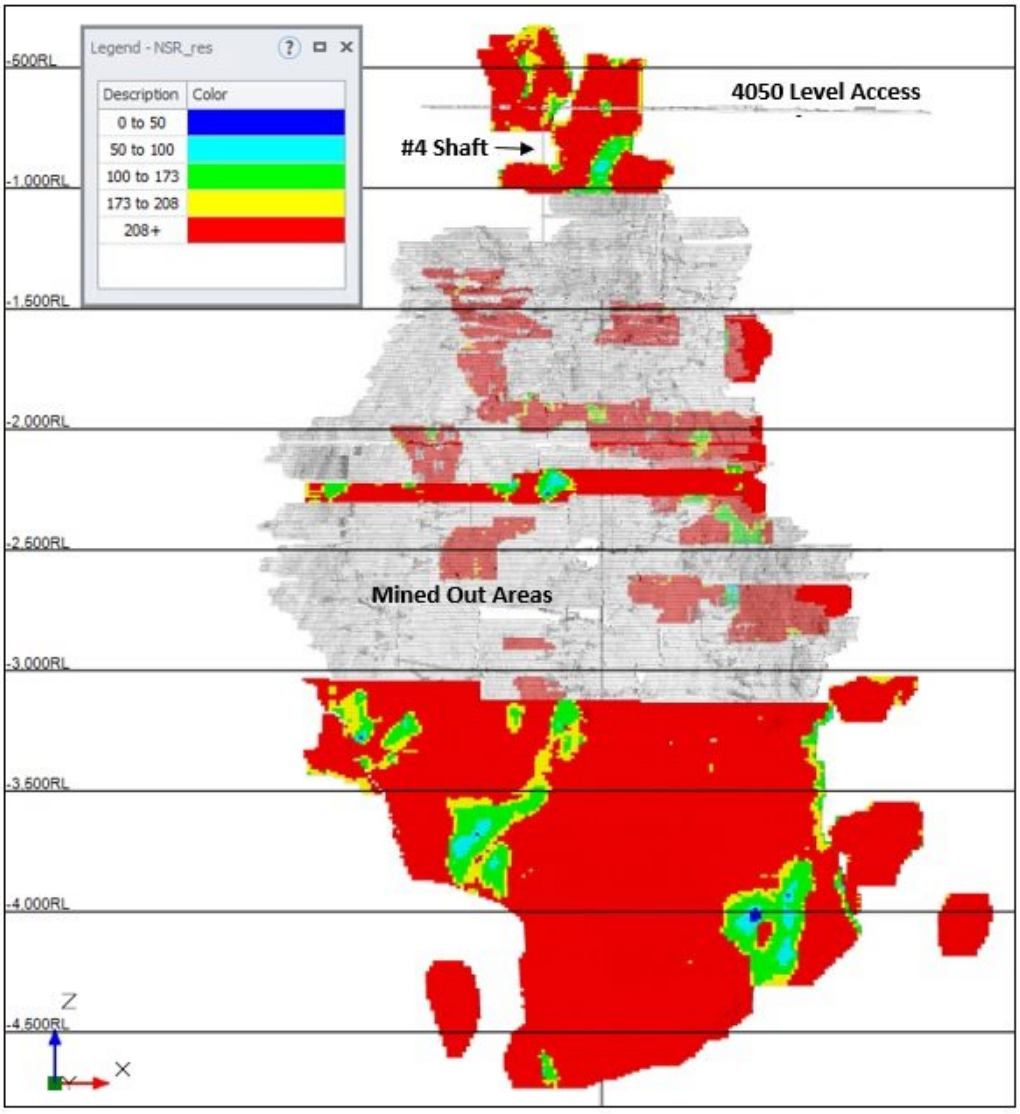


Figure 13-9: Longitudinal Section – 2D View

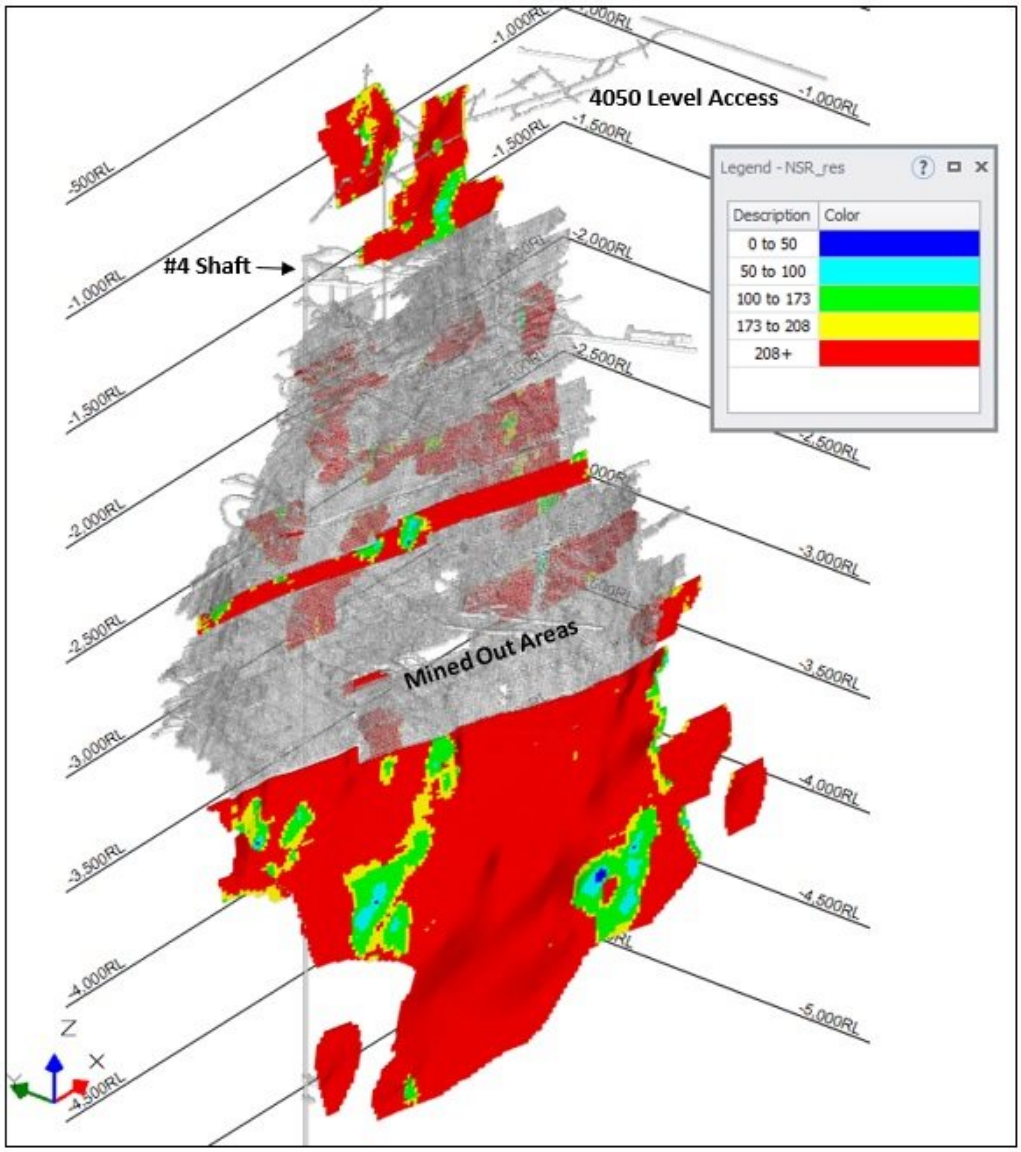


Figure 13-10: Longitudinal Section – Oblique View

Lucky Friday reports lateral development in "expensed" and "capital" categories. Expensed development represents all slot drives connecting waste development to stopes, and capital development captures all other development outside of ore.

The underground development totals for the LOM plan are presented in annual detail in Table 13-4. Development requirements to meet and sustain the increasing production rate are included in the LOM plan.

Table 13-4: Annual Development Plan
Hecla Mining Company – Lucky Friday Mine

Year	Tonnage		
	Expensed	Capital	Total
2022	47,343	107,057	154,400
2023	52,791	119,588	172,380
2024	52,272	126,097	178,369
2025	49,674	143,892	193,566
2026	47,886	104,016	151,902
2027	47,351	119,421	166,772
2028	47,346	76,517	123,864
2029	50,253	76,629	126,883
2030	38,472	110,552	149,025
2031	43,452	85,093	128,545
2032	45,581	75,731	121,312
2033	51,440	75,731	127,171
2034	36,989	75,766	112,755
2035	25,085	75,000	100,085
2036	22,460	25,000	47,460
2037	15,040		15,040
2038	8,585		8,585
Total	**682,021**	**1,396,092**	**2,078,113**

The October 2021 YTD development rate has been 21.4 ft/day. Development advance is expected to increase significantly over the next four years in both vertical and level development. Level development rates are projected to rise to over 35 ft per day by 2024 and to continue to average over 35 ft per day through 2030.

Management plans to facilitate this increase with two new Caterpillar R1600 loaders for ramp development in 2022, two new Caterpillar R1300 loaders in 2022, one new Caterpillar R1300 in 2023 in conjunction with the Epiroc S2 two boom commissioned in 2021. The haulage fleet also increased to seven haul trucks in 2022 with the newer haul trucks being the larger Epiroc MT-2200 model vs the MT-2010 model

13.5.3 Mine Plan Discussion

The mine plan is based upon the continuation of UCB mining in the 30 Vein plus conventional mining in the Intermediate Veins. The planned increase in annual tonnage is based upon assumed productivity increases in the UCB mining coupled with improved utilization of the mine facilities such as hauling and hoisting.

Management's mine planning strategy is to increase production at Lucky Friday by implementing the following improvements;

- Continue to improve the UCB cycle through continuous improvement effort
- Create 4, equally spaced stopes on the 30 Vein
- Increase loader fleet to meet production profile by purchasing additional loaders.
- Implement a proactive maintenance program for the mobile fleet
- Service hoist installation
- Coarse ore bin replacement
- Confirmation that the hoisting and plant can support the increase.
- Revise the organization charts and recruit the necessary hourly and salary staff to support the plan.

SLR is of the opinion that:

- The UCB method is considered to be a good option based upon the depth and seismicity issues.
- More detailed plans outlining how the increased development rates and production tonnages will be attained should be developed with particular attention to mine manpower requirements.
- Attaining the planned increases in head grade, production tonnage and development advance is generally an onerous task and this is exacerbated in a deep narrow vein operation.

13.6 Mine Workforce

Current mining manpower totals 242 and is summarized as follows:

- Mine operations – 178
- Mine maintenance – 38
- Mine supervision and technical services – 26

14.0 PROCESSING AND RECOVERY METHODS

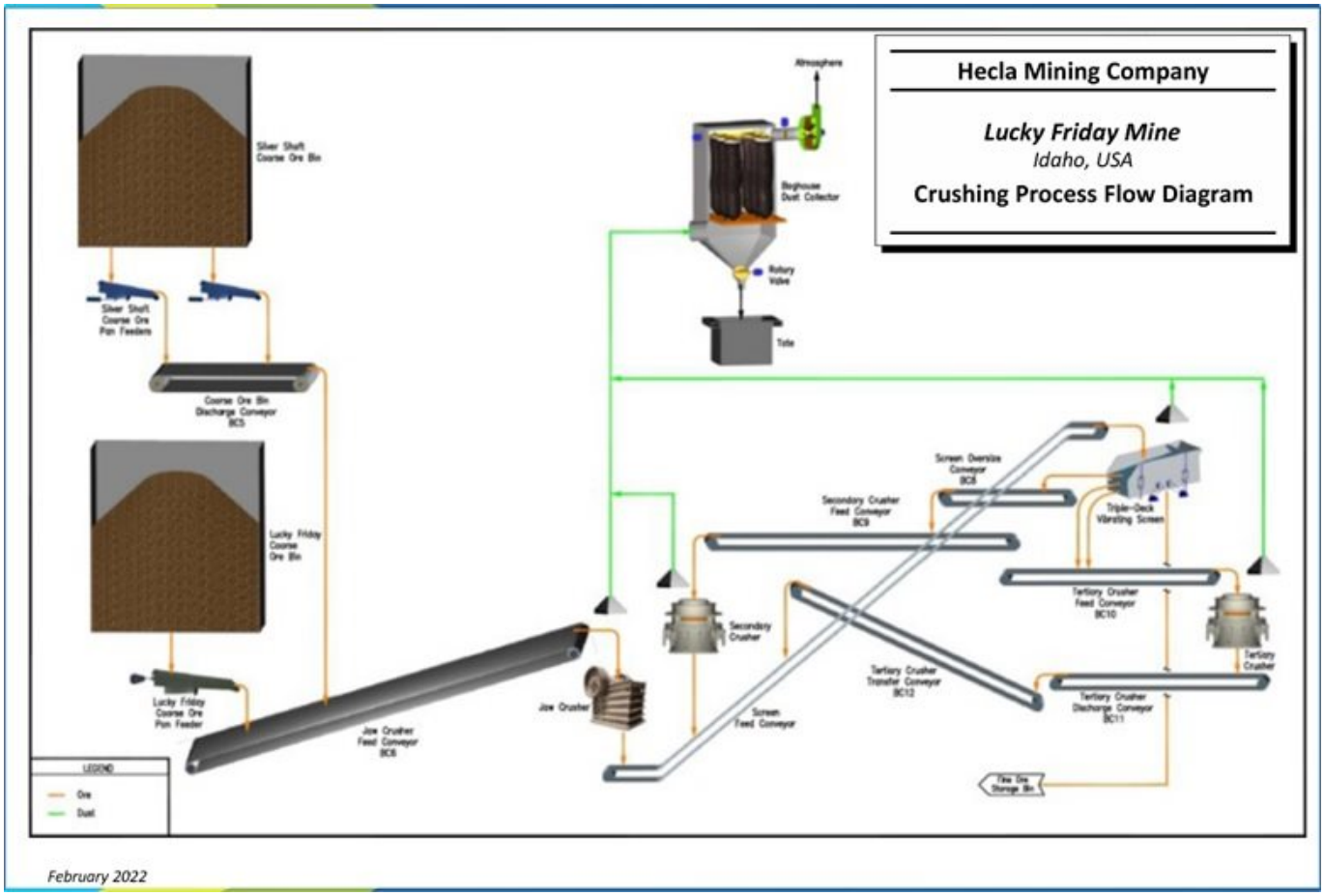
Processing ore at the Lucky Friday uses a conventional lead/zinc flotation flow sheet, with process control guided by a real-time On-Stream Analyzer. Process steps include crushing, grinding, flotation, concentrate dewatering, and tailings dewatering/disposal.

14.1 Crushing

Run of mine (ROM) ore discharges from the ore skips in Lucky Friday Silver shaft into one of two coarse ore bins with capacities of 400 tons and 800 tons. The ore is drawn from the bottom of the bins using variable speed pan feeders and a belt scale is used to control the feed rate to the crushing circuit. Coarse ore is crushed in a three stage crushing plant consisting of a primary jaw crusher, a secondary standard cone crusher and tertiary short head cone crusher with a triple deck screen to close the crushing circuit. Crushing circuit operating time averages approximately 50% with an average throughput rate of 80 tons to 85 tons per operating hour.

The primary crusher, a 20 in X 36 in Kue Ken jaw crusher, reduces ROM ore from minus 12 in. to P_{100} 3 in. Primary crushed ore is delivered to a 5 ft x 12 ft triple deck vibrating screen for sizing. Top deck oversize material is conveyed to the secondary 3 ft Simons standard cone crusher and reduced to P_{100} 1 in. A magnet removes metal from the secondary cone crusher feed to prevent damage to the crusher. The oversized material from both the middle and bottom deck of the triple deck screen is conveyed to a 3 ft Simons short head cone crusher. A second magnet prevents metal from entering the short head crusher. Both the standard and short head crusher discharges returns to the triple deck screen to be reclassified. Triple deck screen undersize material with a P_{100} $^{3}/_{8}$ in. is conveyed to a 400 ton fine ore storage bin. Dust from the crushing area is collected through dust extraction ducts feeding a bag house dust collector.

Figure 14-1 represents a process flow diagram for the crushing process.



Source: Hecla, 2014

Figure 14-1: Crushing Process Flow Diagram

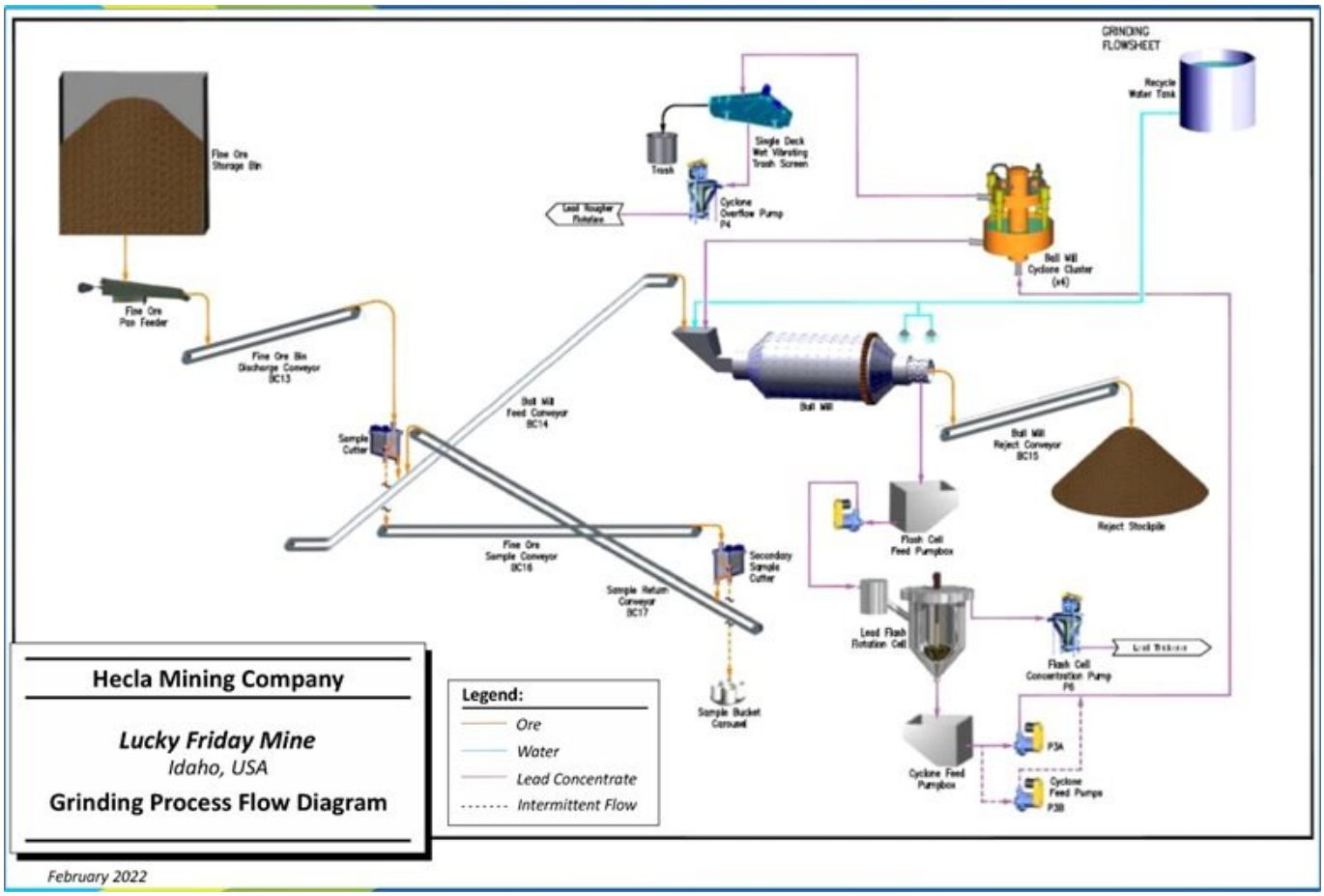
14.2 Grinding

Material from the fine ore bin is discharged by two hydraulic feeders. A 12 hour shift composite feed sample is collected from a conveyor transfer point using primary and secondary automatic sample cutters. The material feed rate to the ball mill is measured by a belt scale. Fine ore, reagents, cyclone underflow, and water feed the ball mill. Overall mill operating time averages 92% and from 2007 to 2013 the average annual mill feed rate ranged from 40.0 stph to 43.6 stph. Operating performance continued in the 37 stph to 44 stph range from 2016 through 2021 (see subsection 14.8).

The ore is ground in one 9.5 ft diameter x 12 ft effective grinding length (EGL) ball mill driven by a 600 hp motor. Water, collector, and frother are added to the ball mill discharge slurry in the flash flotation cell feed pump box and then pumped to an SK-240 lead flash flotation unit cell. Flotation reagents are added to the flash cell tailing and the pulp is pumped to a cyclone cluster for classification. Cyclone overflow is screened to remove trash and then pumped to the lead rougher circuit. Cyclone underflow returns to the ball mill. The cyclone overflow is typically 40% solids with a particle size of 80% passing 150 microns.

The flash flotation cell is used to recover coarse fractions of lead and silver from the mill circulating load to minimize over grinding of the dense materials. The flash cell has proven to be capable of producing a final concentrate grade product, assaying approximately 63% Pb and greater than 100 oz/ton Ag. Typically, approximately 50% of the lead and silver values are recovered to final concentrate through this route. Another benefit of the flash flotation unit cell is in reducing the amount of lead reporting to the lead circuit. When high grade ore is processed through the mill, this increased capacity is fully utilized.

Figure 14-2 represents a simplified process flow diagram of the grinding process.



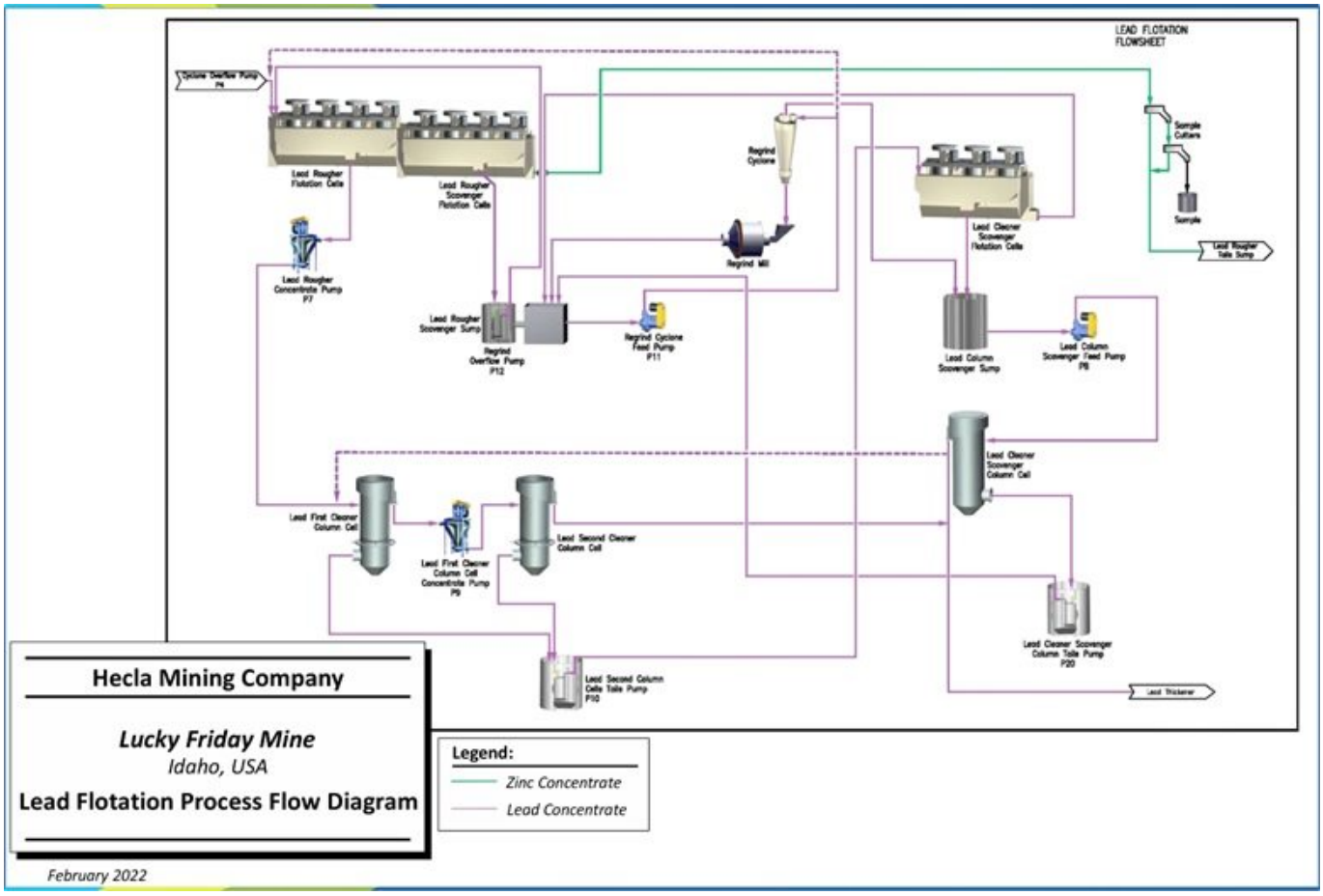
Source: Hecla, 2014

Figure 14-2: Grinding Process Flow Diagram

14.3 Flotation

Lead rougher flotation consists of one bank of five WEMCO 66D conventional flotation cells. Concentrate from the roughers, containing about 38% Pb, reports to the first cleaner column flotation cell while the tailings flows by gravity into a bank of 5 Denver DR-24 conventional flotation cells for lead scavenging. Reagents for collecting, frothing, and conditioning are added to the slurry as needed. Lead scavenger concentrate is pumped back to the rougher feed and the lead scavenger tailings are fed to the zinc flotation circuit.

Lead rougher concentrate slurry reporting to the lead first cleaner column flotation cell is upgraded from approximately 38% Pb to approximately 50% Pb and then pumped to the second Pb cleaner column. Tailings from the first and second Pb cleaner column cells are combined and pumped to a set of four Denver 21 conventional cleaner scavenger flotation cells. Cleaner scavenger concentrate is pumped to a cleaner scavenger column cell while the tailings are pumped to the lead rougher feed. Concentrate from the cleaner scavenger column cell is pumped to the silver concentrate thickener and the tailings are pumped to the lead rougher feed. Final silver concentrate is a combination of lead flash flotation cell, second cleaner column and cleaner scavenger column concentrates and averages 63% Pb and 100 oz/ton Ag. The silver concentrate passes through a primary and secondary sampler before reporting to the silver concentrate thickener. The lead circuit flow diagram is shown in Figure 14-3.



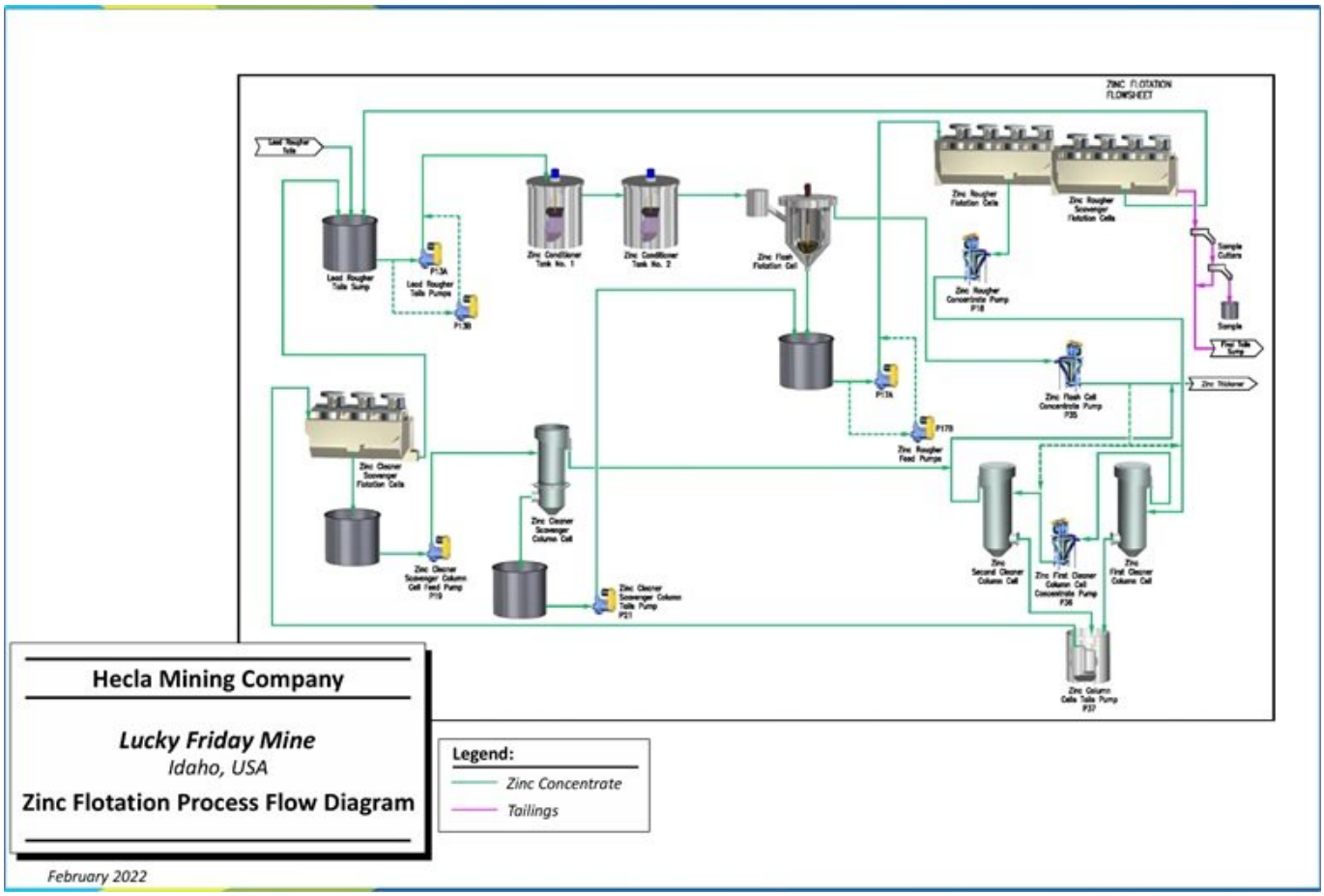
Source: Hecla, 2014

Figure 14-3: Lead Flotation Process Flow Diagram

Lead circuit tailings are mixed with reagents to activate the zinc in the two conditioning stages and flow by gravity to the zinc rougher flotation circuit. Flow rate through the two conditioner tanks is designed for adequate retention time for the reagents to fully condition the slurry for zinc flotation. The second conditioning tank overflows into the zinc flash flotation cell. The concentrate from the flash flotation cell is pumped directly to the zinc concentrate thickener and the tailings from the zinc flash flotation cell are pumped to zinc rougher flotation. Zinc rougher and rougher scavenger flotation consists of a bank of five conventional WEMCO 66D cells for roughing followed by a bank of five conventional Denver DR-24 cells for scavenging. Zinc rougher scavenger tailings report to final tailings.

Zinc rougher concentrate is pumped to the first zinc cleaner column cell. First cleaner column concentrate is pumped to the second cleaner column. Second cleaner column concentrate is pumped to the zinc concentrate thickener. First and second clean column tailings are combined and pumped to a bank of four Denver 21 conventional cleaner scavenger flotation cells. The cleaner scavenger concentrate is pumped to a zinc cleaner scavenger column cell and the cleaner scavenger tailings are pumped to the lead rougher tailings sump prior to the zinc conditioners. The zinc cleaner scavenger column concentrate is pumped the zinc concentrate thickener and zinc cleaner scavenger column tailings are pumped to the feed of the zinc rougher cells. Final zinc concentrate is a combination of the zinc flash flotation, second cleaner column and cleaner scavenger column concentrates.

Figure 14-4 represents the Zn circuit flow diagram.



Source: Hecla, 2014

Figure 14-4: Zinc Flotation Process Flow Diagram

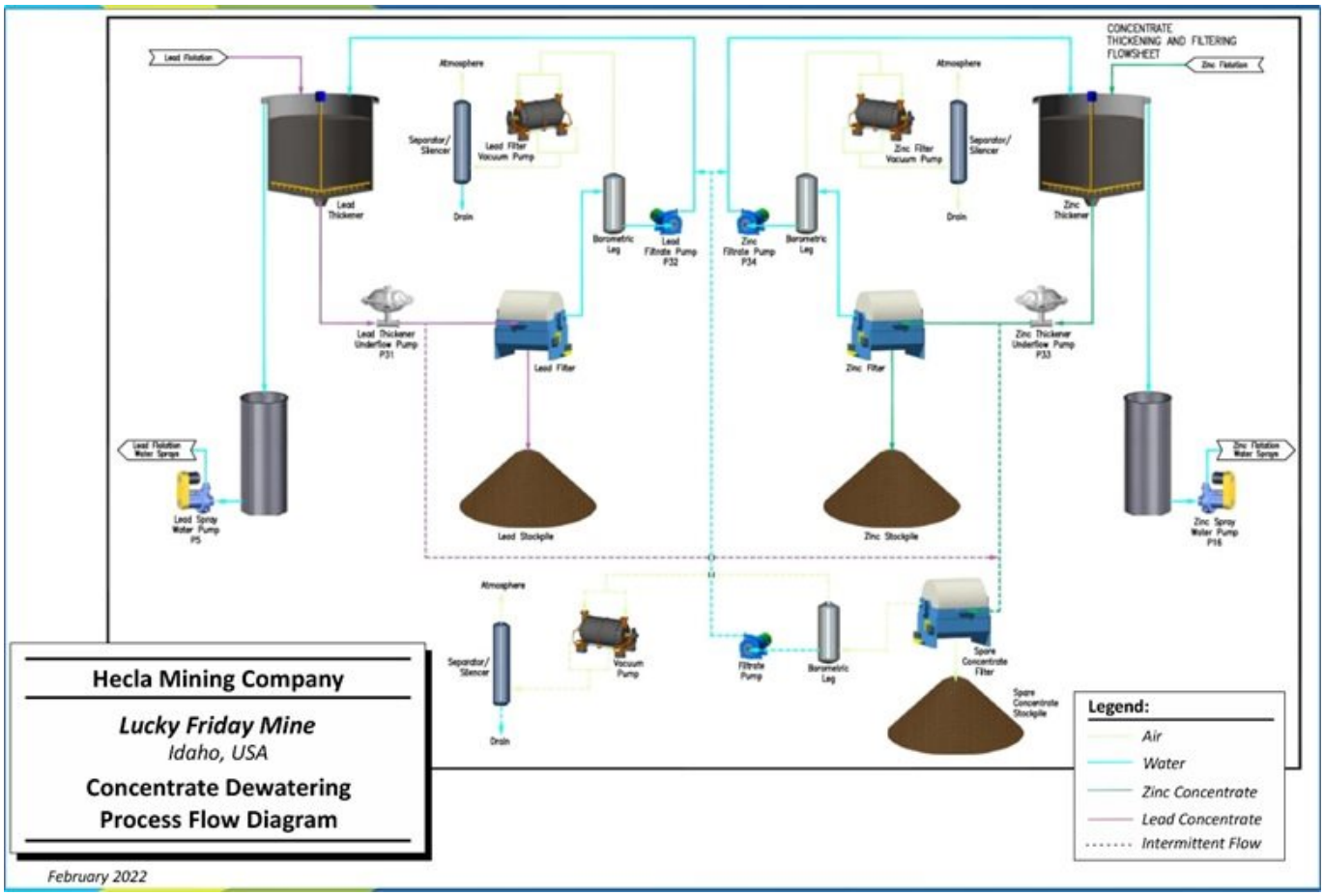
14.4 Concentrate Dewatering

After lead and zinc concentrates have passed through their respective samplers they enter the center well of the final concentrate thickeners. The lead and zinc concentrate handling systems are mirrored like the flotation circuits. Both thickeners are 12 ft diameter high-rate solid-liquid separators producing a bed of solids in the cone of the thickener. Concentrate thickener underflow at approximately 60% solids is pumped to the concentrate filters. Overflow water from the thickener re-enters the flotation circuit as spray water in the froth launders. Separate lead and zinc spray water systems are installed.

The paste discharging from the thickener is pumped by air powered diaphragm pumps to vacuum drum filter for each product. Silver concentrate is filtered by a drum filter equipped with a vacuum pump for dewatering to less that 8% moisture. Zinc concentrate is dewatered to approximately 6% moisture using the same method as the silver concentrate filter. The dry filter cake concentrate falls off of the filter drum into a bunker directly below it. Lead/silver concentrate and zinc concentrate are shipped in highway trucks to a smelter daily for further processing and refining.

Figure 14-5 shows the concentrate dewatering flow diagram.

During the seventy years of operation at Lucky Friday, regulations concerning worker exposure to dust and other air borne contaminates have evolved from none to the relatively stringent rules in place today. Hecla has responded to meet these regulations and is committed to providing a safe work environment. In the future, more stringent regulations may be imposed. It is not known if these potential changes will have a material effect on the concentrator operation or concentrate transportation.



Source: Hecla, 2014

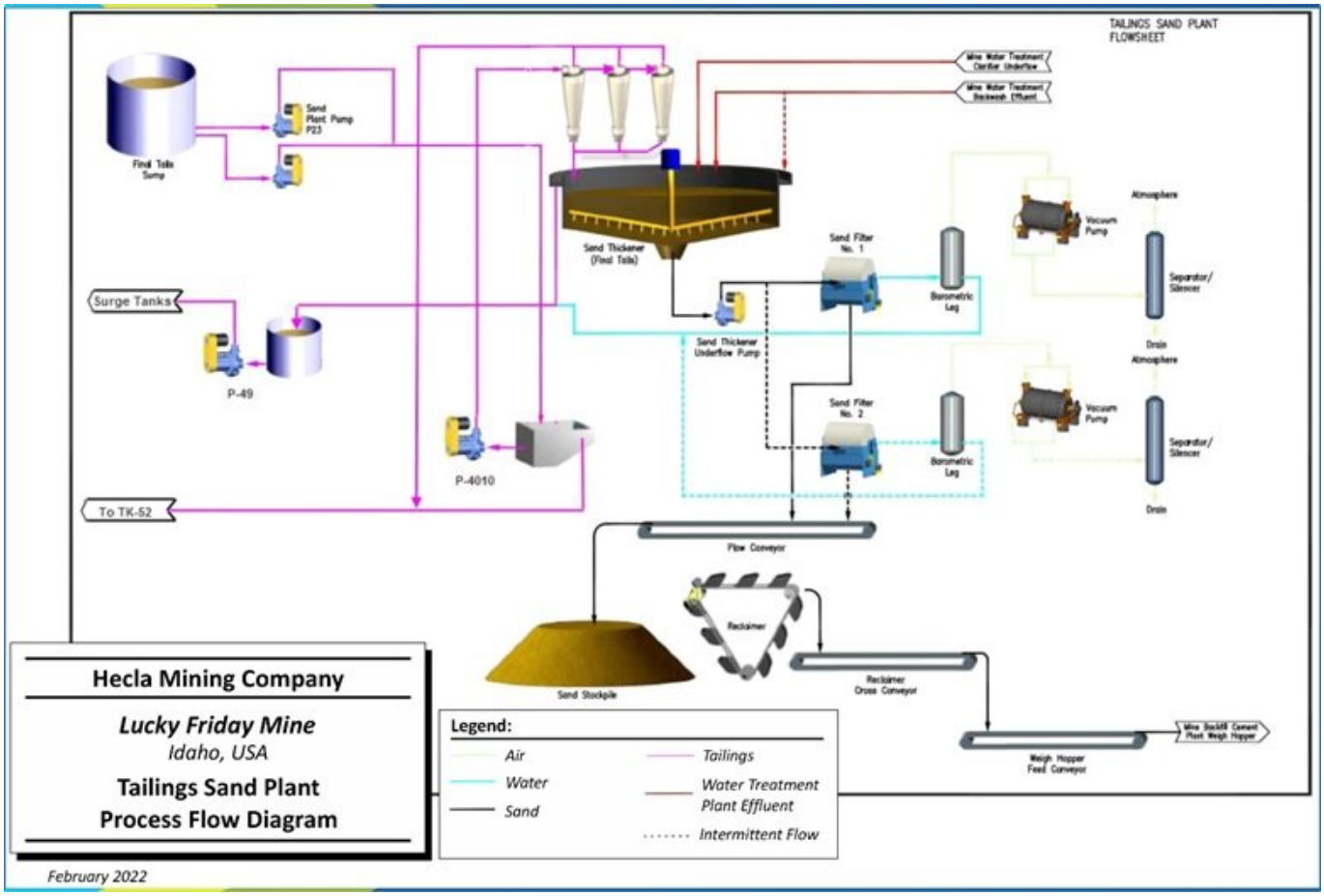
Figure 14-5: Concentrate Dewatering Process Flow Diagram

14.5 Tailings Dewatering and Disposal

All material entering the mill not reporting to concentrates is processed as final tails. The final tails stream is sampled as a 12 hour composite for assay. Final tailings produced by the concentrator flotation processes are handled in two separate ways, backfill and whole tails. First, the tails are classified by a cluster of cyclones with the coarse fraction (sand) dewatered, filtered, and the resultant sand is mixed with cement to backfill stopes in the underground mine.

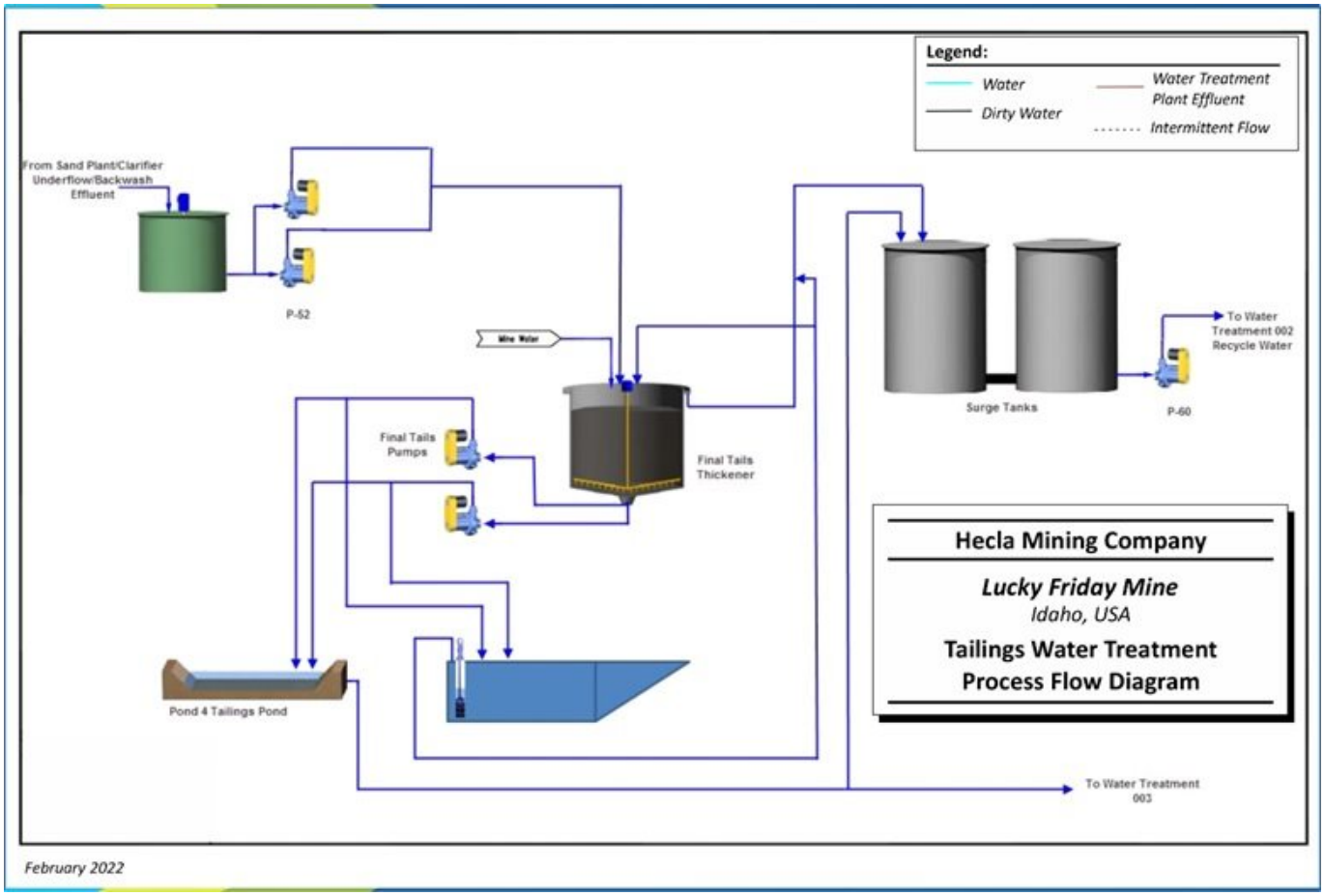
Figure 14-6 shows the sand plant flow diagram.

Whole tails report to the final tails thickener. Overflow of the thickener is reused as process water or sent to a water treatment plant for discharge while the higher solids underflow is pumped out to a tailings dam where the solids settle out of the tailings slurry and clear water is discharged via a water treatment plant into the Coeur d'Alene River. The final tails flowsheet is shown in Figure 14-7.



Source: Hecla, 2014

Figure 14-6: Tailings Sand Plant Process Flow Diagram



Source: Hecla, 2014

Figure 14-7: Tailings Water Treatment Process Flow Diagram

14.6 Water Systems

Make up water used in the process can be from the mine, reclaim water from the MTIS, or tailing thickener overflow depending on availability and system requirements. Lead and zinc concentrate thickener overflow are used as launder spray water for the respective system.

14.7 Water Treatment Plants

Excess water from the process or the MTIS is treated in one of two water treatment plants. Plant 002, located near the mill complex has a capacity of 375 gallons-per-minute (gpm). Plant 003, located near the No. 3 MTIS has a capacity of 750 gpm. The process to treat the water is the same at both plants. Water is treated with sodium sulfide solution and flocculent to facilitate removal heavy metals and suspended solids. The water is then processed through a lamella clarifier and the clarifier overflow is pumped through multi-media filters to remove the solids. The effluent is sampled for regulatory purposes and discharged as described in Section 17.0.

14.8 Mill Production

A summary of mill production and performance from 2016 through 2021 are presented in Table 14-1. The concentrator performed very consistently with steady lead, zinc and silver head grades, lead and zinc concentrate grades and recoveries through the period. The mill operated in the 38 stph (839 stpd) to 44 stph (971 stpd) range with a reported mill availability of 92%. Low production from 2017 through 2019 was due to labor issues.

Table 14-1: Hecla Lucky Friday Mill Production from 2016 through 2021
Hecla Mining Company – Lucky Friday Mine

Hecla Lucky Friday Mill Production	2016	2017	2018	2019	2020	2021
Ore milled, tons	293,875	70,718	17,309	57,091	179,208	321,837
Ag Contained, oz	3,730,620	875,614	186,609	675,280	2,124,369	3,744,719
Ag Feed Grade, oz/ton	12.7	12.4	10.8	11.8	11.9	11.6
Ag Produced, oz	3,596,010	838,658	169,041	632,944	2,031,874	3,564,128
Ag Recovery, %	96.4	95.8	90.6	93.7	95.6	95.2
Ag Payable, oz	3,365,540	781,506	162,546	565,923	1,892,954	3,325,313
Ag Rec, % (Payable)	90.2	89.3	87.1	83.8	89.1	88.8
*Ag Rec to Pb Conc, oz/ton	11.7	11.3	9.8	10.8	10.8	10.7
Ag Rec to Pb Conc, %	91.8	91.7	90.8	91.4	91.4	92.1
Ag Grade in Pb Conc, oz/ton	90.6	93.3	85.7	90.7	89.3	91.6
Pb Feed, tons	22,855	5,022	1,244	4,486	13,423	24,454
Pb Produced, tons	21,876	4,737	1,131	4,098	12,727	23,137
Pb Payable, tons	20,451	4,397	1,063	3,739	11,840	21,500
Pb Concentrate, tons	36,420	8,238	1,790	6,378	20,806	,37,768

Hecla Lucky Friday Mill Production	2016	2017	2018	2019	2020	2021
Pb Feed Grade, %	7.8	7.1	7.2	7.9	7.5	7.6
Pb Conc Grade, %	60.1	57.5	63.2	64.3	61.2	61.7
Pb Rec to Conc, %	95.7	94.3	90.9	91.4	94.8	94.6
*Pb Rec to Pb Conc, %	7.2	6.5	6.6	7.3	6.9	7.0
Pb Rec to Pb Conc, %	92.4	91.8	91.9	92.5	92.2	92.6
Pb Rec Payable, %	89.5	87.6	85.4	83.4	88.2	87.9
Zn Feed, tons	11,510	2,834	726	2,428	6,949	11,080
Zn Produced, tons	10,787	2,560	673	2,052	6,298	9,669
Zn Payable, tons	7,945	1,874	457	1,510	4,555	7,124
Zn Concentrate, tons	17,530	4,121	1,016	3,467	10,960	16,638
Zn Feed Grade, %	3.9	4.0	4.2	4.3	3.9	3.4
Zn Conc Grade, %	61.5	62.1	66.2	59.2	57.5	51.3
Zn Rec to Conc, %	93.7	90.4	92.7	84.5	90.6	89.9
*Zn Grade to Zn Conc, %	3.1	3.1	3.3	3.4	3.0	2.6
Zn Rec to Zn Conc, %	78.3	78.5	78.9	79.0	78.2	76.3
Zn Rec, Payable, %	69.0	66.1	62.9	62.2	65.5	64.3

*Values are based on established Lucky Friday metal distribution equations.

14.9 Process Workforce

Current processing manpower totals 78 and is summarized as follows:

- Plant operations – 39
- Mill maintenance/electrical – 21
- Mill supervision and technical services – 18

15.0 INFRASTRUCTURE

15.1 Access Roads

The Lucky Friday Mine is located immediately north of and adjacent to Interstate Highway 90, one mile east of Mullan, Idaho.

15.2 Power

Power is supplied to an on-site substation by Avista Utilities at 115 kVA. Peak electrical demand is approximately 11 MVA, with on average of 80% used underground, and the remaining 20% on surface. Underground power is supplied at 13.8 kVA cable in the Silver Shaft.

15.3 Water

The Lucky Friday operation uses approximately 450 gpm of water which is fully supplied by a year-round spring located above the mine site.

15.4 Accommodation Camp

There is no accommodation facility at the Lucky Friday mine. Workers are sourced from local communities.

15.5 Site Infrastructure

Mine surface and underground infrastructure is currently in serviceable condition and is in use. Repairs and improvements to facilities are included in the mine sustaining capital plan.

Surface infrastructure is shown in Figure 15-1.

15.5.1 Surface Infrastructure

Key Lucky Friday surface plant infrastructure includes the following installations:

- 1,000 tpd Ag/Pb/Zn flotation concentrator,
- Mine operations buildings and shops,
- Paste backfill mixing and pumping plant,
- Silver Shaft headframe and hoisting complex (primary mine access/intake ventilation),
- No. 2 Shaft hoisting facility (secondary escape/exhaust ventilation),
- Surface maintenance shop,
- Tailings transport and storage facilities,
- Two discharge water treatment plants,
- Electrical power substations and distribution lines,
- Compressed air supply system with a maximum capacity of 13,350 cfm
- And extensive surface laydown/parking/storage areas.

Tailings are stored in the Pond 4 Lift. Construction of this lift was completed in 2013 and the lift is projected to be full in October 2023. Hecla is working on Lift 3 permitting with planned construction in 2022. Pond 4 Lift 3 is estimated to be full in September 2026. Engineering and design of Pond 5 Lift 1 is planned for 2023 with construction in 2024-2025.



Figure 15-1: Infrastructure Layout

16.0 MARKET STUDIES

The Lucky Friday Mine produces silver contained in silver and zinc flotation concentrates. Lucky Friday is an active producer and has been for over 75 years.

16.1 Markets

16.1.1 Overview

Global mined zinc output is approximately 13 million metric tons metal per year, contained in approximately 25 million metric tons of zinc concentrate. Global zinc smelting capacity is approximately 14 million metric tons zinc metal per year and includes 1 million to 1.5 million metric tons of capacity to refine zinc secondary by-products into metal.

Global mined lead output is only approximately 4.6 million metric tons metal per year, contained in approximately 8 million metric tons of concentrates. Global lead smelting capacity is significantly higher at 6.7 million metric tons lead metal and also includes the capability to produce approximately 1 million metric tons lead metal from scrap and residues.

Hecla produces approximately 53,000 metric tons zinc and 44,000 metric tons lead metal in concentrates annually at its two mines in Alaska and Idaho. Hecla's total output comprises less than 1% of both global zinc mine capacity and global lead mine capacity. Because Hecla's concentrate products also contain significant amounts of payable gold and silver, they are sought after by smelters who capture additional value from recovering precious metals through processing and refining zinc and silver concentrates. The current market for Hecla concentrate products is both very liquid and very strong, globally. Hecla's primary customer base operates in Korea, Japan, Canada and China. Its concentrate products have also been exported to and processed in Mexico, Belgium, Italy, England, Germany and the Netherlands.

Global silver supply is approximately 1 billion ounces with mine production accounting for around 80% of silver supply. The majority of silver produced is as a by-product of lead, zinc, copper and gold mines. According to the Silver Institute, lead-zinc mines are the biggest contributors to global silver supply, accounting for about 32% of silver mine production in 2020. Mexico, China and Peru produce 50% of world's silver, while the United States accounts for only 4% of world silver production.

Silver demand is primarily composed of Industrial demand, which accounts for 50% of total silver demand of 1 billion ounces. Investment demand (physical and exchange traded products) and jewelry and silverware account for 25% share each respectively. Silver has the highest electrical conductivity of all metals and this property positions silver as a unique metal for multitude of uses in electronic circuitry in automotive and electronics. Silver's use in photovoltaic cells has also seen a rapid expansion in the past 5 years and is expected to be one of the key growth areas in green energy.

Gold supply is approximately 165 Moz, with mine production contributing 75% of gold supply and recycling accounting for the remaining 25%. In terms of gold demand, jewelry fabrication accounts for approximately 55% of total demand while Investment in physical bars, coins and Exchange Traded Funds is at 25% of overall demand. Gold's use in technology applications was around 11 Moz, or 8% of total demand in 2021, according to the World Gold Council. Accommodative fiscal and monetary policies globally due to COVID-19 lent support to investment demand for gold in 2020 as gold prices reached record levels in 2020.

16.1.2 Commodity Price Projections

Metal prices used in the estimation of Mineral Resources and Mineral Reserves are determined by Hecla's corporate office in Coeur d'Alene, Idaho, USA. Lucky Friday Mineral Reserves are estimated using a silver price of $17.00/oz, lead price of $0.90/lb and a zinc price of $1.15/lb. Mineral Resources are estimated using a silver price of $31.00/oz, lead price of $1.15/lb and a zinc price of $1.35/lb. The difference in prices is the result of a longer historical period used as the basis for the Mineral Resource estimation.

Table 16-1 shows the realized metal prices Hecla has received for sales of its products.

Table 16-1: Hecla Historical Average Realized Metal Prices
Hecla Mining Company – Lucky Friday Mine

Metal Prices	2019	2020	2021	3 Year Avg.
Silver ($/oz)	16.65	21.15	25.24	21.01
Lead ($/lb)	0.91	0.84	1.03	0.93
Zinc ($/lb)	1.14	1.03	1.44	1.20
Gold ($/oz)	1.413	1,757	1,796	1,655

The economic analysis performed in the LOM plan assumes an average silver price of $21.00/oz, lead price of $0.95/lb and a zinc price of $1.25/lb based upon analysis of consensus metal price forecasts by financial institutions. Based on macroeconomic trends, the SLR QP is of the opinion that Hecla's realized metal pricing will remain at least at the current three -year trailing average or above for the next five years.

16.2 Contracts

16.2.1 Concentrate Sales

Concentrates produced at the Lucky Friday mill are transported 209 mi to the Teck lead-zinc smelter in Trail, British Columbia, Canada in highway trucks operated by a contract shipper. The shipping contract commenced in 2017 and was amended in July 2021 to increase rates and to incorporate a bonus for drivers based upon safe performance and absence of traffic violations. Shipping rates are considered to be competitive and within industry norms.

Hecla has a frame contract with Teck that is dated January 1, 2021. The sales contract is commingled with the smelting/refining agreement, as Hecla sells 100% of Lucky Friday production to the smelter. No concentrate brokers are used, though representatives and umpires provide settlement assistance services from time to time. Treatment costs and refining costs vary depending on the concentrate type.

16.2.2 Forward Sales

Hecla uses financially-settled forward contracts to manage the exposure to:

- changes in prices of silver, gold, zinc and lead contained in our concentrate shipments between the time of shipment and final settlement; and
- changes in prices of zinc and lead (but not silver and gold) contained in our forecasted future concentrate shipments.

These forward contracts are not designated as hedges for accounting purposes. At the time of this TRS, the forward contracts in place cover the period to the end of the first quarter of 2024 for lead and to the end of 2024 for zinc. The contracts are summarized in Table 16-2.

Table 16-2: Lead and Zinc Forward Sales Summary
Hecla Mining Company – Lucky Friday Mine

		Unit	Total / LOM	2022	2023	2024
Lead	Hedged	tons	44,427	19,650	23,150	1,626
	% of LOM payable Pb	%	11%	64%	67%	5%
	Hedge price	US$/lb	0.99	0.98	1.00	0.97
Zinc	Hedged	tons	14,334	4,785	5,715	3,833
	% of LOM payable Zn	%	11%	58%	70%	42%
	Hedge price	US$/lb	1.30	1.30	1.30	1.31

16.2.3 Other Contracts

Hecla crews perform all mining and milling duties with the exception of specialty construction. For these project-oriented efforts, contractors with particular expertise relating to the work being done are retained to do the work. In some cases, these are design-build contracts, in others, purely construction. Hecla also contracts with various consultancies and engineering firms for studies and design work as needed to augment the skills of the in-house staff.

17.0 ENVIRONMENTAL STUDIES, PERMITTING, AND PLANS, NEGOTIATIONS, OR AGREEMENTS WITH LOCAL INDIVIDUALS OR GROUPS

Lucky Friday has a well-established and effective environmental and permitting management program. Staff is knowledgeable and experienced in site and regulatory requirements. Budgets are reasonable and there were no critical path permitting items referenced that would limit production. A reclamation/closure plan and estimates to perform this activity are in place. The budgets and staffing to perform required programs are adequate and indicative of activities and responsibilities.

17.1 Environmental Studies and Monitoring

Unlike many other mines and jurisdictions in the US, activities and facilities at the Lucky Friday operations predate the requirement for establishment of environmental baseline(s). Regardless, there are still monitoring programs in place to assess compliance with permits and standards.

Lucky Friday reports experiencing a number of alleged permit exceedances for water discharges (NPDES and MSGP) at the mine. Lucky Friday received an EPA Notice of Violation for non-compliance with the NPDES Permit and various unpermitted discharges exceeding the maximum daily standard for lead (50 µg/L). In all instances, Lucky Friday has worked cooperatively with EPA to resolve these issue(s).

Lucky Friday falls under Hecla's Environmental Management System (EMS) which follows a 13-element plan-do-check-act approach that ensures continuous improvement around issues including obligation registers, management of change, air quality, water and waste management, energy management, training, and reporting. This system promotes a culture of environmental awareness and innovation throughout the company. The EMS program is benchmarked against ISO-14001 and complements Canada's Towards Sustainable Mining (TSM) program.

Internal and external audits are performed to assess compliance with corporate, permit, regulatory and industry requirements. Findings are documented and tracked.

17.2 Permitting

Permitting Operations at the Lucky Friday fall within the purview of numerous entities (regulatory and non-regulatory), including state and federal environmental agencies that require oversight, registration, and/or notification prior to initiating or significantly modifying facilities and operations at the mine. All necessary registrations, authorizations and permits required for operations to date, and for continued operation of this facility, are in place. Although some permits have expired or are set to expire, renewal applications are filed with the appropriate agency in each case or other measures were taken, as necessary, to administratively extend the prior conditions until such time as a renewed permit or additional authorization to utilize is issued.

Listed below in Table 17-1 are the permits that Lucky Friday has in place.

Table 17-1: Permits and Authorizations
Hecla Mining Company – Lucky Friday Mine

Type of Approval/Permit	Reference #	Agency	Purpose	Date of Approval
Certificate of Authorization	IDR053139	USEPA	Authorization to utilize Nationwide MSGP	9/29/2008
*Authorization to Discharge	ID-000017-5	USEPA	NPDES Wastewater Discharge for Outfalls 001, 002, 003	9/14/2003
DOT HazMat Registration	052912002005U	USDOT	Registration for Category E Material Shipper	5/30/2012
General Registration	ID000390	IDWR/USACOE	ID used to identify MTIS #3 in National Dam Inventory	N/A
General Registration	ID000728	IDWR/USACOE	ID used to identify MTIS #4 in National Dam Inventory	N/A
Certificate of Approval	94-xx20	IDWR	IDWR Issued Cert. of Approval to impound water and tails in MTIS #3	8/27/2020
Certificate of Approval	94-xx25	IDWR	IDWR Issued Cert. of Approval to impound water and tails in MTIS #4	8/27/2020
PWS ID No.	1400028	IDEQ	IDEQ designation of PWS System operation	2/6/1995
Operating Permit	731-10-000113	Idaho Fish & Game	Permit to Operate Private Fish Pond	6/21/2010
Waste Generator's Status	IDD009424862	USEPA	Majority of time Lucky Friday is a CESQG. However, periodic projects may trigger status as a SQG	N/A

Lucky Friday is evaluating alternatives and designs for meeting a proposed new discharge standard for copper. Currently, Lucky Friday is piloting two types of advanced treatment technologies to reach the final Biotic Ligand Model (BLM) based copper effluent limits in the most recent updated individual NPDES Permit. The BLM based limits are significantly lower than the previous hardness-based limits in the expired permit. The Permit explains the difference of BLM and hardness-based effluents and how and when the BLM was introduced to the State's water quality standards.

Lucky Friday is evaluating two types of treatment: 1) ion exchange and 2) ultra-filtration. Sampling to date indicate that copper is primarily in the colloidal phase especially after treatment with the organo-sulfide PTB-50. It is understood that both treatment options are viable, and Luck Friday is testing both for efficacy and efficiency.

In addition to the above efforts to test advanced water treatment technologies, Lucky Friday has been working on collecting site specific data to re-run the BLM and Dissolved Metal Translator in an attempt to revise the final permit limits which are effective after a five-year compliance window.

17.2.1 Site Monitoring

Lucky Friday operates through permission granted by multiple permits, which are summarized in Table 17-1. The permits contain requirements for site monitoring including air, water, waste, and land aspects of the Property. The permit-required data are maintained by the facility, and exceptions to the monitoring obligations are reportable to the permitting authority. Monitoring is conducted in compliance with permit requirements, and management plans are developed as needed to outline protocols and mitigation strategies for specific components or activities.

17.2.2 Water

The mine has operated under an EPA issued NPDES Permit regulating the point source discharges from three existing process water outfalls (Outfall 001, Outfall 002, and Outfall 003) since 1973.

The Property maintains a single authorization to utilize the MSGP issued by the EPA. This currently active authorization is applicable to discharges of stormwater runoff from all areas of the mine including development rock stockpiles, support facilities, access roads, and nearby borrow pit developed to supplement materials used to construct impoundment structure embankments.

17.2.3 Hazardous Materials, Hazardous Waste, and Solid Waste Management

Lucky Friday manages its hazardous materials, hazardous wastes and solid wastes in accordance and compliance with issued permits and applicable regulatory requirements.

17.2.4 Tailings Disposal, Mine Overburden, and Waste Rock Stockpiles

All mine waste rock is eventually used for construction of tailings impoundments. The volume requirement for the impoundment structures far exceeds the volume of waste rock that the mine produces and additional material is added from on-site borrow pits and off-site quarries, as needed. Pond construction is an annual activity occurring during the late spring/summer/fall construction season. Plans going forward have construction activity in progress through the end of the mine life. All waste produced by the mine is expected to be consumed in this fashion. MTIS No. 4 is equipped with a gravel blanket and toe drain system located in the foundation of the dam. This feature is designed to intercept meteoric waters which infiltrate into the embankment and transport it to the water treatment plants.

Before being used in impoundment construction, mine waste rock is temporarily stored in two areas: the mine waste dump located near the Silver Shaft and the Silver Mountain storage area that is situated between the mine and the tailings impoundment area. Waste is dumped on surface until the waste dump is full, and then trucked either to the impoundment construction area or temporarily stockpiled. Excess waste is temporarily stored at the Silver Mountain storage area until it can be incorporated into the impoundment structure. This process addresses fluctuations in impoundment construction material demand.

17.3 Reclamation and Closure

The strategy of the Lucky Friday Reclamation and Closure Plan is to return disturbed areas to either a near-natural condition, or condition amenable to future industrial use depending on location and potential future beneficial use options. Individual areas have been assessed for future value added to the City of Mullan and surrounding area. Key buildings and land will be retained for long-term water treatment. Provisions for operational support during the post-closure period are included in the cost estimate.

17.3.1 Reclamation and Permit Requirements

The State of Idaho currently requires reclamation of Mine Tailings Impoundment Structures (MTIS). Those structures are regulated by State-Specific regulations and by Idaho Department of Water Resources (IDWR). IDWR require MTISs to be "abandoned" (i.e., limited reclamation) in a stable and maintenance free condition as defined by Idaho Administrative Procedures Act (IDAPA) 37.03.05 (Rule 45), for which these structures are bonded (IDAPA 37.03.05, Rule 40). The abandonment and reclamation of MTIS 1 and 2 (per IDWR requirements) was completed in 2013 and 2012, respectively.

Lucky Friday is situated completely on privately owned ground. In 2019, the Idaho Department of Lands (IDL) adopted the temporary rule (IDAPA 20.03.02) which was intended to prevent new or expanded underground mines from becoming public hazards if they are abandoned. A recently approved (July 1st, 2021) Idaho rulemaking (IDAPA 20.03.02) requires underground mines which existed prior to July 1, 2019, to develop a reclamation plan if the mine expands its surface disturbance by 50% or more after that date. The final rule requires State approval of a reclamation application that will include total reclamation cost financial assurances, planned reclamation of disturbed sites, and a water management plan for underground mines that expand their surface disturbance by 50% or more.

SLR notes that the final rule does not apply to underground mines that existed prior to July 1, 2019, and have not expanded their surface disturbance by 50% or more after that date. Currently, Lucky Friday has no plans to expand the site that will reach the relevant threshold.

17.3.2 Reclamation and Closure Cost

The Lucky Friday operation has developed a Closure, Reclamation, Post-Closure, and Cost Estimate Plan (Plan). This Plan is intended to satisfy three distinct objectives:

1. Return surface disturbed areas to a stable and productive condition following mining;
2. Provide for public safety; and,
3. Protect long-term land, water and air resources in the area.

The most recent version of the Plan was updated in 2020 and utilized the 2021 LOM plan to estimate the schedule for post closure activities. The updated 2021 LOM plan has forecasted production to 2035. Major closure and reclamation activities are assumed to begin the year following the cessation of production (2037) and last for approximately three years. Post-Closure activities primarily consist of long-term water treatment and monitoring immediately following closure and extending for a period of 30 years.

The most recent cost estimate (2021) to meet these objectives of the current plan is $39,869,900. Reclamation and closure plans have been submitted to the appropriate agencies. Asset Retirement Obligation (ARO) legal obligations are updated regularly and based upon existing site conditions, current laws, regulations and costs to perform the permitted activities. The ARO is to be conducted in accordance with Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 410.

Finally, it is noted that Lucky Friday has developed a Reclamation/Closure plan that addresses facilities and activities even when there is no specific regulatory requirement to do so.

17.4 Social Governance

The Lucky Friday operation has been investing in the region for many decades, including direct employment and contributions to state and local taxes. SLR is not aware of any formal commitments to local procurement and hiring but Lucky Friday has indicated they have long-standing relationships with local vendors, and where possible also purchase through local and regional services and supplies.

Lucky Friday looks for opportunities to work collaboratively with stakeholders to support activities that are of benefit to the communities in which the company operates.

SLR was not able to independently verify adequacy of management of social issues and though no specific adversarial issues were raised, it was relayed by staff that Lucky Friday, in most cases, has a positive relationship with stakeholders. In the event of a complaint, Lucky Friday works directly with affected community member(s) to develop a mutually acceptable resolution.

Public affairs representatives from Lucky Friday formally engage with the community on an ongoing basis and serve as the face of the company. They sit on boards of community and business organizations at regional and local levels, participate in discussions with government officials, and act as a point of contact within the community. In doing so, they keep stakeholders apprised of critical issues to the operations, understand important topics in the community, and seek to listen to any questions or concerns. Lucky Friday indicated that this strategy allows them to maintain an ongoing relationship with stakeholders and collaborate with communities to find solutions should any issues arise.

18.0 CAPITAL AND OPERATING COSTS

Hecla's forecasted capital and operating costs estimates are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would be classified as Class 1 with an accuracy range of 3% to -10% to +3% to +15%, albeit with some variances to be expected in near term with the operation coming back to full production after the recent labor strike.

18.1 Capital Costs

The Lucky Friday Mine is in operation and there is no pre-production capital. The capital is summarized in Table 18-1.

Table 18-1: Capital Cost Summary
Hecla Mining Company – Lucky Friday Mine

Year	Total	2022	2023	2024	2025	2026	27 to 38
($ millions)		**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**(Years 6 to 13)**
Drilling	27.0	3.0	3.0	3.0	3.0	2.0	13.0
Major Projects	75.0	24.0	5.0	12.0	7.0	3.0	24.0
Ore processing	13.0	2.0	7.0	3.0	0.0	1.0	0.0
Mobile Equipment	41.0	5.0	8.0	7.0	2.0	2.0	17.0
Mine Development	200.0	14.0	11.0	21.0	23.0	16.0	115.0
Mine infrastructure	16.0	3.0	6.0	3.0	1.0	2.0	1.0
Total	**372.0**	**51.0**	**40.0**	**49.0**	**36.0**	**26.0**	**170.0**

The major elements of the capital plant include:

- Development $135 million
  - Four accesses to support mining in 30 Vein
  - Delays or reduction may result in shortfalls in meeting the production plan
- #2 Shaft Renovation $28 million
  - Pipe and timber replacements to meet regulatory requirements as this shaft provides the second egress and exhaust ventilation way.
- Pre-production drilling $28 million
  - Pre-production drilling for areas to be mined and to guide the 7500 level mine development.
  - The drilling is expected to increase the confidence in the mine plan and to reduce unplanned dilution.
- Construction $26 million
  - Construction of facilities to support production on 6500 and 7500 levels including shops warehouse areas, air coolers and more.

- Pond 4 and Pond 5 tailings storage facility (TSF) $32 million
  - Design, engineering and construction of ponds 4 and 5.
- Silver shaft service hoist $8 million
  - Installation of conveyance for men and materials, hoist replacement and improvements to hoisting capacity.

The capital estimates have been prepared by mine personnel and contractors. The capital programs will be managed by the mine personnel. Contingency is not included in the capital estimates.

The SLR QP considers the capital plan to be appropriate for the mine. Delays in a number of the projects may reduce the ability to achieve the LOM plan and certain items such as maintaining the second access and ensuring sufficient tailings storage are critical to the continued operation.

Working capital costs, composed of accounts receivable, accounts payable, and product and supply inventories, are included in the mine cash flow and net to zero over the LOM. Accounts receivable balances fluctuate based upon period-end sale amounts and the average duration of time between shipments and receipt of payment. Accounts payable vary over time based upon the average portion of a period's expenditures that are typically unpaid at the end of the period. Inventory values fluctuate based upon the estimated quantities of product produced and the average duration of time between production and sale of products. Depending on the assumptions in the LOM, the working capital variation at the end of the mine life can be positive or negative. In the case of the Lucky Friday Mine, Hecla expects the end-of-life accounts payable to be greater than the other working capital items, such that an estimated $4.3 million cost to draw down working capital to zero will be incurred.

18.2 Operating Costs

18.2.1 Operating Cost History

The operating costs for the mine for the period 2016 to October 2021 YTD are summarized in Table 18-2. Unit costs are not shown for 2017 through 2019 as the mine was not in full operation. Furthermore, the 2020 costs reflect a restart period as operations were restarted in January 2020.

Table 18-2: 2016 to 2021 Operating Cost Data
Hecla Mining Company – Lucky Friday Mine

	Units	2016	2017	2018	2019	2020	2021
Production Costs							
Mining	$ millions	22.4	6.0	3.2	3.5	17.3	27.3
Concentrator	$ millions	5.4	2.9	1.6	1.0	5.0	7.3
Maintenance	$ millions	11.5	7.4	4.7	3.4	16.1	17.2
General Plant	$ millions	14.4	11.9	8.6	10.5	10.4	11.2
Profit sharing	$ millions	6.3	1.3	-	-	0.8	3.5
Total	**$ millions**	**60.0**	**29.5**	**18.1**	**18.4**	**49.6**	**66.5**
Cost per ton milled							
Mining	$/ton	76.46	n/a	n/a	n/a	96.97	84.80
Concentrator	$/ton	18.20	n/a	n/a	n/a	27.76	22.68
Maintenance	$/ton	39.22	n/a	n/a	n/a	89.59	53.43
General Plant	$/ton	48.89	n/a	n/a	n/a	57.89	34.79
Profit sharing	$/ton	21.54	n/a	n/a	n/a	4.46	10.87
Total	**$/ton**	**204.31**	**n/a**	**n/a**	**n/a**	**276.68**	206.57

18.2.2 Operating Cost Estimate

The forecasted LOM operating costs totaling $187.81/t milled are summarized in Table 18-3.

Table 18-3: Operating Cost Summary
Hecla Mining Company – Lucky Friday Mine

Item	Units	Total	2022	2023	2024	2025	2026 to 2038
Production Costs							
Mining (Underground)	$ millions	415.3	29.3	32.0	29.9	29.2	294.8
Processing	$ millions	117.5	8.7	8.9	8.2	7.8	83.9
Maintenance	$ millions	269.9	20.3	20.6	19.9	18.2	190.9
G&A	$ millions	182.7	13.4	13.1	11.9	11.2	133.2
Profit share	$ millions	39.4	2.9	3.0	2.8	2.7	28.1
Total	**$ millions**	**1,024.7**	**74.5**	**77.6**	**72.7**	**69.0**	**731.0**
Cost per ton milled							
Mining (Underground)	$/ton	76.11	86.11	78.32	74.27	73.57	75.45
Processing	$/ton	21.54	25.44	21.88	20.42	19.63	21.47
Maintenance	$/ton	49.46	59.67	50.39	49.35	45.76	48.86
G&A	$/ton	33.48	39.22	31.94	29.56	28.06	34.10
Profit share	$/ton	7.22	8.42	7.30	6.94	6.68	7.20
Total	**$/ton**	**187.81**	**218.86**	**189.84**	**180.54**	**173.69**	**187.08**

18.2.3 Workforce Summary

The current Lucky Friday workforce totals 362 persons as of January 2022. The breakdown by department is shown in Table 18-4 consisting of 86 salaried and 276 hourly employees, of which the majority of the hourly employees have the United Steelworkers, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial, and Service Workers International Union as their bargaining agent as of December 31, 2021.

Table 18-4: Current Manpower
Hecla Mining Company – Lucky Friday Mine

	Hourly FTE	Salary FTE	Total
Mine	178	16	194
Plant	39	12	51
Maintenance	59	16	75
G&A	0	42	42
Total	**276**	**86**	**362**

The Lucky Friday full time equivalent (FTE) workforce for 2020, 2021, and the LOM plan is summarized in Table 18-5. The 2020 workforce levels reflect the start-up of the mine after the strike.

Table 18-5: LOM Manpower Levels
Hecla Mining Company – Lucky Friday Mine

	Hourly FTE	Salary FTE	Total
2020 Actual	241	86	327
2021 Actual	276	86	362
2022	292	105	397
2023	300	105	405
2024 – 2035	288	94	382

SLR notes that in terms of tonnage (ore plus waste) mined per day, the 2022 performance requires a 15% increase in productivity compared to the 2021 performance. The SLR QP is of the opinion that if the productivity does not increase it will be necessary to increase the number of employees. This may be a difficult task considering the skilled nature of the work and the worldwide demand for skilled personnel. SLR considers the required increase in productivity to pose a potential risk to meeting the LOM plan.

19.0 ECONOMIC ANALYSIS

19.1 Economic Criteria

An after-tax Cash Flow Projection has been generated from the LOM production schedule and capital and operating cost estimates, and is summarized in Table 19-2. A summary of the key criteria is provided below.

19.1.1 Physicals

- Total mill feed processed: 5.5 Mst
- Average processing rate: 892 stpd with following production profile (Table 19-1).

Table 19-1: Production Summary
Hecla Mining Company – Lucky Friday Mine

Commodity	Head Grade	% Recovery	Recovered Metal	Annual Production	Payable Metal
Silver	13.7 oz/ton	96.4	72.0 Moz	4.2 Moz	67.4 Moz
Lead	8.3%	95.7	866 Mlb	51 Mlb	811 Mlb
Zinc	3.3%	93.7	340 Mlb	20 Mlb	251 Mlb

19.1.2 Revenue

- Metal prices used in the economic analysis are constant US$21/oz Ag, US$0.95/lb Pb, and US$1.25/lb Zn.
- Revenue is calculated assuming the above metal price forecast and incorporates a $1.8 million hedge gain for lead and zinc over the first three years of cash flow.
- Average LOM concentrate freight cost: $47/wet ton Cost, Insurance, and Freight (CIF) basis to customer's discharge points.
- Average LOM treatment charge: $139/dmt silver concentrate plus $3.90/dmt for antimony penalty, $162/dmt zinc concentrate, and $8.70/dmt for iron and mercury penalties.
- Average LOM refining costs for concentrates: $0.10/dmt.

19.1.3 Capital and Operating Costs

- Mine life of 17 years
- LOM sustaining capital costs of $372 million
- LOM site operating cost of $187.81/ton milled (excludes financing and corporate overhead costs)
- LOM closure/reclamation $38.7 million in year after final production

19.1.4 Taxation and Royalties

Mining companies doing business in Idaho are primarily subject to U.S. corporate income tax, Idaho State income tax and Idaho Mining License tax. The State of Idaho levies a mining license tax on mining net income received in connection with mining properties and activities in Idaho, at a rate of 7%. The U.S. corporate income tax rate is 21% and the Idaho state income tax rate is 6.5%.

No income tax is anticipated to be payable over the LOM. Hecla will use a combination of existing and forecasted depreciation expense, allocation of expenses from other entities within the consolidated tax group, percentage depletion allowances, and existing net operating losses to generate zero annual taxable income through the LOM. However, the Lucky Friday Mine will still incur $4 million for Idaho state mining taxes during the LOM.

The current production zones in the LOM are not subject to any royalty to a third party/previous landowner.

19.2 Cash Flow Analysis

SLR has reviewed Hecla's Lucky Friday Reserves only model and has prepared its own unlevered after-tax LOM cash flow model based on the information contained in this TRS to confirm the physical and economic parameters of the mine.

The Lucky Friday economics have been evaluated using the discounted cash flow method by considering annual processed tonnages and grade of ore. The associated process recovery, metal prices, operating costs, refining and transportation charges, and sustaining capital expenditures were also considered.

The indicative economic analysis results, presented in Table 19-2 with no allowance for inflation, show a pre-tax and after-tax NPV, using a 5% discount rate, of $557 million and $554 million, respectively. The SLR QP is of the opinion that a 5% discount/hurdle rate for after-tax cash flow discounting of long lived precious/base metal operations in a politically stable region is reasonable and appropriate and commonly used. For this cash flow analysis, the internal rate of return (IRR) and payback are not applicable as there is no negative initial cash flow (no initial investment to be recovered) since Lucky Friday has been in operation for a number of years.

Project Timeline				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Commercial Production Timeline in Years				2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Time Until Closure in Years		US$ & US Units	LoM Avg / Total	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	-1
Market Prices																					
Silver		US$/oz	$23.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Lead		US$/lb	$0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Zinc		US$/lb	$1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Physicals																					
Total Ore Processed		kt	5,456	340	406	403	397	386	355	393	411	289	352	368	427	345	299	180	129	68	-
Silver Grade, Processed		opt	13.7	12.9	14.2	14.4	13.1	15.5	17.1	14.5	12.0	11.9	14.3	13.6	13.3	12.9	13.0	12.4	11.4	11.6	-
Lead Grade, Processed		%	8.3	9.0	9.9	9.8	8.2	9.6	11.4	9.6	8.0	7.3	7.7	7.1	7.4	6.2	5.2	6.1	8.8	10.7	-
Zinc Grade, Processed		%	3.3	4.0	3.4	3.2	4.1	3.2	3.7	4.1	3.3	3.0	2.4	2.3	2.6	2.8	3.4	3.3	2.8	3.2	-
Contained Silver, Processed		koz	74,699	4,399	5,799	5,806	5,223	6,041	6,064	5,682	4,933	3,446	5,041	5,029	5,670	4,432	2,724	2,232	1,321	796	-
Contained Lead, Processed		kst	453	31	37	35	32	39	41	38	33	21	27	26	32	21	11	11	11	7	-
Contained Zinc, Processed		kst	181	14	14	15	16	14	13	16	14	9	9	9	11	10	7	6	3	3	-
Average Recovery, Silver		%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	96.4%	–
Average Recovery, Lead		%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	95.7%	–
Average Recovery, Zinc		%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	93.7%	–
Recovered Silver		koz	72,003	4,240	5,589	5,597	5,034	5,823	5,845	5,487	4,755	3,322	4,859	4,847	5,465	4,272	2,626	2,152	1,321	768	-
Recovered Lead		kst	433	29	35	34	31	37	39	36	32	20	26	25	30	21	10	11	10	7	-
Recovered Zinc		kst	179	13	13	14	15	13	12	15	13	8	8	8	10	9	7	5	3	2	-
Payable Silver		koz	67,426	3,961	5,235	5,239	4,702	5,454	5,479	5,131	4,448	3,110	4,562	4,550	5,126	4,006	2,457	2,014	1,237	717	-
Payable Lead		klb	809,546	55,141	66,106	63,533	58,003	69,002	72,293	67,397	59,270	37,619	48,352	47,247	56,633	38,435	19,365	19,662	18,913	13,173	-
Payable Zinc		klb	251,454	18,972	19,081	20,416	22,798	19,694	18,270	22,114	18,889	11,979	11,928	11,938	15,542	13,524	9,927	8,124	4,845	3,488	-
Cash Flow																					
Silver Gross Revenue	57%	$000s	1,415,840	83,177	109,938	110,019	98,741	114,544	115,050	107,752	93,403	65,309	95,805	95,560	107,640	84,065	51,605	42,288	25,971	15,054	-
Lead Gross Revenue	31%	$000s	770,019	52,586	62,801	60,357	55,103	65,552	69,068	64,027	56,390	35,729	45,934	44,885	53,802	36,513	18,397	18,678	17,968	12,515	-
Zinc Gross Revenue	13%	$000s	314,317	23,715	23,852	25,519	28,498	24,617	22,837	27,642	23,594	14,974	14,911	14,923	18,428	16,905	12,409	10,155	6,057	4,372	-
Zinc and lead hedge gain/(loss)		$000s	1,800	(1,836)	2,348	1,288	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross Revenue Before By-Product Credits	**100.0%**	**$000s**	**2,502,075**	**157,440**	**198,939**	**197,183**	**182,341**	**204,713**	**206,955**	**199,421**	**173,234**	**116,012**	**156,649**	**155,368**	**180,870**	**137,503**	**82,410**	**71,121**	**49,996**	**31,941**	-
Silver Gross Revenue		$000s	1,415,840	83,177	109,938	110,019	98,741	114,544	115,050	107,752	93,403	65,309	95,805	95,560	107,640	84,065	51,605	42,288	25,971	15,054	-
Lead Gross Revenue		$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc Gross Revenue		$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross Revenue After By-Product Credits		**$000s**	**1,415,840**	**83,177**	**109,938**	**110,019**	**98,741**	**114,544**	**115,050**	**107,752**	**93,403**	**65,309**	**95,805**	**95,560**	**107,640**	**84,065**	**51,605**	**42,288**	**25,971**	**15,054**	-
Mining Cost		$000s	(415,258)	(29,310)	(32,000)	(28,900)	(29,230)	(29,700)	(29,700)	(26,359)	(26,359)	(26,359)	(26,359)	(26,359)	(26,359)	(26,359)	(19,769)	(14,827)	(14,827)	(1,483)	-
Process Cost		$000s	(117,591)	(8,669)	(8,949)	(8,229)	(7,809)	(8,219)	(8,210)	(7,553)	(7,553)	(7,553)	(7,553)	(7,553)	(7,553)	(7,553)	(5,665)	(4,249)	(4,249)	(425)	-
Maintenance Cost		$000s	(268,868)	(29,310)	(29,599)	(19,879)	(18,180)	(18,700)	(18,700)	(17,189)	(17,189)	(17,189)	(17,189)	(17,189)	(17,189)	(17,189)	(17,189)	(12,892)	(9,669)	(9,668)	(967)	-
G&A Cost		$000s	(182,697)	(13,359)	(13,059)	(11,909)	(11,159)	(11,659)	(11,659)	(11,659)	(11,659)	(11,659)	(11,659)	(11,659)	(11,659)	(11,659)	(11,659)	(8,738)	(6,553)	(6,553)	(6,553)	-
Profit Share		$000s	(39,413)	(2,865)	(2,983)	(2,796)	(2,654)	(2,730)	(2,730)	(2,510)	(2,510)	(2,510)	(2,510)	(2,510)	(2,510)	(2,510)	(2,510)	(1,883)	(1,412)	(1,412)	(377)	-
Concentrate Freight Cost		$000s	(49,580)	(3,471)	(3,968)	(3,923)	(3,801)	(4,130)	(4,221)	(4,186)	(3,647)	(2,317)	(2,796)	(2,747)	(3,357)	(2,435)	(1,381)	(1,309)	(1,135)	(775)	-
TC/RC Cost		$000s	(233,704)	(16,228)	(18,808)	(18,245)	(17,217)	(19,966)	(19,289)	(18,807)	(16,336)	(10,786)	(14,149)	(13,998)	(16,499)	(12,454)	(7,429)	(6,517)	(4,757)	(3,121)	-
Subtotal Cash Costs Before By-Product Credits		$000s	(1,306,021)	(94,194)	(109,336)	(94,854)	(90,033)	(94,186)	(94,591)	(88,251)	(85,245)	(78,374)	(82,197)	(82,067)	(85,118)	(80,151)	(57,766)	(44,536)	(42,569)	(13,700)	-
By-Product Credits		$000s	1,986,136	74,263	88,000	87,164	83,601	90,169	91,995	91,669	79,811	59,709	69,845	59,807	73,239	53,418	30,806	28,834	24,924	16,887	-
Total Cash Costs After By-Product Credits		**$000s**	**(321,885)**	**(19,931)**	**(21,339)**	**(7,690)**	**(6,432)**	**(4,018)**	**(2,596)**	**3,419**	**(5,434)**	**(17,671)**	**(21,352)**	**(22,260)**	**(11,880)**	**(26,733)**	**(26,960)**	**(15,702)**	**(18,545)**	**3,186**	-
Operating Margin	**48%**	**$000s**	**1,194,055**	**63,246**	**98,599**	**102,329**	**92,308**	**110,526**	**112,454**	**111,170**	**87,969**	**47,638**	**74,452**	**73,301**	**95,752**	**57,353**	**24,645**	**26,586**	**7,427**	**18,240**	-

Table 19-2: After-Tax Cash Flow Summary
Hecla Mining Company – Lucky Friday Mine

Project Timeline			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Commercial Production Timeline in Years			2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Time Until Closure in Years	US$ & US Units	LoM Avg / Total	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	-1
EBITDA	$000s	1,194,055	63,245	98,599	102,329	92,308	110,526	112,454	111,170	87,969	37,636	74,452	73,361	95,752	57,353	34,645	26,586	7,427	14,340	-
Depreciation/Amortization Allowance	$000s	(494,032)	(22,440)	(26,224)	(28,487)	(29,855)	(30,897)	(31,983)	(30,579)	(30,891)	(28,194)	(28,271)	(27,915)	(43,996)	(27,569)	(26,816)	(24,441)	(16,491)	(19,892)	-
Earnings Before Taxes	$000s	700,024	40,805	72,375	73,842	62,453	79,630	81,371	80,600	57,077	9,535	46,181	45,446	51,757	29,792	(2,171)	2,145	(9,064)	7,349	-
ID Mine License Tax	$000s	(4,069)	(265)	(378)	(489)	(327)	(457)	(470)	(472)	(300)	(119)	(195)	(191)	(277)	(113)	(31)	(31)	-	(78)	-
Income Tax Payable	$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Income	$000s	695,955	40,541	71,997	73,439	62,126	79,172	80,901	80,128	56,778	9,415	45,986	45,255	51,480	29,680	(2,202)	2,114	(9,064)	7,330	-
Non-Cash Add Back - Depreciation	$000s	494,032	22,440	26,224	28,487	29,855	30,897	31,983	30,579	30,891	28,194	28,271	27,915	43,996	27,569	26,816	24,441	16,491	19,892	-
Working Capital	$000s	-	1,599	2,762	1,687	(243)	(144)	(1,397)	564	1,799	786	(1,175)	(1,016)	523	(291)	(1,267)	(3)	1,853	(1,560)	(4,377)
Operating Cash Flow	$000s	1,189,986	64,481	100,983	103,612	91,738	109,925	110,587	111,252	89,469	38,394	73,082	72,154	95,999	56,949	23,345	26,552	9,280	15,641	(4,377)
Capital Spend	$000s	(372,000)	(51,000)	(40,000)	(49,000)	(36,000)	(26,000)	(23,000)	(23,000)	(23,000)	(33,000)	(17,000)	(15,000)	(15,000)	(11,000)	(5,000)	(5,000)	-	-	-
Closure/Reclamation Costs	$000s	(38,714)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(38,714)
Total Capital	$000s	(410,714)	(51,000)	(40,000)	(49,000)	(36,000)	(26,000)	(23,000)	(23,000)	(23,000)	(33,000)	(17,000)	(15,000)	(15,000)	(11,000)	(5,000)	(5,000)	-	-	(38,714)
Cash Flow Adj/Reimbursements	$000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LoM Metrics																				
Economic Metrics																				
Discount Factors	BOP	5%	0.9524	0.9070	0.8638	0.8227	0.7835	0.7462	0.7107	0.6768	0.6446	0.6139	0.5847	0.5568	0.5303	0.5051	0.4810	0.4581	0.4363	0.4155
a) Pre-Tax																				
Free Cash Flow	$000s	783,341	13,746	61,361	55,016	56,065	84,382	88,957	88,734	66,768	5,424	56,277	57,345	81,276	46,061	18,378	21,583	9,280	16,680	(43,091)
Cumulative Free Cash Flow	$000s		13,746	75,107	130,123	186,188	270,570	358,627	447,361	514,129	519,553	575,830	633,175	714,451	760,512	778,888	800,472	809,752	826,432	783,341
NPV @ 5%	$000s	557,021	13,091	55,656	47,524	46,125	66,116	65,719	63,061	45,191	3,486	34,548	33,528	45,257	24,427	9,282	10,382	4,251	7,278	(17,905)
Cumulative NPV	$000s		13,091	68,748	116,272	162,397	228,513	294,223	357,284	402,475	405,972	440,521	474,048	519,306	543,734	553,016	563,397	567,648	574,926	557,021
b) After-Tax																				
Free Cash Flow	$000s	779,272	13,481	60,983	54,612	55,738	83,925	87,587	88,262	66,469	5,306	56,082	57,154	80,999	45,949	18,346	21,552	9,280	16,641	(43,091)
Cumulative Free Cash Flow	$000s		13,481	74,464	129,076	184,814	268,739	356,326	444,588	511,057	516,361	572,444	629,597	710,596	756,544	774,891	796,442	805,722	822,364	779,272
NPV @ 5%	$000s	553,991	12,839	55,313	47,176	45,856	65,757	65,359	62,726	44,988	3,419	34,430	33,417	45,103	24,368	9,266	10,367	4,251	7,261	(17,905)
Cumulative NPV	$000s		12,839	68,152	115,328	161,184	226,942	292,300	355,027	400,015	403,435	437,864	471,281	516,384	540,751	550,017	560,384	564,635	571,896	553,991
Operating Metrics																				
Mine Life	Years	17																		
Average Daily Processing Rate	t/d ore milled	892	946	1,135	1,118	1,104	1,080	987	1,092	1,142	805	977	1,025	1,185	957	582	499	334	191	-
Mining Cost	$ / t ore milled	$76.11	86.11	78.32	74.27	73.57	76.40	83.59	67.06	64.10	91.23	74.94	71.44	61.78	76.51	94.49	82.52	123.23	21.59	-
Processing Cost	$ / t ore milled	$21.54	25.44	21.88	20.42	19.63	21.12	23.11	19.21	18.37	26.14	21.48	20.47	17.70	21.93	27.06	23.65	35.31	6.19	-
Maintenance Cost	$ / t ore milled	$49.46	59.67	50.39	49.35	45.76	48.10	52.63	43.72	41.80	59.49	48.87	46.59	40.29	49.89	61.56	53.81	80.36	14.08	-
G&A Cost	$ / t ore milled	$33.48	39.22	31.94	29.56	28.06	29.97	32.79	29.63	28.33	40.32	33.12	31.58	27.31	33.82	41.72	36.47	54.46	95.41	-
Profit Share	$ / t ore milled	$7.22	8.42	7.30	6.94	6.68	7.02	7.68	6.38	6.10	8.69	7.14	6.80	5.88	7.29	8.99	7.86	11.73	5.48	-
Total Site Operating Costs	$ / t ore milled	$187.81	218.86	189.84	180.54	173.69	182.61	199.80	166.00	158.70	225.88	185.55	176.88	152.96	189.64	233.72	204.30	305.09	142.76	-

19.3 Sensitivity Analysis

The Project's after-tax cumulative cash flow discounted at 5% from the model presented above were analyzed for sensitivity to variations in revenue, operating, and capital cost assumptions.

Positive and negative variations were applied independently to each of the following parameters:

- Metal grades
- Metal recoveries
- Metal prices
- Operating costs
- Capital costs

Table 19-3 shows the sensitivity cases analyzed, which are shown in the chart in Figure 19-1. Because of the Project's 30-year operating history, values for capital and operating costs, metal recoveries, and metal grades are well understood. Therefore, these parameters were flexed over a smaller range compared to metal prices, which are more volatile and were evaluated over a wider range of sensitivity.

Table 19-3: Sensitivity Analysis Summary
Hecla Mining Company – Lucky Friday Mine

Variance From Base Case	Head Grade (oz/ton Ag)	NPV at 5% (US$ M)
0.90	12.3	398
0.95	13.0	476
1.00	**13.7**	**554**
1.05	14.4	630
1.10	15.1	701
Variance From Base Case	**Recovery (% Ag)**	**NPV at 5% (US$ M)**
0.90	86.8	398
0.95	91.6	476
1.00	**96.4**	**554**
1.05	101.2	630
1.10	106.0	701
Variance From Base Case	**Metal Prices (US$/oz Ag)**	**NPV at 5% (US$ M)**
0.80	16.80	201
0.90	18.90	378
1.00	**21.00**	**554**
1.10	23.10	721
1.20	25.20	893
Variance From Base Case	**Operating Costs (US$/t milled)**	**NPV at 5% (US$ M)**
0.90	169.03	625
0.95	178.42	590
1.00	**187.81**	**554**
1.08	201.90	500
1.15	215.98	447
Variance From Base Case	**Capital Costs (US$ M)**	**NPV at 5% (US$ M)**
0.90	370	584
0.95	390	569
1.00	**411**	**554**
1.08	442	532
1.15	472	509

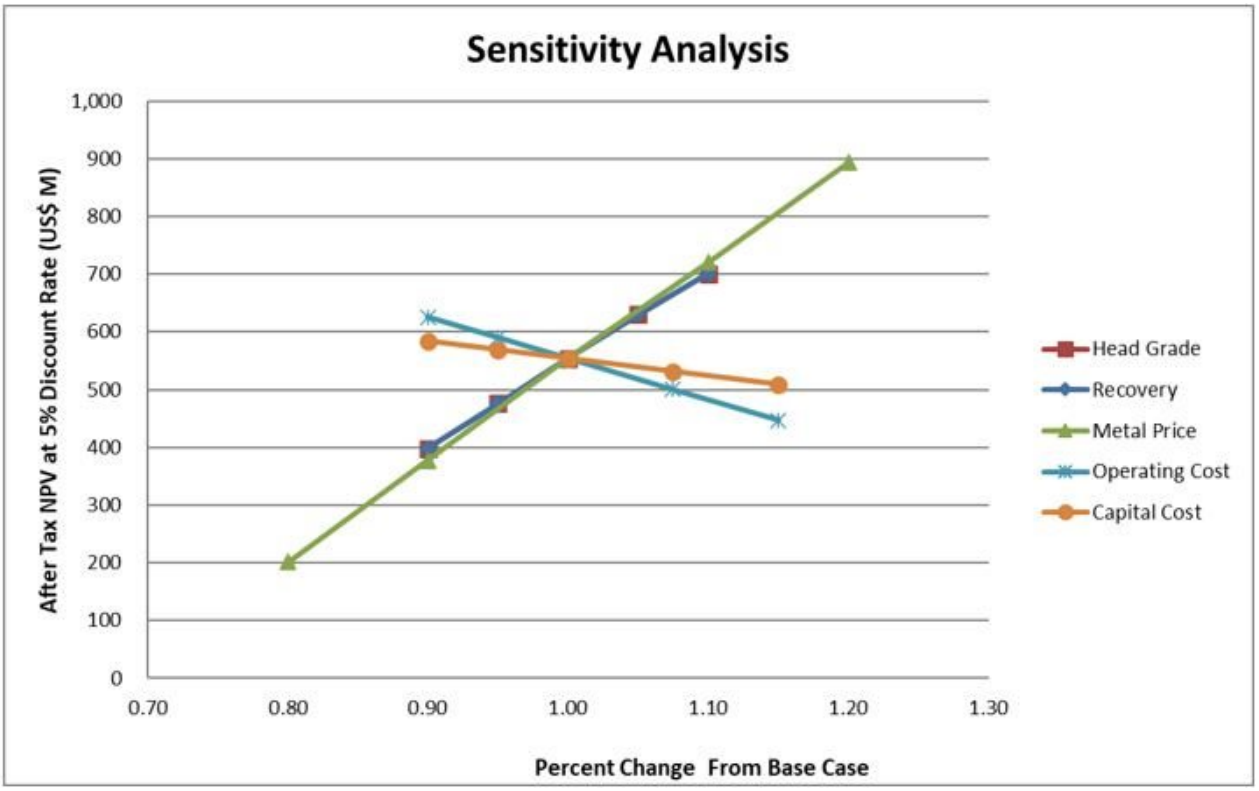


Figure 19-1: After-tax NPV at 5% Sensitivity Analysis

The results of the sensitivity analysis demonstrate that the Mineral Reserve estimates are most sensitive to variations in metal prices, less sensitive to changes in metal grades and recoveries, and least sensitive to fluctuations in operating and capital costs.

20.0 ADJACENT PROPERTIES

There are several lead-zinc-silver mines in the Silver Valley mining district in Idaho. The Mineral Resource and Mineral Reserves stated in this TRS are contained entirely within Hecla's mineral leases, and information from any other operations was not used in this TRS.

21.0 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this TRS understandable and not misleading.

22.0 INTERPRETATION AND CONCLUSIONS

SLR offers the following conclusions by area.

22.1 Geology and Mineral Resources

- As prepared by Hecla and reviewed and accepted by SLR, the Lucky Friday Measured and Indicated Mineral Resources are estimated to total approximately 10.50 Mst at an average grade of approximately 7.6 oz/ton Ag, 4.9% Pb, and 2.5% Zn. Inferred Mineral Resources are estimated at approximately 5.38 Mst at an average grade of approximately 7.8 oz/ton Ag, 5.8% Pb, and 2.4% Zn. All Mineral Resources are effective as of December 31, 2021 and are stated exclusive of Mineral Reserves.
- The drilling, core handling, logging, and sampling at Lucky Friday is being conducted according to common industry practice, in a manner appropriate for the deposit type and mineralization style.
- The chip sampling practices at the site are reasonable, appropriate for the mineralization style, and consistent with common industry practice.
- Bulk density estimates are conducted in a reasonable fashion, using an appropriate method.
- Samples are handled and transported securely and only in the custody of Hecla employees or bonded carriers.
- The assay QA/QC protocols in place at Lucky Friday are rigorous, and the results to date are satisfactory.
- The sampling is done such that the samples are representative of the mineralized bodies. There are no concerns apparent with the assay results and they are suitable for use in a Mineral Resource estimate.
- The databases are managed in a secure environment, using conventional off-the-shelf software packages that are up-to-date and appropriate for the tasks to which they are applied. The staff are competent, well-trained, and experienced and they have been provided with clear and reasonable protocols to follow.
- The database on which resource estimation is based is properly configured and maintained and is appropriate for use in estimation of Mineral Resources and Mineral Reserves.
- The wireframe models for the veins are reasonable and representative of the host structures. Minor inconsistencies exist but are not considered to be a serious concern, and will be resolved with additional work.
- The sample grade distributions for silver, lead, and zinc are observed to be positively skewed which could result in biases in the block interpolations unless corrective measures are taken. Capping is currently being employed at Lucky Friday and this is viewed as appropriate.
- There is evidence of sub-populations within the grade distributions for several veins. Additional work may be warranted to identify and isolate these sub-populations if possible.
- Compositing of the samples is carried out in a reasonable fashion.
- The block model is configured appropriately and constructed with off-the-shelf software that is commonly used in the industry.
- The grade interpolations were conducted in a reasonable manner consistent with common practice using an appropriate estimation algorithm commonly used within the industry.

- The Mineral Resources are classified according to the CRIRSCO definitions and, as such, are consistent with the requirements of S-K 1300.
- The method used to apply the classification is broadly consistent with common industry practice, although the resulting categorizations appear somewhat aggressive for Measured.
- The NSR cut-off value is a reasonable approach which has been applied in an appropriate manner.
- The validation methods used at Lucky Friday are appropriate, although they represent a fairly minimum standard of review.
- The stope optimization and reporting procedures are generally reasonable.
- The Mineral Resource estimate for Lucky Friday has been carried out in a reasonable fashion, consistent with conventional, although somewhat dated, industry practice.

22.2 Mining and Mineral Reserves

- Mineral Reserve estimates, as prepared by Hecla and reviewed and accepted by SLR, have been classified in accordance with the definitions for Mineral Reserves in S-K 1300. Mineral Reserves as of December 31, 2021 total 5.46 Mst grading 13.7 oz/ton Ag, 8.3% Pb, and 3.3% Zn and containing 74.7 Moz of silver, 452,000 tons of lead and 181,000 tons of zinc at an NSR cut-off value of US$208/ton.
- Measured and Indicated Mineral Resources were converted to Proven and Probable Mineral Reserves, respectively, through the application of modifying factors. Inferred Mineral Resources were not converted to Mineral Reserves.
- The Mineral Reserves are all located within the Gold Hunter deposit in seven separate veins. The 30 Vein is the most significant with 68% of the Mineral Reserve tonnage and 70% of the contained silver.
- Mineral Reserves are estimated by qualified professionals using modern mine planning software in a manner consistent with industry practice.
- Lucky Friday is an old, well established mine with many years of operating experience, providing the necessary expertise to safely and economically extract the Mineral Reserves.
- Mining at Lucky Friday utilizes mechanized underhand cut and fill, and UCB with cemented paste backfill. In this method, the mining progresses downwards in a stope, occurring beneath the cemented paste backfill of the preceding lift. The mining methods used are appropriate to the deposit style, depth and geotechnical conditions and employ a range of modern mining equipment;
- The mine developed the UCB method for bulk mining of the 30 Vein. This method is designed to improve safety through the management of seismic events and to increase productivity. The UCB method is a bulk mining method which utilizes 27 ft deep blastholes with ore mucked in 11.5 ft benches.
- The current Mineral Reserve estimate is based on the use of UCB mining for the majority of the deposit and represents a change from previous mining methods and Mineral Reserve estimates.
- Over the past nine years, the mine production silver grade has been less than the Mineral Reserve grade estimate, indicating a poor correlation with production data.

- Stopes in the mine are relatively narrow with an eleven foot minimum mining width in the 30 Vein above the 7500 level, nine foot minimum width below the 7500 level, and eight foot minimum width in the Intermediate Veins.
- Stopes are diluted to the greater of the ore width or the minimum mining width. This dilution is assigned background metal grades based upon the block model estimates. Subsequently, the stopes are diluted by a further 15% for UCB stopes and 5% for cut and fill stopes with zero grade unplanned dilution.
- SLR is of the opinion that the 15% dilution estimate in the UCB mining is a potentially optimistic estimate considering the short time that the method has been in use, the impact of vein deviation over the 27 ft cut depth, the use of infill drill information as opposed to face by face mapping, changes in the vein along strike and dip, and potential overbreak from blasting.
- The 30 Vein Mineral Reserve includes internal low grade and waste blocks that do not meet the cut-off grade criteria but are included as the material must be mined considering the stope geometry and seismicity.
- The planned use of UCB mining at a nine foot minimum width (30 Vein at depth) is not based upon detailed layouts and represents potential risks related to production capacity and dilution estimates at depth.
- Extraction for all mining methods is assumed to be 100%.
- SLR verified that Hecla's selected metal prices for estimating Mineral Reserves are consistent with independent forecasts from banks and other lenders.
- The mine uses proven, modern trackless mobile equipment with LHD units up to 3.5 yd^3 capacity.
- The LOM plan has been appropriately developed to maximize mining efficiencies, based on the current knowledge of geotechnical, hydrological, mining, and processing information on the Lucky Friday Mine.
- The equipment and infrastructure requirements for LOM operations are well understood.
- The LOM extends 17 years to 2038, with mine production projected to increase to an annual rate of approximately 425,000 tons. The increased production is based upon projected productivity improvements in mining, increased daily development advance, and higher utilization of the existing mine infrastructure, however, improvements may be difficult to achieve considering the extent of the mine, stope widths, and mining depths.
- Meeting growth requirements of the LOM plan (production and development) is typically a challenge for wide spread narrow vein mines. SLR is of the opinion that meeting the LOM plan will require ongoing effort to optimize the UCB mining method and attain planned increases in productivity.

22.3 Mineral Processing

- The Lucky Friday mill is a conventional silver and zinc flotation concentrator that has been in operation since 1942 and owned and operated by Hecla since 1958. Concentrates are shipped by highway trucks to the Teck smelter at Trail, British Columbia, Canada. The mill has a compact and efficient design that has been upgraded over the years including the addition of flash flotation in the grinding circuit, column flotation for concentrate cleaning, and on-stream analyzers for process control.

- The concentrator performed very consistently from 2016 through 2021 with steady lead, zinc, and silver head grades, silver and zinc concentrate grades, and recoveries. The mill operated in the 38 stph to 44 stph range with a reported mill availability of 93%. Low production from 2017 through 2019 was due to labor issues.

- The mine plan includes a 20% increase in mill production from the current 340,000 stpa, or 930 stpd, to 425,000 stpa, or 1,164 stpd, each at 92% availability. Work is being done to debottleneck the Plant including slurry pumping capacity to achieve the new targets.

- The target concentrate grade for lead is 60% for the best recovery, though the grade can be increased to 63% to 64% without significant loss of recovery.

- The focus of metallurgical testing is on plant performance including quality improvements and the potential to increase production. A significant metallurgical test program was performed to characterize the Gold Hunter deposit in 2008, including mineralogy, comminution testing, and flotation testing. The ore is very consistent, which benefits plant performance.

- In July 2011, an audit of the Lucky Friday process including detailed circuit sampling was performed to support studies to increase plant production. During the survey, the lead flash cell recovered 60% to 70% of the lead and silver in the plant feed, reducing the load on the lead cleaning circuit. The total silver, lead, and zinc recoveries to silver concentrate were 91.7%, 90%, and 12%, respectively, to a concentrate containing 60% Pb, 130 oz/ton Ag, and 3.5% Zn. Zinc recovery to the zinc concentrate was 81.3% to a concentrate grading 48.6% Zn. Lead recovery to the zinc concentrate was 2.3% and the silver recovery to the zinc concentrate was 3.9%.

22.4 Infrastructure

- Lucky Friday has all of the infrastructure necessary for the ongoing operations and has plans for refurbishment or repair as necessary within the mine plan.

22.5 Environment

- Lucky Friday maintains a comprehensive environmental management and compliance program. All permits needed for current Lucky Friday operations are in place, and staff at the Property continually monitors permit/regulated conditions and files required reports with the applicable regulatory agencies at the federal, state, and local level.

- Hecla's EMS follows a 13-element plan-do-check-act approach that ensures continuous improvement around issues including obligation registers, management of change, air quality, water and waste management, energy management, training, and reporting. This system promotes a culture of environmental awareness and innovation throughout the company. The EMS program is benchmarked against ISO-14001 and complements Canada's TSM program. On a related matter, there appears to be good cross-discipline support for the overall environmental program.

- In previous resource/reserve reporting documents, Lucky Friday reported experiencing a number of alleged permit exceedances for water discharges NPDES and MSGP at the Property. Lucky Friday received an EPA Notice of Violation for non-compliance with the NPDES Permit and various discharges exceeding the maximum daily standard for lead (50 µg/L). In all instances, Lucky Friday has worked cooperatively with EPA to resolve these issues.

- Lucky Friday has developed reclamation/closure plan and the most recent cost estimate (2021) to perform this work is US$39.9 million. Reclamation and closure plans have been submitted to the appropriate agencies. ARO legal obligations are updated regularly and based upon existing site conditions, current laws, regulations and costs to perform the permitted activities. The ARO is to be conducted in accordance with FASB ASC 410.

- Lucky Friday reports that community relationships are excellent, and the company maintains an office in the city of Wallace to maintain a community presence.

23.0 RECOMMENDATIONS

SLR offers the following recommendations by area.

23.1 Geology and Mineral Resources

1. Conduct additional review of the sample grade distributions within the veins to see if coherent groupings of sub-populations can be isolated for interpolation purposes.
2. Modify the resource classification procedures to provide an opportunity for manual adjustments, as opposed to a strictly computer-driven approach. This will allow changes to be made to remove unrealistic artifacts in the classification.
3. Consider an additional level of block model validation, such as comparisons to alternative estimation methods.

23.2 Mining and Mineral Reserves

1. Continue the use of UCB mining in the 30 Vein and continue to attempt to improve the UCB method.
2. Conduct close monitoring of the stoping performance including regular surveys as the void is exposed and reconciliation of the stope designs to the Mineral Reserve estimates to confirm and, if necessary, refine the Mineral Reserve estimate
3. Calculate NSR values on a fully diluted basis and use these values to determine cut-off values and Mineral Reserve boundaries.
4. Evaluate the internal portions of Mineral Reserve material that fall below cut-off value within the 30 Vein to confirm that they are economically justifiable to mine and develop further cut-off criteria for must take material.
5. Undertake a more detailed dilution and extraction study, including consideration of the existing reconciliation studies, to better quantify the extraction, dilution, and other modifying factors that Hecla is currently applying to all production designs.
6. Use the results of the above noted studies to determine the actions necessary to align mine production grades with the Mineral Reserve estimates.
7. Review mining plans to define definitive actions to attain the planned improvements in mining productivity and daily development advance.
8. Further develop the plans for UCB mining at the planned nine foot minimum mining width.

23.3 Mineral Processing

1. Continue metallurgical testing to support the plan for increased production.
2. The ability to perform on-site metallurgical testing is limited due to the capabilities of the current laboratory. An upgrade to the laboratory is recommended and has been budgeted for 2024.

23.4 Infrastructure

1. Continue the upgrades, repairs, and rehabilitation to existing infrastructure to support the LOM plan.

23.5 Environment

1. Track and participate in the development of new environmental and mine permitting regulations that could impact operations.
2. Continue to perform internal and external audits of environmental compliance.
3. Even though opportunity is limited, investigate opportunities for concurrent reclamation to minimize financial obligation(s) at closure.
4. Continue to update reclamation and closure cost estimates on a regular basis.

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25.0 RELIANCE ON INFORMATION PROVIDED BY THE REGISTRANT

This TRS has been prepared by SLR for Hecla. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this TRS,
- Assumptions, conditions, and qualifications as set forth in this TRS, and
- Data, reports, and other information supplied by Hecla and other third party sources.

For the purpose of this TRS, SLR has relied on ownership information provided by Hecla and verified by the Senior Property and Contract Coordinator. SLR has not researched property title or mineral rights for Hecla as we consider it reasonable to rely on Hecla's Land Administration personnel who are responsible for maintaining this information..

SLR has relied on Hecla for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Lucky Friday in the Executive Summary and Section 19.0. As Lucky Friday has been in operation for over ten years, Hecla has considerable experience in this area.

The Qualified Persons have taken all appropriate steps, in their professional opinion, to ensure that the above information from Hecla is sound.

Except for the purposes legislated under provincial securities laws, any use of this TRS by any third party is at that party's sole risk.

26.0 DATE AND SIGNATURE PAGE

This report titled “Technical Report Summary on the Lucky Friday Mine, Idaho, USA” with an effective date of December 31, 2021 was prepared and signed by:

Signed *SLR International Corporation*

Dated at Bothell, WA
February 21, 2022

SLR International Corporation

27.0 APPENDIX 1

27.1 Sample Statistics

Table A1: Sample Statistics - Silver (oz/ton)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Mx	Mean	Median	Stdev	Variance	CV
5	1,033	0.00	477.40	12.37	2.90	28.23	797.08	2.28
20	3,928	0.00	350.10	12.03	5.40	21.77	473.76	1.81
30	62,212	0.00	434.00	19.28	8.20	24.93	621.65	1.29
40	6,666	0.00	127.70	7.44	3.60	10.26	105.20	1.38
41	4,064	0.00	202.10	7.52	3.30	11.48	131.73	1.53
50	2,733	0.00	100.30	6.69	2.90	10.71	114.79	1.60
60	3,443	0.00	229.70	15.06	4.94	21.72	471.72	1.44
70	3,161	0.00	270.10	14.50	3.60	25.47	648.81	1.76
80	7,925	0.00	233.00	13.53	5.60	18.76	351.86	1.39
90	3,815	0.00	330.00	12.50	4.60	19.98	399.02	1.60
100	1,595	0.00	291.70	12.34	3.30	28.00	784.20	2.27
110	3,280	0.00	1,105.10	21.35	6.90	47.01	2,209.57	2.20
120	599	0.00	225.00	7.25	2.20	21.87	478.38	3.02
130	388	0.00	217.00	10.44	3.00	20.39	415.83	1.95
140	173	0.00	129.40	5.32	1.80	13.34	178.02	2.51
150	114	0.00	90.80	5.13	2.30	10.31	106.32	2.01

Table A2: Sample Statistics - Iron (%)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Max	Mean	Median	Stdev	Variance	CV
5	1,033	0.10	43.70	11.78	10.00	7.52	56.54	0.64
20	3,928	0.00	47.40	18.85	18.90	8.44	71.17	0.45
30	62,212	0.00	53.50	19.81	19.50	8.14	66.28	0.41
40	6,666	0.20	59.50	25.35	26.20	7.75	60.12	0.31
41	4,064	0.10	49.00	23.52	25.10	9.06	82.02	0.39
50	2,733	0.50	45.50	20.88	20.91	10.31	106.30	0.49
60	3,443	0.10	42.10	14.19	13.70	7.19	51.67	0.51
70	3,161	0.00	47.90	11.97	11.50	5.89	34.65	0.49
80	7,925	0.00	38.20	11.31	10.80	5.35	28.58	0.47
90	3,815	0.10	37.00	12.37	11.90	5.85	34.26	0.47
100	1,595	0.50	39.30	13.82	13.90	6.16	37.95	0.45
110	3,280	0.50	38.90	15.92	15.50	6.93	47.96	0.43
120	599	0.40	40.40	12.97	13.40	6.10	37.26	0.47
130	388	0.50	33.20	12.12	11.70	6.24	38.97	0.51
140	173	0.30	27.60	9.66	8.20	5.77	33.31	0.60
150	114	0.90	26.30	9.17	8.32	5.84	34.07	0.64

Table A3: Sample Statistics - Lead (%)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Max	Mean	Median	Stdev	Variance	CV
5	1,033	0.00	54.60	3.00	0.80	5.87	34.50	1.96
20	3,928	0.00	78.40	5.96	3.50	7.15	51.19	1.20
30	62,212	0.00	78.20	11.67	6.10	12.81	164.01	1.10
40	6,666	0.00	79.50	5.68	3.00	7.00	49.04	1.23
41	4,064	0.00	56.10	6.04	2.90	7.83	61.29	1.30
50	2,733	0.00	68.30	4.82	2.40	6.46	41.71	1.34
60	3,443	0.00	67.20	7.16	3.90	8.11	65.81	1.13
70	3,161	0.00	68.70	6.64	3.60	8.11	65.70	1.22
80	7,925	0.00	82.60	10.49	5.50	12.47	155.51	1.19
90	3,815	0.00	79.20	9.57	4.50	12.31	151.50	1.29
100	1,595	0.00	58.80	3.43	1.40	5.60	31.39	1.63
110	3,280	0.00	73.20	2.85	1.10	4.69	22.01	1.64
120	599	0.00	49.10	3.10	0.70	5.61	31.46	1.81
130	388	0.00	52.00	5.63	1.80	8.98	80.69	1.60
140	173	0.00	71.00	2.81	0.70	4.95	24.55	1.76
150	114	0.00	43.80	4.03	1.90	6.41	41.11	1.59

Table A4: Sample Statistics - Zinc (%)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Max	Mean	Median	Stdev	Variance	CV
5	1,033	0.00	39.60	0.87	0.10	2.50	6.23	2.87
20	3,928	0.00	40.90	4.01	2.00	4.98	24.84	1.24
30	62,212	0.00	49.80	3.22	1.50	4.12	17.01	1.28
40	6,666	0.00	43.20	5.68	4.40	5.07	25.70	0.89
41	4,064	0.00	34.30	5.33	3.80	5.19	26.90	0.97
50	2,733	0.00	61.50	3.72	1.60	5.20	27.01	1.40
60	3,443	0.00	40.60	5.70	2.30	6.80	46.18	1.19
70	3,161	0.00	43.10	3.77	0.60	6.02	36.21	1.59
80	7,925	0.00	42.70	2.25	0.30	4.47	19.94	1.99
90	3,815	0.00	39.40	1.86	0.20	4.34	18.81	2.33
100	1,595	0.00	29.90	1.63	0.20	3.78	14.28	2.32
110	3,280	0.00	33.60	2.38	0.30	4.36	19.05	1.84
120	599	0.00	30.00	1.56	0.10	3.53	12.45	2.26
130	388	0.00	34.80	2.25	0.10	5.32	28.27	2.37
140	173	0.00	33.70	2.30	0.10	5.23	27.32	2.27
150	114	0.00	31.10	1.44	0.10	5.14	26.38	3.56

27.2 Composite Statistics

Table A5: Composite Statistics - Silver (oz/ton)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Max	Mean	Median	Stdev	Variance	CV
5	723	0.00	72.00	11.08	4.10	15.35	235.56	1.39
20	2,715	0.00	54.80	11.32	7.10	11.32	128.11	1.00
30	46,382	0.00	81.50	20.74	14.28	18.30	334.91	0.88
40	5,296	0.00	30.90	7.20	4.50	6.82	46.49	0.95
41	2,895	0.00	31.40	7.09	4.58	6.77	45.81	0.95
50	1,754	0.00	32.70	6.46	3.78	6.72	45.15	1.04
60	2,144	0.00	62.35	15.58	8.21	15.65	245.01	1.00
70	1,930	0.00	83.20	15.07	5.64	19.12	365.44	1.27
80	4,905	0.00	58.50	14.41	9.95	12.84	164.93	0.89
90	2,185	0.00	55.30	12.97	7.50	12.60	158.73	0.97
100	1,011	0.00	69.90	10.45	4.42	15.03	225.98	1.44
110	1,972	0.00	125.05	19.12	9.96	22.66	513.54	1.19
120	359	0.00	44.05	5.72	2.97	7.61	57.97	1.33
130	220	0.00	51.00	9.68	4.57	11.41	130.12	1.18
140	105	0.00	39.70	4.65	2.36	6.80	46.30	1.46
150	75	0.20	28.25	4.75	2.90	5.49	30.12	1.16

Table A6: Composite Statistics - Iron (%)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Max	Mean	Median	Stdev	Variance	CV
5	723	0.30	40.57	12.33	10.20	7.12	50.73	0.58
20	2,715	0.50	42.30	19.48	19.10	7.52	56.48	0.39
30	46,382	0.00	47.00	20.06	19.85	7.08	50.12	0.35
40	5,296	0.49	51.15	25.69	25.93	6.75	45.51	0.26
41	2,895	0.10	45.90	24.07	24.51	7.68	58.98	0.32
50	1,754	0.60	42.53	21.90	20.80	9.54	91.06	0.44
60	2,144	0.40	38.50	14.47	14.14	5.89	34.71	0.41
70	1,930	0.20	39.60	12.24	11.82	5.19	26.91	0.42
80	4,905	0.70	35.00	11.45	11.11	4.46	19.92	0.39
90	2,185	0.80	37.00	12.54	12.20	4.85	23.49	0.39
100	1,011	0.60	36.90	14.16	14.19	5.43	29.50	0.38
110	1,972	1.00	35.83	16.34	15.93	5.67	32.18	0.35
120	359	0.50	32.40	13.33	13.56	5.08	25.78	0.38
130	220	0.80	29.80	12.45	12.24	5.12	26.20	0.41
140	105	0.30	25.10	9.92	9.57	4.97	24.71	0.50
150	75	0.90	26.30	9.40	8.80	5.21	27.12	0.55

Table A7: Composite Statistics - Lead (%)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Max	Mean	Median	Stdev	Variance	CV
5	723	0.00	21.00	3.06	1.53	4.13	17.05	1.35
20	2,715	0.00	23.85	6.23	4.53	5.33	28.44	0.86
30	46,382	0.00	41.80	12.76	9.80	9.79	95.89	0.77
40	5,296	0.00	22.90	5.66	3.71	5.09	25.87	0.90
41	2,895	0.00	25.50	6.00	3.86	5.55	30.82	0.92
50	1,754	0.00	21.40	4.83	3.14	4.52	20.43	0.94
60	2,144	0.00	25.30	7.56	5.53	6.01	36.14	0.80
70	1,930	0.00	27.50	7.06	4.69	6.19	38.33	0.88
80	4,905	0.00	41.95	11.55	8.23	9.46	89.40	0.82
90	2,185	0.00	40.40	10.51	6.74	9.42	88.69	0.90
100	1,011	0.00	19.80	3.51	2.19	4.06	16.46	1.16
110	1,972	0.00	14.10	2.82	1.78	2.98	8.89	1.06
120	359	0.00	19.00	3.20	1.60	3.98	15.85	1.24
130	220	0.00	23.60	5.94	2.62	6.74	45.42	1.13
140	105	0.00	12.40	2.90	1.67	3.30	10.90	1.14
150	75	0.04	18.34	4.09	2.40	4.74	22.43	1.16

Table A8: Composite Statistics - Zinc (%)
Hecla Mining Company – Lucky Friday Mine

Zone	Count	Min	Max	Mean	Median	Stdev	Variance	CV
5	723	0.00	9.20	0.84	0.16	1.58	2.51	1.88
20	2,715	0.00	14.95	4.24	2.60	4.16	17.29	0.98
30	46,382	0.00	32.88	3.38	1.95	3.65	13.33	1.08
40	5,296	0.00	16.80	5.70	4.74	4.05	16.44	0.71
41	2,895	0.00	16.80	5.33	4.31	4.08	16.66	0.77
50	1,754	0.00	15.50	3.76	2.31	3.82	14.56	1.01
60	2,144	0.00	20.20	6.07	4.15	5.54	30.72	0.91
70	1,930	0.00	19.45	4.02	1.80	4.89	23.87	1.21
80	4,905	0.00	13.70	2.17	0.81	2.91	8.48	1.34
90	2,185	0.00	12.10	1.71	0.48	2.59	6.73	1.52
100	1,011	0.00	11.90	1.58	0.37	2.50	6.23	1.58
110	1,972	0.00	14.70	2.42	0.99	3.17	10.03	1.31
120	359	0.00	12.05	1.57	0.30	2.45	5.98	1.56
130	220	0.00	14.20	2.03	0.50	3.18	10.08	1.56
140	105	0.00	13.30	2.14	0.16	3.33	11.11	1.56
150	75	0.04	7.00	0.78	0.11	1.46	2.14	1.86

27.3 Semi-Variograms

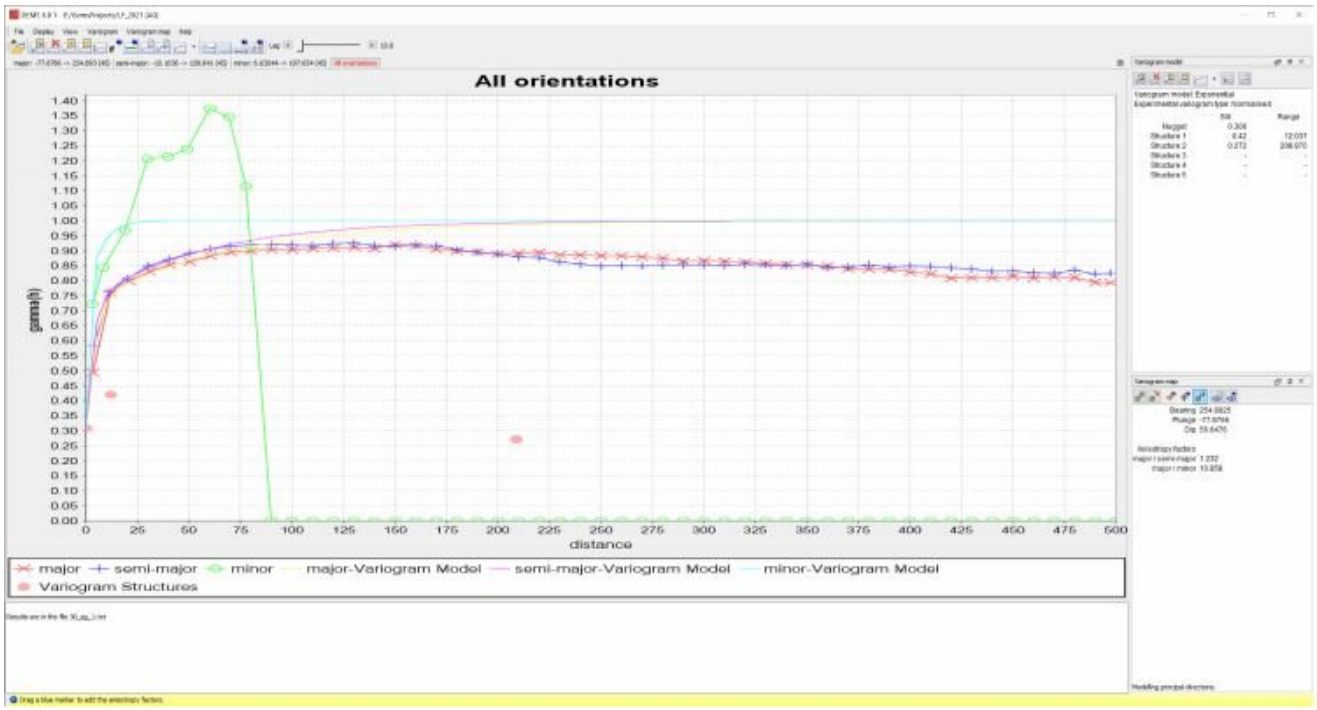


Figure A1: Variogram Model For Silver – 30 Vein



Figure A2: Variogram Model For Iron – 30 Vein

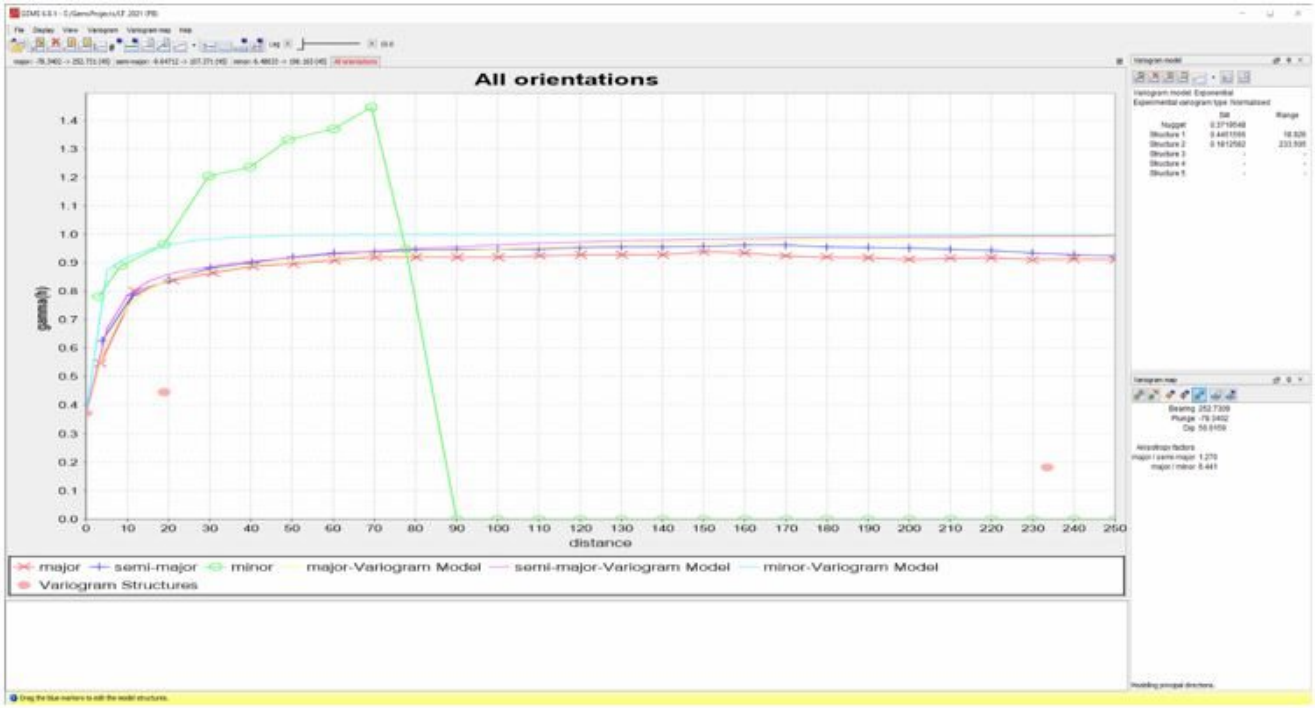


Figure A3: Variogram Model For Lead – 30 Vein

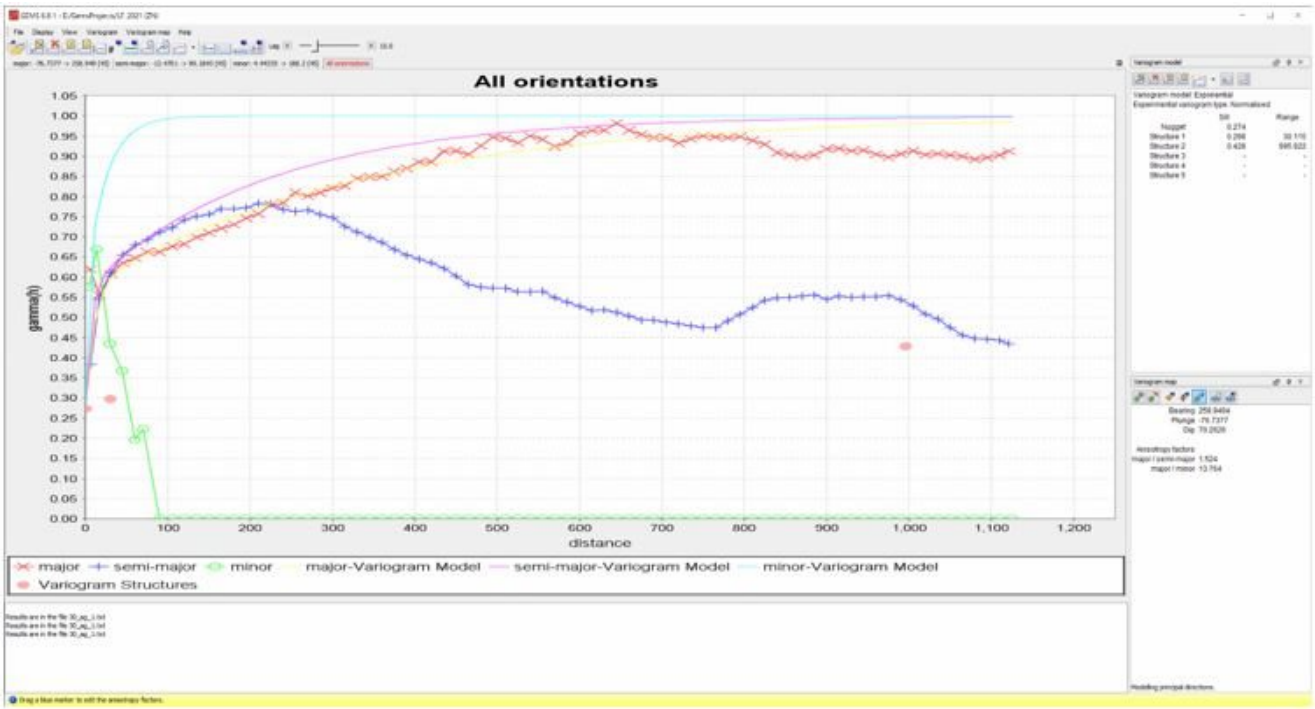


Figure A4: Variogram Model For Zinc – 30 Vein

27.4 List of Claims

Table A9: Unpatented Mineral Claims – Lucky Friday Mine
Hecla Mining Company – Lucky Friday Mine

Claim Name	BLM Serial Number	BLM Legacy Serial Number	Township Range Section Quadrant	Original Location Date	Ownership
Alameda	ID101349088	IMC13875	48N 5E 26 NE	7/2/1921	Hecla Limited
Atlie	ID101433030	IMC11455	48N 5E 27 NE,NW	8/28/1915	Silver Hunter
Aubert Abot	ID101433808	IMC62560	48N 5E 26 SE	5/30/1981	Hecla Limited
Aubert Abot Fraction	ID101481552	IMC62559	48N 5E 26 SE	5/31/1981	Hecla Limited
Aubert Gold Hunter Fraction	ID101432795	IMC62558	48N 5E 26 NW,SW	5/28/1981	Hecla Limited
Black Hawk	ID101482202	IMC13880	48N 5E 26 SE	7/2/1921	Hecla Limited
Black Rock	ID101483505	IMC13878	48N 5E 25 NW	11/2/1919	Hecla Limited
			48N 5E 26 NE		
Commander Fraction	ID101379219	IMC11432	48N 5E 26 NW	5/24/1900	Silver Hunter
Creek	ID101433319	IMC11424	48N 5E 25 SW	10/5/1945	Hecla Limited
Crown Point	ID101482263	IMC11420	48N 5E 25 SW	04/20/1897	50/50 Hecla Limited/Hunter Creek
			48N 5E 26 SE		
Crown Point Fraction	ID101454042	IMC11417	48N 5E 25 SW	6/1/1909	50/50 Hecla Limited/Hunter Creek
			48N 5E 26 SE		
Dewey	ID101433468	IMC11415	48N 5E 26 SW,SE	1/1/1911	50/50 Hecla Limited/Hunter Creek
Eleanor	ID101431582	IMC13876	48N 5E 25 NW	5/30/1957	Hecla Limited
			48N 5E 26 NE		
Elm Orlu	ID101485812	IMC13558	48N 5E 26 SW	11/15/1945	25/75 Hecla Limited/Lucky Friday Extension
Elm Orlu Fraction	ID101370264	IMC13560	48N 5E 26 SW	11/15/1945	Lucky Friday Extension
			48N 5E 27 SE		
Elm Orlu No. 2	ID101482888	IMC13559	48N 5E 26 SW	11/15/1945	Lucky Friday Extension

Claim Name	BLM Serial Number	BLM Legacy Serial Number	Township Range Section Quadrant	Original Location Date	Ownership
Friday Fraction	ID101432648	IMC11426	48N 5E 25 SW	5/1/1962	Hecla Limited
			48N 5E 26 SE		
			48N 5E 35 NE		
			48N 5E 36 NW		
Gem Dandy	ID101884485	IMC199547	48N 5E 26 NE	9/18/2009	Hecla Limited/Silver Hunter
Gem Dandy Fraction	ID101359015	IMC212723	48N 5E 26 NE,NW,SE,SW	4/18/2013	Hecla Limited/Silver Hunter
Harold	ID101484841	IMC11430	48N 5E 26 NW	4/5/1911	Silver Hunter
			48N 5E 27 NE,SE		
Hippie Fraction	ID101484856	IMC11427	48N 5E 27 NE	9/15/1967	Silver Hunter
Holiday	ID101433299	IMC11431	48N 5E 27 NE,SE	1/1/1915	Silver Hunter
Hunter	ID101481945	IMC11423	48N 5E 25 SW	10/5/1945	Hecla Limited
			48N 5E 26 SE		
Irene	ID101482808	IMC13874	48N 5E 26 NE	8/6/1951	Hecla Limited
Karl Jr. Fraction	ID101750698	IMC214836	48N 5E 27 NW	7/28/2015	Hecla Limited
Leslie Fraction	ID101350317	IMC11425	48N 5E 26 SW,SE	6/9/1968	Hecla Limited
Mexican	ID101481250	IMC11418	48N 5E 25 SW	10/17/1889	50/50 Hecla Limited/Hunter Creek
			48N 5E 26 SE		
Miles	ID101434994	IMC11435	48N 5E 26 NW,SW,SE	1/1/1911	Silver Hunter
Molly No. 1	ID101430729	IMC13551	48N 5E 26 SW	6/6/1945	Lucky Friday Extension
			48N 5E 27 SE		
			48N 5E 34 NE		
			48N 5E 35 NW		
Molly No. 2	ID101482598	IMC13552	48N 5E 26 SW	5/26/1945	Lucky Friday Extension
			48N 5E 35 NW		
Molly No. 3	ID101480722	IMC13553	48N 5E 26 SW	5/25/1945	50/50 Hecla Limited/Lucky Friday Extension

Claim Name	BLM Serial Number	BLM Legacy Serial Number	Township Range Section Quadrant	Original Location Date	Ownership
Moon	ID101483360	IMC11422	48N 5E 25 SW	7/24/1929	50/50 Hecla Limited/Hunter Creek
Morning Glory	ID101434498	IMC11436	48N 5E 26 SW,SE	8/19/1915	Silver Hunter
North	ID101348892	IMC11414	48N 5E 26 SW,SE	7/22/1929	50/50 Hecla Limited/Hunter Creek
Panama	ID101480936	IMC11456	48N 5E 27 NE,NW	7/19/1915	Silver Hunter
Panama No. 3	ID101434985	IMC11458	48N 5E 27 NE,NW	8/30/1915	Silver Hunter
Panama Fraction	ID101866653	IMC213620	48N 5E 27 NE	12/17/2013	Hecla Limited/Silver Hunter
Park Ave Fraction	ID101373608	IMC13561	48N 5E 26 SW	8/3/1967	25/75 Hecla Limited/Lucky Friday Extension
Pat	ID101431290	IMC11437	48N 5E 26 SE	7/14/1944	Silver Hunter
Pat Fraction	ID101334010	IMC13557	48N 5E 26 SW,SE	9/12/1950	Lucky Friday Extension
Pat No 1	ID101435088	IMC13554	48N 5E 27 SE	6/6/1945	Hecla Limited
Pat No 2	ID101434861	IMC11438	48N 5E 26 SW,SE	7/14/1944	Silver Hunter
Pat No 2	ID101304179	IMC13555	48N 5E 26 SW	6/4/1945	Lucky Friday Extension
			48N 5E 27 SE		
Pat No 3	ID101433909	IMC13556	48N 5E 26 SW	6/6/1945	Lucky Friday Extension
			48N 5E 27 SE		
Pinch Hitter	ID101434399	IMC13881	48N 5E 26 SE	4/12/1929	Hecla Limited
Silver Hunter	ID101884484	IMC199546	48N 5E 27 NE	9/18/2009	Silver Hunter
Silver Reef	ID101431093	IMC11421	48N 5E 25 SW	10/17/1889	50/50 Hecla Limited/Hunter Creek
			48N 5E 26 SE		
Silver-Lead	ID101484084	IMC13877	48N 5E 26 NE	1/1/1920	Hecla Limited
South	ID101481517	IMC11416	48N 5E 26 SW,SE	7/23/1929	50/50 Hecla Limited/Hunter Creek
Springfield	ID101452781	IMC11433	48N 5E 26 NW,SW	04/25/1897	Silver Hunter
			48N 5E 27 SE		
Star	ID101348544	IMC11419	48N 5E 26 SE	7/23/1929	50/50 Hecla Limited/Hunter Creek
White Ledge	ID101484653	IMC14790	48N 5E 26 SW,SE	11/5/1945	Hecla Limited
Wonder	ID101481101	IMC11434	48N 5E 26 SW	9/20/1915	Silver Hunter

Table A10: Patented Mineral Claims – Lucky Friday Mine
Hecla Mining Company – Lucky Friday Mine

Claim Name	Mineral Survey Number	Township Range Section	Ownership
Gold Hunter	MS 612	48N 5E 26	Hecla Limited
Yolande	MS 719	48N 5E 26	Hecla Limited
Ryan Millsite	MS 732	48N 5E 35	Hecla Limited
Thomas Brennan Millsite	MS 733	48N 5E 35	Hecla Limited
P. M. Hennessey Millsite	MS 734	48N 5E 35	Hecla Limited
P. T. Kavanah Millsite	MS 735	48N 5E 35	Hecla Limited
Enterprise	MS 1033	48N 5E 26	Hecla Limited
Away Up	MS 1245	48N 5E 26	Hecla Limited
Joe Dandy		48N 5E 26	
True Blue	MS 1249	48N 5E 22/27	Silver Hunter
Victor		48N 5E 22/27	
Mary Norem	MS 1285	48N 5E 27	Silver Hunter
Cuban Republic	MS 1363	48N 5E 27	Silver Hunter
Jersey Minor	MS 1459	48N 5E 26	Hecla Limited
America	MS 1471	48N 5E 25/26	Silver Hunter
Commander	MS 1492	48N 5E 26	Silver Hunter
Clear Grit	MS 1501	48N 5E 26/27	Hecla Limited
Lost Wonder	MS 1504	48N 5E 27	Hecla Limited
Paymaster		48N 5E 26/27	
Northern Light	MS 1832	48N 5E 26	Hecla Limited
Spokane		48N 5E 26	
America	MS 1927	48N 5E 25/26	Hecla Limited
Bacchus		48N 5E 25/26	
General Boulanger		48N 5E 25/26	
Switzerland		48N 5E 23/26	
Gettysburg	MS 2196	48N 5E 22/27	Silver Hunter
Lion		48N 5E 27	
Mabel May Millsite	MS 2246B	48N 5E 36	Hecla Limited
Enterprise	MS 2390	48N 5E 22	Hecla Limited
Hennessy Fraction	MS 2563	48N 5E 26	Hecla Limited
Jap		48N 5E 26	
Ted		48N 5E 26	
Victor Fraction		48N 5E 26	
U.S. Permit No. 1	MS 2857	48N 5E 25	Hecla Limited
U.S. Permit No. 2		48N 5E 25	
Iron Cap	MS 2943	48N 5E 25/26	Hecla Limited
Missoula		48N 5E 25/26	
Good Friday	MS 3028	48N 5E 35	Hecla Limited
Lucky Friday		48N 5E 35	
Lucky Friday Fraction No. 2		48N 5E 35	
Northern Light		48N 5E 26	
Pointer	MS 3399	48N 5E 22/23/26	Hecla Limited
Red Doc		48N 5E 22/23/26	



Exhibit 96.3

Technical Report Summary on the Casa Berardi Mine, Northwestern Québec, Canada S-K 1300 Report

Hecla Mining Company

SLR Project No: 101.00632.00021

February 21, 2022



Technical Report Summary on the Casa Berardi Mine, Northwestern Québec, Canada

SLR Project No: 101.00632.00021

Prepared by
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Effective Date – December 31, 2021
Signature Date - February 21, 2022

FINAL

Distribution: 1 copy – Hecla Mining Company
1 copy – SLR International Corporation

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1.0 EXECUTIVE SUMMARY

1.1 Summary

SLR International Corporation (SLR) was retained by Hecla Mining Company (Hecla) to prepare an independent Technical Report Summary (TRS) on the Casa Berardi Mine (Casa Berardi or the Property), located in Québec, Canada. The purpose of this TRS is to support the disclosure of the Casa Berardi Mineral Resource and Mineral Reserve estimates as of December 31, 2021. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary. SLR visited the Property on August 24 to 25, 2021.

Hecla was established in 1891 and has its headquarters in Coeur d'Alene, Idaho, USA. In June 2013, Hecla acquired Aurizon Mines Ltd. (Aurizon) and renamed the company Hecla Québec Inc. (Hecla Québec). Hecla has an administrative/exploration office in Val-d'Or, Québec and an office in Vancouver, British Columbia. Hecla holds a 100% interest in Casa Berardi through its wholly owned subsidiary Hecla Québec. The Casa Berardi complex has a 33 year history of surface and underground mining operations.

The Property is located in the northwestern Québec, approximately 95 km north of the town of La Sarre, in the James Bay Municipality. The Property extends east-west for more than 37 km and reaches 3.5 km in width. The Property is bounded in the west by the Québec/Ontario border and covers parts of Casa Berardi, Dieppe, Raymond, D'Estrées, and Puiseaux townships. The Casa Berardi gold deposits are located along a five kilometre east-west mineralized corridor associated with the Casa Berardi Fault. They comprise the West Mine, including the Principal area, and the East Mine.

The Casa Berardi gold deposits can be classified as an Archean sedimentary hosted lode gold deposit. The gold mineralization is superimposed on a continuous graphitic mudrock unit corresponding to the Casa Berardi Fault plane. Gold occurs mainly south of the Casa Berardi Fault, and occasionally on both sides of the fault.

The Casa Berardi operation includes several open pits and two underground mines (Figure 1-1). The Mine has produced approximately 2.84 million ounces (Moz) Au (recovered) since commencing production in 1988, including approximately 2.15 Moz Au (recovered) since production recommenced in November 2006.

The Casa Berardi processing facilities consists of a 3,836 tonnes per day (tpd) mill, with the ability to process 4,100 tpd, and a carbon-in-leach (CIL) process to recover gold from the ore.

Production for Casa Berardi over the current life of mine (LOM), 2022 to 2035, will be comprised of 2.4 million tonnes (Mt) from the underground operations from 2022 until 2027 and 16.5 Mt from the open pit operations from 2022 until 2035. Production will be split evenly over the initial four year period, when production from the underground operations reduces and subsequently from 2027 the open pits will provide the full production tonnage at a rate of approximately 4,000 tpd or 1.4 Mt per annum (Mtpa). Gold production over the LOM is forecasted to total 1.49 Moz Au (average of 106,000 oz Au per annum) while recovered silver is forecasted to total 357,000 oz Ag (average of 25,500 oz Ag per annum).

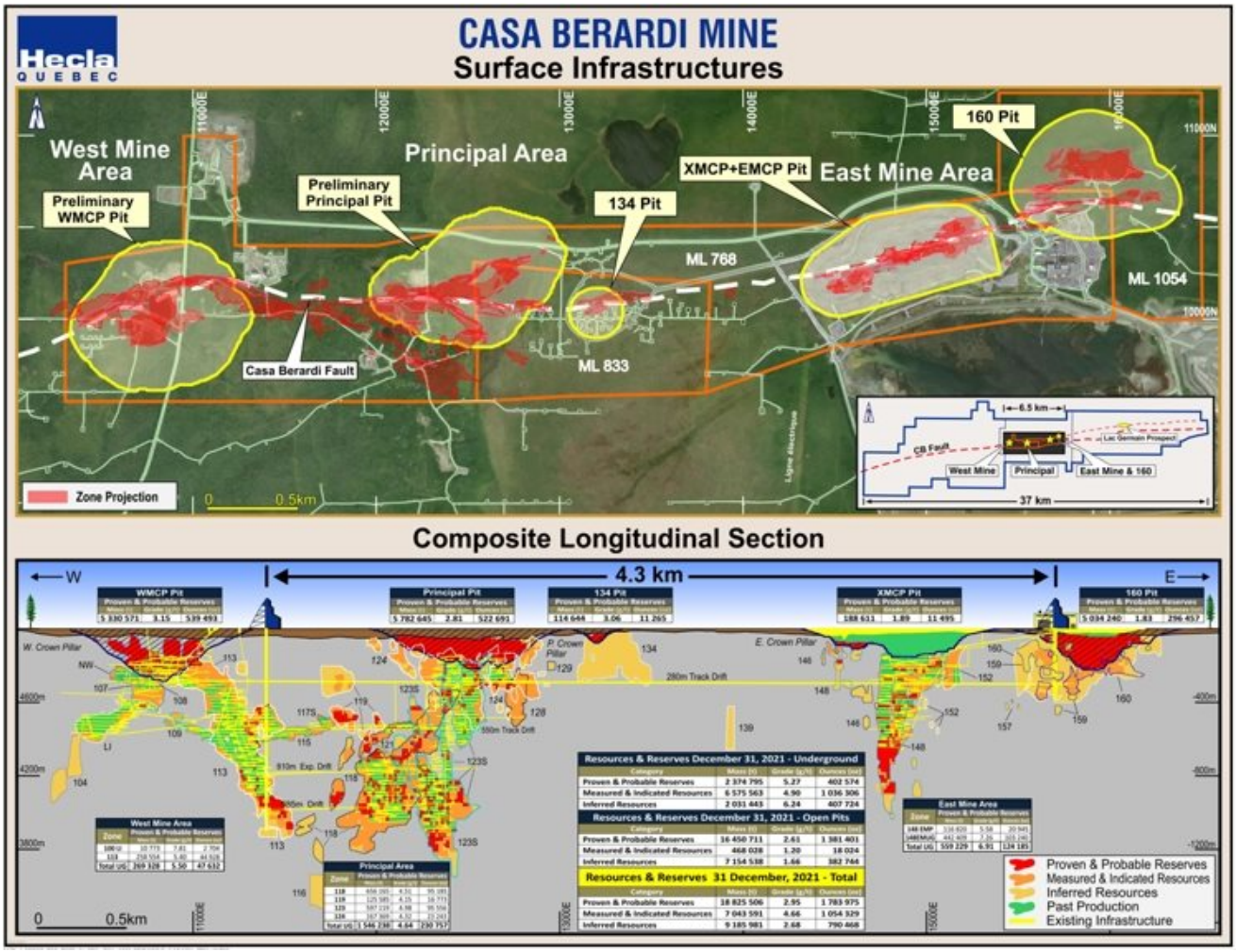


Figure 1-1: Mine Plan View Infrastructure with Composite Longitudinal Section

1.1.1 Conclusions

SLR offers the following conclusions and observations by area:

1.1.1.1 Geology and Mineral Resources

- Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300. Total Measured and Indicated Mineral Resources, exclusive of Mineral Reserves, as of December 31, 2021, are estimated to be 7.04 Mt at 4.66 g/t Au containing 1,05 Moz Au. Inferred Mineral Resources total 9.18 Mt at 2.68 g/t Au for 0.79 Moz Au. The underground portion of Measured and Indicated Mineral Resources represent 98% of the total Measured and Indicated Mineral Resources.

- The Casa Berardi Measured and Indicated Mineral Resources and the underground Inferred Mineral Resources have been prepared to industry best practices and conform to the resource categories defined by the SEC in S-K 1300. The SLR Qualified Person (QP) notes that the open pit Inferred Mineral Resources situated at the 134 and 160 pits are not constrained by a resource pit shell and that the elevation datums used to limit the open pit resources at depth are optimistic and should be replaced with resource shells in the future. Notwithstanding, the SLR QP is of the opinion that this is not a significant issue because this material represents approximately 9% of the total reserve and resource ounces at Casa Berardi, it is all classified as Inferred, and none of it is included in the Long Term Plan (LTP).

- The Mineral Resources for Casa Berardi conform to the resource categories defined by the SEC in S-K 1300. Resource classification polygons were manually created for reach lens based on drill hole composites with average distances of up to 25 m for Measured and Indicated blocks. Measured blocks have the added requirement of having underground development nearby. Inferred blocks are located outside the 25 m average distance polygons and are based on average distances up to generally a maximum of 35 m and rarely up to 50 m.

- The open pit block models are diluted to whole block models using scripts in Gemcom. For the open pit diluted block models, only the blocks with more than 25% of mineralized material were classified, the remaining blocks with less than 25% of mineralized material are not classified and excluded from the resource estimate.

- From 1974 to 2021, surface and underground diamond drilling, totalling over 3.5 million metres, has been completed at Casa Berardi.

- Over the past few decades, the Casa Berardi geology team has developed an advanced understanding of the complex geology, lithology, structural, and alteration controls present at Casa Berardi.

- The mineralization style and setting are well understood and support the declaration of Mineral Resources and Mineral Reserves.

- The Casa Berardi sample preparation, analyses, quality assurance/quality control (QA/QC) protocols, and security procedures are acceptable, meet industry standard practice, and are adequate for Mineral Resource estimation.

    - Sample collection and handling of core is undertaken in accordance with industry standard practices, with procedures implemented to limit potential sample losses and sampling biases.

    - Sample preparation for samples that support Mineral Resource estimation has followed a similar procedure since 1998. These preparation procedures are consistent with industry standard methods for gold deposits.

    - Core from exploration and infill diamond drilling programs are analyzed by independent and accredited laboratories using industry standard methods for gold and silver analyses. Current run of mine sample analyses are performed by the mine laboratory.

    - While limited information is available regarding the QA/QC procedures for the pre-1998 drill programs, sufficient reanalysis programs and vast amounts of more recent data support the use of pre-1998 data.

- The QA/QC program results indicate that the sample preparation and analytical procedures at the mine laboratory and Swastika Laboratories Ltd. (Swastika) are well aligned to generate reliable and accurate results.

    - Blank sample results imply minimal cross sample contamination.

    - Certified reference material (CRM) results demonstrate that assay values are sufficiently accurate to be used in Mineral Resource estimation and no significant biases are evident at the mine and Swastika laboratories.

- Sequential insertion of duplicate samples has resulted in a relatively low proportion of duplicate results for mineralized samples.
- External pulp and reject check assays suggest that the ALS Geochemistry (ALS) gold assays may be biased high relative to the Swastika and Mine laboratory results.

- Sample security is regarded as very good. Samples are always attended or locked in the on site logging or sampling facilities. Chain of custody procedures consist of completing sample submittal forms that are sent to the laboratory with sample shipments and shipment tracking to ensure that all samples are received by the laboratory.
- The data verification programs undertaken on the data collected from the Project comply with industry standards and adequately support the geological interpretations, validate the analytical and database quality, and support the use of the data in Mineral Resource and Mineral Reserve estimation and in mine planning
- The SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that would materially affect the Mineral Resource estimate.
- The Property is very large and covers a very favourable geological environment for gold mineralization including a 37 km strike length along the Casa Berardi Fault.
- The SLR QP is of the opinion that excellent exploration potential remains on the Property, both along strike and at depth in the immediate mine area and on the rest of the Property.
- Geophysics and drilling are the key exploration tools needed to make new discoveries under the thick layer of overburden that covers most of the Property.

1.1.1.2 Mining and Mineral Reserves

- Mineral Reserves have been classified in accordance with the definitions for Mineral Reserves in S-K 1300. Mineral Reserves as of December 31, 2021 total 18.82 Mt grading 2.95 g/t Au containing 1.78 Moz Au.
- Measured and Indicated Mineral Resources were converted to Proven and Probable Mineral Reserves, respectively. Inferred Mineral Resources were not converted to Mineral Reserves, however, are typically included in the Casa Berardi LTP and therefore are removed from the LOM cash flows to ensure economic confirmation of the Mineral Reserves.
- The mining methods at Casa Berardi are well established with many years of operating experience, providing the necessary expertise to, safely and economically, extract the Mineral Reserves.
- While both transverse and longitudinal longhole stoping methods are employed effectively challenging ground conditions require the use of various types of backfill to provide the necessary support.
- Underground mining will come predominantly from the West Mine with a minor amount from the East Mine. Mining from various open pits on surface represent the bulk of the Mineral Reserves to be mined, accounting for approximately 77% of the Casa Berardi Mineral Reserves.
- The current LOM period is estimated to be fourteen years ending in 2035. Underground Mineral Reserves totalling 2.4 Mt will be mined during the first six years while open pit Mineral Reserves totalling 16.5 Mt will be mined over the entire LOM period.

1.1.1.3 Mineral Processing

- Metallurgical and production models have been developed from extensive baseline sampling and are further adjusted annually to account for process and metallurgical improvements and changes.
- The test work performed on open pit material was used to estimate gold recovery, while operating data was used for underground material. Recent test work has been performed by an external laboratory on future open pit material (West Mine Crown Pillar (WMCP) and Principal). WMCP test results were used to inform the long term mine plan. An update on data pertaining to the Principal Pit will be made once the test results are available.
- Test work programs, both internal and external, continue to be performed to support current operations and potential improvements.
- The current process facilities are appropriate for the mineralization types provided from the mine. The flowsheet, equipment, and infrastructure are expected to support the current LOM plan.

1.1.1.4 Infrastructure

- Hecla plans to build a new maintenance garage to handle the 150 t trucks.
- Hecla plans to build a new pre-crusher.

1.1.1.5 Environment

- Hecla has sufficiently assessed the environmental impact of the operation, and subsequent closure and remediation requirements such that Mineral Resources and Mineral Reserves can be declared, and the mine plan deemed appropriate and achievable. Closure provisions are appropriately considered and monitoring programs are in place.
- Hecla has developed a community relations plan to identify and ensure an understanding of the needs of the surrounding communities and to determine appropriate programs for addressing those needs. Hecla appropriately monitors socio-economic trends, community perceptions, and mining impacts.
- Permits held by Hecla for the Property are sufficient to ensure that mining activities are conducted within the regulatory framework required by regulations.
- There are currently no known environmental, permitting, or social/community risks that could impact the Mineral Resources or Mineral Reserves.

1.1.2 Recommendations

It is normal that there are not many recommendations for mature operations like Casa Berardi. SLR offers the following recommendations by area.

1.1.2.1 Geology and Mineral Resources

1. Continue drilling to expand the near mine open pit and underground Mineral Resources.
2. Convert open pit and underground Inferred Mineral Resources to Indicated, especially material in the LTP.
3. Continue to drill below the 134 and 160 pits.
4. Create resource open pit shells for 134 and 160.

5. Increase regional exploration activities to make new discoveries on the very large Property.
6. Consider changing QA/QC protocols related to pulp duplicate selection and sending rejects for external check assays.
7. Investigate the potential high gold assay bias at the secondary umpire laboratory.
8. Implement procedures that will help reduce CRM mislabelling or "swaps".

1.1.2.2 Mining and Mineral Reserves

1. Investigate the potential use of contractors, improved equipment performance, revised schedules and other incentives to complete the planned development.
   - While mining operations at Casa Berardi are being carried out in an appropriate fashion annual mine development to access future mining areas has fallen short of planned advance rates. Additional efforts will be required to meet production targets.
2. Continue conducting definition diamond drilling throughout the remainder of the underground mining operation until 2027.
   - Based on positive ongoing results consider increasing the drilling program.
3. Continue to convert Mineral Resources to Mineral Reserves to extend the underground operation past 2027 and extend open pit mining where possible.
4. Investigate adding marginal underground Measured and Indicated Mineral Resources to the Mineral Reserves.

1.1.2.3 Mineral Processing

1. Continue to conduct additional metallurgical testing to better understand the processing of mineralization from the Principal and WMCP pits. This will aid in projecting metallurgical recoveries for these pits and will indicate any variability in gold recovery and grindability of the material. SLR notes that testing was undertaken at an external laboratory in 2021 and some results were not available at the time of preparation of this TRS.

1.2 Economic Analysis

The economic analysis contained in this TRS is based on the Casa Berardi Proven and Probable Mineral Reserves material only, economic assumptions, and capital and operating costs provided by Hecla's technical team in its LOM plan model and reviewed by SLR. All costs in this section are expressed in US dollars. Unless otherwise stated, all costs in this section of the TRS are expressed without allowance for escalation or currency fluctuation. All costs received from Hecla's site technical team in its Casa Berardi LOM 2022 Reserves only model were quoted in Canadian dollars and were converted to US dollars at an exchange rate of US$1 = C$1.275.

A summary of the key project criteria is provided in the subsequent subsections.

1.2.1 Economic Criteria

1.2.1.1 Physicals

- Mine life: 14 year LOM (between years 2022 and 2035)
- Open Pit operations
  - Open pit mine life: 14 years (between years 2022 and 2035)
  - Total ore tonnes mined: 16.45 Mt at 2.61 g/t Au
  - Waste tonnes: 245.64 Mt
  - Maximum mining rate: 72,000 tpd (ore + waste) in year 2028
- Underground operations
  - Underground mine life: 6 years (between years 2022 and 2027)
  - Total ore tonnes mined: 2.37 Mt at 5.27 g/t Au
  - Maximum mining rate: 1,300 tpd
- Processing of Mineral Reserves:
  - Total Ore Feed to Plant: 18.83 Mt
    - Gold grade: 2.95 g/t Au
    - Silver grade: 0.71 g/t Ag
    - Silver/Gold ratio: Ag = 23.99% of Au
  - Maximum milling rate: 4,500 tpd
  - Contained Metal
    - Gold: 1.78 Moz Au
    - Silver: 0.428 Moz Ag
  - Average LOM Plant Recovery 83.5%
  - Recovered Metal
    - Gold: 1.49 Moz Au
    - Silver: 0.358 Moz Ag

1.2.1.2 Revenue

- SLR conducted a preliminary economic analysis using flat Mineral Reserve pricing of US$1,600/oz Au and US$21/oz Ag and confirmed the mine was economic at those prices.
- For the purposes of this economic analysis described in this section, revenue is estimated over the LOM with a flat long term price of US$1,650/oz Au and US$21/oz Ag, respectively. SLR considers this price to be aligned with latest industry consensus long term forecast prices.Transportation, insurance and refining charges are estimated at US$4.31/oz Au over the LOM. Payable metals in the Casa Berardi LOM 2022 plan are estimated at 99.9% for gold and 99% for silver. These rates are based on actual figures for refining losses.

- LOM net revenue is US$2,456 million (after Refining Charges).

1.2.1.3 Capital Costs

- Total sustaining capital costs total US$347.2 million
- Capital costs in years 2024 and 2025, are higher than the LOM average to prepare infrastructure needed to achieve full production in the open pits.
- Salvage value of US$20.9 million.
- Closure costs of US$22.9 million are included in the analysis at the end of the LOM.

1.2.1.4 Operating Costs

- Open Pit mining: US$15.50/t ore mined
- Underground mining: US$53.43/t ore mined
- Processing (includes paste fill plant): US$20.05/t ore milled
- Site Services - Mechanical & Electrical: US$16.42/t ore milled
- Hedging Operating Costs Savings: - US$0.26/t ore milled
- G&A US$12.53/t ore milled
- Total unit operating costs US$69.03/t ore milled
- LOM total operating costs US$1,300 million.
- Excludes financing and corporate overhead costs

1.2.1.5 Taxation and Royalties

- Royalties: The current production zones as well as any in the 2022 LOM are not subject to a net smelter return (NSR) or royalty to a third party / previous landowner.
- Income tax is payable to the Federal Government of Canada, pursuant to the Income Tax Act (Canada). The applicable Federal income tax rate is 15% of taxable income.
- Income tax is payable to the Province of Québec at a tax rate of 11.5% of taxable income.
- No income taxes are payable until 2029 as Hecla uses its current tax pools and net operating loss carry forwards. Beginning in 2029 the effective tax rate used is 26.5% (combined federal and provincial)
- Québec Mining Tax base rate is 16%

1.2.2 Cash Flow Analysis

SLR has reviewed the Hecla's Casa Berardi LOM 2022 Reserves only model and has prepared its own unlevered after-tax LOM cash flow model based on the information contained in this TRS to confirm the physical and economic parameters of the Casa Berardi Mine.

The Casa Berardi economics have been evaluated using the discounted cash flow method by considering annual processed tonnages and grade of ore. The associated process recovery, metal prices, operating costs, refining and transportation charges, and sustaining capital expenditures were also considered.

The indicative economic analysis results, presented in Table 1-1 in US dollars with no allowance for inflation, show a pre-tax and after-tax NPV, using a 5% discount rate, of $514 million and $396 million, respectively. The SLR QP is of the opinion that a 5% discount/hurdle rate for after-tax cash flow discounting of long lived precious/base metal operations in a politically stable region is reasonable and appropriate and commonly used. For this cash flow analysis, the internal rate of return (IRR) and payback are not applicable as there is no negative initial cash flow (no initial investment to be recovered) since Casa Berardi has been in operation for a number of years.

Table 1-1: Life of Mine Indicative Economic Results
Hecla Mining Company – Casa Berardi Mine

	Units	Total LOM
Production		
LOM	years	14
OP Production	000 t	16,451
Au Grade	g/t	2.61
Waste	000 t	245,640
UG Production	000 t	2,375
Au Grade	g/t	5.27
Mill Feed	000 t	18,826
Au Grade	g/t	2.95
Ag Grade	g/t	0.71
Ag/Au Conversion Ratio	%	23.999
Total Contained Production		
Contained Au	000 oz	1,784
Contained Ag	000 oz	428
Average Recovery	%	83.5
Total Recovered Production		
Recovered Au	000 oz	1,490
Recovered Ag	000 oz	358
Metal Prices		
Gold Price	US$/oz	1,650
Silver Price	US$/oz	21.00
Cash Flow		
Gross Revenue	**US$ million**	**2,464**
Treatment & Refining	US$ million	(6)
Operating Costs		
Mining OP Costs	US$ million	(255)
Mining UG Costs	US$ million	(127)

	Units	Total LOM
Processing Costs (includes paste fill plant)	US$ million	(377)
Site Services - Mechanical & Electrical	US$ million	(309)
Operating Costs Savings due to Hedging	US$ million	5
G&A	US$ million	(236)
Operating Cash Flow	**US$ million**	**1,158**
Sustaining Capital Costs	US$ million	(347)
Salvage Value	US$ million	21
Reclamation & Closure	US$ million	(23)
Pre-Tax Net Cash Flow	**US$ million**	**809**
Québec Mining Tax	US$ million	(116)
Federal & Provincial Income Taxes	US$ million	(72)
After-Tax Cashflow	**US$ million**	**621**
	Project Economics	
Pre-tax NPV at 5%	**US$ million**	**514**
After-Tax NPV at 5%	**US$ million**	**396**
	Operating Metrics	
Maximum Daily OP Mining Rate	t/d mined	87,000
Maximum Daily UG Mining Rate	t/d mined	1,300
Maximum Daily Processing Rate	t/d milled	4,500
OP Mining Cost	US$ / t ore mined	15.50
UG Mining Cost	US$ / t ore mined	53.43
Processing Cost	US$ / t ore	20.05
Site Services (Mech. & Elec.) Costs	US$ / t ore	16.42
Operating Costs Savings due to Hedging	US$ / t ore	(0.26)
Administration Cost	US$ / t ore	12.53
Total Cost	**US$ / t ore**	**69.03**

1.2.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities on after-tax NPV at a 5% discount rate. The Mine is most sensitive to changes in metal prices and US$/C$ exchange rate, then to head grade and metallurgical recoveries, followed by operating costs and capital costs.

1.3 Technical Summary

1.3.1 Property Description

The Property is located in the Province of Québec, approximately 95 km north of the town of La Sarre, in the James Bay Municipality. Mine is located at longitude 79°16'46.4" and latitude 49°33'56.7".

1.3.2 Land Tenure

The Property consists of 391 contiguous designated claims, covering a total area of 19,151.08 ha, and three mining leases, BM 768, BM 833, and BM 1054 covering areas of 397.09 ha, 84.35 ha, and 92.56 ha, respectively. The Property area totals 19,725.08 ha. Other legal titles include non-exclusive leases BNE 25938, tailings lease 70218, and two waste rock facility (WRF) leases 192410 and 819410. Legal titles are under the name of Hecla Québec.

The Casa Berardi claims are in good standing.

1.3.3 History

Prior to 1974, the Casa Berardi area was explored for base metal deposits. In 1974, the first 13 claims were staked by Inco Gold Ltd. (Inco Gold). The discovery hole was drilled in 1981, and 590 additional claims were staked.

In 1982, Inco Gold (60%) and Golden Knight Resources Inc. (Golden Knight) (40%) formed a joint venture (JV) to operate the Mine , with the East Mine commencing production in 1988 and the West Mine in 1990. In 1991, TVX Gold Inc. (TVX) acquired Inco Gold's 60% interest in the Property. In 1994, TVX and Golden Knight purchased the remaining interest in the Domex claim block, a part of the Principal (Main) Zone between the West Mine and East Mine, from Teck Corporation. In January 1997, TVX announced the closure of the East Mine due to ground control issues. Two months later, the West Mine was closed. The total combined production for the period from 1988 to 1997 was 3.5 Mt at an average grade of 7.1 g/t Au. The total gold recovered during the operating years was 688,400 oz Au, with an average mill gold recovery rate of 87%.

In September 1998, Aurizon signed an agreement and completed the acquisition of all Casa Berardi assets and mining rights. Aurizon completed exploration diamond drilling programs, feasibility studies, underground development, shaft sinking, and construction.

In early November 2006, Aurizon completed construction and development at the West Mine area and commenced underground mining and milling operations. From November 2006 to May 31, 2013, Aurizon production totalled approximately 4.31 Mt at an average grade of 7.7 g/t Au for a total of 0.98 Moz Au recovered.

In June 2013, Hecla acquired Aurizon and the company was renamed Hecla Québec, a 100% subsidiary of Hecla. From 2012 to the end of 2016, the Casa Berardi Regional exploration was still under a JV between Lake Shore Gold Inc. (Lake Shore) and Hecla. In February 2016, Tahoe Resources Inc. (Tahoe) purchased Lake Shore, and at the end of 2016, Hecla bought Tahoe's 50% interest in the Property in exchange for C$5 million (US$ 4 million) and 1% NSR on 227 claims. From June 1, 2013 to December 31, 2021, production from Casa Berardi totalled approximately 9.0 Mt at an average grade of 4.88 g/t Au for a total of 1.17 Moz Au recovered.

Since 1988, a total of 16.8 Mt at an average grade of 5.98 g/t Au have been milled at Casa Berardi for a total recovered gold of 2.8 Moz Au and an average gold recovery of 88.1%

1.3.4 Geological Setting, Mineralization, and Deposit

The Property is located in the northern part of the Abitibi Subprovince, a subdivision of the Superior Province, the Archean core of the Canadian Shield. The Casa Berardi area is included in the Harricana-Turgeon Belt, which is part of the North Volcanic Zone.

The regional geology is characterized by a mixed assemblage of mafic volcanic rocks, flysch-type sedimentary iron formations, and graphitic mudrocks that are limited by a large granodioritic to granitic batholith. Structurally, the Property is enclosed in the Casa Berardi Tectonic Zone, a 15 km wide corridor that can be traced over 200 km. A network of predominantly east-west ductile high strain or shear zones mainly follow the lithological contacts.

The Casa Berardi Fault is defined by a stratigraphic contact between a graphite rich sediment sequence at the base of the Taïbi Domain, a northern continuous intermediary fragmental volcanic unit, and a southern polymictic conglomerate unit. On the north side of the Casa Berardi Fault, a thick sequence of very homogeneous wacke belonging to the Taïbi Group is affected by amphibolite grade metamorphism. One kilometre further north is the easterly elongated Recher Batholith, which is part of the northwestern boundary of the Abitibi greenstone belt.

The Casa Berardi Fault strikes east-west and dips 80° to the south. Inside the fault or deformation zone, ductile deformation intensity is heterogeneous. Kinematic indicators observed inside the main foliation, combined with the foliation dip pattern, indicate a possible south verging thrust movement.

Gold mineralization is largely located in quartz veining, either in the form of plurimetric veins, small scale veins, or veinlet networks. Veins are heterogeneous and contain a variable percentage of foliated enclaves exhibiting a laminated appearance. Veins are of different colour, texture, and structure. Gold grades are generally correlated with increasing complexity. Different quartz phases have been recognized in mineralized veins to exhibit the following sequence:

- Phase 1: grey quartz, with abundant sulphides and fluid inclusions, comprising more than 50% of mineralized veins.
- Phase 2: mosaic micro-crystalline quartz occurring in higher grade portions of veins.
- Phase 3: non-mineralized coarsely crystallized white quartz which cuts the two others.

The gold bearing vein filling is rarely massive, but often brecciated, micro-brecciated, or laminated. The fracture planes are rich in graphite and muscovite. Veins contain only minor sulphides (1% to 3%), predominately including arsenopyrite, pyrite, and traces of sphalerite, chalcopyrite, pyrrhotite, tetrahedrite, galena, and gold. Arsenopyrite is the main gold bearing sulphide present in all veins of the Casa Berardi deposit.

In general, gold occurs as free particles up to a few tens of micrometres in size and as grains attached to or locked in sulphides, including pyrite and arsenopyrite in various proportions depending on the mineralized area.

The Casa Berardi gold deposit can be classified as an Archean age, sedimentary-hosted lode gold deposit. Gold predominantly occurs south of the Casa Berardi Fault, and is sometimes observed on both sides of the Casa Berardi Fault.

1.3.5 Exploration

From 1974 to 2021, surface and underground diamond drilling, totalling over 3.5 million metres, has been completed at Casa Berardi. Most of this drilling has successfully expanded resources along a five kilometre segment of the Casa Berardi Fault in the immediate mine area. Some regional exploration work including geophysical surveys and diamond drilling has been carried out on the Property, which is very large and covers a very favourable geological environment for gold mineralization including a 37 km strike length along the Casa Berardi Fault. The SLR QP is of the opinion that excellent exploration potential remains on the Property, both along strike and at depth in the immediate mine area and on the rest of the Property. Geophysics and drilling are the key exploration tools needed to make new discoveries under the thick layer of overburden that covers most of the Property.

1.3.6 Mineral Resource Estimates

Total Measured and Indicated Mineral Resources, exclusive of Mineral Reserves, as of December 31, 2021, are estimated to be 7.04 Mt at 4.66 g/t Au containing 1.05 Moz Au. Inferred Mineral Resources total 9.18 Mt at 2.68 g/t Au for 0.79 Moz Au. The underground portion of Measured and Indicated Mineral Resources represent 98% of the total Measured and Indicated Mineral Resources.

The Casa Berardi Mineral Resources conform to the resource categories defined by the SEC in S-K 1300. Resource classification polygons were manually created for reach lens based on drill hole composites with average distances of up to 25 m for Measured and Indicated blocks. Measured blocks have the added requirement of having underground development nearby. Inferred blocks are located outside the 25 m average distance polygons and are based on average distances up to generally a maximum of 35 m and rarely up to 50 m.

The Casa Berardi Mineral Resource estimate as of December 31, 2021, is presented in Table 1-2.

Table 1-2: Mineral Resource Estimate Summary – December 31, 2021
Hecla Mining Company – Casa Berardi Mine

Resource Category	Tonnes	Grade (g/t Au)	Contained Metal (oz Au)
Underground			
Measured	2,060,934	5.30	351,430
Indicated	4,514,629	4.72	684,875
Measured + Indicated	**6,575,563**	**4.90**	**1,036,306**
Inferred	2,031,443	6.24	407,724
Open Pit			
Measured	87,427	1.33	3,730
Indicated	380,600	1.17	14,294
Measured + Indicated	**468,028**	**1.20**	**18,024**
Inferred	7,154,538	1.66	382,744
Total			
Measured + Indicated	**7,043,591**	**4.66**	**1,054,329**
Inferred	9,185,981	2.68	790,468

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla Québec and reviewed and accepted by SLR
3. Mineral Resources are exclusive of Mineral Reserves and do not have demonstrated economic viability.
4. Mineral Resources are 100% attributable to Hecla.
5. Underground Mineral Resources are estimated at cut-off grades ranging from 3.11 g/t Au to 4.00 g/t Au.
6. Open pit Mineral Resources are estimated at cut-off grades ranging from 0.95 g/t Au to 1.33 g/t Au.
7. Underground and open pit Mineral Resources are estimated using an average long term gold price of US$1,700 /oz Au and a US$/C$ exchange rate of 1.275.
8. A minimum mining width of three metres was used.
9. Totals may not represent the sum of the parts due to rounding.

The SLR QP is of the opinion that with consideration of the recommendations summarized in in this section, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

1.3.7 Mineral Reserve Estimates

Mineral Reserves have been classified in accordance with the definitions for Mineral Reserves in S-K 1300. Mineral Reserves as of December 31, 2021 are summarized in Table 1-3.

Measured Mineral Resources were converted to Proven Mineral Reserves, and Indicated Mineral Resources were converted to Probable Mineral Reserves. Inferred Mineral Resources were not converted to Mineral Reserves, however, are typically included in the Casa Berardi LTP and therefore are removed from the LOM cash

flows to ensure economic confirmation of the Mineral Reserves.

Table 1-3: Summary of Mineral Reserves – December 31, 2021
Hecla Mining Company – Casa Berardi Mine

Reserve Category	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)	Metallurgical Recovery (%)
		Underground		
Proven	836,930	5.33	143,294	-
Probable	1,537,865	5.24	259,279	-
Proven + Probable	**2,374,795**	**5.27**	**402,574**	**85.6**
		Open Pit		
Proven	4,321,010	3.26	452,992	-
Probable	12,129,701	2.38	928,409	-
Proven + Probable	**16,450,711**	**2.61**	**1,381,401**	**82.9**
		Total		
Proven + Probable	**18,825,506**	**2.95**	**1,783,975**	**83.5**

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Underground and open pit Mineral Reserves were estimated by Hecla Québec and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla.
4. Underground Mineral Reserves are estimated at a cut-off grade of 3.27 g/t Au for 100, 113,119 and 124 zones. A cut-off grade of 3.57 g/t Au for the 115, 118, 121, 123 and 128 zones. A cut-off grade of 3.83 g/t Au for the 146 and 148 zones, and a cut-off grade of 3.54 g/t for the 159 and 160 zones.
5. Open pit Mineral Reserves are estimated at a cut-off grade of 1.01 g/t Au for the 160 pits. A cut-off grade of 1.37 g/t Au for the WMCP. A cut-off grade of 1.31 g/t Au for the Principal Pit. A cut-off grade of 1.30 g/t Au for the 134 Pit. A cut-off grade of 1.39 g/t Au for the EMCP and XMCP.
6. Underground and open pit Mineral Reserves are estimated using an average long term gold price of US$1,600/oz Au and a US$/C$ exchange rate of 1.275.
7. A minimum mining width of three metres was used.
8. Totals may not represent the sum of the parts due to rounding.

Production for Casa Berardi over the current life of mine (LOM), 2022 to 2035, will be comprised of 2.4 million tonnes (Mt) from the underground operations from 2022 until 2027 and 16.5 Mt from the open pit operations from 2022 until 2035. Production will be split evenly over the initial four year period, when production from the underground operations reduces and subsequently from 2027 the open pits will provide the full production tonnage at a rate of approximately 4,000 tpd or 1.4 Mtpa. Gold production over the LOM is forecasted to total 1.49 Moz Au (average of 106,000 oz Au per annum) while recovered silver is forecasted to total 358,000 oz Ag (average of 25,600 oz Ag per annum).

The SLR QP is not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

1.3.8 Mining Methods

The mine design and planning processes reflect the previous mining experience at the West and East mines. Currently the bulk of the production comes from the West Mine which can be accessed by a shaft or a ramp down to the 1,080 m level while the East Mine connects to the West Mine on the 280 m level and does not have an operating hoist in place, however, the East Mine does have a ramp and can be accessed independently from West Mine. The East Mine represents less than 24% of the underground tonnage and presents challenging mining conditions with small stopes following the Casa Berardi fault.

A combination of longitudinal and transverse blasthole stoping is typically used at the Casa Berardi, depending on mineral zone geometry (width and attitude) and development requirements. While timely delivery of backfill plays a crucial role in controlling dilution and maintaining the short stoping cycle, since 2006 this mining approach has been implemented safely and reliably. The zones vary in thickness, ranging from over 50 m to less than three metres (e.g., minimum mining width). In general, the zones are subvertical (e.g., 55° to 85°).

Over the years, Hecla's Casa Berardi mine operators have acquired essential experience in addressing and successfully overcoming the mining challenges presented.

1.3.9 Processing and Recovery Methods

The Casa Berardi processing facility consists of a 3,836 tpd mill, with the ability to process 4,100 tpd, and a CIL process to recover gold from the ore. The key unit operations to produce gold include:

- Crushing
- Grinding
- Gravity Circuit
- CIL Circuit
- Carbon Circuit
- Elution Circuit
- Electrowinning Circuit
- Smelting

Residual pulp from the CIL mixing tank is pumped to the cyanide destruction tank to which sulphur dioxide and compressed air is added to destroy residual cyanide with agitation. After cyanide destruction, the treated pulp is then pumped to the paste backfill plant or the tailings pond. Ferric sulphate is also added to this material in order to reduce arsenic content in the solution. Approximately 5% of the Casa Berardi Mine tailings are used in the mine backfill cycle. Tailings that are not used for mine backfill are disposed of at the tailings storage facility (TSF).

1.3.10 Infrastructure

Existing surface and underground infrastructure at the East Mine includes the following:

- A nominal 3,836 tpd mill, with the ability to process 4,100 tpd.
- TSF with four tailings cells, a polishing pond, a sedimentation pond for settling iron arsenate precipitates, and a process water pond.
- Two story administrative building with offices, warehouse, dry, laboratory, two heavy equipment maintenance garage, millwright shop, and electrical shop.

- Two core shacks.
- Water pumping station.
- Hoistroom, a headframe, and a 380 m deep shaft (with no hoist).
- Mine access decline and a series of ramp-connected levels.
- Three petrol tanks with pump gas and fuel.
- One mineral stockpile.
- One waste and till-clay pile.

Existing surface and underground infrastructure at the West Mine include the following:

- Backfill plant, including a compressor room and a ventilation raise intake.
- Settling ponds.
- Pumping station.
- A 380 m^2 garage.
- Two dry houses with offices.
- Emergency building for mine rescue and infirmary.
- Warehouse.
- Core storage area.
- Gatehouse.
- Mine access decline providing access to the West Mine and Principal area.
- Hoistroom, headframe, and mine shaft to the 1,080 m level.
- A 125 tonnes per hour (tph) paste backfill plant and a cement plant with tailings feed line from the mill and distribution holes to the underground.
- Mine ventilation fans and mine air heater with ventilation raise to the mine workings.
- One WRF and one ore rock pile.

There is no additional surface infrastructure related to the Principal Mine. A five kilometre track drift joins the East and West mines and provides access to the Principal Mine at the 280 m level.

The power supply of the site is provided by a 55 km, 120 kV power line, from the town of Normétal.

1.3.11 Market Studies

Hecla currently has a refining agreement with Asahi Refining Canada (Asahi) whereby the refined gold and silver is refined and credited to Hecla's account at Asahi. The doré bars produced at Casa Berardi are refined at Asahi's facilities in Brampton, Ontario, Canada.

Gold and silver bullion is sold through commercial banks or metal traders via a sale contract at spot prices. Settlement of funds from bullion sales occurs two business days after the contract date.

The terms and conditions of the refining and bullion sales contracts are typical and consistent with standard industry practice and would be similar to contracts for the supply of gold elsewhere in North America.

1.3.12 Environmental Studies, Permitting and Plans, Negotiations, or Agreements with Local Individuals or Groups

Hecla has sufficiently assessed the environmental impact of the operation, and subsequent closure and remediation requirements such that Mineral Resources and Mineral Reserves can be declared, and the mine plan deemed appropriate and achievable. Closure provisions are appropriately considered and monitoring programs are in place.

Hecla has developed a community relations plan to identify and ensure an understanding of the needs of the surrounding communities and to determine appropriate programs for addressing those needs. Hecla appropriately monitors socio-economic trends, community perceptions, and mining impacts.

Permits held by Hecla for the Property are sufficient to ensure that mining activities are conducted within the regulatory framework required by regulations.

There are currently no known environmental, permitting, or social/community risks that could impact the Mineral Resources or Mineral Reserves.

1.3.13 Capital and Operating Cost Estimates

The estimated capital costs for Casa Berardi are presented in Table 1-4. The majority of the sustaining capital is to be spent over the initial six year period with the remainder over the following eight years of the mine life.

Table 1-4: LOM Capital Cost Summary
Hecla Mining Company – Casa Berardi Mine

Area	2022-2037 (US$000)	2022-2027 (US$000)	2028-2037 (US$000)
Hedging Gain	(182)	(182)	-
Underground Infrastructure and Development	50,917	50,917	-
Open Pit	41,894	15,872	26,021
Process Plant	37,563	28,495	9,069
Administration	5,888	5,712	176
Site Services (Mechanical & Electrical)	199,430	108,193	91,237
Definition Drilling	11,730	11,730	-
Total Capital	**347,239**	**220,735**	**126,504**

Capital development will include approximately 23.3 km of ramps and drifts up to 2027. The capital costs under Mechanical will include approximately 37% for mine equipment, 42% for stripping, and the remainder to construct roads and waste pads as well as dewatering and miscellaneous items. Definition diamond drilling will be continued throughout the underground mine life.

The capital costs are based on updates from equipment suppliers and verified with engineering companies providing services to Casa Berardi. The capital costs accuracy would be considered equivalent or better than AACE Class 1 with an expected accuracy range of -3% to -10% on the low side and +3% to +15% on the high side.

Mine development costs are based upon operating experience, current development contracts, and the LOM development schedule. Open pit costs include mobilization of the open pit contractor and capitalized stripping costs. In year 2035 there is a salvage value of approximately US$20.9 million for mine and other equipment that can be sold.

The estimated operating costs over the LOM (2022 to 2035) are presented in Table 1-5.

Table 1-5: LOM Operating Cost Summary
Hecla Mining Company – Casa Berardi Mine

Item	Total LOM (US$000)	Total LOM (US$/t milled)
Tonnes Milled (000 t)	18,826	18,826
Hedging Gain	(4,871)	(0.26)
Mining	381,955	20.29
Processing	377,483	20.05
Admin. Casa Berardi	235,892	12.53
Site Services (Mechanical & Electrical)	309,050	16.41
Total	1,299,509	69.03

While the operating costs have been higher than budget over the last two years the LOM operating costs have been adequately estimated. This is reflected by higher costs during the underground operations and lower costs during open pit mining, as expected.

Hecla-forecasted operating costs estimates are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would be classified as Class 1 with an accuracy range of - 3% to -10% to +3% to +15%.

2.0 INTRODUCTION

SLR International Corporation (SLR) was retained by Hecla Mining Company (Hecla) to prepare an independent Technical Report Summary (TRS) on the Casa Berardi Mine (Casa Berardi or the Property), located in Québec, Canada. The purpose of this TRS is to support the disclosure of the Casa Berardi Mineral Resource and Mineral Reserve estimates as of December 31, 2021. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 229.1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300) and Item 601 (b)(96) Technical Report Summary.

Hecla was established in 1891 and has its headquarters in Coeur d'Alene, Idaho, USA. In June 2013, Hecla acquired Aurizon Mines Ltd. (Aurizon) and renamed the company Hecla Québec Inc. (Hecla Québec). Hecla has an administrative/exploration office in Val-d'Or, Québec and an office in Vancouver, British Columbia. Hecla owns 100% interest in Casa Berardi through its wholly owned subsidiary Hecla Québec. The Casa Berardi complex has a 33 year history of surface and underground mining operations.

The Property is located in the northwestern Québec, approximately 95 km north of the town of La Sarre, in the James Bay Municipality. The Property extends east-west for more than 37 km and reaches 3.5 km in width. The Property is bounded in the west by the Québec/Ontario border and covers parts of Casa Berardi, Dieppe, Raymond, D'Estrées, and Puiseaux townships. The Casa Berardi gold deposits are located along a five kilometre east-west mineralized corridor associated with the Casa Berardi Fault. They comprise the West Mine, including the Principal area, and the East Mine.

The Casa Berardi gold deposits can be classified as an Archean sedimentary hosted lode gold deposit. The gold mineralization is superimposed on a continuous graphitic mudrock unit corresponding to the Casa Berardi Fault plane. Gold occurs mainly south of the Casa Berardi Fault, and occasionally on both sides of the fault.

The Casa Berardi operation includes several open pits and two underground mines. The Mine has produced approximately 2.84 million ounces (Moz) Au (recovered) since commencing production in 1988, including approximately 2.15 Moz Au (recovered) since production recommenced in November 2006.

The Casa Berardi processing facilities consist of a 3,836 tonnes per day (tpd) mill, with the ability to process 4,100 tpd, and a carbon-in-leach (CIL) process to recover gold from the ore.

Production for Casa Berardi over the current life of mine (LOM), 2022 to 2035, will be comprised of 2.4 million tonnes (Mt) from the underground operations from 2022 until 2027 and 16.5 Mt from the open pit operations from 2022 until 2035. Production will be split evenly over the initial four year period, when production from the underground operations reduces and subsequently from 2027 the open pits will provide the full production tonnage at a rate of approximately 4,000 tpd or 1.4 million tonnes per annum (Mtpa). Gold production over the LOM is forecasted to total 1.49 Moz Au (average of 106,000 oz Au per annum) while recovered silver is forecasted to total 358,000 oz Ag (average of 25,600 oz Ag per annum).

2.1 Site Visit

SLR qualified persons (QPs) visited Casa Berardi on August 24 and 25, 2021. SLR QPs visited the East Mine Crown Pilar (EMCP) western extension (XMCP) Pit, the East Mine underground, the mill, tailings storage facilities (TSF), core logging facilities, and surface infrastructure. Bedrock stripping at the 160 Pit was nearing completion while SLR QPs were at site. SLR QPs held meetings with site personnel and followed up with a number of teleconference meetings after the site visit.

The SLR geology QPs viewed the Casa Berardi Fault, which is well exposed and transects the XMCP pit, and the freshly washed and well-mineralized working face on the 630 m level at the East Mine where the face was marked up and sampled by a very experienced geological technician. An underground diamond drill in the process of drilling a deep hole (CBE-0243) was also visited. The drill bay was safe and clean and the two drillers were well organized. Approximately 100% core recovery was evident in the core boxes at 312 m.

The SLR geology QPs found the core logging facilities to be clean and well organized with good lighting. Overhead hoses provide a convenient source of water to wet the core. An area with a high definition camera on a tall tripod is designated for taking core photographs. The pre-packaged blanks and CRMs are well-organized. The diamond core saw has continuous water flow and is located in a separate, sound insulated, room. The core logging area is separate from the core reception and sample dispatch area, which is large enough for trucks to enter and has a long core layout table and a number of core racks for temporary core storage. A core reference library is available for new geologists to help ensure logging consistency.

The SLR mining QP found the open pit mining operations were well organized with the mining contractor carrying out drilling and mucking operations in a safe and efficient manner. Mining equipment utilized was consistent with current equipment types and appeared to be very well maintained. The contractor has maintenance facilities that appeared to be very functional and well organized. Control drilling of the pit walls was successful in controlling overbreak and muck fragmentation was reasonable given some difficult ground conditions.

The underground mining operations were equally well organized with adequate ground control measures in place, well executed production drilling and blasting in the production areas and development areas. Oversize was observed due to the very difficult conditions created by the Casa Berardi Fault and handling of oversize appeared to be well done as was remote control mucking of the drawpoints. Backfill placed appeared to be of good quality to provide the required ground support to permit safe mining. The diamond drill station observed was well secured and all safety devices appeared to be in place. Good housekeeping and cleanliness of the working areas was observed.

The SLR metallurgical and environmental QPs visited the mill operations, however, some equipment was down for repair and maintenance and access to some plant areas were limited. In general, all equipment in the key unit operations appeared to be in use or were being reliably maintained to achieve the target production. The TSF, waste and ore stockpiles, and water management monitoring systems were also visited. Roscoe Postle Associates Inc (RPA), now a part of SLR is very familiar with Casa Berardi with work dating back to the listing report for Aurizon in 1997 and NI 43-101 Technical Reports in 2005, 2009, 2010, 2011, 2013 for Aurizon and 2014 for Hecla. SLR also audited the year-end Mineral Resource and Mineral Reserve estimates in 2007 and 2008.

2.2 Sources of Information

During the preparation of this TRS, discussions were held with Hecla personnel:

- Mr. Keith Blair, Chief Geologist, Hecla
- Mr. Patrice Simard, Geology Superintendent, Hecla Québec
- Mr. Real Parent, Principal Geologist, Hecla Québec
- Mr. Alain Quenneville, Engineer in Geology, Hecla Québec
- Mr. Azougrou Bozon Koto, Principal Engineer, Hecla Québec

- Mr. Chris McLean, VP & CFO, Hecla Québec
- Mr. Denis Baribeau, Controller, Hecla Québec
- Mr. Guy Pouliot, Senior Technician, Hecla Québec
- Mr. Jean Collard, Engineering Superintendent, Hecla Québec
- Mr. Nicolas Lemieux, Open Pit Operations Superintendent, Hecla Québec
- Mr. Patrick Gibouleau, Mechanical Maintenance Planning Coordinator, Hecla Québec
- Mr. Emmanuel Ferragne-Theoret, Open Pit Senior Planning Engineer, Hecla Québec
- Mr. David Tremblay, Engineer-in-Training, Hecla Québec
- Mr. Sylvain Morissette, General Plant Process Superintendent, Hecla Québec
- Mr. Thiago Tolentino Silva, Senior Metallurgist, Hecla Québec
- Ms. Lucienne Anctil, Environmental Coordinator, Hecla Québec

The documentation reviewed, and other sources of information, are listed at the end of this TRS in Section 24.0 References.

2.3 List of Abbreviations

Units of measurement used in this TRS conform to the metric system. All currency in this TRS is United States dollars (US$) unless otherwise noted. Canadian dollars (C$) have been converted to US$ dollars at an exchange rate of US$1 = C$1.275 unless otherwise noted.

µ	micron	kVA	kilovolt-amperes
µγ	microgram	kW	kilowatt
a	annum	kWh	kilowatt-hour
A	ampere	L	litre
bbl	barrels	lb	pound
Btu	British thermal units	L/s	litres per second
°C	degree Celsius	m	metre
C$	Canadian dollars	M	mega (million); molar
cal	calorie	m^2	square metre
cfm	cubic feet per minute	m^3	cubic metre
cm	centimetre	MASL	metres above sea level
cm^2	square centimetre	m^3/h	cubic metres per hour
d	day	mi	mile
dia	diameter	min	minute
dmt	dry metric tonne	µµ	micrometre
dwt	dead-weight ton	mm	millimetre
°F	degree Fahrenheit	mph	miles per hour
ft	foot	MVA	megavolt-amperes
ft^2	square foot	MW	megawatt
ft^3	cubic foot	MWh	megawatt-hour
ft/s	foot per second	oz	Troy ounce (31.1035g)
g	gram	oz/st, opt	ounce per short ton
G	giga (billion)	ppb	part per billion
Gal	Imperial gallon	ppm	part per million
g/L	gram per litre	psia	pound per square inch absolute
Gpm	Imperial gallons per minute	psig	pound per square inch gauge
g/t	gram per tonne	RL	relative elevation
gr/ft^3	grain per cubic foot	s	second
gr/m^3	grain per cubic metre	st	short ton
ha	hectare	stpa	short ton per year
hp	horsepower	stpd	short ton per day
hr	hour	t	metric tonne
Hz	hertz	tpa	metric tonne per year
in.	inch	tpd	metric tonne per day
in^2	square inch	US$	United States dollar
J	joule	Usg	United States gallon
k	kilo (thousand)	Usgpm	US gallon per minute
kcal	kilocalorie	V	volt
kg	kilogram	W	watt
km	kilometre	wmt	wet metric tonne
km^2	square kilometre	wt%	weight percent
km/h	kilometre per hour	yd^3	cubic yard
kPa	kilopascal	yr	year

3.0 PROPERTY DESCRIPTION

3.1 Location

The Property is located in the Province of Québec, approximately 95 km north of the town of La Sarre, in the James Bay Municipality (Figure 3-1). The Mine is located at longitude 79° 16’ 46.4” and latitude 49°33’56.7”. The Property is bounded in the west by the Québec/Ontario border and covers parts of Casa Berardi, Dieppe, Raymond, D’Estrées, and Puiseaux townships.

The Property extends east-west for more than 37 km and reaches 3.5 km in width. The immediate mine area comprises three mining leases covering an area of 574.00 ha (Figure 3-2). The gold deposits are located along a five kilometre, east-west trending mineralized corridor and are included within the East and West mine areas (Figure 3-3).

3.2 Land Tenure

The Property consists of 391 contiguous designated claims, covering a total area of 19,151.08 ha, and three mining leases, BM 768, BM 833, and BM 1054 covering areas of 397.09 ha, 84.35 ha, and 92.56 ha, respectively. The Property area totals 19,725.08 ha (Figure 3-4 and Table 27-1 in Appendix 1). Other legal titles include non-exclusive leases BNE 25938, tailings lease 70218, and two waste rock facility (WRF) leases 192410 and 819410. Legal titles are under the name of Hecla Québec.

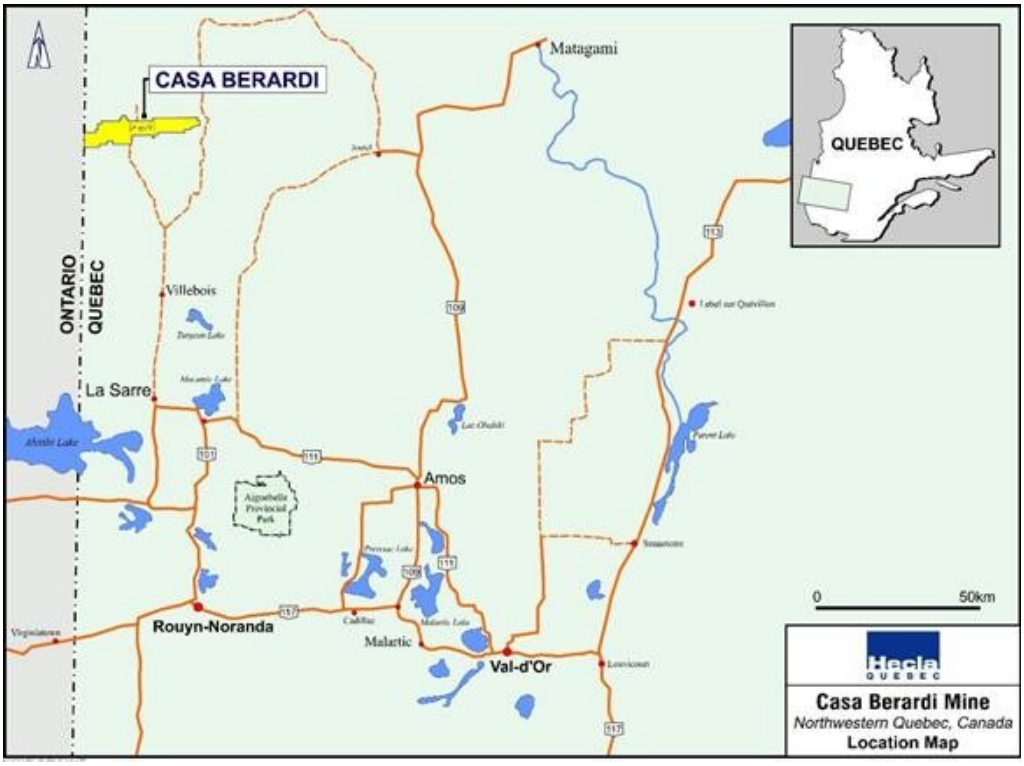


Figure 3-1: Location Map

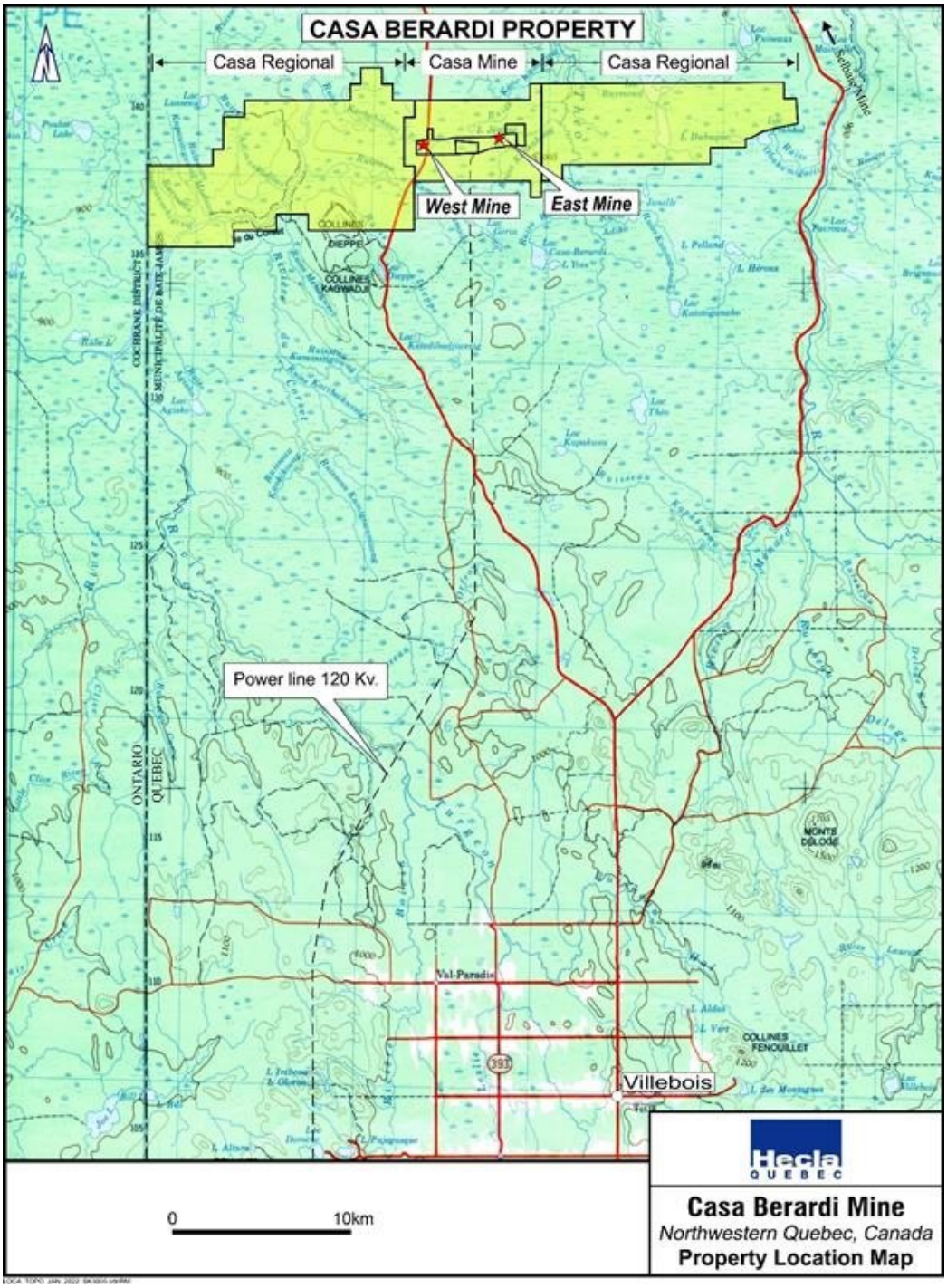


Figure 3-2: Property Location Map

According to the Québec Mining Act, renewal of claims takes place every two years, with costs dependent on area. Mining leases are renewed annually. The Casa Berardi claims and mining leases will be renewed for amounts of C$25,608 (US$20,085) and C$29,896 (US$23,448), respectively, in accordance with the 2022 rates set by the government. The Casa Berardi claims are in good standing. The renewal costs are adjusted to the annual inflation rate.

The Québec Mining Act stipulates that a titleholder is required to conduct statutory work during the validity period of the claim. Each claim or lease shows excess spending amounts for required works. These amounts are put to the credit of the claims and are expected to cover several years in most cases. The Property has excess work credits of approximately C$17,291,526 (US$13,561,981).

The school taxes to the James Bay School Board and the Lac-Abitibi School Board have been paid for 2021.

The municipal taxes to the James Bay, Villebois, Dupuy, and La Sarre municipalities have been paid for 2021.

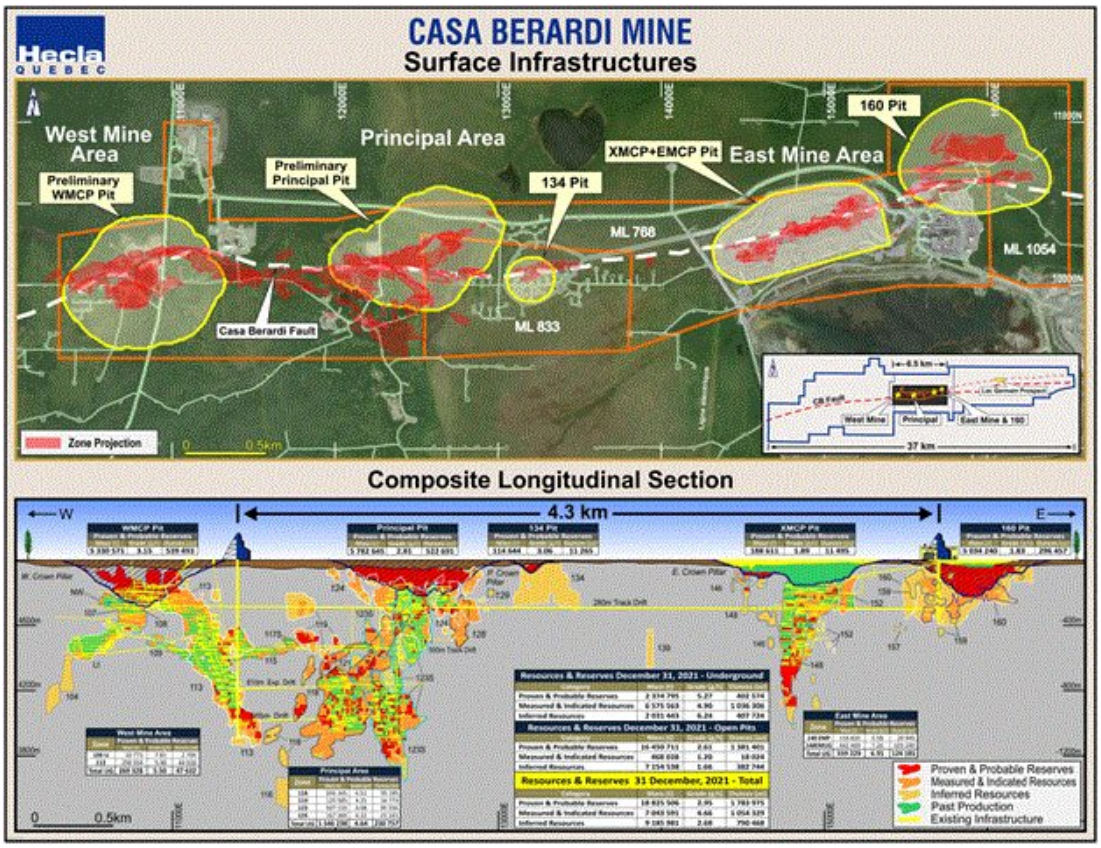


Figure 3-3: Mine Plan View Infrastructure with Composite Longitudinal Section

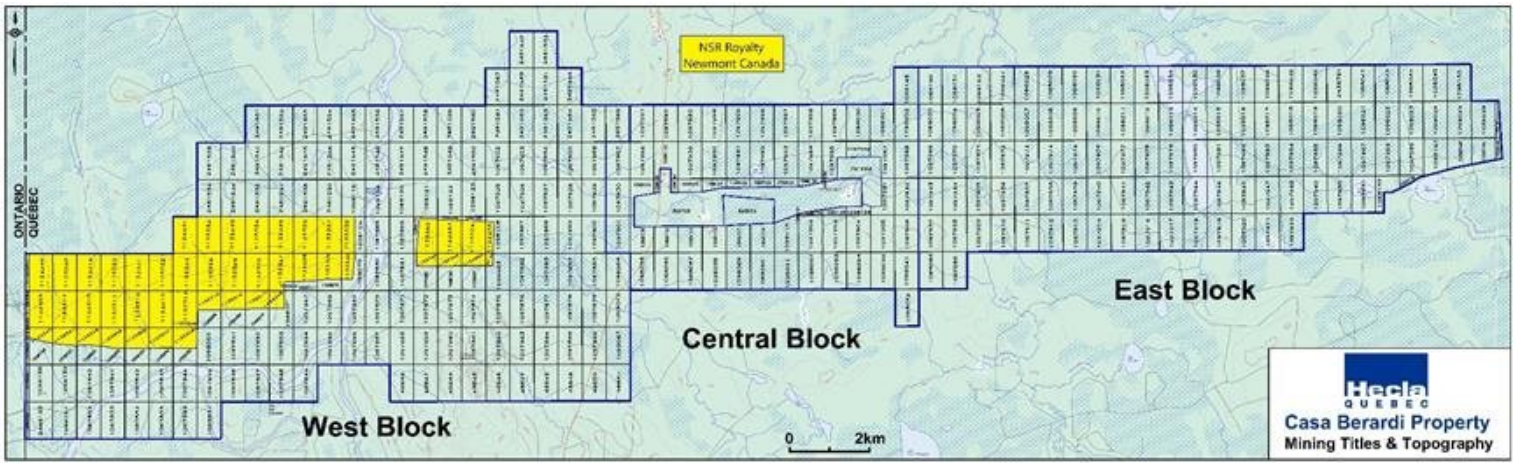


Figure 3-4: Property Claim Map

3.3 Encumbrances

Hecla has all required permits to conduct the mining operations on the Property. There are no significant encumbrances to the Property nor any violations or fines.

3.4 Royalties

The Casa Berardi landholdings within the three mining leases are not subject to any royalty and Hecla, through its wholly owned subsidiary, Hecla Québec, holds a 100% interest in Casa Berardi. Most of the Casa Berardi Mineral Reserves and the processing plant are located inside the mining leases as indicated on Figure 3-3. The Casa Berardi property outside the mining leases is completely owned by Hecla Québec. The property is subject to a 3.0% net smelter return (NSR) to Newmont Canada on 52 claims (Figure 3-4 and Table 27-1 in Appendix 1).

3.5 Other Significant Factors and Risks

- The appropriate environmental permits have been granted for the current operation.
- Hecla does not have permits for facilities labeled as “Preliminary”. The locations, size, and timing of facilities labeled as “Preliminary” have not been finalized and are subject to future long term mine plans.
- As of the effective date of this TRS, environmental liabilities are limited to those that would be expected to be associated with an operating gold mine where production occurs from underground and open pit sources, including roads, site infrastructure, and WRFs.
- Hecla is not aware of any significant environmental, social, or permitting issues that would prevent continued exploitation of the Casa Berardi deposits.
- Hecla is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the Property.
- Information provided by Hecla land tenure experts supports that the mining tenure held is valid and is sufficient to support the declaration of Mineral Resources and Mineral Reserves.
- Hecla holds sufficient surface rights in the Project area to support the mining operations, including access and power line easements.

4.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

4.1 Accessibility

The Property is located 95 km north of the town of La Sarre, in the James Bay Municipality in the Abitibi region of northwestern Québec. The nearest commercial airport is located at Rouyn-Noranda which is approximately 175 km south of the Property. La Sarre can be reached from Rouyn-Noranda via provincial roads 101 and 111. The 38 km all season gravel road to Casa Berardi diverges from the paved road linking La Sarre and the Selbaie Mine through the village of Villebois. The exit is approximately 21 km north of Villebois. On the Property, a gravel road connects the East and West mines, and a number of exploration roads provide access to the rest of the Property from east and west.

4.2 Climate

The mean annual temperature for the Property area is -0.5°C, with an average high in July of 17°C, and average low in January of -18°C.

The data used in this section is from Hecla (2014) and is based on a weather station near the Property that includes La Sarre, Brouillan, and Matagami. The average annual precipitation in the Property area is 906 mm. Rain precipitation is highest in July and August, averaging 105 mm. While snow precipitation is registered from October to April, it is most abundant in February and March when the monthly average reaches 107 mm (expressed in millimeters of water). Exploration and mine operation take place year-round.

4.3 Local Resources

The Abitibi region has a long history of mining activity, and mining suppliers and contractors are locally available. Both experienced and general labour is readily available from the La Sarre area, a municipality of approximately 7,282 inhabitants (2016 census). Hecla Québec has had success in hiring experienced staff and personnel with good mining expertise. The Mine enjoys the support of local communities.

4.4 Infrastructure

The surface infrastructure at Casa Berardi, which includes both West Mine and East Mine, is presented in Figure 4-1.

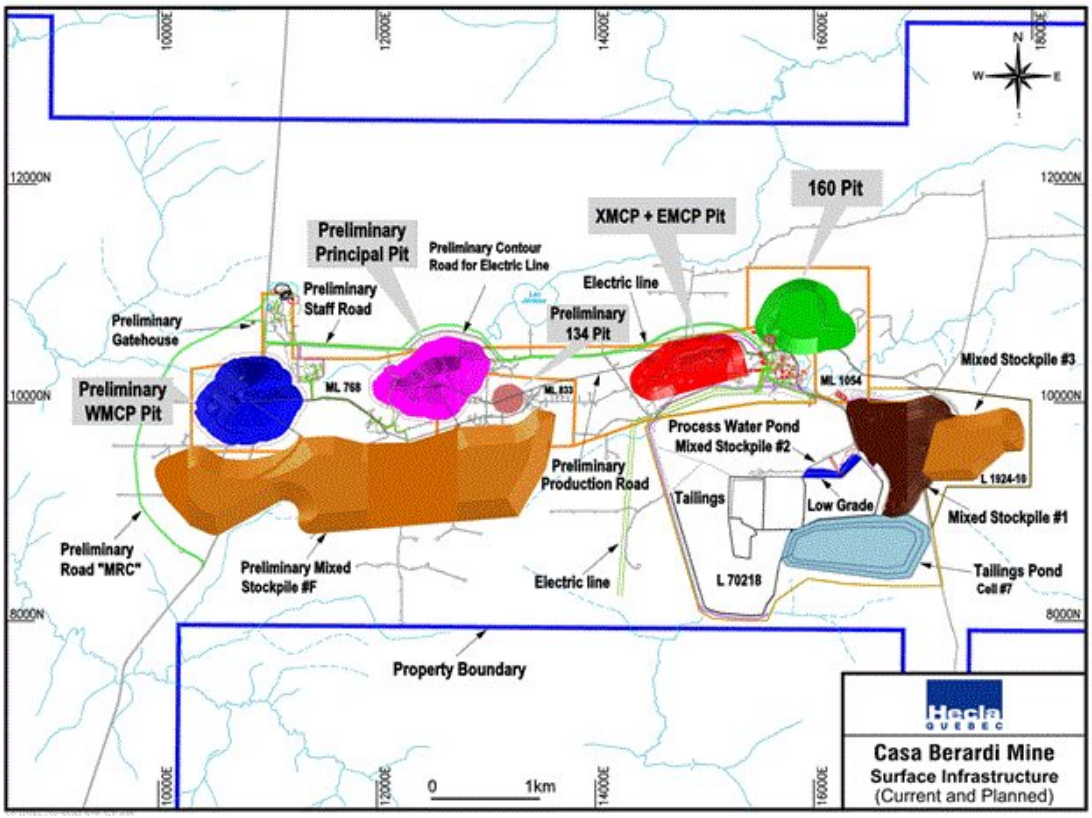


Figure 4-1: Casa Berardi Surface Infrastructure (Current and Preliminary)

Existing surface and underground infrastructure at the East Mine include the following (Figure 4-2):

- A nominal 2,200 tpd mill, with the ability to process at rates over 4,125 tpd.
- TSF with four tailings cells, a polishing pond, a sedimentation pond for settling iron arsenate precipitates, and a process water pond.
- Two story administrative building with offices, warehouse, dry, laboratory, two heavy equipment maintenance garage, millwright shop, and electrical shop.
- Two core shacks.
- Water pumping station.
- Hoistroom, a headframe, and a 380 m deep shaft (with no hoist).
- Mine access decline and a series of ramp-connected levels.
- Three petrol tanks with pump gas and fuel.
- One mineralized rock stockpile.
- One waste and till-clay pile.

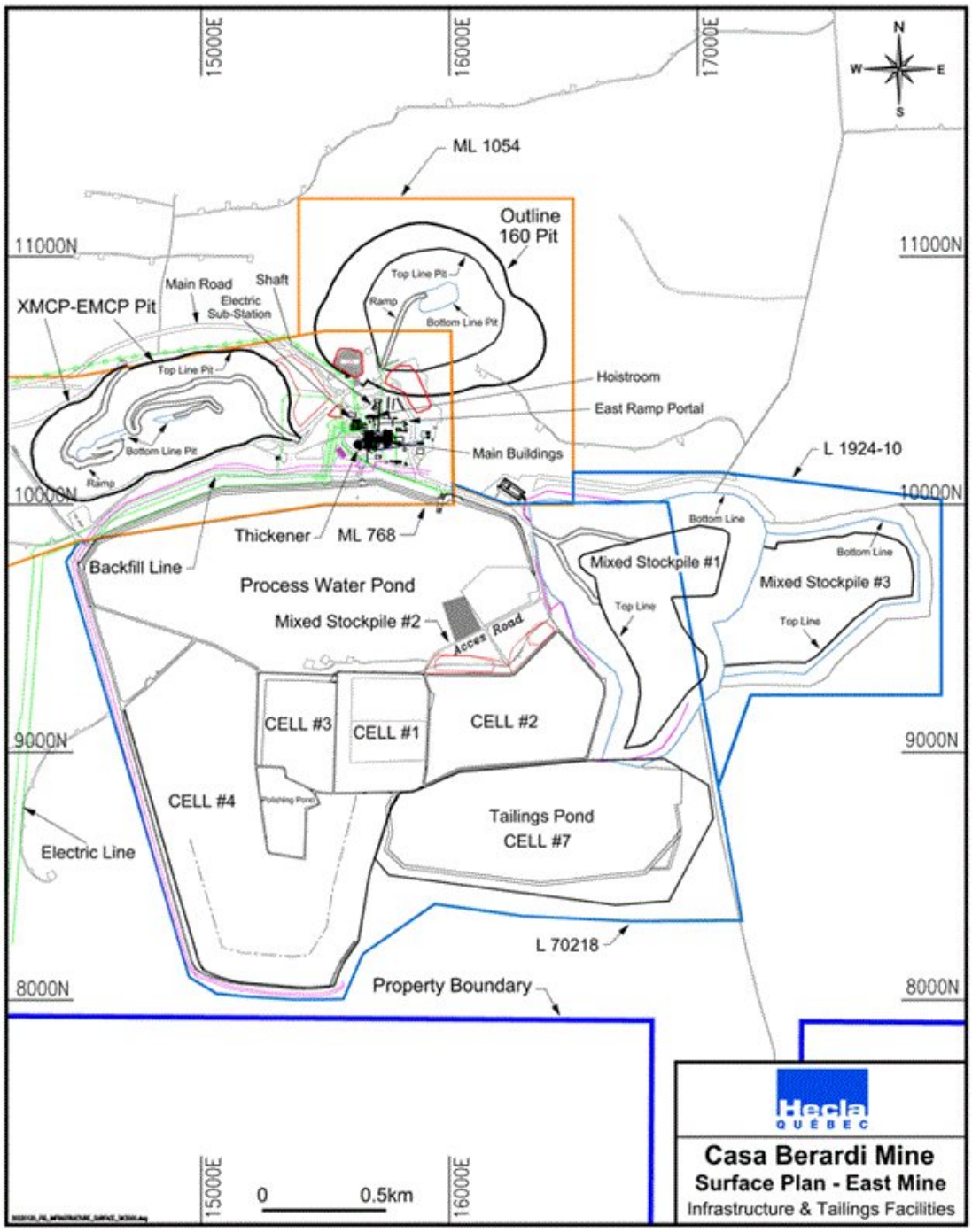


Figure 4-2: East Mine Surface Infrastructure

Existing surface and underground infrastructure at the West Mine include the following (Figure 4-3):

- Backfill plant, including a compressor room and a ventilation raise intake.
- Settling ponds.
- Pumping station.
- A 380 m2 garage.
- Two dry houses with offices.
- Emergency building for mine rescue and infirmary.
- Warehouse.
- Core storage area.
- Gatehouse.
- Mine access decline providing access to the West Mine and Principal area.
- Hoistroom, headframe, and mine shaft to the 1,080 m level.
- A 125 tph paste backfill plant and a cement plant with tailings feed line from the mill and distribution holes to the underground.
- Mine ventilation fans and mine air heater with ventilation raise to the mine workings.
- One WRF and one ore rock pile.

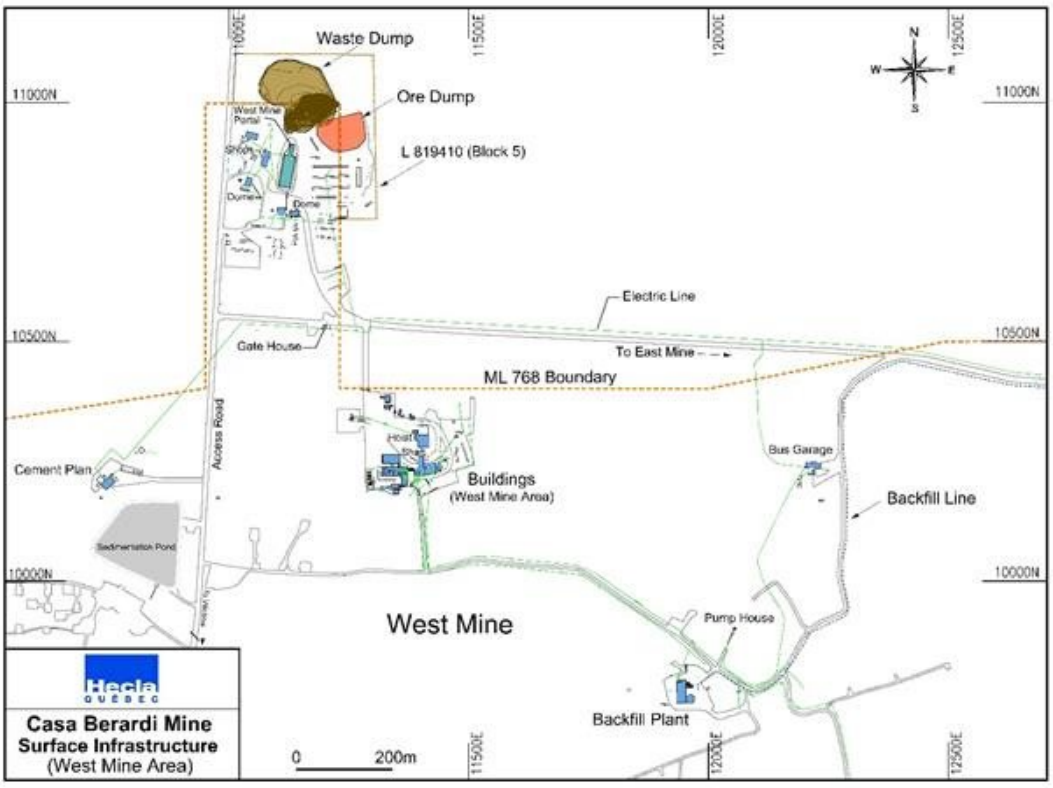


Figure 4-3: West Mine Surface Infrastructure

There is no additional surface infrastructure related to the Principal Mine. A five kilometre track drift joins the East and West Mines and provides access to the Principal Mine at the 280 m level.

The power supply of the site is provided by a 55 km, 120 kV power line, from the town of Normétal.

There is sufficient suitable land available within the mineral tenure held by Hecla for tailings disposal, mine waste disposal, and installations such as the process plant and related mine infrastructure.

A review of the existing power and water sources, personnel availability, and transport options indicate that there are reasonable expectations that sufficient labor and infrastructure will continue to be available to support declaration of Mineral Resources, Mineral Reserves, and the proposed LOM plan.

4.5 Physiography

The topography is generally gentle and is mostly predominately characterized by swamps and thick overburden coverage (up to 60 m locally). Elevation varies between 270 MASL and 360 MASL. According to the map of ecological regions of Québec, the area falls within the boreal zone and the spruce and moss domain. The forested zones are predominately characterized mainly by jack pine and spruce and have generally been logged. The Mine area is characterized by swamps and is therefore classified as a bare to semi-bare wetland. The Turgeon River crosses the Property in its western part, while Raymond Lake is located to the east of the Property.

5.0 HISTORY

5.1 Exploration and Development History

5.1.1 1974 to 1998

Prior to 1974, the Casa Berardi area was explored for base metal deposits. In 1974, the first 13 claims were staked by Inco Gold Ltd. (Inco Gold). The discovery hole was drilled in 1981, and 590 additional claims were staked. In 1983, a joint venture (JV) agreement was reached between Inco Gold (60%) and Golden Knight Resources Inc. (Golden Knight) (40%). The subsequent years were marked by exploration drilling and, eventually, project engineering and construction. Under the Inco Gold-Golden Knight JV commercial production from the East and West mines began in 1988 and 1990, respectively.

In 1991, TVX Gold (TVX) acquired Inco Gold's 60% interest in the Property. In 1994, TVX and Golden Knight purchased the remaining interest in the Domex claim block, a part of the Principal (Main) Zone between the West and the East Mine, from Teck Corporation.

By 1997, 3,769 holes had been drilled on the Property for a total of 463,492 m. Approximately 92% of these holes were located in the area between the West and East mines. Table 5-1 summarizes the historic drilling programs.

Table 5-1: Historical Diamond Drilling
Hecla Mining Company – Casa Berardi Mine

Project	Location	Number of Drill Holes	Metres (m)
Casa Berardi – Exploration	West Block & East Block	3,759	660,441
Casa Berardi – Mine	Mining Lease 768	10,087	1,377,969
	Mining Lease 833	544	126,501
Total		14,390	2,164,911

The first mineral reserve estimate for Casa Berardi was published in 1987. Table 5-2 presents the evolution of the historic mineral reserves at Casa Berardi from 1987 to 1997.

Table 5-2: Historical Mineral Resources and Mineral Reserves 1987 to 1997
Hecla Mining Company – Casa Berardi Mine

	Mineral Resources			Mineral Reserves		
Year	Tonnes (Mt)	Grade (g/t Au)	Contained Metal (Moz Au)	Tonnes (Mt)	Grade (g/t Au)	Contained Metal (Moz Au)
1987	-	-	-	11.106	6.8	2.421
1988	-	-	-	12.412	7.4	2.909
1989	-	-	-	9.652	7.3	2.251
1990	-	-	-	8.934	7.1	2.028
1991	-	-	-	6.234	6.3	1.265
1992	-	-	-	6.216	6.4	1.275
1993	-	-	-	4.767	6.2	0.946
1994	-	-	-	4.526	6.1	0.881
1995	-	-	-	3.253	5.9	0.620
1996	-	-	-	6.199	5.5	1.105
1997	3.189	5.8	0.591	-	-	-

The historic mineral resources listed in Table 5-2 pre-date NI 43-101, are relevant as an indication of mineralization on the property however should not be relied upon. They are being shown for historical reference only. A QP has not completed sufficient work to classify the historical estimate as a current Mineral Resource or Mineral Reserve and Hecla is not treating the historical estimates as current Mineral Resources or Mineral Reserves.

Production began at the East Mine in September 1988 and at the West Mine in April 1990. The total combined production for the period from 1988 to 1997 was 3.5 Mt at an average grade of 7.1 g/t Au totalling 688,400 oz Au recovered, with an average mill gold recovery rate of 87%. Although average statistics are not readily available for daily production, it appears that for the period from 1988 to 1997, the average production rate of the mill was less than 1,800 tpd. Historical annual production is presented in Table 5-3.

Table 5-3: Historical Mine Production
Hecla Mining Company – Casa Berardi Mine

Year	Tonnes Milled (t)	Grade (g/t Au)	Mill Recovery (%)	Gold Recovered (oz Au)
1988	124,057	5.9	88.0	19,025
1989	337,130	5.5	86.4	51,096
1990	361,935	8.9	87.4	88,999
1991	487,769	8.7	86.9	119,015
1992	315,938	9.3	87.1	80,319
1993	306,597	10.0	89.3	86,964
1994	550,638	6.5	86.8	97,518
1995	469,542	4.7	85.7	61,179
1996	498,405	5.4	87.2	76,039
1997	51,356	5.8	87.2	8,270
Total	3,503,367	7.1	87.0	688,424

In January 1997, TVX announced the closure of the East Mine due to ground control issues. Two months later, the West Mine was also closed.

5.1.2 Aurizon (1997 to 2013)

Casa Berardi was offered for sale in the fall of 1996, and in January 1997, Aurizon expressed interest in a letter to TVX. In September 1998, Aurizon signed an agreement and completed the acquisition of all Casa Berardi assets and mining rights.

Following the acquisition of Casa Berardi, Aurizon completed an exploration diamond drilling program consisting of more than 76,000 m (50,000 m from surface and 26,000 m from underground). The primary objective of the campaign was to increase the gold mineral inventory of the Property by drilling prospective sectors below the 400 m level in the West Mine area. The program resulted in the discovery of the 113 Zone and other smaller mineralized bodies.

Using the results of this drilling program as a basis for Mineral Resource estimation, Aurizon issued an internal study in March 2000, which provided positive indications of the economic potential of the West Mine area below the 400 m level.

Following two years of limited exploration drilling activities due to depressed gold prices, Aurizon re-embarked on a surface exploration program that led to the discovery of additional zones east of the 113 Zone.

To increase the confidence level of the Mineral Resources and prove the potential of a mining operation, an underground exploration program was planned and initiated in April 2003 to test the continuity of the 113 Zone mineralization. In 2003, the West Mine ramp was also extended 1,074 m from the 450 m level to the 550 m level, to provide access to the 113 Zone for metallurgical test work and to provide drill bases for infill definition drilling. Approximately 44 m of the exploration drift were completed by the year-end, allowing for the completion of 1,400 m of definition drilling. A further 21,000 m of surface exploration drilling was completed in the 118 through 120 zones during 2003.

In 2004, C$27.6 million (US$ 21.6 million) were invested into Casa Berardi for the construction of the surface foundations and shaft collar, a shaft pilot raise from the 550 m level to surface, 878 m of exploration drifts, 53,100 m of exploration and definition drilling, 102 m of ventilation raising, and 1,590 m of ramping down to the 550 m level. Met-Chem Canada Inc. (Met-Chem) was commissioned to prepare a feasibility study. Aurizon proceeded with the implementation and construction of the West Mine infrastructure.

In 2005, C$43.8 million (US$ 34.4 million) were invested in Casa Berardi for:

- Completion of two feasibility studies (the Feasibility Study by Met-Chem in January 2005, based upon Mineral Reserves above the 700 m level, and the Updated Feasibility Study in October 2005, incorporating Mineral Reserves to the 900 m level).
- Construction of a new headframe, hoistroom, and ore and waste bins.
- Shaft sinking 290 m from surface.
- 113 Zone ramp extension 1,200 m down to the 680 m level.
- Access to the Lower Inter Zone down to the 570 m level with the completion of 429 m of ramping and drifting.
- 685 m of drifting and 367 m of ventilation raising.

- Initiation of mill rehabilitation with the refurbishing of the crushing circuits, conveyors, and assay laboratory.
- 33,500 m of definition drilling from 137 holes, 19,000 m of surface exploration drilling from 32 holes, and detailed engineering for the shaft and surface infrastructure.

In 2006, an additional C$75.5 million (US$59.2 million) was invested to fund construction and development. In early November 2006, Aurizon completed construction and development at the West Mine area and commenced underground mining and milling operations.

In 2007, C$16.9 million (US$13.3 million) were invested to fund pre-production up to May 1, 2007, the date of achieving commercial production. From 2008 to 2013, a total of C$297 million (US$232.9 million) was invested in fund development, infrastructure improvements, new equipment, and exploration expenses.

5.1.3 Hecla (2014 to Present)

From 2014 to 2021, C$471.7 (US$370.0 million) was invested by Hecla in fund development, infrastructure improvements, new equipment, and exploration expenses. In 2016 Hecla began production from the first open pit at Casa Berardi with the East Mine Crown Pillar (EMCP) Pit. Hecla also invested in underground development ore and waste passes to feed the automated haulage truck system in the lower West Mine in the 118 and 123 zones. Infrastructure improvements around the tailings and water treatments facilities were also completed. The years 2017 and 2018 were the highest and third highest diamond drilling campaigns since the 2006 in exploration definition and infill drilling program.

5.2 Production

Since 1988, a total of 16.8 Mt at an average grade of 5.98 g/t Au have been milled at Casa Berardi for a total recovered gold of 2.8 Moz Au and an average gold recovery of 88.1% (Table 5-4).

Table 5-4: Casa Berardi Production 1988 to 2021
Hecla Mining Company – Casa Berardi Mine

Company	Year	Tonnes Milled (t)	Grade (g/t Au)	Contained Metal (oz Au)	Gold Recovered (oz Au)	Gold Mill Recovery (%)
Inco Gold – TVX	1988 – 1997	3,503,367	7.10	791,292	688,424	87.0
Aurizon	Nov 2006	68,481	8.58	18,891	17,731	93.9
	2007	545,259	9.78	171,416	159,469	93.0
	2008	654,398	8.16	171,628	158,830	92.5
	2009	688,677	7.77	172,013	159,261	92.6
	2010	722,746	6.76	157,134	141,116	89.8
	2011	698,123	8.00	179,462	163,845	91.3
	2012	693,859	6.77	151,059	136,848	90.6
	May 2013	238,931	6.17	47,394	43,447	91.7

Company	Year	Tonnes Milled (t)	Grade (g/t Au)	Contained Metal (oz Au)	Gold Recovered (oz Au)	Gold Mill Recovery (%)
Hecla	June 2013	351,636	6.16	69,652	62,532	89.8
	2014	750,778	5.90	142,443	128,241	90.0
	2015	765,763	5.96	146,733	127,893	87.2
	2016	904,998	5.72	166,499	145,973	87.7
	2017	1,175,930	4.77	180,373	156,652	86.8
	2018	1,248,039	4.66	186,844	162,742	87.1
	2019	1,250,172	4.10	164,938	134,408	81.5
	2020	1,165,050	4.00	149,934	121,492	81.0
	2021	1,386,417	3.56	158,685	134,511	84.8
Total 2006 – 2021		13,309,257	5.69	2,435,098	2,154,991	88.5
Total 1988 – 2021		**16,812,624**	**5.98**	**3,226,390**	**2,843,415**	**88.1**

6.0 GEOLOGICAL SETTING, MINERALIZATION, AND DEPOSIT

6.1 Regional Geology

The Property is located in the northern part of the Abitibi Subprovince, a subdivision of the Superior Province, the Archean core of the Canadian Shield. The Casa Berardi area belongs to the Harricana-Turgeon Belt, which is a part of the North Volcanic Zone (Figure 6-1).

The regional geology is characterized by a mixed assemblage of mafic volcanic rocks, flysch-type sedimentary iron formations, and graphitic mudrocks that are limited by a large granodioritic to granitic batholith.

Structurally, the Property is enclosed in the Casa Berardi Tectonic Zone, a 15 km wide corridor that can be traced over 200 km. A network of east-west striking ductile, high strain deformation zones mainly follow the lithological contacts.

Many significant deposits and past producers of different types are present in the region. Base metals have been produced from the Joutel (Selbaie Mine, Estrades Mine) and Matagami camps. Further east, along the Casa Berardi structural trend, is the former Agnico Eagle Mines Limited's (Agnico Eagle) Telbel Mine. Other deposits have also been outlined on the Douay, Vezza, and Desjardins properties.

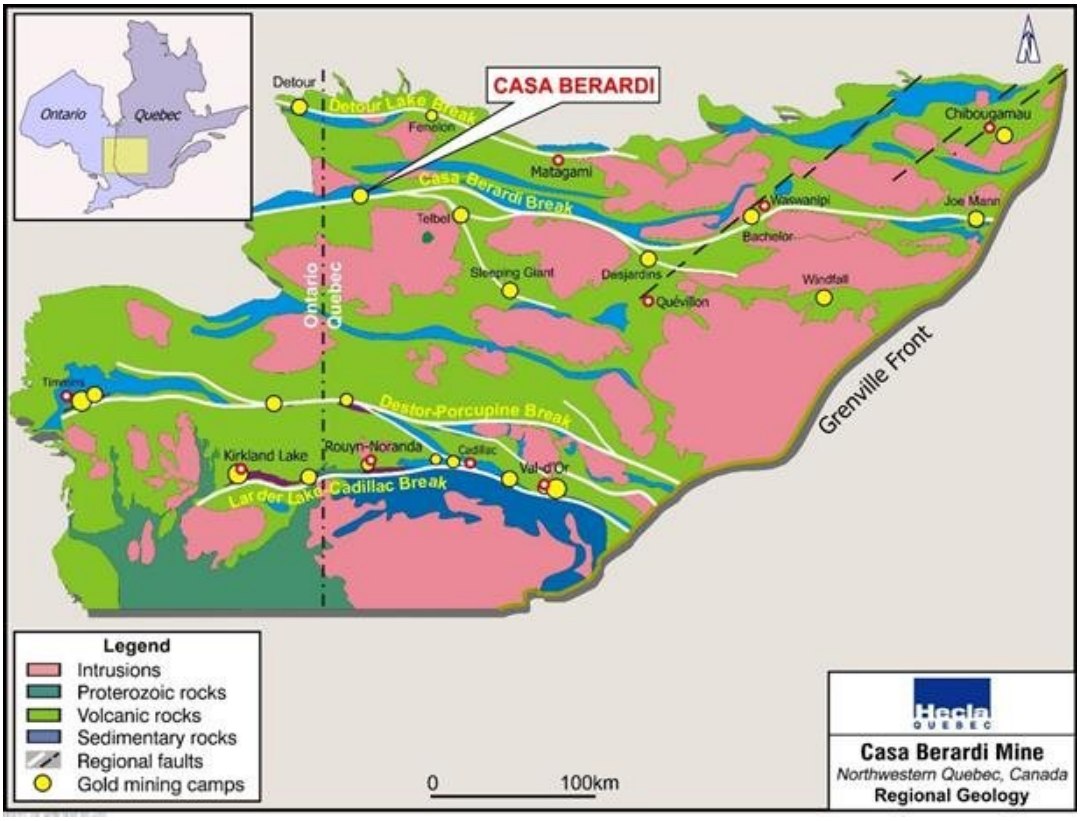


Figure 6-1: Regional Geology of Northwestern Québec, Canada

6.2 Property Geology

6.2.1 Stratigraphic Divisions

The Property's geological environment is centered on the Taïbi volcano-sedimentary domain, which is bounded to the north by the Recher Batholith and to the south by various volcanic domains of tholeiitic to transitional affinity (Figure 6-2). The Dieppe Domain covers half of the southwestern portion of the Property, and the Turgeon Domain lies immediately south of the eastern half of the Property. Intermediate volcanic rocks of the Joutel-Raymond Group are located within the Turgeon Domain. Dieppe volcanism is defined by a thick (up to 100 m) massive flow or volcanic conduit with sub-ophitic textures, which indicate a deep volcanic environment with high rates of magma generation. Discontinuous volcanic units characterized by breccias flows, tuffs, and cherty horizons, lying in contact with graphitic sediments and conglomerate in the gold deposit area and the eastern volcanic domain that covers the eastern half of the Property, can both be correlated with the Harricana Group.

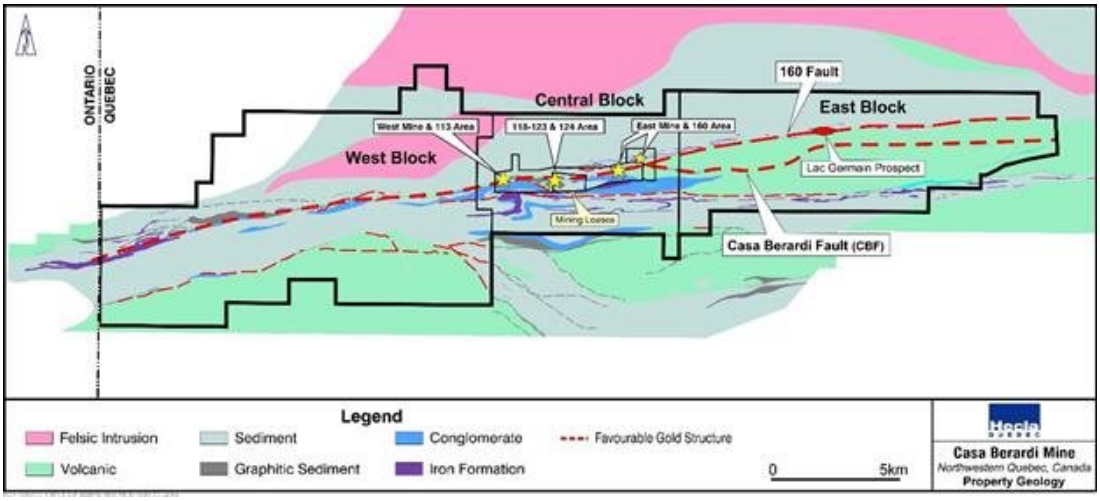


Figure 6-2: Casa Berardi Property Geology

The stratigraphic sequence starts with basal mafic volcanism (2,730 Ma to 2,720 Ma). Pyrite rich graphitic mudrock and the associated chert appear to be synchronous with the volcanism as evidenced by fragmentary hyaloclastic units of different compositions. The main sedimentary event corresponds to a flysch-type sequence deposition. U/Pb dating of the iron formation and conglomerate indicates ages between 2,695 Ma and 2,692 Ma for this event (Figure 6-3).

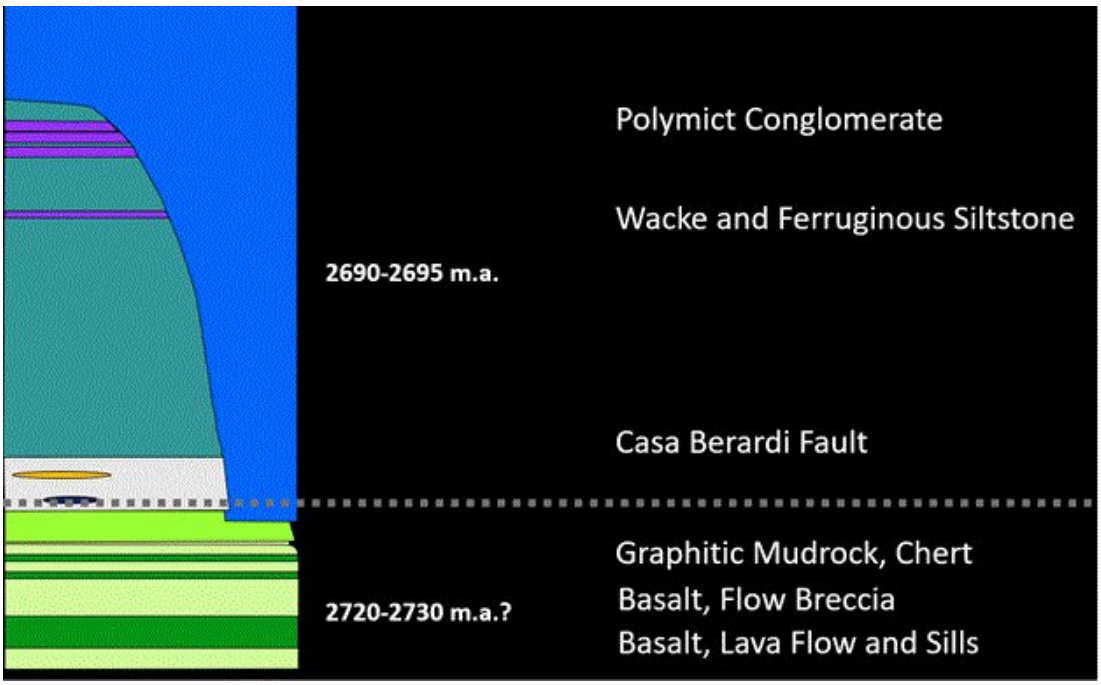


Figure 6-3: Stratigraphic Sequence

Well-defined flysch-type sedimentary units, like magnetite rich wacke and conglomerate, can be traced over tens of kilometres without significant facies variations. Volcanic units extend for five kilometers to 15 km inside the sediments and form lens shape structures. Smaller lenses are a few hundred metres wide and are included in the Casa Berardi Deformation Zone.

Basaltic to andesitic flows, with thickness generally less than 50 m, exhibit normal progression facies from coarse crystalline to massive, amygdaloidal, and vesicular in lapilli tuffs and tuffs. Flow contacts are identified by graphitic mudrock horizons. Gabbroic sills, which are related to the Dieppe Domain, are visible near the flow contacts. The Turgeon volcanism is considered a distal, near surface, more evolved volcanic environment. Graphitic rocks (in the form of pyritic graphitic mudrock), black chert, wacke, and conglomerate form a 500 m wide structural corridor that coincides with the Casa Berardi Fault.

6.2.2 Structures

The mafic volcanic units along the Taïbi Domain represent in plan view a lenticular shape corresponding to structural doming. Polarity inversions are recognized in sediments on both sides of their contacts with these units. Tight isoclinal folding forms an asymmetric dome and basin pattern which is well preserved around volcanic units in the iron formations. The main north-south compression event, which is responsible for an 8:1 elongation ratio, is indicated by a strong penetrative east-west foliation.

Two fabrics are observed:

- A constant main penetrative east-west foliation, dipping 60° south.
- A crenulation cleavage with an undefined oblique orientation related to northeast or northwest fold components. A higher strain rate along main sediment-volcanic contacts has resulted in a small scale complex dome and basin folding and strong stretching mineral lineation with steep opposite plunges.

The Casa Berardi Fault is defined by a stratigraphic contact between a graphite rich sediment sequence at the base of the Taïbi Domain, a northern continuous highly deformed and brecciated mafic fragmentary volcanic unit, and a southern highly deformed polymictic conglomerate unit (Figure 6-4). On the north side of the Casa Berardi Fault, a thick sequence of very homogeneous wacke belonging to the Taïbi Group is affected by amphibolite grade metamorphism. One kilometre north is the easterly elongated Recher Batholith, which is part of the northwestern boundary of the Abitibi greenstone belt.

The Casa Berardi Fault strikes east-west and dips 80° to the south. The Casa Berardi Deformation Zone corresponds to a braided network of laminated high strain zones following drag folded contacts of less deformed competent rocks such as mafic volcanic and polymictic conglomerate. The thickness of the affected rock package is used to define a 100 m to 500 m wide corridor that hosts all the mineralized zones explored and developed at Casa Berardi.

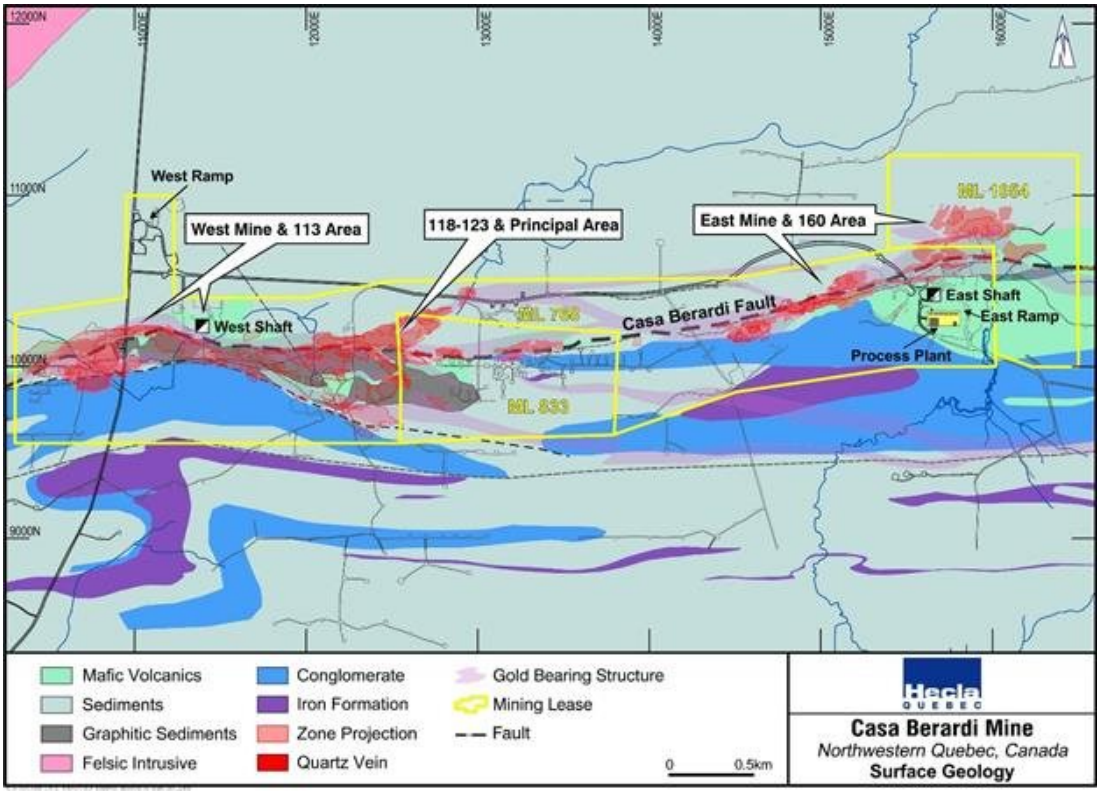


Figure 6-4: Property Surface Geology

The main brittle deformation and fault zones that have been developed correspond to the Casa Berardi Fault, bounding the strongly metamorphosed Taïbi flyschic sediments with interlayered, tuffaceous intermediate units to the north and a package of strongly deformed graphitic sediments, conglomerate, and mafic volcanic flows to the south.

Inside the Casa Berardi Fault zone, ductile deformation intensity is heterogeneous. Foliation is uniform in larger competent rock units, such as mafic volcanics and conglomerates. Kinematic indicators observed inside the main foliation, combined with the foliation dip pattern, indicate a south verging thrust movement.

6.2.3 Alteration and Metamorphism

The regional metamorphism, which is of lower greenschist facies, is locally influenced by a series of syntectonic batholiths with associated thermal aureoles. The Recher thermal aureole limit follows the northern boundary of the Property, approximately two kilometres from the batholith and the Casa Berardi Fault.

Inside the contact metamorphism halo, the sediments are affected by a quartz-plagioclase-biotite assemblage. In the case of iron rich sediments, the sediments are affected by a chlorite-chloritoid assemblage. Garnet is locally visible. Mafic volcanics are affected by a plagioclase-tremolite assemblage. Chloritoid, plagioclase, and garnet are porphyroblastic, with chlorite-biotite pressure shadows indicating the synchronicity of crystallization and regional foliation.

6.3 Mineralization

6.3.1 Deposition Model

Some essential conditions were initially present in the Casa Berardi area during the formation of the Harricana-Turgeon volcano-sedimentary belt, preparing the area for a later gold deposition event.

The Casa Berardi Fault represents an old discontinuity at the top of a mafic volcanic rock in a basement where hydrothermal activity has led to the formation of chert and graphitic mudrock containing large, massive pyrite lenses. The 30 million to 40 million year old unconformity between the mafic volcanics and the flysch-type sequence is exposed in many places along the Casa Berardi Fault. Iron formations and iron rich sediments are present near the base of the sequence and appear on both sides of the Casa Berardi Fault. The presence of sulphur and iron in the environment is a factor which is highly favorable for gold mobilization.

The tectonic mechanism generated many structural features at different scales, creating a favourable context for the formation of gold deposits. The regional north-south main compression events resulted in tight kilometre scale isoclinal folding and in bringing the geological units into a vertical position. The Casa Berardi Fault was generated during this stage by a movement at the contact of a graphitic unit. The proximity of large volcanic units, such as the Dieppe and the Joutel-Raymond domains, has formed competent cores inside antiforms. Those competent cores forced oblique movement and generated a polyphase elongated dome and basin folding pattern. This first tectonic stage corresponds regionally to a 50% shortening and occured under ductile conditions at a depth of six kilometres to 10 km.

High constraint zones, associated with pervasive carbonization, are generally developed where graphitic mudrock horizons are localized at major rock contacts. This combination of factors acted as a ground preparation for the positioning of vein networks and long veins. The orientation of the veins and internal structures are generally concordant with the ambient fabric. The veins are localized within the foliation and contain two types of enclaves: foliated host rocks and graphitic planes exhibiting a stylolithic pattern. Vein contacts are usually sharp, and the lack of fabric development indicates a late emplacement.

6.3.2 Styles of Mineralization

6.4 Veins

Gold mineralization is largely located in quartz veining, either in the form of plurimetric veins, small scale veins, or veinlet networks. Veins are heterogeneous and contain a variable percentage of foliated enclaves exhibiting a laminated appearance. Veins are of different colour, texture, and structure. Gold grades are generally correlated with increasing complexity. Different quartz phases have been recognized in mineralized veins to exhibit the following sequence:

- Phase 1: grey quartz, with abundant sulphides and fluid inclusions, comprising more than 50% of mineralized veins.
- Phase 2: mosaic micro-crystalline quartz occurring in higher grade portions of veins.
- Phase 3: non-mineralized coarsely crystallized white quartz which cuts the two others.

The gold bearing vein filling is rarely massive, but often brecciated, micro-brecciated, or laminated. The fracture planes are rich in graphite and muscovite. Veins contain only minor sulphides (1% to 3%), predominately including arsenopyrite, pyrite, and traces of sphalerite, chalcopyrite, pyrrhotite, tetrahedrite, galena, and gold. Arsenopyrite is the main gold bearing sulphide present in all veins of the Casa Berardi deposit.

The granulometric distribution of gold is similar for all locations. According to petrographic compilations, 50% of the gold particles have an average diameter less than 30 µm, and approximately 3% are greater than 100 µm. The gold distribution inside the mineral assemblage varies slightly according to the location of the mineralized zones. In the 113 Zone of the West Mine area, the vein mineralization, which is spatially close to the Casa Berardi Fault, is mostly free gold in contact with arsenopyrite grains (< 10 µm to 0.5 mm). Arsenopyrite is associated with sphalerite and tetrahedrite in clusters, joints, and in micro-brecciated areas.

In the South West Zone, parts of the Principal area, and some areas of the East Mine mineralization, the gold distribution is variable and depends on the amount of sulphides in quartz veins and host rocks. Fifty percent of gold grains that have been observed are inclusions in pyrite and arsenopyrite crystals.

Alteration halos with gold values of above 100 ppb Au and anomalous values of arsenic and antimony surround most of the mineralized zones along the Casa Berardi Fault. Those halos can be observed up to five kilometres away, on both sides of the Casa Berardi deposit.

6.5 Stockworks

Stockworks are the second style of gold mineralization in the Casa Berardi deposit and represent nearly the same volume as the large quartz veins. While the stockworks are generally non-economic, they are mined with quartz veins when deemed economic. Across the deposit, hanging wall stockworks are present in contact with important mineralized quartz veins. From 10% to 20% of the rock volume is composed of centimetre to decimetre thick quartz veins with gold values ranging from 1 g/t Au to 10 g/t Au. Veins of all textures and composition are concordant with host rocks. Foliated and finely bedded rocks are cut by concordant veins. Less deformed basalts or heavily carbonated iron rich rocks are cut by fracture-controlled vein sets.

At the deposit scale, the Principal area of the West and East mine areas exhibit stockworks surrounding quartz cores. The stockworks are not limited to the main Casa Berardi Fault and can affect the total width of the deformation zone as metre to decametre wide mineralization subzones.

In the Principal area of the West Mine, the stockwork extends laterally for 400 m at a 50° western plunge. In the East Mine, the mineralized system extends laterally for 400 m, reaching a depth of 800 m down dip (Figure 6-5). The system crosses the Casa Berardi Fault at a low angle over 100 m of strike length. Mineralization continues to the west on the south side of the Casa Berardi Fault and to the east on the north side of the fault.

6.6 Banded Iron Formation

The third type of mineralization is the Banded Iron Formation (BIF) hosted mineralization.

This type of mineralization is found in the 124-8, 124-1, and 116 zones of the Principal area, at the western extension of the East Mine pit in the 148-09 Zone, and at the extension of the East Mine area in the 160 Zone. These zones are restricted to the highly sheared, brecciated, and altered ferruginous sediments occurring north of the Casa Berardi Fault. Mineralization occurs within metric to sub-metric quartz veins and stockworks with up to 10% chert-magnetite beds, and exhibits high sulphide content which consists of pyrite, arsenopyrite, traces of pyrrhotite, and little or no visible gold. These sulphides have replaced the oxide rich layers which surround the quartz veins and the veinlet stockworks. Strong carbonate and chlorite alteration halos surround the quartz rich areas.

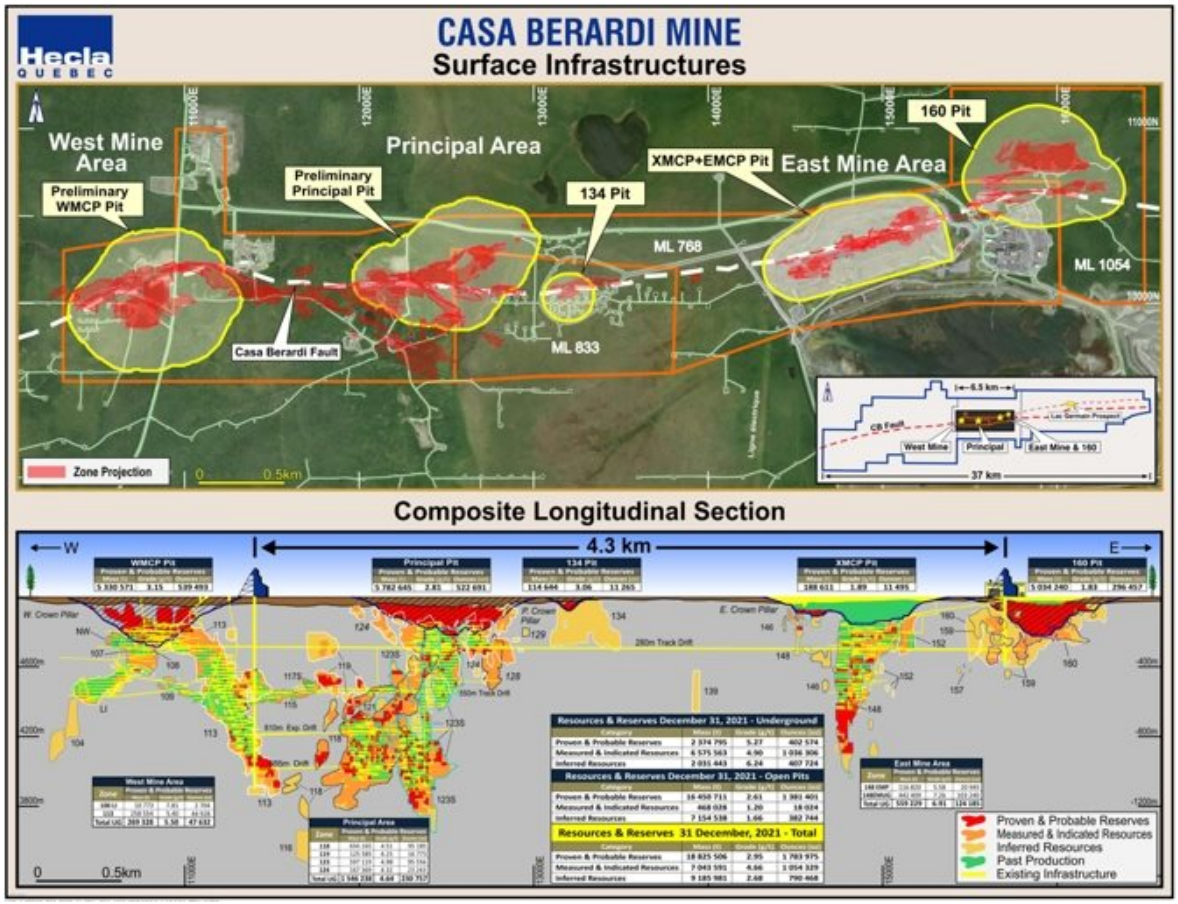


Figure 6-5: Mine Plan View Infrastructure with Composite Longitudinal Section

The mineralized zones in the vicinity of the underground infrastructure of the West Mine are all located between sections 10,350E and 11,250E, which correspond to the western limit of the Lower Inter Zone and the eastern limit of the 111 Zone, respectively (Figure 6-6). Mineralization occurs at the Casa Berardi Fault (in the 109, 111, 113, NW, NE zones), between the Casa Berardi Fault and the South Fault (in the 104, Inter, Lower Inter and 115 zones), and at the South Fault (in the South West zone).

Mineralization at the West Mine is represented by two main types:

- Low sulphide quartz veins: networks of centimetric to plurimetric quartz veins located south of the Casa Berardi Fault in highly deformed volcanic and sedimentary rocks that are predominantly basalt, wacke, conglomerate, chert, and mudrock.

- Sulphide rich stockworks: these represent the same volume as large quartz veins but have lower grades and are largely unexploited. Hanging wall stockworks are present in contact with important mineralized quartz veins across the Casa Berardi deposit.

The modeled mineralization for pit resource evaluation at the West Mine Crown Pillar (WMCP) are designated the 105 to 114 zones and occur west of the West Shaft and from the surface to the 450 m level. They include stacked quartz veins occurring at the Casa Berardi Fault above the 330 m level in the North West, North East, 111 and 113 zones. Between the Casa Berardi Fault and the conglomerate to the south, the South West (107), South East, and Inter (108) zones contain mineralized quartz veins with graphitic and sericitic schists with sulphides inside the South Fault corridor. The orientation of mineralization is mainly east-west with a south dip of 50° to 60°. Visible gold is associated with the veins. There is a low content of sulphides, primarily pyrite with traces of arsenopyrite. The mineralization plunges west at 15° and is open to the west along the South Fault. Further east, mineralization has a plunge of 20° east and is open to the south from the 100 m level to the 450 m level.

The South West (107-02 and 107-03 lenses) area occurs as metre to multi-metre quartz veins stacked along the South Fault and folded near the surface. The strike of the lenses exhibit variable orientations from east-southeast and dipping to the south at 50° to 60°. The Inter Zone (108-01, 02 and 04 lenses) occurs between the Casa Berardi Fault and the South Fault. The mineralized structure is located at the contact between the graphitic sediments and a mafic volcanoclastic unit. The orientation of the mineralized structures is generally east-southeast striking with a shallow dip to the south of 5° to 45°. The zones typically extend 150 m along strike and 75 m along dip. The upper portion of the Inter Zone is connected to the North East Zone and its lower portion connects with the South West Zone. The type of quartz vein and mineralization is quite similar to the veins observed in the Lower Inter Zone.

6.6.1 Mineralization along the Casa Berardi Fault

Mineralized zones such as the North East, North West, and 109 occur at the Casa Berardi Fault in the form of metric to plurimetric quartz veins. Veins occur over one thousand feet along strike and from 250 m to 550 m elevation and have a direction which varies from northeast to nearly east-west with a sub-vertical dip. The 109 Zone has a sub-horizontal dip at its western limit and a steeper dip to the east where it connects to the 113 Zone.

The 113 Zone is a mineralized corridor with a width ranging from 20 m to 70 m. The strike length ranges from 150 m at the 250 m level to over 400 m at the 550 m level. This mineralization strikes east-southeast and dips to the south at 75°. From the 450 m level to 800 m level, the strike varies from east-west to east-southeast, with a sub-vertical dip (Figure 6-6). From the 810 m level to the 1,000 level, mineralization occurs as metric quartz veins with visible gold and traces of fine disseminated pyrite and arsenopyrite. The zones strike north-northeast and dip to the southeast at 70°. The zones have a steep plunge to the east and the 113 Zone is open along the plunge and at depth.

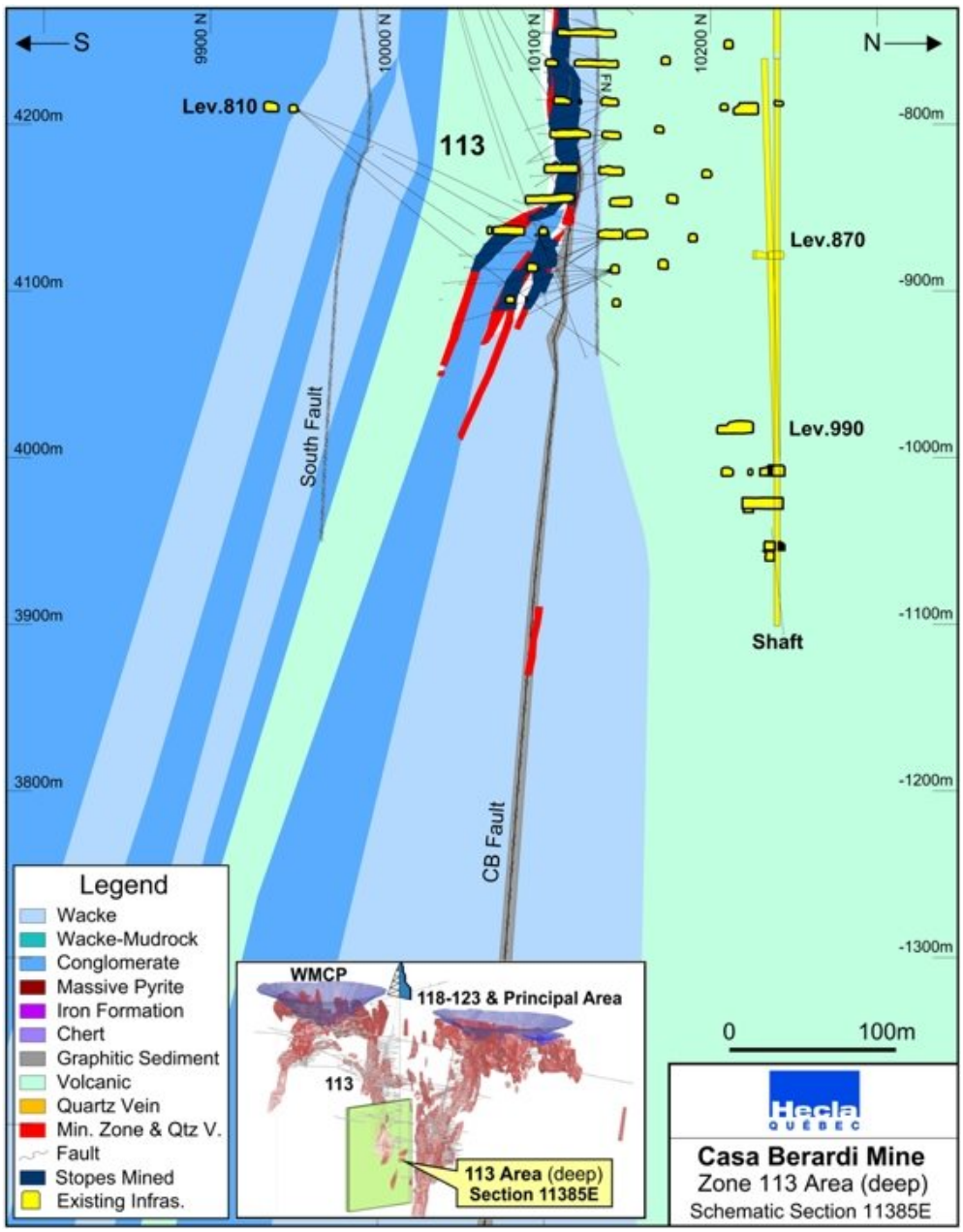


Figure 6-6: Section 11,385E, West Mine including the 113 Zone and Casa Berardi Fault

6.6.2 Mineralization Between the Casa Berardi and South Faults

The Lower Inter, Inter, and 115 zones are relatively flat dipping and plunge at approximately 15° to the west on the flat portions. The zones become steeper and are disrupted by minor thrust faults near the Casa Berardi Fault and near the South and Lower Inter Faults.

The Lower Inter Zone (the 100 Zone) is located between the 375 m level and 600 m level, and from sections 10,525E to 10,360E. The Lower Inter Zone dips at 25° to 45° south and plunges to the west at 15°. The zone is controlled by the Casa Berardi and the Lower Inter faults and lies on top of the folded wacke-basalt contact (Figure 6-7). The thickness of the quartz vein varies from four metres to 50 m, with the maximum thickness observed just beneath the contact of the two faults. The thin sections are observed down-dip, along the Lower Inter Fault, and extend for approximately 200 m. Stacking of quartz veins is observed in a deformation zone that is located at the lithological contact between the footwall mafic volcanic rock and the hanging wall graphitic mudrock.

The Inter Zone is located from sections 10,600E to 10,950E, and from the 150 m level to the 310 m level. The mineralized structure is located at the contact between the graphitic sediments and a mafic volcanoclastic unit. The mineralized structure strikes southeast with a shallow dip to the south (5° to 45°) and extends 150 m laterally and 75 m along dip. Its upper portion is connected to the North East Zone where the quartz vein and mineralization are similar to the Lower Inter Zone.

The 104 Zone corresponds to the Lower Inter Zone that is steeply plunging to the west. The 104 Zone strikes east-northeast, dips to the southeast at 70°, and it is composed of quartz veins with visible gold and low sulphide content.

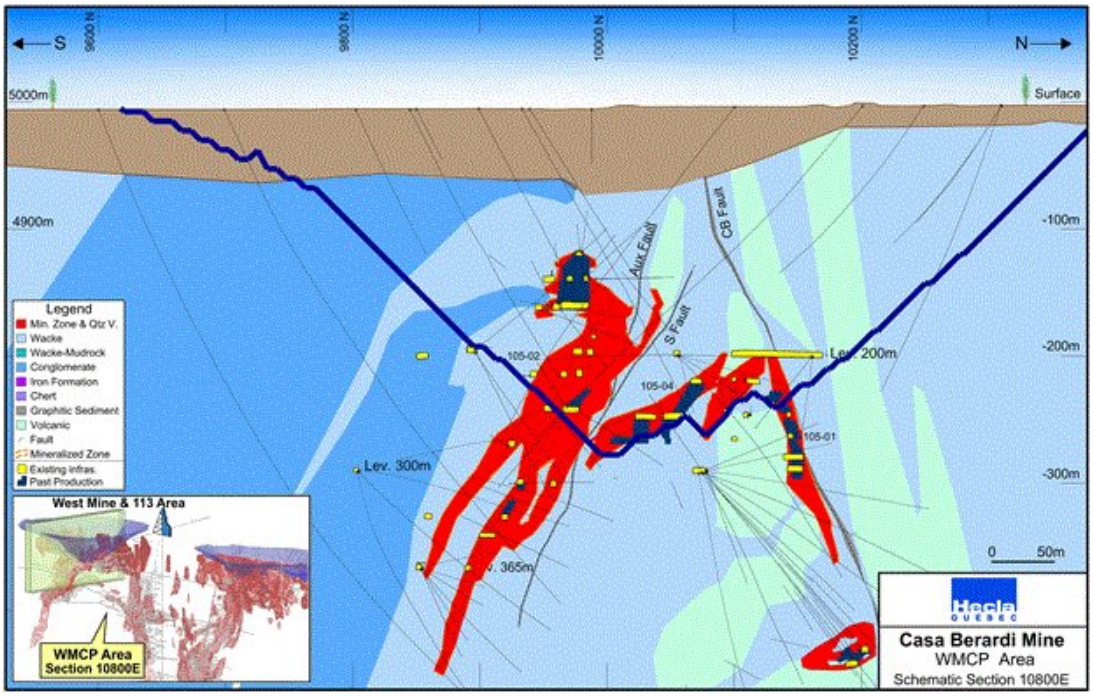


Figure 6-7: Section 10,800E, West Mine Geology and Mining Infrastructure

6.6.3 Mineralization at the South Fault

In plan view, the South West (107) and South East zones can be interpreted as a dome that is cut by the South Fault and by the subsidiary Auxiliary Fault. The mineralized system extends 200 m laterally and 300 m along dip, extending from surface to the 300 m level.

The main quartz vein structures are developed at the contact between a conglomerate and a graphitic mudrock and are associated with a large stockwork of disseminated sulphides. The internal vein structure shows variable orientations and is, in many places, brecciated. The economic mineralization extends down dip and is represented by a system of parallel veins which dip at 60° southwest.

6.6.4 Mineralization at the 118 Zone

The 118 Zone occurs from section 11,600E to 12,400E, between the 400 m and 1,200 m levels (Figures 6-8 and 6-9). The mineralization occurs within a 20 m to 70 m wide mineralized corridor south of the Casa Berardi Fault. The 118-10, 20, 21, 22, 27, 64, 81, 82, and 118-83 zones are stacked metric to sub-metric quartz veins with by sericite-carbonate envelope with high sulphide content, mainly arsenopyrite and pyrite with local visible gold. The zones contain up to 20% of metre to sub-metre quartz veins and veinlets sub-parallel to the schistosity. The zones strike east-southeast and dip to the southwest at 60° to 80° . The high grade zones show a steep plunge to the southwest at 70°. The 118-06 Zone is similar to the 118-27 lens, with the same orientation and dip. The structure is also well mineralized within the conglomerate unit and represents a strongly mineralized quartz stockwork with fine to coarse grained arsenopyrite and pyrite with visible gold. The upper part of the zone from the 330 to 610 level is folded and stacked. The general strike is east-southeast and dips to the southwest at 60° to 80° and follows the west plunge of the conglomerate. At the 330 level, the mineralization connects with the 124-81 and 82 zones. The 118-14, 15, 41, 42, 43, 44, 45, 46, and 47 zones are metre to multi-metre quartz veins sitting on top of the conglomerate unit and along its plunge. The quartz veins are locally faulted with a minor thrust fault and plunge to the west at approximately 15° to 20°. The 118-05, 11, 12, 13, 31, and 34 zones are metre to multi-metre stacked quartz veins and quartz stockwork along the Casa Berardi Fault with an east-west strike and south dip at 60° to 80° . Mineralization consists of fine to medium grained disseminated arsenopyrite, pyrite, sphalerite, and visible gold associated with quartz veins. The 118-16 and 17 zones are characterized by sericite-carbonate schist with high sulfide content, mainly arsenopyrite and pyrite, with local visible gold. They contain up to 20% metre to sub-metre quartz veins oriented east-southeast and dipping southwest at 70°. The mineralization follows the plunge of the 113 Zone along the conglomerate. Thickness of the veins ranges from three to five metres with east-southeast strike and dip southwest at 70° . Mineralization remains open at depth and along the plunge of the conglomerate.

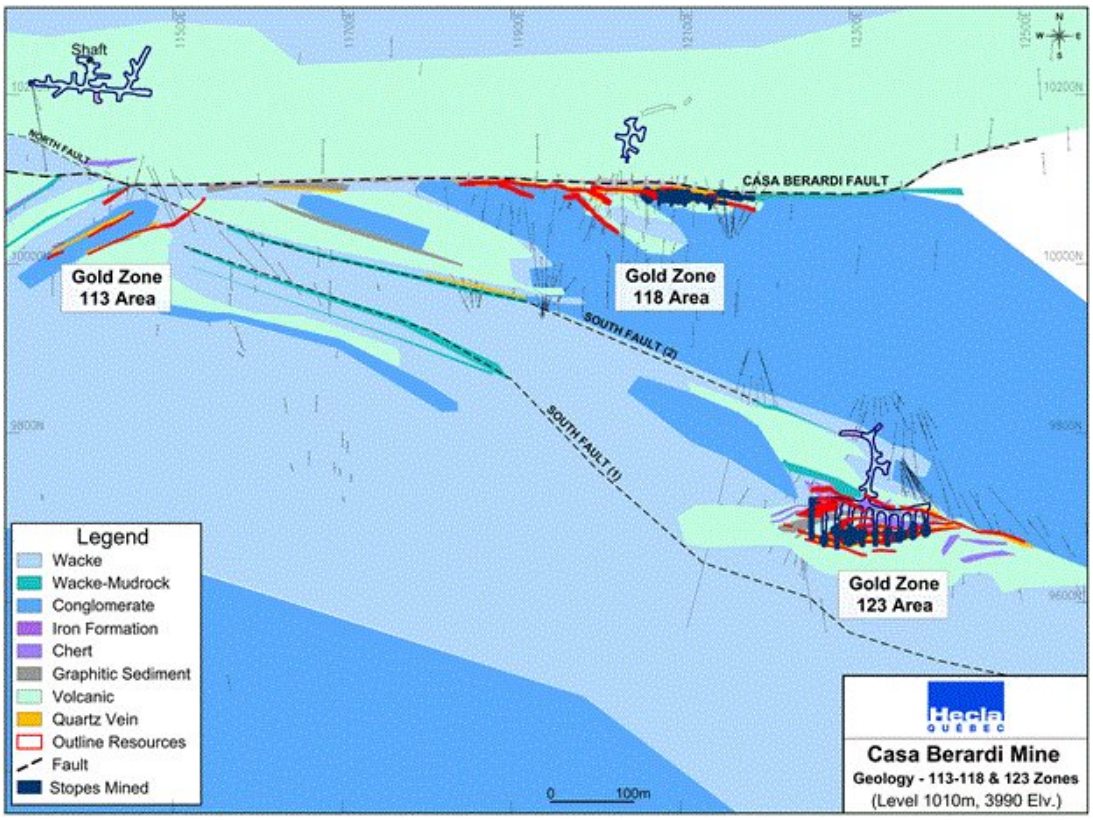


Figure 6-8: Plan View of the 1,010 m Level, Principal Area, Showing the 113, 118, and 123 Zones

6.6.5 Mineralization at the 123 and 128 Zones

The 123 Zone occurs in the South Domain of the Casa Berardi Deformation Zone and consists of stacked quartz veins and stockwork, varying in width from approximately five metres to up to 30 m, within a sequence of highly deformed and altered volcanic rocks and chert, at the sheared contact of volcanics and sediments, and close to the faulted southern contact of the conglomerate that hosts the 118 Zone (Figure 6-8 and Figure 6-9). Mineralization in quartz veins occurs as disseminations and stringers of pyrite, pyrrhotite, and arsenopyrite, with fine visible gold and minor disseminations of sphalerite. The veins near the chert bands strike east-northeast while dipping to the south at 60° to 70 ° and plunging to the east at 80°. The veins near the volcanic and sediments strike west-northwest with subvertical to 70° south dips. Mineralization occurs at the surface in lenses 123-21, 23, and 24 and the mineralization is open at surface and at depth to the west.

The 128 Zone is located on section 12,800 E at the 400 m level and is located at the same stratigraphic level as the 123 Zone within fragmental volcanic rocks. The 128 Zone is composed of quartz veins with visible gold. The mineralization has an east-west strike and a vertical to sub vertical dip to the south. The 128 Zone is open at depth and along strike.

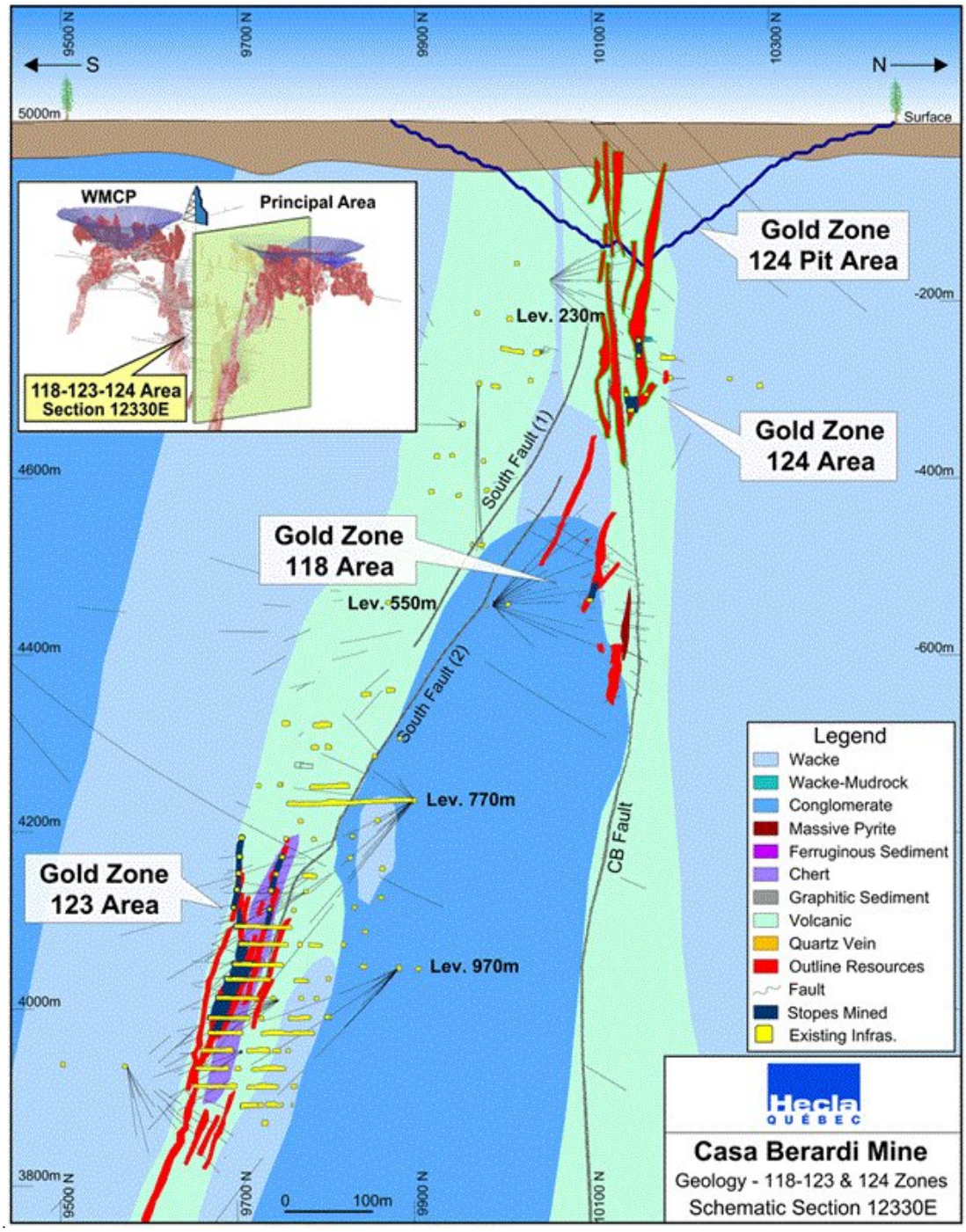


Figure 6-9: Section 12,330E, Principal Area Geology 118, 123, and 124 Zones

6.6.6 Mineralization at the Principal Mine Area

Mineralization within the Principal Zone occurs near the surface to the north and south of the Casa Berardi Fault and extends to depth to the 118 Zone along the Casa Berardi Fault and to the 123 Zone in the South Domain of the Casa Berardi Deformation Zone (Figure 6-10). The zones are located between section 11,900 E and section 13,000 E.

South of the Casa Berardi Fault, Zone 124-3 occurs as stacked, metre-wide, quartz veins near the Casa Berardi Fault, and is the up-dip extension of the 118 Zone occurring on top of the conglomerate. The overall orientation is east-southeast with dips to the southwest at 50° to 80° with a plunge to the southeast of 50°. Mineralization consists of arsenopyrite, pyrite, and visible gold with quartz veins. Zones 124-11 and 124-22 occur along secondary structures south of the Casa Berardi Fault and connect at depth with Zone 123-05. The zones occur in a corridor of metre-wide quartz veins and veinlets with visible gold, fine disseminations of arsenopyrite, and traces of sphalerite. These zones are oriented east-southeast and dip to the southwest at 60°.

Zones north of the Casa Berardi Fault (124-6, 124-8, 124-12, 124-13, 124-14, 124-16, 124-17) appear within highly sheared, brecciated, and altered ferruginous sediments between or near chert bands with minor magnetite. Gold mineralization occurs within metre to sub-metre quartz veins and stockworks containing fine grained to massive pyrite and arsenopyrite, traces of pyrrhotite, and very minor visible gold. Alteration is primarily chloritization and carbonatization (calcite and ankerite), with sericitization along the quartz veins. The strike varies from east-west (124-6) to east-northeast (124-8, 124-12, 124-13, 124-14, 124-16, 124-17) with dips to the south at 70° to near-vertical, and the zones plunge to the east at 50°. Mineralization remains open to depth and to the east of the 124-16 Zone.

The mineralized lenses in the 134 Zone are located between sections 13,100E and 13,500E and between the surface and level 300. Mineralization consists of arsenopyrite, pyrite, and visible gold with metre to multi-metre quartz veins and ankerite, sericite schist occurring within a sequence of highly deformed and altered volcanic rocks and sediments at the Casa Berardi Fault and north of the Casa Berardi Fault along secondary graphitic faults. The overall orientation is east-northeast with dips to the southeast at 75° and a plunge to the southeast of 60°.

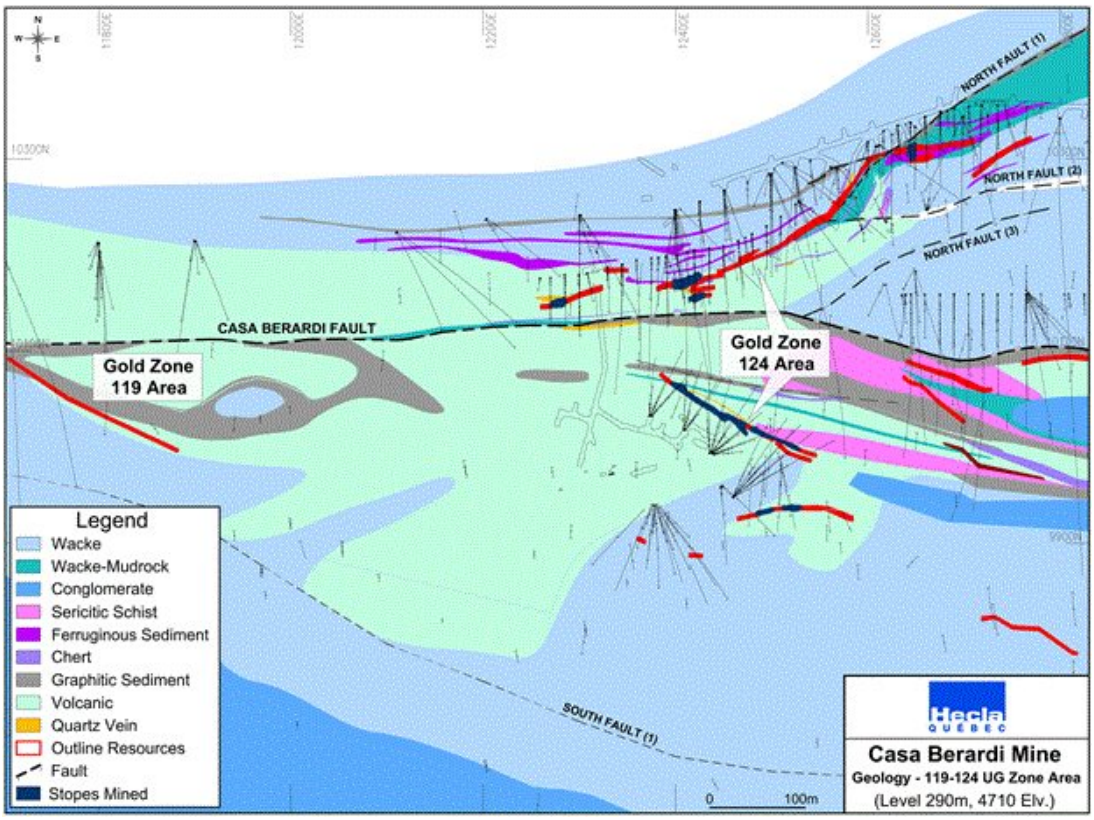


Figure 6-10: Plan View of the 290 m Level, Principal Area including the 124 Zone Lenses

6.6.7 Mineralization at the East Mine Area

The mineralized zones in the East Mine area are located between sections 14,000 E and 15,800 E and from surface to the 900 m level (Figure 6-11). The East Mine has underground and open pit Mineral Resources and Mineral Reserves that include the 146, 148, 152 and 157 zones.

The EMCP Pit includes the 148 Zone at the Casa Berardi Fault, from 14,725E to 15,400E, and the mineralized zones of the XMCP which extend from 14,400 E to 14,725 E and appear up to 100 m south of the Casa Berardi Fault. EMCP is composed of massive quartz veins with fine disseminations of pyrite and pyrrhotite with visible gold while XMCP mineralization is composed of 5% to 10% quartz veins and centimetric veinlets in stockwork with predominantly fine pyrite veinlets and disseminations, within highly sheared, sericitized, and ankeritized wacke and iron formation. These zones have an east-northeast direction and dip to the south at 75°.

The underground Mineral Resources and Mineral Reserves are predominately located between sections 14,725 E and 15,200 E. The zones included are the 148 and 152 zones. Between surface and the 200 m level, the mineralized envelopes are composed of quartz veins and quartz stockwork several metres thick and mineralized with fine disseminated pyrite, arsenopyrite and visible gold. Mineralization appears mainly at the Casa Berardi Fault and the strike of the lenses varies from east-southeast to west-northwest with a steep dip to the north, exhibiting an anastomosing pattern. Between the 200 m and 550 m levels, the mineralization is restricted to a continuous 10 m wide vertical quartz vein which is parallel to the Casa Berardi Fault. Between the 550 m level and 1,050 m level, the remaining Mineral Resources are in the south dipping area which is represented by a succession of mudrock layers inside the volcanic rock sequence. The quartz veins are metre to multi-metre thick and strike east-northeast with south dips varying from 60° to 85°. Mineralization is still open at depth and along strike.

The 152 Zone lies to the north of the Casa Berardi Fault, with a vertical extent of 200 m, from section 15,050E to section 15,250E, and from the 100 m level to 300 m level, and is laterally continuous over 100 m (Figure 6-11 and Figure 6-12). Stacked quartz veins are concentrated at the sheared mafic volcanic-wacke contact. The dip and thickness of the mineralization are highly variable.

West of section 14,725E, the mineralization appears mainly to the south of the Casa Berardi Fault and at depth below the XMCP Pit. The mineralization occurs predominately near the sheared ferruginous sediments and it is still open at depth.

The 160 and 159 (Cherty) Zones are located between sections 15,400 E and 16,300 E and are 200 m and 30 m north of the Casa Berardi Fault, respectively. Lenses that are parts of the zones have an average lateral extent of 200 m and a vertical extent of 100 m, down to the 350 m level (Figure 6-12). The zones have been defined by drilling on 15 m spaced sections.

Mineralization in the 160 Zone occurs at or near the sheared contact of pyroclastic rocks and fine grained sediments, mainly wacke, graphitic mudrock, and metric to multi-metric thick ferruginous sediments and along secondary graphitic fault. The main orientation of the lenses is generally east-northeast with dips to the south at 65° to 75°. Mineralization is composed of metric to sub-metric quartz veins and stockworks containing fine pyrite and arsenopyrite, traces of pyrrhotite, and visible gold. Alteration is predominately chloritization and carbonatization (calcite and ankerite), with sericitization along the quartz veins. The 160 Zone mineralization exhibits a shallow plunge to the west-southwest at 40°.

Mineralization of the Cherty (159) Zone occurs north of the Casa Berardi Fault and east of the 152 Zone. Mineralization is composed of stacked metric to sub-metric quartz veins and veinlets occurring near a band of chert north of the Casa Berardi Fault and near the contact between the volcanic rocks and the sediments north of the Casa Berardi Fault. General orientation of the quartz veins is east-northeast with dips to the south at 70° to 75°. Mineralization remains open at depth and to the east.

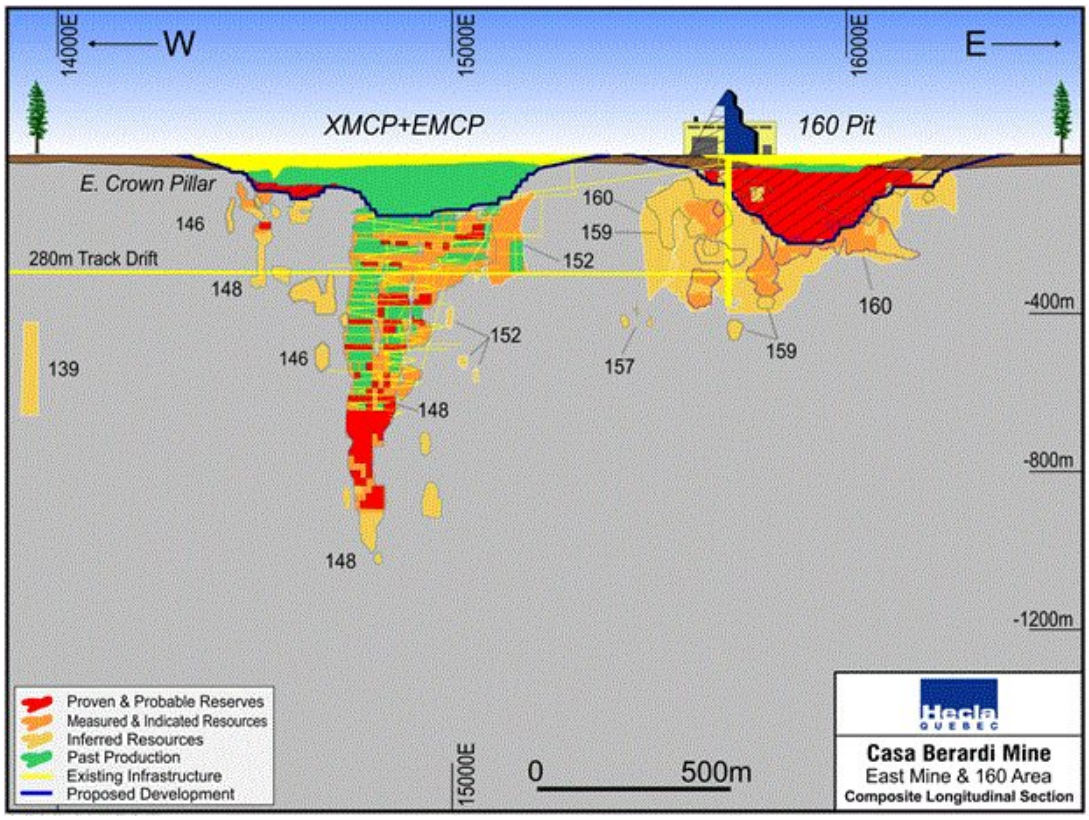


Figure 6-11: East Mine Composite Longitudinal Section

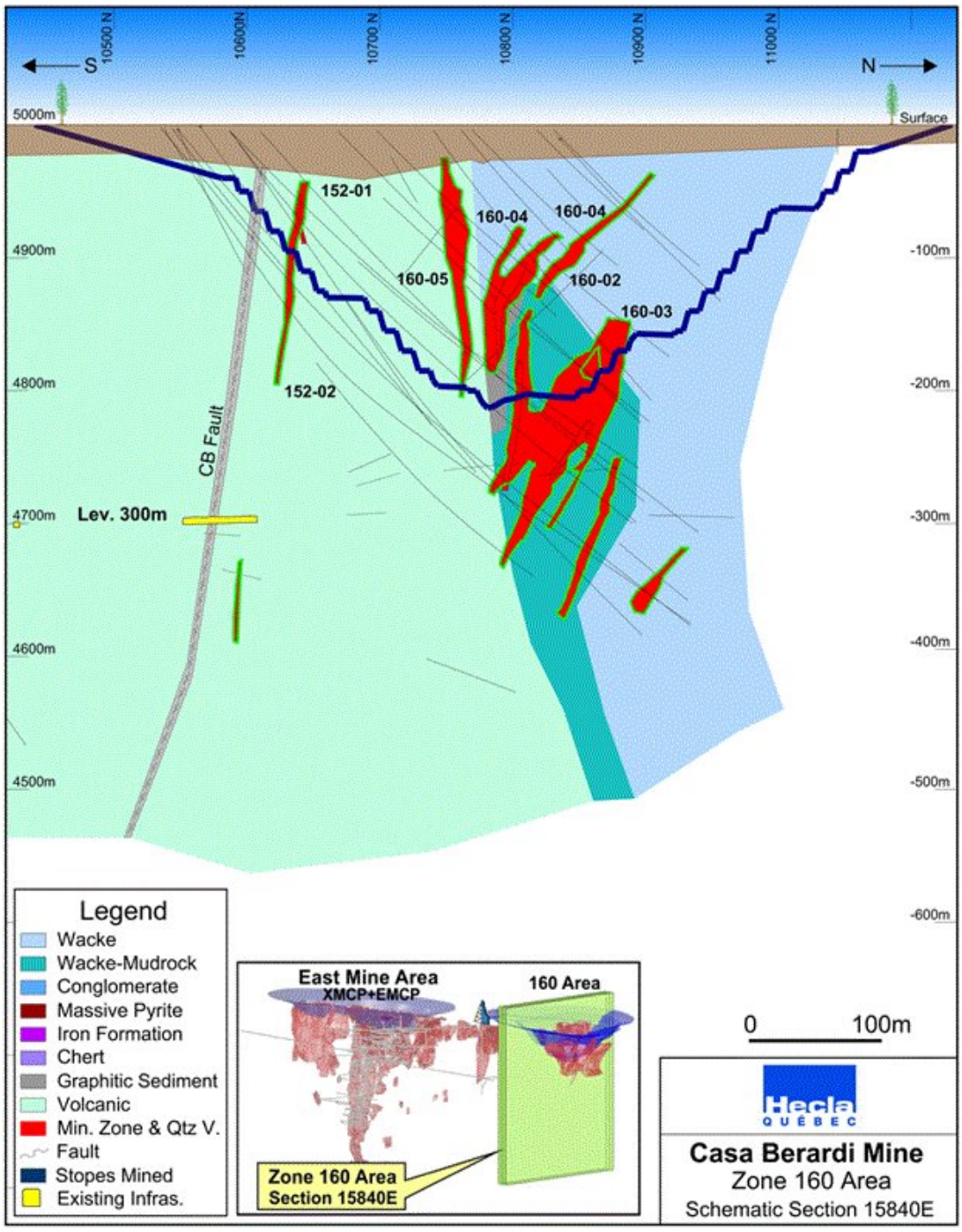


Figure 6-12: Section 15, 840E, East Mine Geology and Infrastructure – 160 Zone

6.7 Deposit Types

The Casa Berardi deposit can be classified as an Archean age, sedimentary hosted lode gold deposit. Gold deposits of the Archean Abitibi greenstone belt predominantly consist of epigenetic disseminated and vein hosted deposits, and syngenetic gold rich massive sulphides (Robert et al., 2005; Monecke et al., 2017). Both types of mineralization could potentially occur within the same deposit in areas where deformation and metamorphism overprint volcanic successions. Deformation and metamorphism can significantly modify the mineralogy and geometry of previously formed mineralization. Nevertheless, superposition of hydrothermal events, metamorphism, and deformation, represent important processes for gold concentration and the formation of world class gold deposits in greenstone belts and sedimentary rocks in general (e.g., Dubé et al. 2007; Large et al., 2007).

The Casa Berardi gold mining camp in the northern Abitibi greenstone belt contains different styles of mineralization within the same deposit including gold rich massive sulphides, auriferous pyritic and carbonaceous phyllite and chert, and pyrite-arsenopyrite-gold-quartz veins. It is therefore considered an ideal setting to study the effects of superimposed hydrothermal systems and to contribute to a better understanding of Casa Berardi and prospective areas along the extensive Casa Berardi Deformation Zone.

7.0 EXPLORATION

From 1974 to 2021, surface and underground diamond drilling, totalling over 3.5 million metres, has been completed at Casa Berardi. Most of this drilling has successfully expanded resources along a five kilometre segment of the Casa Berardi Fault in the immediate mine area. Some regional exploration work including geophysical surveys and diamond drilling has been carried out on the Property, which is very large and covers a very favourable geological environment for gold mineralization including a 37 km strike length along the Casa Berardi Fault. The SLR QP is of the opinion that excellent exploration potential remains on the Property, both along strike and at depth in the immediate mine area and on the rest of the Property. Geophysics and drilling are the key exploration tools needed to make new discoveries under the thick layer of overburden that covers most of the Property.

The SLR QP notes that the exploration and drilling programs comply with industry standards and they have been carried out by experienced geoscientists. SLR's QP is of the opinion that the exploration data are of high quality and are acceptable to support Mineral Resource and Mineral Reserve estimation.

The drilling on the property is shown in Figure 7-1.

7.1 Hecla Exploration 2016 to 2021

Since Hecla's acquisition of Casa Berardi in June 2013 exploration activities have largely consisted of drilling data compilation and integration. During autumn 2017, a helicopter-borne versatile time domain electromagnetic (VTEM) and horizontal magnetic gradiometer geophysical survey, totalling 1,587 line-km, was flown over the entire Property.

7.1.1 2016

From 2012 to the end of 2016, Casa Berardi was still under a JV between Lake Shore and Hecla, however, no exploration work was carried out in the field. In February 2016, Tahoe purchased Lake Shore, and at the end of 2016, Hecla purchased Tahoe's 50% interest in the Property.

In 2016, Hecla resumed data compilation and integration to generate drill targets and staked three new claims to add to the Property.

7.1.2 2017

In 2017, Hecla staked 36 new claims to bringing the total number of claims to 266. In winter 2017, Hecla conducted, a 19 hole (6,620 m) drilling program in the West Block between the West Shaft and the former Agnico Eagle claim block. Hecla's geologists also re-logged and sampled 47 Lakeshore drill holes totalling 20,910 m from Lac Germain and the West Block for lithogeochemistry. During autumn 2017, a helicopter-borne VTEM and horizontal magnetic gradiometer geophysical survey, totalling 1,587 line-km, was flown over the entire Property.

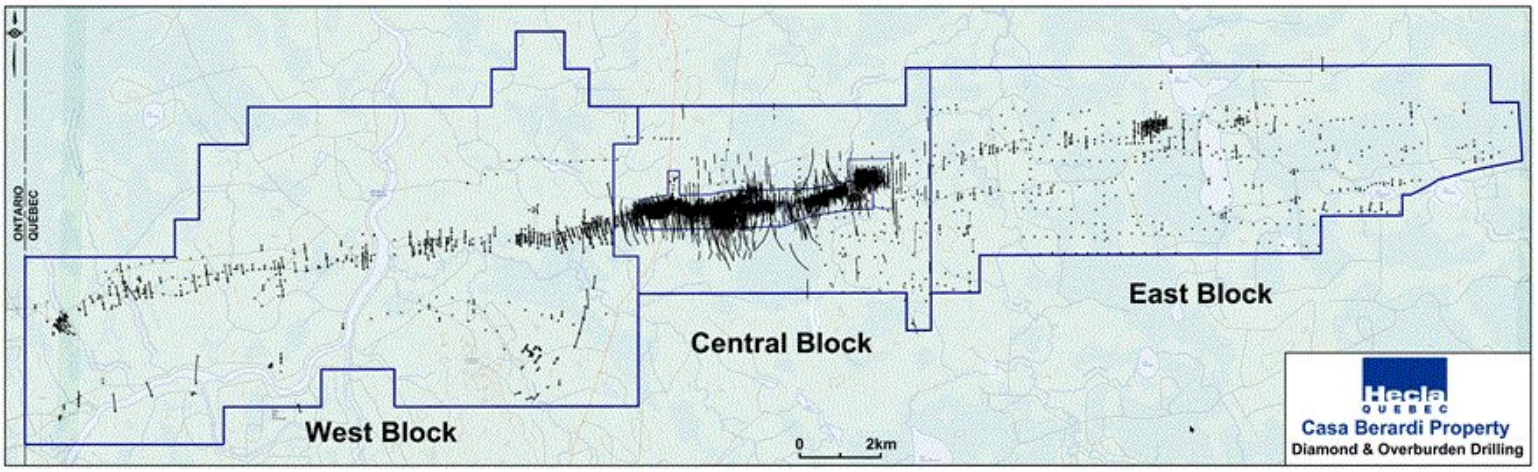


Figure 7-1: Diamond and Overburden Drilling

The 2017 exploration program was successful in defining new mineralization to the west of the Casa Berardi Mining Lease. Drilling on the West Block succeeded in discovering new gold mineralization. In hole CBS-17-783, the best assay result was 1.57 g/t Au over 3.5 m and mineralization is related to the 30% pyrite and trace arsenopyrite in a sericitized and silicified wacke. In hole CBS-17-788, two intervals of quartz veins stockwork with up to 10% pyrite and trace arsenopyrite yielded 4.49 g/t Au over one metre and 4.76 g/t Au over 1.7 m at borehole depths of 135 m and 235 m, respectively. Drilling and relogging succeeded in improving the geological model and furthering Hecla's understanding of the West Block and Lac Germain, by confirming exploration potential and delineating exploration targets for 2018.

7.1.3 2018

In 2018, Hecla purchased four claims from an individual prospector, bringing the total number of claims to 270. During the winter of 2018, Hecla drilled 13 follow-up drill holes (4,610 m) on near surface targets on the West Block and 27 holes (6,656 m) on the Lac Germain prospect. A bridge was built over Theo River to improve access to the Lac Germain area. Relogging of 46 holes from previous drilling on the East and West Blocks was also completed.

On the West Block, the most significant mineralization was in hole CBS-18-959 that intersected 73.1 m of chloritized felsic quartz porphyry volcanic rock with up to 30% pyrite as semi-massive to massive beds and stringer (from 182.1 m to 253.4 m). Assays returned 1.23 g/t Au over 19.1 m including a massive sulphide section that yielded 3.76 g/t Au over 1.8 m.

On the Lac Germain prospect, drilling succeeded in intersecting high grade and wide gold bearing mineralized zones. Mineralization was interpreted as six gold bearing subparallel lenses, LG 1 to LG 6, forming a 100 m wide corridor in a sequence of wacke and BIFs. These lenses strike at approximately 070° and dip between 65° to 75° to the south. In the LG 1 Zone, hole CBS-18-955 returned 11.31 g/t Au over 3.6 m including 25.30 g/t Au over 1.2 m. In the LG 2 Zone, hole CBS-18-940 returned 5.5 g/t Au gold over four metres and hole CBS-18-942 returned an exceptional value of 461.0 g/t Au over 0.6 m. In the LG 3 Zone, holes CBS-18-935 and CBS-18-947 returned 5.61 g/t Au over 3.3 m and 4.08 g/t Au over 2.6 m, respectively. In the LG 4 Zone wide intersections of 5.22 g/t Au over 6.5 m in CBS-18-955, 3.66 g/t Au over 8.4 m in CBS-18-960, and 5.97 g/t Au over 4.5 m in CBS-18-968, were reported. Gold bearing mineralization was interpreted to be related to quartz and quartz carbonate veinlets and veins up to 1.5 m thick. The veins contained minor amounts of pyrite, pyrrhotite, and arsenopyrite and gold grades correlated with the amount of arsenopyrite. Visible gold was related to traces of sphalerite and galena.

7.1.4 2019 and 2020

No drilling was completed for regional exploration in 2019 and 2020.

7.1.5 2021

In 2021, relogging of eight drill holes totalling 3,055 m on the Dieppe East Block confirmed that the geology of the Dieppe East Block is similar to the geology intersected in drill holes from 2017 and 2018 consisting of graphitic mudstone with nodular pyrite, felsic and mafic volcanic rocks, and major graphitic faults (Casa Berardi Deformation Zone). In addition, eight drill holes totalling 3,675 m were re-logged on the Dieppe 1 mineral occurrence. Historical drilling returned values of 26.90 g/t Au over 1.5 m and 2.76 g/t Au over 8.02 m.

This drill hole re-logging confirmed that gold mineralization is related to quartz veins in a brecciated chert horizon at the contact within mafic volcanic rocks. Importantly, the area around the Dieppe 1 mineral occurrence is characterized by a strong volcanic massive sulphide mineralizing system. The thickness of the sulphide system is up to 150 m and has strong potential for gold bearing volcanic massive sulphide deposits.

In 2021, Hecla drilled 5,879 m in 12 drill holes on the West Block area and returned anomalous values that extended previously identified mineralization at depth within both quartz veining and massive sulphides, although these intercepts were low grade. Drill hole CBS-21-023 intercepted massive sulphides over 15 m in thickness and return anomalous gold values over 20 m down hole. Further west, drill hole CBS-21-017 confirmed mineralization at depth and extended the mineral zone over hundreds of meters down plunge intercepting 6.90 g/t over 3.6 m. The geology and mineralization have strong similarities to the 123 and 124 mining zones within the Central Block at Casa Berardi.

7.2 Drilling

Table 7-1 summarizes exploration and definition diamond drilling programs carried out from 2006 to 2021. The extensive surface and underground drilling programs have been developed to investigate the West Mine and East Mine areas.

Table 7-1: Exploration, Definition, and Infill Drilling Programs from 2006 to 2021
Hecla Mining Company – Casa Berardi Mine

Company	Year	Surface Exploration (m)	Underground Exploration (m)	Infill Definition (m)	Total (m)
Aurizon	2006	28,304	19,779	24,578	72,661
	2007	10,445	-	20,434	30,879
	2008	1,014	7,043	21,928	29,985
	2009	19,303	16,477	38,787	74,567
	2010	27,974	37,834	32,881	98,689
	2011	35,979	5,552	63,317	104,848
	2012	29,928	13,052	57,894	100,874
	2013	12,906	3,916	16,149	32,971
Hecla	2013	7,650	3,152	24,648	35,450
	2014	20,556	7,068	40,797	68,421
	2015	22,058	6,158	63,016	91,232
	2016	21,185	4,827	56,950	82,962
	2017	32,877	17,326	73,418	123,621
	2018	28,447	15,942	60,023	104,412
	2019	18,528	17,014	48,781	84,323
	2020	3,650	11,723	43,598	58,971
	2021	16,320	10,485	43,457	70,262
Total		337,124	197,348	730,656	1,265,128

The main exploration and definition drilling programs are summarized in the following subsections.

7.2.1 2006

Definition drilling was active in the 113 and the Lower Inter zones. Exploration drilling was carried out to follow up on Inferred Mineral Resources in the 118 to120 zones that were identified by wide spaced drilling from surface. The extension of mineralization contained in the EMCP was also tested. Exploration of the 122 Deep Zone continued where underground exploration intersected high grade mineralization along the Casa Berardi Fault, 1,000 m below surface and 800 m from the existing infrastructure.

7.2.2 2007

Definition drilling continued in the 113 Zone. The first phase of definition drilling in the Lower Inter Zone was completed. Underground exploration drilling was focused on the 118 to 120 zones.

Surface exploration drilling targeted the 123 Zone, the most significant discovery of mineralization to date outside the Casa Berardi Fault. The 123 Zone is located 350 m south and 900 m east of the existing West Mine infrastructure.

7.2.3 2008

Surface exploration was conducted at the East Mine to convert Inferred Mineral Resources into Indicated Mineral Resources. Definition and infill drilling programs were conducted in the 113 and Principal area zones.

7.2.4 2009

Surface exploration drilling was mainly concentrated in the Principal area to increase Mineral Resources and to evaluate open pit and underground potential. Underground exploration was carried out in the 118 and 123 zones from the 810 m level exploration drift. Definition and infill drilling were primarily carried out in the 113, 118, 123, and Lower Inter zones.

7.2.5 2010

Surface exploration drilling was predominately concentrated in the Principal area of the West Mine to convert Mineral Resources into Mineral Reserves. Underground exploration was carried out in the 118 and 123 zones from the 810 m level exploration drift. Definition and infill drilling were primarily carried out in the Lower Inter, 109, 113, 115, 118, 123, and 124 zones.

7.2.6 2011

The surface exploration program tested the down-plunge of the Lower Inter Zone, the northeast extension of the 118, 123 and 124 zones, the deep down-plunge of the 123 Zone, the potential at depth of the East Mine, and the open pit potential of the 160 Zone. Underground exploration drilling was carried out to verify continuity and extensions of the Principal Mine, primarily in the 118 Zone. Definition and infill drilling were conducted in the 109, 118, 119, 123, and 146 zones.

7.2.7 2012

The surface exploration program was carried out to test the western extension of the 160 Zone, the eastern extension of the Principal area in the West Mine, and the potential at depth of the Lower Inter, 123 zones, and the East Mine. Underground exploration drilling was conducted to verify continuity and extensions of the Lower Inter, Principal Mine, 118, 140, and 160 zones. 2013

The surface exploration program tested the extensions of the 123 and 134 zones. Underground exploration drilling was primarily carried out in the 140 and 159 zones, while definition and infill drilling were mainly carried out in the 113, 115, 118, 119, 123 zones.

7.2.8 2014

The underground exploration targeted the West Mine with the down plunge extension of the 113 Zone, in the 118, 123 and 124 zones in the Principal area, and a small campaign was conducted on the east extension of the Principal area for the 140 Zone. Surface exploration targeted the Principal area east extension with the 134 and 140 zones. Definition and infill drilling were completely entirely from underground to drill the extension of known Mineral Reserves and Mineral Resources near the West Mine in the 113, 118, 123, and 124 zones.

7.2.9 2015

Exploration drilling targeted the 118, 123, 124 and Lower Inter zones in the West Mine from underground and surface. Drilling continued to target the East Mine potential for the 144 and 157 zones and to test the down plunge of the 148 and 160 zones. Infill and definition drilling were conducted mostly in the Principal area on the 118, 123 and 124 zones.

7.2.10 2016

The surface exploration drilling program continued to target the West Mine with the 109 and 113 zones below the current infrastructure. From underground the extension of the Lower Principal targeted to the 117 Zone. Infill and definition drilling were primarily carried out in the Principal area including the 118, 123, and 124 zones.

7.2.11 2017

The 2017 program was the largest drilling campaign since 2006. Exploration drilling has targeted the 123 and 124 zones from underground and surface. A surface exploration campaign was completed on the 134 Zone to test the open pit potential east of the Principal area. The potential for open pit resources near the West Mine was tested by drilling the North West and South West zones in the crown pillar. Infill and definition drilling from surface targeted the EMCP Pit, 134 Zone, and 160 Zone preliminary pit. Underground infill and definition drilling were completed at the Principal area to extend the Mineral Resources and Mineral Reserves for the 118, 123, and 124 zones.

7.2.12 2018

Exploration covered the West Mine and the East Mine to evaluate both surface and underground targets. Surface exploration targeted the down plunge of the 134 Zone under the preliminary pit. Surface drilling also targeted the east extension for underground potential of the 124 Zone. Exploration drilling from surface tested the west extension of the 146 and 148 zones for underground potential. A combination of definition and exploration drilling targeted the WMCP to better define the pit potential. Underground exploration continued in the Lower Principal area from the 990 m level to test the down plunge mineralization of the 118 and 123 zones. Infill and definition drilling from surface were primarily designed to define an open pit in the EMCP Pit, 134 Pit, 160 Pit, and WMCP Pit areas. Underground infill and definition drilling were carried out in the Principal area to evaluate the 118, 123, and 124 zones. In 2018 underground definition drilling commenced in the East Mine from the 300 m level under the 160 Zone preliminary pit to test the down plunge mineralization for underground mining potential.

7.2.13 2019

Surface exploration drilling targeted the eastern portion of the Principal Mine within the 128 Zone specifically the high grade plunge of known lenses and aimed to further define the 160 Zone lenses within the Pit Shell. Furthermore, surface drilling targeted the continuation of those lenses under the pit shell. In the North Domain, the surface campaign aimed to investigate the eastern potential of the 160 Zone in the East Mine, and the extension of the 157 Zone to the south of Casa Berardi Fault.

Underground drilling pursued five targets: i) the eastern extensions of the 128 Zone from the 290 m level, ii) the western extension of the 118 Zone from the 990 m level exploration drift, iii) the 113 Zone from the 1,010 m level, iv) the 152 Zone from the 455 m level ramp in the East Mine and v) the 148 Zone below current infrastructures from the 485 m level in the East Mine.

7.2.14 2020

Surface exploration drilling was active to help determine the near surface eastern extent of the 160 Pit (159-05 lens) thus assisting the pit engineers determine where to move the creek.

Underground exploration drilling actively pursued the 123 Zone below current infrastructures from the 1,070 m level, the 128 Zone from the 490 m level in the Principal Mine area, and the 148 Zone below current infrastructures from the 485 m level in the East Mine.

7.2.15 2021

Surface exploration drilling targeted the different lenses located outside of the WMCP Pit shell, the down trend of the 105 Zone in the West Mine, the east and west extension of the 128 Zone, the downward plunge of the 139 lens and the extension of the 159 and 160 lenses within the 160 Pit shell.

Underground exploration drilling aimed to investigate many zones of the Casa Berardi Mine from west to east, targeting: the upper portion of the 113 Zone from the 990 m level, ii) the downward plunge of the lower 123 Zone from the 1,070 m level, iii) the upward plunge of the 123-01 lens, and iv) the downward extension of the 148-01 lens.

7.3 Casa Berardi Regional Drilling

7.3.1 Lake Shore Drilling 2007 to 2012

In September 2007, Aurizon and Lake Shore Gold Inc. (Lake Shore) signed an option agreement by which Lake Shore could acquire a 50% interest in Casa Berardi. Lake Shore earned its 50% interest at the end of 2012.

7.3.1.1 2008

In winter 2008, an initial drilling program comprising 12 holes, totalling 4,470 m, was carried out. Ten holes were drilled approximately 7.5 km east of the East Mine and Mill Complex, in an area now known as the Lac Germain prospect. Two holes, CE-08-06 and CE-08-09, were drilled near Inco Gold's hole 84716-0, two kilometres to the west of this area. In addition, 79 reverse circulation (RC) holes were completed over the East Block.

The winter 2008 diamond drilling program succeeded in the discovery of the "G Zone" at the Lac Germain prospect. The best intersection in hole CE-08-03 yielded 13.03 g/t Au over 6.45 m within a broader interval of 8.58 g/t Au over 10.4 m. This mineralization was located approximately 90 m below a historical value of 11.11 g/t Au over 2.24 m in Inco Gold's hole 84724-0. The G Zone was then subdivided into three sub-zones referred to as the G-S Zone, G-Mid Zone, and G-N Zone. Gold mineralization was associated with quartz-carbonate-sulphide veins within sedimentary rocks, north of a mafic volcanic package. Higher grade mineralization displayed stronger wall rock alteration and a higher sulphide content, with some quartz and sulphide stringers at a shallow angle to the core axis.

The 79 hole RC drill program was designed to test new areas and to follow up on areas of interest identified via the compilation of previous data. A total of 173 bedrock samples were collected during the RC program and assayed for gold. The source of two gold dispersal trains, east of the Theo River, was interpreted near the northern contact between mafic volcanics and sediments. The first dispersal train was located south of Lake Shore's drill holes CE-08-06 and CE-08-09. The second gold dispersal train occured approximately 4.1 km east of Lac Germain and 5.1 km east of the Lac Germain prospect.

7.3.1.2 2009

In 2009, Lake Shore drilled 16 holes totalling 6,896 m on the Property. Ten of the 16 holes, totalling 3,656 m, were drilled on the Lac Germain prospect while the remaining six, totalling 3,240 m, were drilled on the West Block between the West Mine and the former Agnico Eagle claim block. The drilling on the Lac Germain prospect extended the G Zone. Hole CE-09-12, to the east, returned 2.33 g/t Au over 7.3 m, and hole CE-09-18, to the west, returned 3.04 g/t Au over 6.3 m. Drilling on the West Block led to the discovery of a new gold zone in hole CW-09-23 that returned 3.44 g/t Au over 3.9 m in a broader 23.2 m gold anomalous interval. Mineralization consisted of ribboned, quartz-ankerite veins with 5% to 70% pyrite and pyrrhotite and minor arsenopyrite, within a large package of chert-sulphide iron formation in strongly deformed and altered graphitic wacke.

7.3.1.3 2010

In 2010, Lake Shore drilled 11 holes totalling 4,111 m. Eight holes of the 11 holes, totalling 2,814 m, were drilled on the Lac Germain prospect, while the remaining three targeted aeromagnetic anomalies similar to the one at the Lac Germain prospect. New drilling results on the G Zone included 11.54 g/t Au over 3.9 m in CE-10-30 and 4.75 g/t Au over one metre in hole CE-10-32, both located in the west-central portion of the G Zone. On the eastern end of the G Zone, holes CE-10-29 and CE-10-31 returned several anomalous and high grade gold intervals, notably 40.2 g/t Au over 0.4 m and 8.4 g/t Au over 1.4 m in hole CE-10-29, and 14.7 g/t Au over 0.5 m in hole CE-10-31.

Hole CE-10-35, which tested a magnetic anomaly to the east of Lac Germain approximately five kilometres east of the Lac Germain prospect, did not intersect gold mineralization. Holes CE-10-36 and CE-10-37 were drilled to test magnetic anomalies at the west end of the East Block. Only one interval in hole CE-10-36 yielded 1.63 g/t Au over one metre. Hole CE-10-37 intersected a narrow quartz vein with one speck of visible gold that yielded no value, and another quartz vein which returned 2.57 g/t Au over 0.8 m.

7.3.1.4 2012

During the summer of 2012, Lake Shore drilled hole CW-12-38 to test the down-dip extension of the gold mineralization intersected in hole CW-09-23. Hole CW-12-38 intersected some gold bearing mineralization and the best intervals were 3.24 g/t Au over 1.5 m and 1.38 g/t Au over 12.4 m including 2.53 g/t Au over 3.1 m.

7.4 Hecla Drilling Protocols

Casa Berardi exploration drilling can have a wide range of purposes along the extensive property length and is classified into three categories. Surface and underground exploration drilling, which is planned inside the mining leases along the strike of known gold occurrences to build future Inferred Mineral Resources. Regional exploration outside the mining leases which targets favourable geoscientific features along the Casa Berardi Deformation Zone. Additionally, conversion holes classified as definition and infill drilling occur mainly at the Mine site (surface and underground) within the mine areas and are designed to convert and increase the Indicated Mineral Resources for future mining potential. Condemnation drills holes have also been completed to condemn sectors from exploration and locate the infrastructure of the Casa Berardi complex.

Drill holes are planned (azimuth, dip, length) by Hecla geologists on vertical cross-sections and on vertical longitudinal sections. Drill lines are marked underground (front site and back site) by the mine surveyors. Prior to drilling, a technician verifies the drill rig alignment on hole set up. On surface, drill collars are spotted on the field lines with the use of surveying equipment. Typically, two front sites, identified with wood pickets, are used to align the drill rig. Down hole deviations (azimuth and dip) are measured with Reflex instruments approximately every 50 m along the hole. Complementary with the Reflex survey, a North Seeking Gyro is used when drilling is completed near magnetic rock. This type of survey is not impacted by magnetism and can provide accuracy in defining the down hole drill trace. Once a hole is completed, collars are surveyed by Hecla mine surveyors and geology technicians. All drill holes on site are cemented on the total length as far as possible.

Surface diamond drilling is focused during winter to take advantage of the frozen ground (January to April) and minimize the environmental impacts of the drilling. The drill rigs are moved on ice roads using heavy equipment and snowmobiles and are set up on winter drill pads. Surface drilling is reduced during the summer season to minimize the footprint of gravel roads that are built to access the drilling pads. Underground drilling from the West Mine and East Mine are conducted from drill bays, haulage drifts, or other accessible drilling platforms. The underground drills are moved with heavy underground equipment and access to the drill is via service truck or tractor.

Typically, NQ diameter drill core is used for exploration, infill, and definition drill holes. In some surface and underground holes, due to difficulties in drilling, usually ground condition problems, the drill core diameter is reduced from NQ to BQ.

Once retrieved from the core barrel, the core is placed in sequential order in core boxes labelled with the hole number. Each run, usually three metres, is identified by a wood block on which the depth of the hole is marked. Missing (not recovered) core is identified by a wood stick indicating the length of the missing section. At the end of each shift, core boxes are transported by the drillers' foreman to the core shack on site. A Hecla technician then sorts and opens the core box to evaluate the core quality and measure the accumulated core length. Each core box is photographed and linked with the log database. An aluminum tag etched with the hole number, box, and the contained ''from-to'' is fixed to each core box. After this quality control the Hecla geologist enters a detailed log description of the holes into the Gems logger database.

7.4.1 Comments on Drilling

The SLR QP notes that the quantity and quality of the logging, geotechnical, collar, and down hole survey data collected in the exploration and infill drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation and makes the following comments:

- Core logging performed by Hecla staff meets industry standards for exploration on gold deposits.
- Core logging performed prior to Hecla acquiring 100% ownership met industry standards at the time of logging.
- Collar surveys for Hecla core holes have been performed using industry standard instrumentation.
- Collar surveys for drill holes prior to 2013 were performed using methods that were industry standard for the time.
- Down hole surveys have been performed using industry standard instrumentation.
- Drilling practices, logging, collar surveys, and down hole surveys have been periodically reviewed by independent auditors and confirmed to comply with industry practice.
- Recovery data from core drill programs are acceptable.
- Geotechnical logging of drill core meets industry standards for planned open pit and underground operations.
- No significant factors were identified with the data collection from the drill programs that could affect Mineral Resource or Mineral Reserve estimation.

7.5 Hydrogeology Data

In 2021, seven hydrogeological drill holes were completed in the 105, 124, and 160 zones (Table 7-2). Packer tests to measure hydraulic conductivity and vibrating wire piezometers were installed to measure underground water pressure. The hydraulic conductivities in all three areas ranged from moderate to very low (SRK, 2021a).

Table 7-2: Hydrogeological Drill Holes in 2021
Hecla Mining Company – Casa Berardi Mine

Drill Hole Name	Zone	Core Size	Length (m)
BH-WMCP-05-21	105	NQ	177
BH-WMCP-07-21	105	HQ	177
BH-PR-03-21	124	HQ	201
P3-R3	160	HQ	226
P1	160	HQ	120
P2-BH	160	HQ	174
CBF-105-066	105	NQ	177

7.6 Geotechnical Data

In 2021, eight geotechnical drill holes were drilled to assess the 148 Zone (Table 7-3). The rock quality designation (RQD) indicates a mean RQD of approximately 79.5% which is acceptable considering the drill holes passed through the Casa Berardi Fault. The objective of the 2021 drilling was to verify if there was a void at the Casa Berardi Fault and to ensure that the planned stopes were still safe to mine.

Table 7-3: Geotechnical Drill Holes in 2021
Hecla Mining Company – Casa Berardi Mine

	Drill Hole No.	Zone	RQD (%)	Core Diameter	Length (m)
	CBE-0335-001	148	78.83	NQ	71
	CBE-0335-002	148	78.83	NQ	60
	CBE-0335-003	148	82.7	NQ	69
Underground	CBE-0335-004	148	80.5	NQ	81
	CBE-0335-005	148	76.0	NQ	84
	CBE-0335-006	148	75.92	NQ	81
	CBE-0315-010	148	81.6	NQ	63
	CBE-0315-011	148	81.6	NQ	50.2

8.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

8.1 Sampling Method and Approach

8.1.1 Drill Core Handling Procedures

Drill core from Hecla exploration and definition and infill programs is handled and sampled by contractor technicians with the supervision of Hecla staff. Core is logged by Hecla geologists at the mine core shack. Access to the core shack is restricted to geology personnel by the use of magnetic cards that open the core shack door. The samples are prepared and stored in the core shack until sufficient samples have been accumulated, at which time they are sent to the laboratory for analysis.

Upon receipt of the core boxes from the contractor, core boxes are placed on tables and opened. Core is washed and verified for length accuracy prior to logging. RQD measurements and core recovery measurements are carried out in all surface and underground holes prior to logging. In general, RQD measurements are carried out over three metre lengths, with shorter lengths used in areas of bad ground. This allows better hole to hole interpretations of areas of good and poor RQD values. For a certain period between 2008 and 2010, RQD measurements were carried out over much longer lengths with some measurements over 20 m. Such measurements over long lengths are not very useful for rock mechanics purposes to identify zones of bad ground conditions and this practice was discontinued. The entire core from underground drilling is photographed and systematic photography of core from surface drilling commenced in 2008.

The core recovery is generally very good, nearly 100%, with the exception of short intervals within fault zones or highly deformed mudrock. Such intervals are generally marked during drilling and later checked by Hecla geology personnel for depth accuracy and missing sections.

Geological and structural data are described by geologists and entered into a digital logging package. Drill hole logs summarize hole parameters, core descriptions, and sampling intervals. Core logging is carried out in French. Drill core is stored on the mine site, mostly in core racks.

8.1.2 Core Sampling

Sample selection for assaying is determined visually by Hecla's geologists based on rock type, alteration, quartz veining, and mineralization. Sample positions are identified, and commercially printed bar-coded sample tags are placed under the core in the core boxes at the end of each sample. The beginning and end of each sample is also marked on the core with individual sample lengths varying from 0.4 m to 1.5 m and most of the samples are one metre in length. The geologist marks a reference line along the core length for the technician, before sending it to the core saw.

In the case of exploration and definition holes, the selected samples are sawn into two halves by the core shack technician using an electrical core saw equipped with a diamond impregnated blade. One half is placed in a plastic bag with the corresponding tag number. The other half core is returned to core boxes, with the corresponding tag placed at the beginning of the sampled core. Sample tags are stapled to core boxes. The core saw and metallic pans are cleaned between samples. In the case of infill drill holes, the core is not sawn, and the entire sample is sent for assaying. Bags are folded and sealed to prevent spillage during transportation to the laboratories. Each batch of three to four samples is placed in a plastic container for transportation to the mine laboratory or in a burlap bag for transportation to an external laboratory.

The samples are then transported by pick-up truck to the sample receiving facilities of the mine laboratory in the case of infill and definition drilling.

Lithogeochemical data is collected with exploration drilling for rock discrimination. The sampling consists of selecting a representative 40 cm core sample systematically every 30 m to 50 m or when a lithological change occurs, until a representative compilation of that unit is collected.

8.1.3 Sampling of Underground Development Headings

At the mine, chip samples are taken to determine the gold value over a given interval of rock in order to align development and exploration activities, estimate the value of mineralized lenses, and to reconcile mining with the mill. Along the walls of draw-points, chip samples are taken perpendicular to the stratigraphic and structural trend of the mineralized body. Prior to chip sampling, the intervals to be sampled are geologically mapped in order to delineate changes in lithology, mineralization, alteration, and structure.

Chip samples are localized by hip-chain from surveyed anchor points in the mine. The intervals are typically one metre in length, though they may range from a minimum of fifty centimetres to a maximum of 1.5 m to respect geological constraints. The beginning and end of the interval are marked at chest-height using yellow spray paint and are then plotted on the geological map.

Plastic sample bags used to collect the chip samples are prepared with a sample tag and placed at each interval. The bags are sealed for transport to prevent contamination. The sample tag is a scannable, water-resistant tag that is taken from a booklet containing the sample number, the date and location of the sample, the sampler's name, and other notes and sketches.

8.2 Sample Preparation and Analysis

On site exploration drilling samples are sent to external, independent laboratories. Exploration drilling samples are sent for preparation and analysis to Swastika Laboratories Ltd. (Swastika) in the town of Swastika, Ontario. Check assay samples are sent to ALS Geochemistry (ALS) laboratories in Val d'Or, Québec.

Over time, core samples from exploration drilling have been assayed at a number of different laboratories:

- 2004, 2005 and part of 2006: SGS Canada Inc. (SGS) in Rouyn-Noranda, Québec.
- 2006: Mine laboratory, SGS, Techni-Lab S G B Abitibi Inc. (Techni-Lab) in Ste Germaine, Québec, and Swastika.
- 2007: Mine laboratory and Techni-Lab.
- 2008: Mine laboratory and Laboratory Expert Inc. (Lab-Expert) laboratory in Rouyn-Noranda, Québec.
- 2009 to 2021: Mine laboratory and Swastika.

All samples for lithogeochemical analysis are sent to ALS. ALS and Swastika have been accredited by the Canadian Association for Laboratory Accreditation Inc. for meeting the requirements of ISO/IEC 17025:2005 for various gold assay protocols.

8.2.1 Mine Laboratory

A laboratory at the mine is used to assay most of the samples generated at the mine including underground production headings, infill, and definition drilling. Preparation and gold analysis is completed on site by Hecla staff. The mine laboratory is not ISO certified.

Upon arrival at the mine laboratory, samples are sorted by number and checked according to the sample shipment list. All samples are dried in the oven for a few hours. When dried, samples are crushed in a jaw crusher and transported by a conveyor belt onto a rotary splitter. All samples are entirely crushed to 80% passing (P_{80}) 6.3 mm. Jaws are cleaned with compressed air and flushed with barren core. Whole core samples weigh approximately 10 kg. Approximately 200 g to 250 g of material is split from crushed materials and pulverized to a 95% minus 150 mesh or 85% minus 200 mesh sample pulp. Approximately 600 g of the remaining crushed sample (coarse reject) is returned into the original plastic bag in order to minimize manipulation and storage, the remaining coarse reject is sent to the mill.

The pulp is laid down on a piece of rubber and mixed for homogenization. A 15 g sub-sample is then collected and weighed for assay. Each 15 g sample is analyzed with an atomic absorption spectrometer (AAS). All results, reported in grams per tonne, are sent electronically to Hecla. No final paper copies of assay results are generated by the mine laboratory.

8.2.2 Swastika

Exploration drilling samples from underground and surface are sent to the external, independent Swastika laboratory.

Sample submissions are divided into work orders that contain the identifier, batch number, sample numbers, date, weight, elements, and analyses required. Each batch is made up of 63 samples, which comprise 52 Hecla samples and 11 laboratory quality control samples. Each batch starts with a blank and a standard, which is followed by 19 Hecla samples. Duplicates are taken every 10 samples and are placed at the end of the batch. A bar coding system is used and sample receipt reconciliation notices are transmitted by email.

Samples are dried in two ovens at 80°C and then are entirely crushed to P_{80} 1.7 mm with a jaw crusher and split with a rotary splitter. Jaws are cleaned with compressed air and flushed with barren limestone. Approximately one kilogram of crushed sample is entirely pulverized to 90% minus 107 µm. All pulverized materials are poured onto a rubber mat and then into Kraft bags for weighing. Pulverizer bowls and rings are cleaned with compressed air and flushed with barren silica sand. A 30 g aliquot of pulverized material is collected and weighed for assay. Each 30 g sample is analyzed with an AAS finish and a second fire assay is completed with a gravimetric finish for samples with gold results above 10 g/t Au.

All of the remaining pulverized material (pulp) is sent back to Casa Berardi for storage and quality control. Approximately 5% of crushed sample material (reject) is sent back to the mine site for quality control and the remaining reject material is discard by Swastika.

8.3 Hecla QA/QC Program

8.3.1 Database

The quality assurance/quality control (QA/QC) database contains certificate numbers, dates, sample numbers, original assays, duplicate assays, standard assays, standard types, and laboratories used for assaying.

8.3.2 QA/QC Protocols

Hecla's QA/QC protocols include the insertion of standards (4%), blanks (5%), and sending pulps (5%) and rejects (5%) to an external laboratory.

A certified reference material (CRM or commercial standard) is inserted systematically at every 25th sample. Several standards, from different suppliers and with different qualities, are used.

Blanks are inserted at approximately every 20th sample by the geologist while logging core. Local blanks consist of exploration core from barren material that has been previously assayed. A new type of commercial blank has been introduced in 2021.

Approximately 4% of the pulps are duplicated at the mine laboratory and at Swastika.

Since early 2009, approximately 5% of the original pulp (Pulp #1) from the mine laboratory or the Swastika laboratory has been sent to ALS for external check assaying. Prior to 2009, approximately 10% of the original pulps were sent for re-assay. Samples with grades greater than 1.0 g/t Au are selected for check analysis. The sample numbers for the reanalysis are the same as for the original assays. Since October 2018, the intervals selected for reanalysis are focused on the mineralized zones of development drilling.

8.3.3 Pulp Duplicates

Between 2009 and 2021, 36,940 duplicate samples were inserted within the regular sample sequence. The relative differences range from 0% to 20% with an average relative difference of 2%, which the SLR QP notes is quite good for gold mineralization.

In 2021, 2,163 duplicate samples were inserted within the regular sample sequence. Only 209, or 10% of the original samples, returned gold grades equal or greater than 0.1 g/t Au.

The SLR QP recommends that Hecla adjust its duplicate selection protocol to ensure that most of the duplicates are from mineralized intervals and consider decreasing the duplicate insertion rate.

8.3.4 Mine Laboratory – Development Drilling Pulp Duplicates

The pulp duplicate assays from development drilling programs are discussed in this subsection as they have a higher proportion of mineralized samples compared to the exploration drilling programs.

Table 8-1 presents the number of duplicate assays carried out over the period from 2009 to 2021, the mean grade of original assays, and the mean grade of duplicate assays. The difference between the mean grade of original assays and the mean grade of duplicate assays is acceptable at less than 2%. The correlation between original assays and duplicate assays is very good for the mine and Swastika laboratories. An example of the mine laboratory pulp duplicates in 2021 is provided in Figure 8-1.

Table 8-1: Pulp Duplicate Summary from 2009 to 2021
Hecla Mining Company – Casa Berardi Mine

Year	Original Laboratory	Number of Duplicates	Mean Grade of Original Assays (g/t Au)	Mean Grade of Duplicates Assays (g/t Au)	Difference (%)
2009	Mine	309	6.29	6.26	(0.5)
	Swastika	958	5.88	5.79	(1.5)
	ALS	32	6.21	6.17	(0.6)
2010	Mine	965	5.22	5.14	(1.5)
	Swastika	631	2.09	2.11	1
2011	Mine	1,162	5.26	5.29	0.6
	Swastika	1,114	2.48	2.46	(0.8)
2012	Mine	1,707	7.47	7.5	0.4
	Swastika	847	0.561	0.563	0.4
2013	Mine	1,588	6.64	6.6	(0.6)
	Swastika	578	0.341	0.349	2.3
2014	Mine	1,382	6.37	6.38	0.2
	Swastika	1,244	0.994	0.993	(0.1)
2015	Mine	2,045	11.25	11.34	0.8
	Swastika	1,816	0.68	0.69	1.5
2016	Mine	1,827	8.18	8.05	(1.6)
	Swastika	462	0.45	0.45	0
2017	Mine	1,994	5.15	5.14	(0.2)
	Swastika	2,731	1.024	1.228	20
2018	Mine	1,744	4.83	4.75	(1.7)
	Swastika	3,023	0.208	0.208	0
2019	Mine	1,425	5.45	5.48	0.55
	Swastika	2,305	0.305	0.299	(1.97)
2020	Mine	823	2.56	2.56	0.05
	Swastika	1250	0.683	0.621	(9.07)
2021	Mine	525	3.05	3.10	1.63
	Swastika	1,638	0.297	0.299	0.67

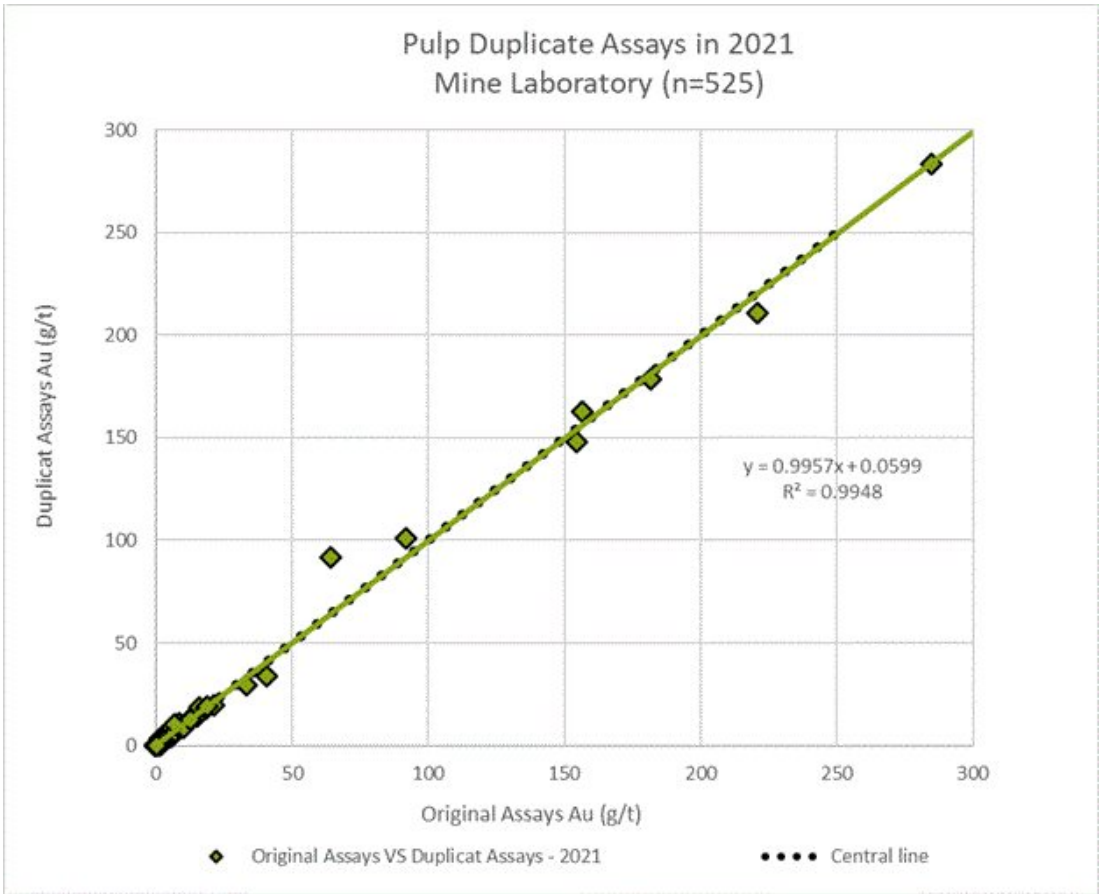


Figure 8-1: Mine Laboratory Pulp Duplicate Assays in 2021

8.3.5 Pulp External Check Assays

Since early 2010, approximately 5% of original pulps (Pulp #1) are sent for re-assay at ALS. Samples with grades above 1.0 g/t Au are generally selected. Sample numbers for re-assays are the same as for original assays. All the laboratories used fire assay with an AAS or gravimetric finish.

A comparison between original assays and check assays of the 2009 to 2018 programs is provided in Table 8-2. The table presents the number of assays from original laboratories and the mean grades of original and check assays.

A comparison of original assays from the mine laboratory with the check assays at ALS demonstrates that the ALS mean grades are generally slightly higher for the period from 2009 to 2018 with higher variances for 2019 to 2021 suggesting that the mine laboratory gold assays may be biased low and slightly conservative relative to ALS. Figure 8-2 presents a scatter plot of the mine laboratory versus ALS check assays on pulps for 2021 and Figure 8-3 presents the results for the 0 g/t Au to 50 g/t Au subset of the pulp external check data for 2021. Overall, the results correlate well with a relatively small number of samples with large differences that are likely related to coarse gold and the nugget effect.

Table 8-2: External Check Assays from 2009 to 2021
Hecla Mining Company – Casa Berardi Mine

Year	Laboratories	Number of Assays	Mean Grade Original (g/t Au)	Mean Grade Check (g/t Au)	Difference (%)
2009	Mine vs. ALS	534	11.98	12.32	2.8
	Swastika vs. ALS	187	5.3	5.23	-1.4
2010	Mine vs. ALS	744	9.77	9.97	2.1
	Swastika vs. ALS	87	4.89	5.05	3.2
2011	Mine vs. ALS	918	7.05	7.18	1.8
	Swastika vs. ALS	87	4.89	5.05	3.2
2012	Mine vs. ALS	1,234	6.31	6.57	4.0
	Swastika vs. ALS	61	2.89	2.76	-4.7
2013	Mine vs. ALS	1,170	6.54	6.6	0.9
	Swastika vs. ALS	50	3.34	3.72	11.4
2014	Mine vs. ALS	1,179	7.63	7.65	0.2
	Swastika vs. ALS	169	2.73	2.86	4.7
2015	Mine vs. ALS	1,471	8.49	8.54	0.6
	Swastika vs. ALS	180	3.49	3.49	0.1
2016	Mine vs. ALS	1,427	7.23	7.33	1.4
	Swastika vs. ALS	68	1.73	1.85	6.9
2017	Mine vs. ALS	1,023	5.31	5.37	1.1
	Swastika vs. ALS	85	1.74	2.02	16.1
2018	Mine vs. ALS	788	5.7	5.8	1.8
	Swastika vs. ALS	653	2.93	3.18	8.5
2019	Mine vs. ALS	943	4.568	4.61	0.9
	Swastika vs. ALS	343	1.73	1.86	7.5
2020	Mine vs. ALS	517	3.79	3.56	6.7
	Swastika vs. ALS	349	3.7	3.76	1.6
2021	Mine vs. ALS	671	7.05	7.18	1.8
	Swastika vs. ALS	40	7.81	7.30	(6.5)

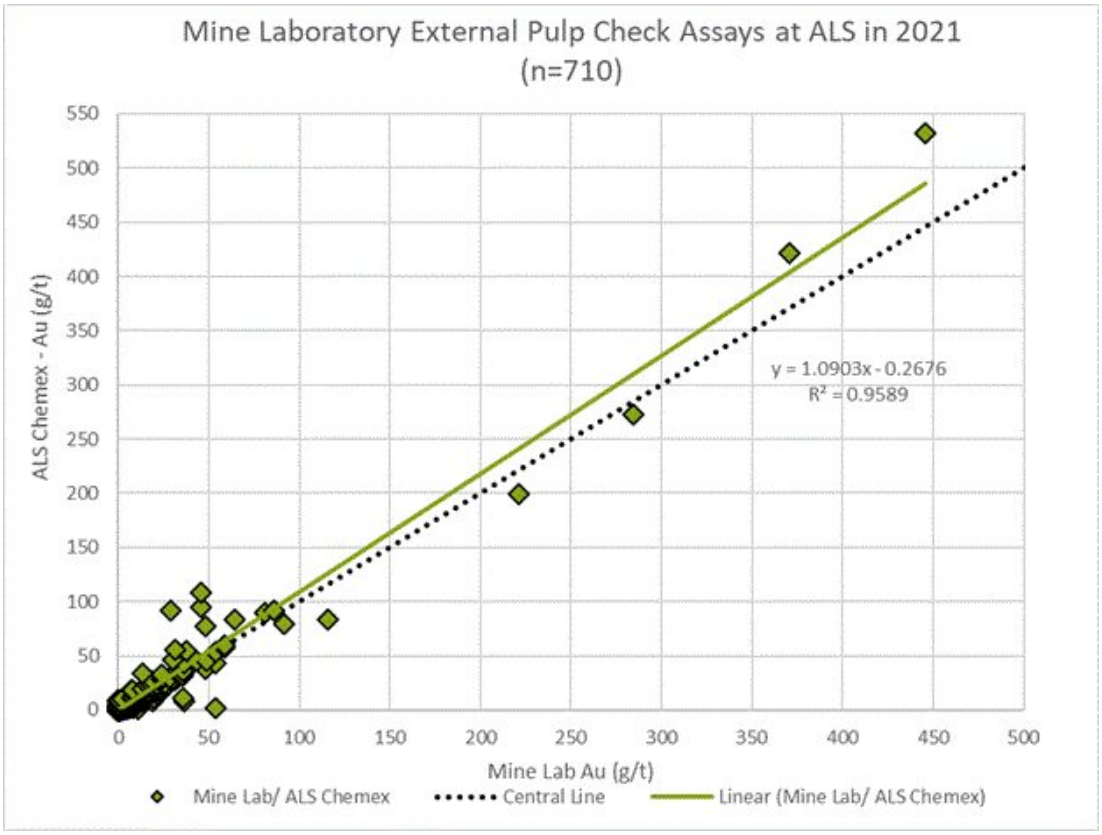


Figure 8-2: Mine Laboratory External Check Assays at ALS in 2021

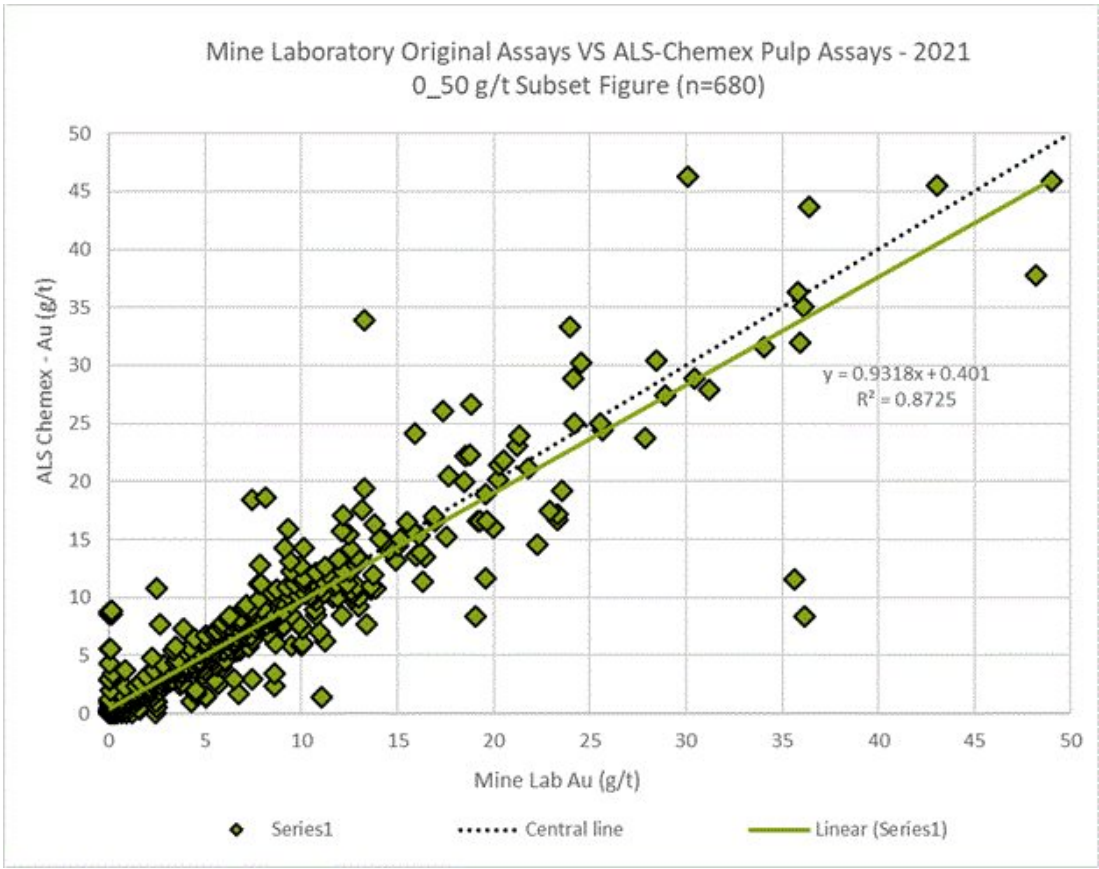


Figure 8-3: Mine Laboratory External Check Assays at ALS in 2021- 0 g/t to 50 g/t Au Subset

The Swastika versus ALS annual mean gold grades demonstrate a wider range of differences that may be due to smaller annual populations that are skewed by small numbers of outliers that should be removed. Nevertheless, Swastika has lower mean grades than ALS for 10 of the 13 years summarized in Table 8-2 and the mine laboratory has lower mean grades than ALS for all 13 years. This suggests that the ALS gold assays may be biased high relative to the mine and Swastika laboratories. The SLR QP is of the opinion that this warrants further investigation, including reviewing the CRM results sent to ALS.

8.3.6 Reject External Check Assays

Approximately 5% of original coarse rejects are sent for re-assay at ALS. Sample numbers for re-assays are the same as for original assays. Samples with a grade above 1.0 g/t Au are generally selected. A second pulp is prepared at the secondary laboratory from original rejects. The ALS annual means are generally higher than the mine and Swastika annual means (Table 8-3), which suggests that ALS gold assays may be biased high relative to the mine and Swastika laboratories. The SLR QP is of the opinion that this warrants further investigation including reviewing the CRM results sent to ALS.

Table 8-3: Reject External Check Assays
Hecla Mining Company – Casa Berardi Mine

Year	Laboratories	Number of Assays	Mean Grade Original (g/t Au)	Mean Grade Check (g/t Au)	Difference (%)
2009	Mine vs. ALS	473	6.39	6.35	(0.7)
	Swastika vs. ALS	232	4.79	4.84	1
2010	Mine vs. ALS	708	5.24	5.23	(0.3)
	Swastika vs. ALS	76	2.5	2.78	11.3
2011	Mine vs. ALS	788	5.02	5.26	4.5
	Swastika vs. ALS	72	2.18	2.51	13.2
2012	Mine vs. ALS	1,135	4.95	5.14	3.7
	Swastika vs. ALS	82	2.46	2.5	1.6
2013	Mine vs. ALS	1,103	6.05	6.17	2
	Swastika vs. ALS	45	3.78	4.07	7.7
2014	Mine vs. ALS	1,178	7.49	7.37	(1.6)
	Swastika vs. ALS	163	2.29	2.43	6
2015	Mine vs. ALS	1,473	7.48	7.65	2.3
	Swastika vs. ALS	204	3.82	3.65	(4.5)
2016	Mine vs. ALS	1,347	6.54	6.73	3
	Swastika vs. ALS	293	2.33	2.49	7
2017	Mine vs. ALS	1,055	4.93	5.01	1.6
	Swastika vs. ALS	45	1.92	1.67	(13)
2018	Mine vs. ALS	801	6.04	5.79	(4.0)
	Swastika vs. ALS	430	3.35	3.31	(1.2)
2019	Mine vs. ALS	1,033	6.48	6.35	(2.0)
	Swastika vs. ALS	513	1.08	1.18	9.3
2020	Mine vs. ALS	378	6.89	6.47	(6.1)
	Swastika vs. ALS	339	2.82	2.98	5.7
2021	Mine vs. ALS	601	6.83	6.79	(0.6)
	Swastika vs. ALS	281	4.33	4.6	6.2

8.3.7 Certified Reference Materials

Table 8-4 summarizes the number of CRMs sent to various laboratories from 2005 to 2021. The differences between the measured value and the true or expected value of the CRMs. Most of the differences are within plus or minus a few percent, which is an acceptable range. Larger differences are generally related to small populations. Overall, the CRMs represent approximately 5.6% of the 2005 to 2021 sample database. No significant biases are evident at the mine and Swastika in the CRM results for 2005 to 2021.

Table 8-4: CRM Results
Hecla Mining Company – Casa Berardi Mine

Standard #	Nominal Value ±95% Confidence Limit	Laboratory	Year	Number of Assays	Average	Difference (%)
6Pa	1.65 ±0.04	SGS	2004	6	1.37	-17.1
6Pb	1.422 ±0.026	SGS	2004	72	1.39	-2.2
			2005	43	1.53	7.8
7Pa	3.00 ±0.06	SGS	2004	95	2.95	-1.5
			2005	32	2.97	-0.9
10Pb	7.15 ±0.11	Mine	2008	74	6.97	-2.5
			2009	217	7.08	-1
			2010	367	7.08	-1
			2011	55	7.06	-1.3
		Swastika	2009	117	7.21	0.8
			2010	173	7.13	-0.3
			2011	25	7.13	-0.3
15H	1.019 ±0.007	Mine	2011	226	0.99	-2.9
			2012	459	1.01	-1
			2013	104	1.02	0.1
		Swastika	2011	51	1	-2
			2012	115	1.01	-1
			2013	18	1	-1.9
15Pa	1.02 ±0.02	Lab-Expert	2008	16	1.22	19.5
		Mine	2007	61	1.05	3.2
			2008	130	1.01	-1.2
			2009	181	1.01	-0.7
			2010	275	1	-2
			2011	95	1.01	-0.9
		Swastika	2009	86	1.01	-1.2

Standard #	Nominal Value ±95% Confidence Limit	Laboratory	Year	Number of Assays	Average	Difference (%)
			2010	163	0.99	-2.9
			2011	24	1.01	-0.9
15Pb	1.06 ±0.02	Mine	2007	4	0.95	-10.4
			2010	81	1.05	-0.9
		Swastika	2010	48	1.07	1.9
18C	3.52 ±0.05	Mine	2011	269	3.44	-2.3
			2012	619	3.48	-1.1
			2013	502	3.48	-1.1
		Mine	2014	249	3.48	1.21
		Swastika	2011	74	3.51	-0.1
			2012	142	3.46	-1.7
			2013	87	3.51	-0.3
			2014	79	3.48	1.21
18Pa	3.36 ±0.05	Mine	2006	116	3.33	-0.8
			2007	33	3.33	-0.8
		SGS	2004	62	3.27	-2.7
			2005	61	3.11	-7.5
			2006	39	3.12	-7.2
18Pb	3.63 ±0.3	Swastika	2006	27	3.63	7.9
		Techni-Lab	2006	78	3.3	-1.8
		Lab-Expert	2008	3	3.79	4.5
		Mine	2007	99	3.56	-2
			2008	28	3.45	-4.8
50P	0.727 ±0.021	SGS	2004	110	0.73	0.5
			2005	72	0.77	6.5
			2006	49	0.79	8.4
		Swastika	2006	7	0.72	-0.6
		Techni-Lab	2006	49	0.77	6.5
51P	0.430 ±0.013	Mine	2006	138	0.48	10.6
			2007	89	0.45	3.9
		Techni-Lab	2006	16	0.52	21.8
52P	0.183 ±0.07	Mine	2007	1	0.44	140.4
		SGS	2005			

Standard #	Nominal Value ±95% Confidence Limit	Laboratory	Year	Number of Assays	Average	Difference (%)
			2006	3	0.22	18.4
		Swastika	2006	1	0.21	12.9
		Techni-Lab	2006	3	0.2	9.3
61D	4.76 ±0.07	Mine	2008	67	4.64	-2.4
		Swastika	2009	180	4.74	-0.4
			2010	394	4.73	-0.6
			2011	207	4.67	-1.9
61Pa	4.46 ±0.08	SGS	2004	12	3.72	-16.6
			2005	23	4.25	-4.8
62C	8.79 ±0.10	Mine	2011	407	8.63	-1.8
			2012	482	8.72	-0.8
			2013	63	8.78	-0.1
			2015	216	8.73	0.68
			2017	1	3.02	191.06
		Swastika	2011	125	8.93	1.6
			2012	128	8.79	0.1
			2015	39	8.67	1.35
			2016	66	8.68	1.32
62D	10.50 ±0.33	Mine	2013	341	10.56	0.6
			2014	379	10.54	-0.41
			2015	297	10.55	-0.52
		Swastika	2013	86	10.91	3.9
			2014	151	10.83	-3.01
			2015	225	10.83	-3.08
62E	9.13 ±0.41	Swastika	2017	204	9.04	0.96
			2018	344	9.25	-1.27
			2019	35	8.95	-1.9
62Pa	9.64 ±0.14	Lab-expert	2008	1	9.38	-2.7
		Mine	2006	113	9.25	-4
			2007	106	9.41	-2.4
			2008	12	9.42	-2.3

Standard #	Nominal Value ±95% Confidence Limit	Laboratory	Year	Number of Assays	Average	Difference (%)
		SGS	2004	31	9.31	-3.5
			2005	71	9.45	-2
			2006	44	9.26	-3.9
		Swastika	2006	23	9.46	-16.5
		Techni-Lab	2006	93	9.14	-5.2
62Pb	11.33 ±0.17	Mine	2007	10	9.46	-16.5
		SGS	2004	86	10.47	-7.6
			2005			
62F	9.71±0.239	Mine	2019	3	9.53	-1.85
			2020	15	9.87	1.65
			2021	32	9.87	1.65
		Swastika	2019	302	9.62	-0.93
			2020	144	9.65	-0.62
			2021	56	9.59	-1.24
204	1.043 ±0.039	Mine	2013	401	1.05	0.7
			2014	361	1.05	-0.26
			2015	535	1.04	0.54
			2016	482	1.05	-0.19
			2017	85	1.15	-9.09
			2018	129	1.04	0.16
		Swastika	2013	77	1.02	-2.2
			2014	140	1.02	2.1
			2015	270	1.02	2.13
			2016	69	1.03	1.63
			2017	55	1	4.45
			2018	43	1.04	-0.07
207	3.472 ±0.13	Mine	2014	121	3.49	-0.58
			2015	460	3.5	-0.73
			2017	2	1.6	117
			2018	1	1.61	116.65
		Swastika	2014	48	3.49	-0.63

Standard #	Nominal Value ±95% Confidence Limit	Laboratory	Year	Number of Assays	Average	Difference (%)
			2015	266	3.48	-0.13
			2016	65	3.46	0.33
			2017	196	3.43	1.22
			2018	2	3.47	0.06
208	9.248 ±0.0438	Mine	2016	465	9.4	-1.59
			2017	282	9.33	-0.84
			2018	171	9.33	-0.88
			2019	140	9.4	1.64
		Swastika	2017	30	8.95	3.28
			2018	38	9.24	0.04
			2019	4	9.59	3.7
209	1.580 ±0.044	Mine	2016	14	1.58	-0.05
			2018	439	1.59	-0.83
			2019	375	1.57	-0.63
			2020	116	1.55	-1.9
		Mine	2021	17	1.55	-1.9
		Swastika	2017	185	1.62	-2.49
			2018	132	1.57	0.37
			2019	6	1.585	0.31
			2020	18	1.57	-0.63
			2021	2	1.545	-2.21
214	3.030 ±0.082	Mine	2016	67	3.04	-0.43
			2017	521	3.01	0.53
			2018	537	3.03	0.14
			2019	315	3.03	0.14
			2020	16	2.975	-1.82
		Swastika	2017	168	2.93	3.44
			2018	176	2.99	1.36
			2019	5	2.97	-1.98
215	3.54 ±0.097	Mine	2016	414	3.54	0.13
			2017	1	2.95	-20

Standard #	Nominal Value ±95% Confidence Limit	Laboratory	Year	Number of Assays	Average	Difference (%)
			2018	4	3.51	1
			2019	2	3.625	2.4
		Swastika	2018	352	3.5	1.11
			2019	271	3.52	-0.56
221	1.06 ±0.04	Swastika	2017	152	1.11	-4.81
			2018	356	1.07	-1.25
			2019	327	1.06	-0.19
			2020	135	1.06	-0.19
			2021	59	1.09	2.83
		Mine	2018	1	1.16	-8.62
			2019	1	1.07	0.75
			2020	13	1.07	0.75
221	1.06 ±0.04	Mine	2021	26	1.06	-0.19
228	8.73 ±0.28	Mine	2017	334	8.89	-1.8
			2018	340	8.81	-0.93
			2019	198	8.78	0.57
			2020	107	8.75	0.23
			2021	31	8.74	0.11
		Swastika	2017	157	8.4	3.98
			2018	128	8.69	0.48
			2019	3	8.76	0.34
			2020	15	8.75	0.23
			2021	18	8.85	1.37
235	1.59 ±0.04	Mine	2021	23	1.55	-2.52
		Swastika	2021	29	1.56	-1.89
238	3.03±0.08	Mine	2019	32	3.03	-0.11
			2020	97	3.02	-0.33
			2021	27	2.99	-1.32
		Swastika	2020	15	2.978	-1.72
			2021	22	3.08	1.65
239	3.55±0.09	Swastika	2019	74	3.54	-0.28

Standard #	Nominal Value ±95% Confidence Limit	Laboratory	Year	Number of Assays	Average	Difference (%)
			2020	138	3.55	0.16
			2021	53	3.45	-2.82
		Mine	2020	14	3.49	-1.69
			2021	28	3.51	-1.13
SG99	1.04±0.006	Labomine	2020	15	1.03	-0.96
			2021	30	1.03	-1.15
		Swastika	2020	70	1.05	0.96
			2021	56	1.07	2.65
SH82	1.33±0.007	Mine	2020	36	1.31	-1.5
			2021	25	1.43	7.52
		Swastika	2020	8	1.3	-2.25
			2021	19	1.3	-2.25
SK109	4.10±0.03	Mine	2020	15	4	-2.44
			2021	29	3.94	-3.9
		Swastika	2020	54	3.98	-2.93
			2021	53	4.06	-0.98
SN106	8.46±0.05	Mine	2020	35	8.54	0.95
			2021	35	8.45	-0.12
		Swastika	2020	9	8.64	2.13
			2021	23	8.7	2.84

The standard results generally range within ±2% of the certified value, which is considered to be an acceptable range. In general, the mean grade of standard assays is within ±two standard deviations (±2SD) of the certified means, which is acceptable for commercial laboratories for gold analyses.

Standards assayed from 2006 to 2021 were plotted against time to visualize the distribution relative to the nominal values. Figure 8-4 presents the results of the standards used from 2006 to 2021. In general, standard assays are well distributed relative to the nominal values and to ±2SD nominal values. Notwithstanding, the SLR QP recommends implementing procedures that will help reduce CRM mislabelling or swaps.

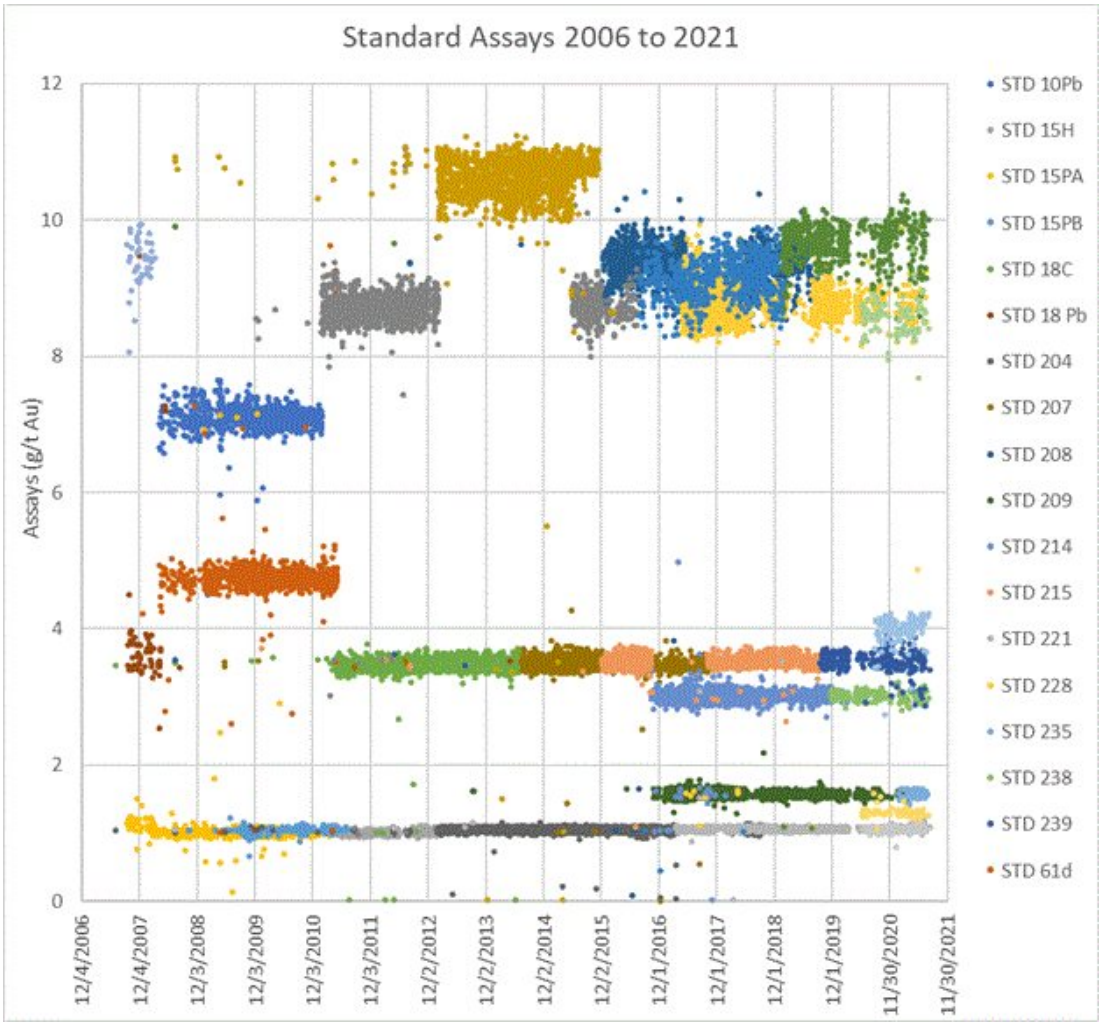


Figure 8-4: Standard Results from 2006 to 2021

8.3.8 Blanks

Out of the 892 local blank and commercial blank samples assayed during the 2021 drilling campaigns , 561 returned values below the detection limit and 324 returned values slightly higher than detection but within acceptable limits. A total of seven samples failed or 0.78% with relatively low background values (Figure 8-5). The local blanks are from core that has been assayed and returned below the detection limit gold grades. A commercial blank is also used.

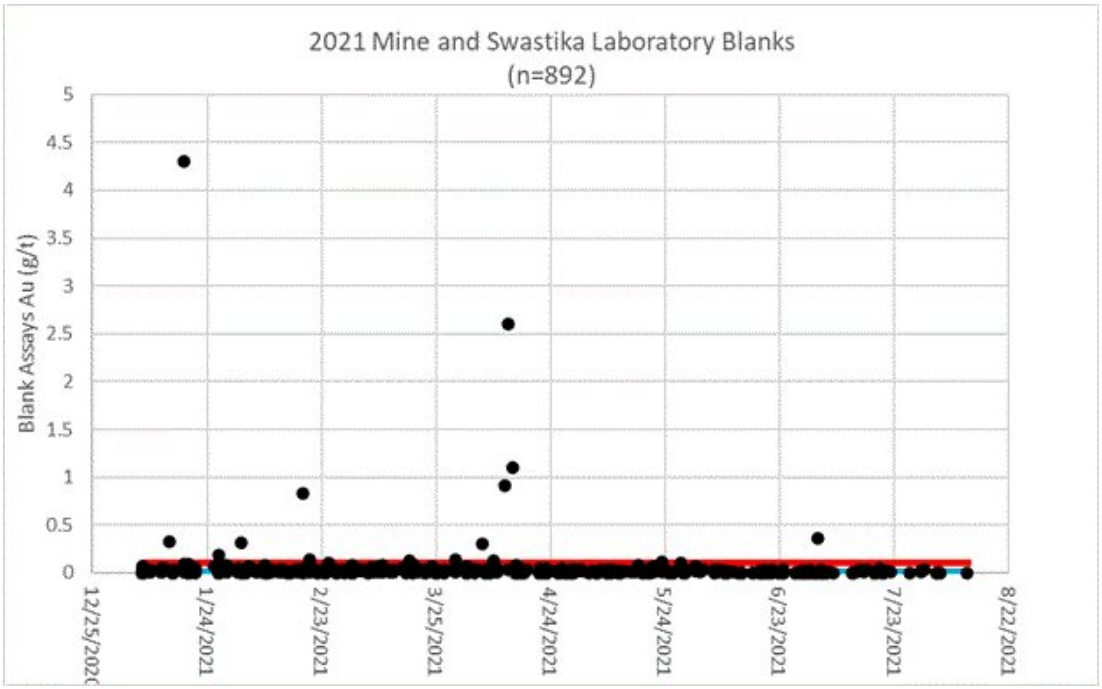


Figure 8-5: Mine and Swastika Blanks – 2021

8.4 Mine Laboratory QA/QC Program

All assays, reported in grams per tonne, are sent electronically to Hecla.

The Mine laboratory has its own QA/QC program including the analysis of one blank sample, one CRM (standard), and one duplicate in every 24 samples. Results of the mine laboratory QA/QC program are provided to the Casa Berardi geology department, which compiles them into graphs. In 2021, the mine laboratory used a total of six standards (Table 8-5).

Table 8-5: Casa Berardi Laboratory Program CRMs
Hecla Mining Company – Casa Berardi Mine

Type	Nominal Value (g/t Au)	Mean Grade (g/t Au)	Difference (%)	Number of Assays
SL76	5.96	5.915	0.76	519
SH82	1.333	1.317	1.18	740
OxK160	3.674	3.656	0.48	663
OxN155	7.762	7.748	(0.18)	559
Sp73	18.17	18.13	0.22	335
OxE150	0.658	0.659	(0.16)	173

8.5 Conclusions

In the SLR QP's opinion, the sample preparation, analyses, QA/QC protocols, and security are acceptable, meet industry standard practice, and are adequate for Mineral Resource estimation. The SLR QP makes the following conclusions:

- Sample collection and handling of core is undertaken in accordance with industry standard practices, with procedures implemented to limit potential sample losses and sampling biases.
- Sample preparation for samples that support Mineral Resource estimation has followed a similar procedure since 1998. These preparation procedures are consistent with industry standard methods for gold deposits.
- Core from exploration and infill diamond drilling programs are analyzed by independent and accredited laboratories using industry standard methods for gold and silver analyses. Current run of mine sample analyses are performed by the mine laboratory.
- While limited information is available regarding the QA/QC procedures for the pre-1998 drill programs, sufficient reanalysis programs and vast amounts of more recent data support the use of pre-1998 data.
- The QA/QC program results indicate that the sample preparation and analytical procedures at the mine and Swastika laboratories are working well aligned to generate reliable and accurate results.
    - Blank sample results imply minimal cross sample contamination.
    - CRM results demonstrate that assay values are sufficiently accurate to be used in Mineral Resource estimation and no significant biases are evident at the mine and Swastika laboratories.
    - Sequential insertion of duplicate samples has resulted in a relatively low proportion of duplicate results for mineralized samples. For instance, only 10% of the original pulp duplicate samples in 2021 had gold grades equal to or greater than 0.1 g/t Au.
    - External pulp and reject check assays suggest that the ALS gold assays may be biased high relative to the Swastika and the mine laboratories.
- Sample security is regarded as very good. Samples are always attended or locked in the on site logging or sampling facilities. Chain of custody procedures consist of completing sample submittal forms that are sent to the laboratory with sample shipments and shipment tracking to ensure that all samples are received by the laboratory.

The SLR QP makes the following recommendations:

- Investigate the potential high gold assay bias at ALS by reviewing CRM results sent to ALS.
- Send only pulps for external check assays in the future.
- Implement procedures that will help reduce CRM mislabelling or "swaps".

9.0 DATA VERIFICATION

The SLR QPs visited the Property from August 24 and 25, 2021. SLR visited the XMCP Pit, East Mine underground, the mill, TSFs, core logging facilities, and surface infrastructure. Bedrock stripping at the 160 Pit was nearing completion while the SLR QPs were on site. The SLR QPs held meetings with site personnel and followed up with a number of teleconference meetings after the site visit.

The SLR geology QPs viewed the Casa Berardi Fault, which is well exposed and transects the XMCP Pit, and the freshly washed and well-mineralized working face on the 630 m level at the East Mine where the face was marked up and sampled by a very experienced geological technician. An underground diamond drill in the process of drilling a deep hole (CBE-0243) was also visited. The drill bay was safe and clean and the two drillers were well organized. Approximately 100% core recovery was evident in the core boxes at 312 m.

The SLR geology QPs found the core logging facilities to be clean and well organized with good lighting. Overhead hoses provide a convenient source of water to wet the core. An area with a high definition camera on a tall tripod is designated for taking core photographs. The pre-packaged blanks and CRMs are well-organized. The diamond core saw has continuous water flow and is located in a separate, sound insulated, room. The core logging area is separate from the core reception and sample dispatch area, which is large enough for trucks to enter and has a long core layout table and a number of core racks for temporary core storage. A core reference library is available for new geologists to help ensure logging consistency.

Drill core descriptions are entered directly into laptop computers using GemLogger Version 5.23, a Microsoft (MS) Access data collection interface developed by Geovia. Drill hole data is stored in separate tables, with drill hole collar data entered in the “HEADER” table and down hole deviation tests entered in the “SURVEY” table. This software performs a first pass validation by flagging data entry errors such as overlapping from-to intervals and non-unique sample numbers. Pick-lists are employed where possible to maintain a consistent nomenclature in geology and mineral zones interpretation.

Roscoe Postle Associates Inc (RPA), now a part of SLR is very familiar with Casa Berardi with work dating back to the listing report for Aurizon in 1997 and NI 43-101 Technical Reports in 2005, 2009, 2010, 2011, 2013 for Aurizon and 2014 for Hecla. SLR also audited the year-end Mineral Resource and Mineral Reserve estimates in 2007 and 2008.

9.1 Drill Hole Database Verification

Geovia GEMS version 6.8 is the software used to perform Mineral Resources estimations, manage drill hole data, and generate 3D wireframe models. Drill hole data is stored on a SQL server, of which regular back-ups are performed as well as an annual backup to a separate MS Access database.

Validation of the lithological logs is completed when the geology is interpreted in section and plan. The logs are further validated by comparison against historical drill data and geochemical samples. The lithogeochemical analyses are used to complement both the initial drill core descriptions and gold analyses. This data is compiled and used to be able to better understand and interpret the lithological units and their associated alteration as an exploration tool to target potential mineralization.

Assay sample results are imported to the SQL database after being validated with the LabLogger software, a purpose-built sample management interface developed by Geovia. When a QA/QC sample fails validation, the importation is halted, and the user notified. The software also notifies the user of non-unique sample numbers. Once imported, Hecla geologists reconcile the assay results with their logs and adjust if necessary.

Single shot down hole deviation tests are manually transcribed using the GemLogger interface. When available, multi shot results are imported using the Reflex process software. An adjustment for magnetic declination of -12.5° is applied to all azimuth measurements. Gyroscopic down hole surveys are used where local magnetic interference has produced questionable survey results.

When possible, surface drill collar locations, as well azimuth and inclination data, are surveyed. Survey data is manually entered and compared with the planned parameters. The geologist who planned the hole marks it as completed after having integrated and validated new data. Any changes to a hole marked as completed are saved in the "MODIF" table. The data is visually reviewed during modeling. A similar procedure is employed for underground drilling, in which case the azimuth is surveyed before the drilling begins, and the drill collar location is derived mathematically.

Hecla geology personnel also visually confirm in 3D that the drill hole locations, downhole deviations, and assay and lithology data appear reasonable and correct.

The SLR QP ran a number of database validation queries and compared gold grades in the database with assay certificates and identified no errors.

9.2 Comments on Data Verification

The process of data verification for Casa Berardi has been performed by external consulting firms, as well as by Hecla personnel. Since 2014, all data verification has been completed by Hecla staff as the data is collected and imported into the GemLogger database. Regular checks on the GemLogger database and workspaces are carried out and no serious deficiencies have been identified.

The SLR QP considers that a reasonable level of verification is completed on a regular basis, and that no material issues exist with the drill hole database. External reviews of the database have been undertaken in support of acquisitions, support of feasibility level studies, and in support of Mineral Resource and Mineral Reserve estimates, producing independent assessments of the database quality. No significant issues with the database, sampling protocols, analytical flowsheets, check analysis program, or data storage were noted. Drill data is verified prior to Mineral Resource and Mineral Reserve estimation using various automated and manual checks.

The SLR QP is of the opinion that the data verification programs undertaken on the data collected from the Casa Berardi Mine complies with industry standards and adequately support the geological interpretations, validate the analytical and database quality, and support the use of the data in Mineral Resource and Mineral Reserve estimation and in mine planning.

10.0 MINERAL PROCESSING AND METALLURGICAL TESTING

10.1 Introduction

The Casa Berardi processing plant originally commenced production in September 1988 and production was suspended in September 1997. During this initial production period, the plant processed 3.5 Mt of ore with an average grade of 7.1 g/t Au and average mill gold recovery of 87%. A total of 688,400 oz Au were recovered.

Production restarted in early November 2006, and commercial production was achieved as of May 1, 2007. Since 2006, a total of 13.3 Mt at an average grade of 5.69 g/t Au have been milled at Casa Berardi for a gold output of 2.15 Moz Au.

The mill received ore from the EMCP and XMCP pits from August 2016 and subsequent years. Ongoing processing plant operations demonstrate the levels of gold recovery to be expected from the underground ores. LOM projected mill recoveries range from 81.3% to 91.5% for the underground Mineral Reserves and from 85% to 90.2% for the open pit Mineral Reserves. Ore from the 160 Pit is expected to be milled in Q4 2022.

Historical metallurgical test work programs and results were previously reported (Hecla, 2019). Test work programs, both internal and external, continue to be performed to support current operations and potential improvements, including:

- Blue Coast Research Ltd. (Blue Coast) (Parksville, B.C.), Project No. PJ5296 (Blue Coast, 2020) – A metallurgical test work program was conducted on material from a mineralized zone in the 160 Pit area, with the objective of evaluating the potential for 160 Pit material to become a valuable ore source for mining in the near future. The test work included chemical and mineralogical characterization, comminution, gravity, and cyanidation. A total of 11 composites and blends were evaluated during this test work program.

- Blue Coast (Parksville, B.C.) – metallurgical investigations were undertaken on the WMCP and Principal Pit material in 2021. The SLR QP notes that some of the results were not available at the time of preparation of this TRS.

Since the mine has been operating steadily since 2006, the metallurgical recoveries are based primarily on historical operating data.

The SLR QP reviewed the following data provided by Casa Berardi:

- Recent metallurgical test work programs

- Historical mill production and recovery data

- Production reports

10.2 Metallurgical Testing

Historical metallurgical test work programs and results were previously reported (Hecla, 2019).

In 2020, a test work program was completed by Blue Coast on mineralization from the 160 Pit. The objective of this test program was to evaluate the potential for 160 Pit material to become a valuable ore source for mining in the near future. For this assessment, chemical and mineralogical characterization, comminution, gravity, and cyanidation tests were completed on 11 different composite samples (Table 10-1).

Table 10-1: Chemical Assays of Composite Samples
Hecla Mining Company – Casa Berardi Mine

Composite	Au (g/t)	As (%)	Fe (%)	S_{tot} (%)	S^{2-} (%)	C_{tot} (%)	C_{org} (%)
160-01LG	1.36	0.38	5.23	1.46	1.40	2.22	0.26
160-01MG	3.57	0.43	6.63	1.95	1.93	2.11	0.15
160-03LG	0.84	0.22	6.47	0.49	0.47	1.86	0.01
160-03MG	1.21	0.21	5.41	0.46	0.44	1.34	0.02
160-03HG	8.63	2.50	8.27	2.91	2.69	1.70	0.01
160-04LG	0.80	0.21	5.40	1.11	1.02	2.10	0.03
160-04MG	3.27	0.50	5.54	1.58	1.58	1.68	0.02
160-04HG	17.17	1.18	6.34	2.57	2.37	1.95	0.02
160-08MG	2.53	0.38	6.66	1.17	1.09	1.17	0.01
160-10LG Blend	0.97	0.10	5.34	0.60	0.53	1.43	0.01
160-01/03/04LG Blend	1.22	0.23	5.43	1.08	1.04	1.92	0.07

Mineralogical characterization indicates that the 160 Pit material consists of pyrite and arsenopyrite, with the majority of the non-sulphide gangue being comprised of quartz, muscovite, and calcite/ankerite, as shown in Figure 10-1.

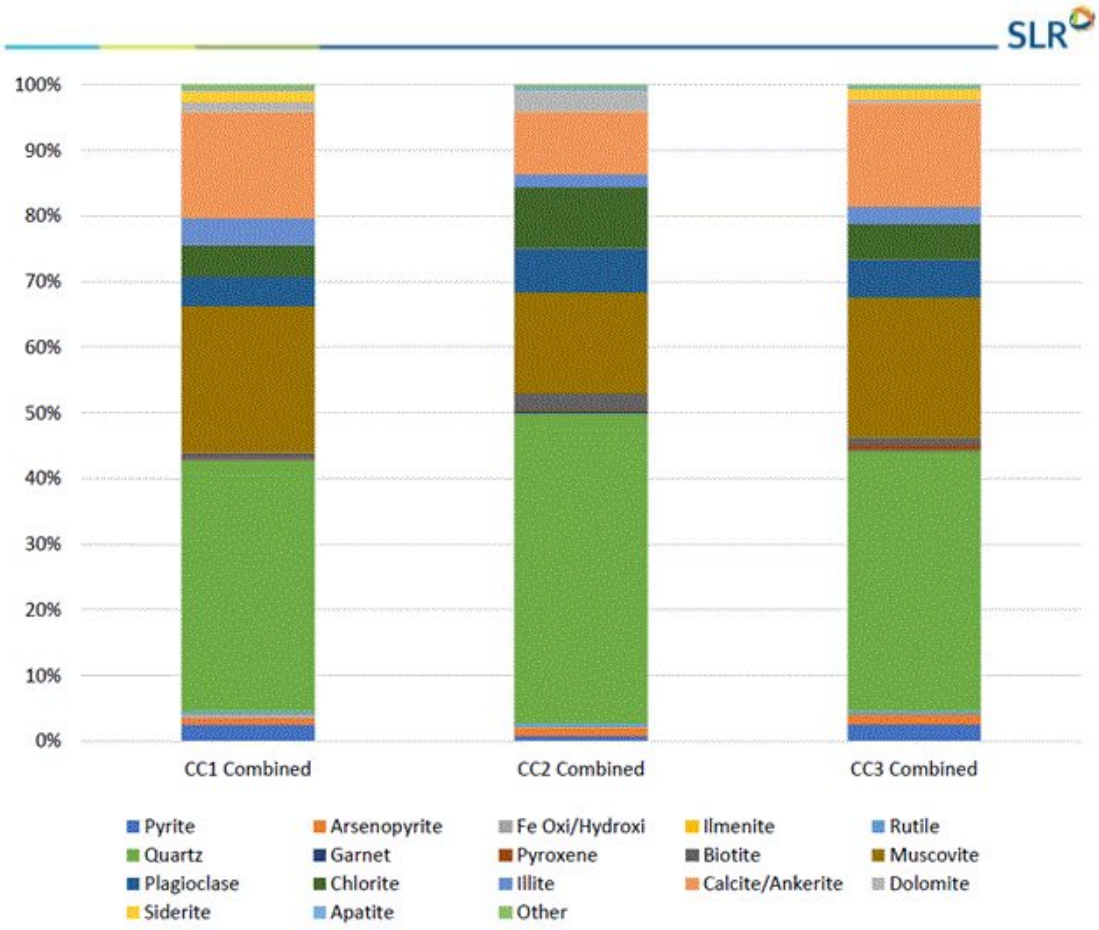


Figure 10-1: Mineralogical Analyses on Composites

The comminution test results on composites are summarized in Table 10-2. Semi-autogenous grinding (SAG) mill comminution (SMC) tests demonstrated that the three comminution composites had Axb values ranging from 56.1 to 59.0, which suggests that the material is in the moderately soft category. SAG Power Index (SPI) test results ranged from 48.5 minutes to 73.3 minutes, correlating to an ore hardness of moderately soft to moderately hard. The Bond Abrasion Index (Ai) test results ranged from 0.12 to 0.29, indicating that the abrasiveness of the material is light to medium. Finally, the Bond Ball Mill Work Index (BWI) test results demonstrated that the 160 Pit material is considered to have medium hardness.

Table 10-2: Comminution Test Results on Composites
Hecla Mining Company – Casa Berardi Mine

	SMC Test					BWI	Bond Abrasion Index		SPI	
Composite	**A**	**b**	**Axb**	**ta**	**DWI**	**(kWh/t)**	**Ai**	**POA[1]**	**SPI (min)**	**POH[2]**
CC1	64.1	0.92	59.0	0.54	4.77	9.6	0.12	24.8	48.5	28.6
CC2	63.7	0.88	56.1	0.51	5.13	13.4	0.29	56.6	93.8	65.2
CC3	62.4	0.94	58.7	0.54	4.82	11.9	0.19	39.2	73.3	50.9
Average	63.4	0.91	57.9	0.53	4.91	11.6	0.20	40.2	71.8	48.2
Maximum	62.4	0.88	56.1	0.51	4.77	13.4	0.29	56.6	93.8	65.2
Minimum	64.1	0.94	59.0	0.54	5.13	9.6	0.12	24.8	48.5	28.6

Notes:

1. Percentile of Abrasivity
2. Percentile of Hardness

Table 10-3 demonstrates that gravity tests indicated that the average gravity recoverable gold (GRG) is 64.6% for the 160 Pit ore.

Table 10-3: GRG Test Results on Composite Sample
Hecla Mining Company – Casa Berardi Mine

Product	Mass		Assay	Distribution
	(g)	(%)	(g/t Au)	(%)
Stage 1 Concentrate	88.4	0.45	206.9	23.7
Stage 2 Concentrate	86.0	0.44	194.6	21.6
Stage 3 Concentrate	119.2	0.61	125.0	19.3
Total Concentrate	293.6	1.51	170.1	64.6
Total Tailings	19,178.4	98.5	1.43	35.4
Calculated Head	19,471.9	100.0	3.97	100.00

A total of 48 cyanidation tests were performed on 11 different composite samples at different P_{80} sizes (53 µm, 75 µm, and 106 µm) and % solids (45% and 50%). These test results are presented in Table 10-4.

Table 10-4: Summary of Leaching Test Results
Hecla Mining Company – Casa Berardi Mine

Data Ranges	Gold Recovery (%)	Final Residue Grade (g/t Au)
Average of all 106 µm	88.6	0.54
Average of all 75 µm	91.6	0.30
Average of all 53 µm	93.2	0.20
Average of all 45% solids	91.3	0.32
Average of all 50% solids	91.0	0.39
Average of all 45% solids and 106 µm	88.9	0.51
Average of all 45% solids and 75 µm	91.9	0.26
Average of all 45% solids and 53 µm	93.1	0.18
Average of all 50% solids and 106 µm	88.3	0.57
Average of all 50% solids and 75 µm	91.2	0.36
Average of all 50% solids and 53 µm	93.4	0.23

The test results indicated that high recoveries can be achieved (> 90%) for a P_{80} of 75 µm. Simultaneously, a finer grind (53 µm) indicates a potential increase in recovery for this type of ore.

10.2.1 Principal and WMCP Pits

In 2021, test work was conducted by Blue Coast on a number of samples taken from the Principal and WMCP pits, however, the final results have not yet been reported.

10.3 Operation Data

Annual production from 2006 to 2021 is presented in Table 10-5.

Table 10-5: Casa Berardi Annual Production
Hecla Mining Company – Casa Berardi Mine

Year	Tonnes (t)	Grade (g/t Au)	Recovery (%)	Metal Recovered (oz Au)
2006	68,481	8.58	93.9	17,731
2007	545,259	9.78	93.0	159,469
2008	654,398	8.16	92.5	158,830
2009	688,677	7.77	92.6	159,261
2010	722,746	6.76	89.8	141,116
2011	698,123	8.00	91.3	163,845
2012	693,859	6.77	90.6	136,848
2013	590,567	6.16	90.5	105,978
2014	750,778	5.90	90.0	128,241
2015	765,763	5.96	87.2	127,893
2016	904,998	5.72	87.7	145,973
2017	1,175,930	4.77	86.8	156,652
2018	1,248,039	4.66	87.1	162,742
2019	1,250,172	4.10	81.5	134,408
2020	1,165,050	4.00	81.0	121,492
2021	1,386,417	3.56	84.8	134,511
Total	13,309,252	5.69	88.5	2,154,992

10.3.1 Yearly Review

Historic key operation parameters are presented in Table 10-6. The throughput has increased regularly since 2015 following improvements in the process.

Table 10-6: Detailed Yearly Mill Production
Hecla Mining Company – Casa Berardi Mine

Date	Dry Tonnes Milled (t)	Dry Tonnes /Operating Hour (tph)	% Passing 200 mesh	Head Grade (g/t Au)	Ounces Produced (oz Au)	Gravimetric Recovery (%)	Total Mill Recovery (%)	Cyanide Consumption (kg/t)	Mill Availability (%)
2015	765,763	95.6	86	5.96	127,893	35.3	87.2	0.82	95.2
2016	904,998	112.3	84	5.72	145,973	37.3	87.7	0.77	92.8
2017	1,175,930	153.4	75	4.77	156,652	37.1	86.8	0.67	88.9
2018	1,248,039	161.0	75	4.66	162,742	36.5	87.1	0.57	89.1
2019	1,250,172	161.5	72	4.10	134,408	26.4	81.5	0.54	88.6
2020	1,165,050	167.6	71	4.00	121,492	34.3	81.0	0.48	86.1
2021	1,386,417	177.7	74	3.56	134,511	36.7	84.8	0.54	89.7

10.4 Recovery Models

10.4.1 Underground (Zones 115/118/121/123/148)

The historical recovery model provides a good indication of the expected performance in the mill. With the measurement of arsenic content, it is possible to have a more accurate estimation of gold recovery. Two recovery models were obtained and are defined by the following equations:

- Low As

$$Gold\ recovery\ (\%) = \frac{0.9753 \times Au\ head\ grade - 0.4287}{Au\ head\ grade}$$

- High As

$$Gold\ recovery\ (\%) = \frac{0.9918 \times Au\ head\ grade - 0.7723}{Au\ head\ grade}$$

The decision to fit the appropriate model to each zone is approved and verified by a Hecla geologist. The data used to compute the model is derived from the actual mill performance. As such uncertainty regarding mill feed variability is reduced because the data covers many months of operation. Therefore, the results from previous metallurgical testing are not used to predict the recovery for the underground ore.

10.4.2 Open Pit

For the open pit gold recovery used in the LOM, the data is based on available metallurgical test work results reported by Blue Coast in 2020 and 2021.

10.4.2.1 EMCP/XMCP Pit

The metallurgical test work was completed using representative samples with different grind sizes, head grades, and with dilution to simulate a real situation in the pit. The SLR QP is confident that the information below provides a good estimation of the expected recovery in the LOM plan.

$$Gold\ recovery\ (\%) = \frac{0.942\ \times\ Au\ head\ grade - 0.35}{Au\ head\ grade}$$

10.4.2.2 134/Principal Pit

The same equation for recovery as presented for the EMCP/XCMP Pit material is used for the 134/Principal Pit material, as no results from the work conducted by Blue Coast 2021 were available at the time of writing. The SLR QP is confident that the information below will provide a good estimation of the expected recovery in the LOM plan.

$$Gold\ recovery\ (\%) = \frac{0.942\ \times\ Au\ head\ grade - 0.35}{Au\ head\ grade}$$

10.4.2.3 160 Pit

The metallurgical test work was completed at Blue Coast in 2020 using representative samples with different grind sizes, head grades, and with dilution to simulate near a real situation in the pit. The SLR QP considers that the information below provides a good estimate of the expected recovery in the LOM plan and the confidence is appropriate for the precision required.

$$Gold\ recovery\ (\%) = \frac{0.9411\ \times\ Au\ head\ grade - 0.07995}{Au\ head\ grade}$$

10.4.2.4 WMCP Pit

The metallurgical test work was completed using representative samples with different grind sizes, head grades, and with dilution to simulate a real situation in the WMCP Pit. The SLR QP considers that the equation below provides a good estimate on the expected recovery in the LOM plan and the confidence is appropriate for the precision required.

$$Gold\ recovery\ (\%) = \frac{0.916\ \times\ Au\ head\ grade - 0.35}{Au\ head\ grade}$$

10.5 Expected Recoveries

The expected recoveries from the different open pits are summarized in Table 10-7.

Table 10-7: Expected Recovery LOM for Open Pit
Hecla Mining Company – Casa Berardi Mine

Zone	Expected Recovery (%)	LOM Grade (g/t Au)
EMCP – XMCP	75.70	1.90
134 Pit	82.70	3.06
160 Pit	89.70	1.83
WMCP Pit	80.50	3.15
Principal Pit	81.80	2.81

10.6 Deleterious Elements

There are two deleterious elements that could potentially affect the process:

- Arsenic: Ferric sulphate is added to precipitate arsenic in the tailings pond.
- Carbon: The carbon in the ore could cause preg-robbing and affect the gold recovery.

10.7 Conclusions and Recommendations

The test work performed on open pit material was used to estimate the gold recovery, while operating data was used for the underground material.

The SLR QP recommends that the following metallurgical test work continue:

- Additional metallurgical testing to better understand the processing of mineralization from the Principal and WMCP pits. This will aid in projecting metallurgical recoveries for these pits and will indicate any variability in gold recovery and grindability of the material. SLR notes that testing was undertaken at an external laboratory in 2021 and some results were not available at the time of preparation of this TRS.

Test work programs, both internal and external, continue to be performed to support current operations and potential improvements.

The SLR QP has reviewed the information provided by Hecla, as summarized in Section 10, and has performed a review of the reconciliation data available to verify the information used in the LOM plan. Based on these checks, in the opinion of the SLR QP, the metallurgical test work, reconciliation, and production data support LOM planning:

- Industry standard and appropriate metallurgical testing procedures consistent for the deposit's mineralogy have been consistently used by Hecla staff for optimizing and improving mill process capabilities and performance.
- Numerous external and internal studies have been conducted to the date of this TRS, which have been used to develop and optimize the existing flowsheet.

- The samples used in the test work are considered representative of mill feed types across the Casa Berardi deposit.
- LOM projections are based on production results and informed by metallurgical test data that is updated in the model forecasts annually.
- Mill metallurgical results and forecasts are consistent with the deposit mineralogy and the process circuit used.
- Metallurgical and production models were developed from metallurgical sampling and testing. The methodologies, process, and data used in making recovery projections are unbiased and provide reliable projections.

11.0 MINERAL RESOURCE ESTIMATES

11.1 Summary

Mineral Resource estimates for the Casa Berardi Mine as of December 31, 2021, are presented in Table 11-1 and Table 11-2. Total Measured and Indicated Mineral Resources, exclusive of Mineral Reserves, are estimated to be 7.04 Mt at 4.66 g/t Au containing 1.05 Moz Au. Inferred Mineral Resources total 9.18 Mt at 2.68 g/t Au for 0.79 Moz Au. The underground portion of the Measured and Indicated Mineral Resources represent 98% of the total Measured and Indicated Mineral Resources.

Mineral Resources are classified based on the density of drill hole data and the continuity of the auriferous zones. This classification complies with the resource definitions used by the SEC in S-K 1300 (SEC, 2018).

The classification of Casa Berardi Mineral Resources is guided by the quality of drill hole data, the continuity of the auriferous zones, the drill hole spacing (which ranges from 15 m to 50 m), the ranges of variograms (which are between 10 m and 60 m), and production experience. The Casa Berardi Mineral classification also considers the distance of drill hole composites to the block center which is an attribute generated in the Gems software at the time of grade interpolation (Mean Distance of Samples to Block Center or MeanDist).

For each lens, a polygon was created around blocks that were estimated based on drill hole composites with an average mean distance of 25 m. The Mineral Resources were classified as follows:

- **Measured Mineral Resources:** blocks inside the 25 m mean distance polygon with underground development nearby that confirmed the continuity of mineralization.
- **Indicated Mineral Resources:** blocks inside the 25 m mean distance polygon.
- **Inferred Mineral Resources:** blocks outside the 25 m mean distance polygon, generally up to a maximum of 35 m mean distance, and rarely up to 50 m mean distance.

The location of the Mineral Resource zones is presented in Figure 11-1.

Table 11-1: Mineral Resource Estimate by Zone – December 31, 2021
Hecla Mining Company – Casa Berardi Mine

Classification and Zone	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)
Measured Mineral Resources			
Underground			
100 Lower Inter	105,885	5.35	18,196
101 North West	41,556	6.41	8,564
107	286,130	4.03	37,090
109	14,899	5.25	2,514
113	428,701	6.11	84,213
115	16,592	7.31	3,899
117	5,908	4.30	816

Classification and Zone	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)
118	336,660	4.89	52,928
123	322,479	4.66	48,276
124	229,356	4.50	33,171
148	261,408	7.17	60,268
152	11,361	4.09	1,494
Total Underground	2,060,934	5.30	351,430
	Open Pit		
WMCP	83,375	1.34	3,592
Principal	1,041	1.28	43
EMCP	43	1.37	2
160	2,968	0.98	93
Total Open Pit	87,427	1.33	3,730
Total Measured Resources	**2,148,361**	**5.14**	**355,160**
	Indicated Mineral Resources		
	Underground		
100 Lower Inter	77,006	5.02	12,436
107	150,982	3.93	19,086
109	81,928	7.68	20,227
113	516,550	4.51	74,840
115	28,719	5.57	5,148
118	1,341,480	4.64	200,333
119	95,366	4.86	14,899
121	19,538	4.16	2,614
123	690,802	4.46	98,977
124	697,697	4.65	104,259
128	100,561	4.49	14,502
148	194,039	5.59	34,865
152	101,875	4.75	15,552
159	91,583	5.61	16,526
160	326,503	4.82	50,612
Total Underground	4,514,629	4.72	684,875

Classification and Zone	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)
	Open Pit		
WMCP	41,105	1.34	1,770
Principal	174,190	1.28	7,177
134	1,014	1.29	42
EMCP	10,515	1.36	459
160	153,776	0.98	4,845
Total Open Pit	380,600	1.17	14,294
Total Indicated Mineral Resources	**4,895,230**	**4.44**	**699,169**
Total Measured and Indicated	**7,043,591**	**4.66**	**1,054,329**
	Inferred Mineral Resources		
	Underground		
100 Lower Inter	5,240	13.78	2,322
104	147,040	4.74	22,397
113	90,727	5.13	14,978
116	215,995	13.18	91,505
118	273,712	4.92	43,297
119	108,000	4.15	14,417
121	571	4.25	78
123	234,942	5.72	43,183
124	182,547	5.39	31,617
129	39,385	6.69	8,467
139	120,677	6.24	24,206
146	69,522	6.44	14,404
148	140,687	6.47	29,251
152	27,300	7.04	6,179
157	9,131	5.49	1,613
159	247,702	5.09	40,571
160	118,267	5.06	19,239
Total Underground	2,031,443	6.24	407,724
	Open Pit		

Classification and Zone	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)
WMCP	53,289	2.10	3,591
Principal	482,334	3.03	47,028
134 (in reserve pit shell)	2,684	2.91	251
134 (below reserve pit shell)	938,077	1.86	56,232
160 (in reserve pit design)	197,060	2.05	12,993
160 (below reserve pit design)	5,481,094	1.49	262,649
Total Open Pit	7,154,538	1.66	382,744
Total Inferred Mineral Resources	**9,185,981**	**2.68**	**790,468**

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla staff and reviewed and accepted by SLR.
3. Mineral Resources are exclusive of Mineral Reserves and do not have demonstrated economic viability.
4. Mineral Resources are 100% attributable to Hecla.
5. Underground Mineral Resources are estimated at cut-off grades ranging from 3.11 g/t Au to 4.00 g/t Au.
6. The 160 underground Indicated and Inferred Mineral Resources are reported at a 4.00 g/t Au cut-off grade.
7. Open pit Mineral Resources are estimated at cut-off grades ranging from 0.95 g/t Au to 1.33 g/t Au.
8. The 134 open pit Inferred Mineral Resources are reported between the reserve pit shell and 4,680 MASL at a 1.25 g/t Au cut-off grade.
9. The 160 open pit Inferred Mineral Resources are reported between the reserve pit design and 4,600 MASL at a 0.95 g/t Au cut-off grade.
10. Underground and open pit Mineral Resources are estimated using an average long term gold price of US$1,700 /oz Au and a US$/C$ exchange rate of 1.275.
11. A minimum mining width of three metres was used.
12. Totals may not represent the sum of the parts due to rounding.

Table 11-2: Mineral Resource Estimate Summary – December 31, 2021
Hecla Mining Company – Casa Berardi Mine

Resource Category	Tonnes	Grade (g/t Au)	Contained Metal (oz Au)
Underground			
Measured	2,060,934	5.30	351,430
Indicated	4,514,629	4.72	684,875
Measured and Indicated	6,575,563	4.90	1,036,306
Inferred	2,031,443	6.24	407,724
Open Pit			
Measured	87,427	1.33	3,730
Indicated	380,600	1.17	14,294
Measured and Indicated	468,028	1.20	18,024
Inferred	7,154,538	1.66	382,744
Total			
Measured and Indicated	7,043,591	4.66	1,054,329
Inferred	9,185,981	2.68	790,468

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Mineral Resources were estimated by Hecla Québec and reviewed and accepted by SLR
3. Mineral Resources are exclusive of Mineral Reserves and do not have demonstrated economic viability.
4. Mineral Resources are 100% attributable to Hecla.
5. Underground Mineral Resources are estimated at cut-off grades ranging from 3.11 g/t Au to 4.00 g/t Au.
6. Open pit Mineral Resources are estimated at cut-off grades ranging from 0.95 g/t Au to 1.33 g/t Au.
7. Underground and open pit Mineral Resources are estimated using an average long term gold price of US$1,700 /oz Au and a US$/C$ exchange rate of 1.275.
8. A minimum mining width of three metres was used.
9. Totals may not represent the sum of the parts due to rounding.

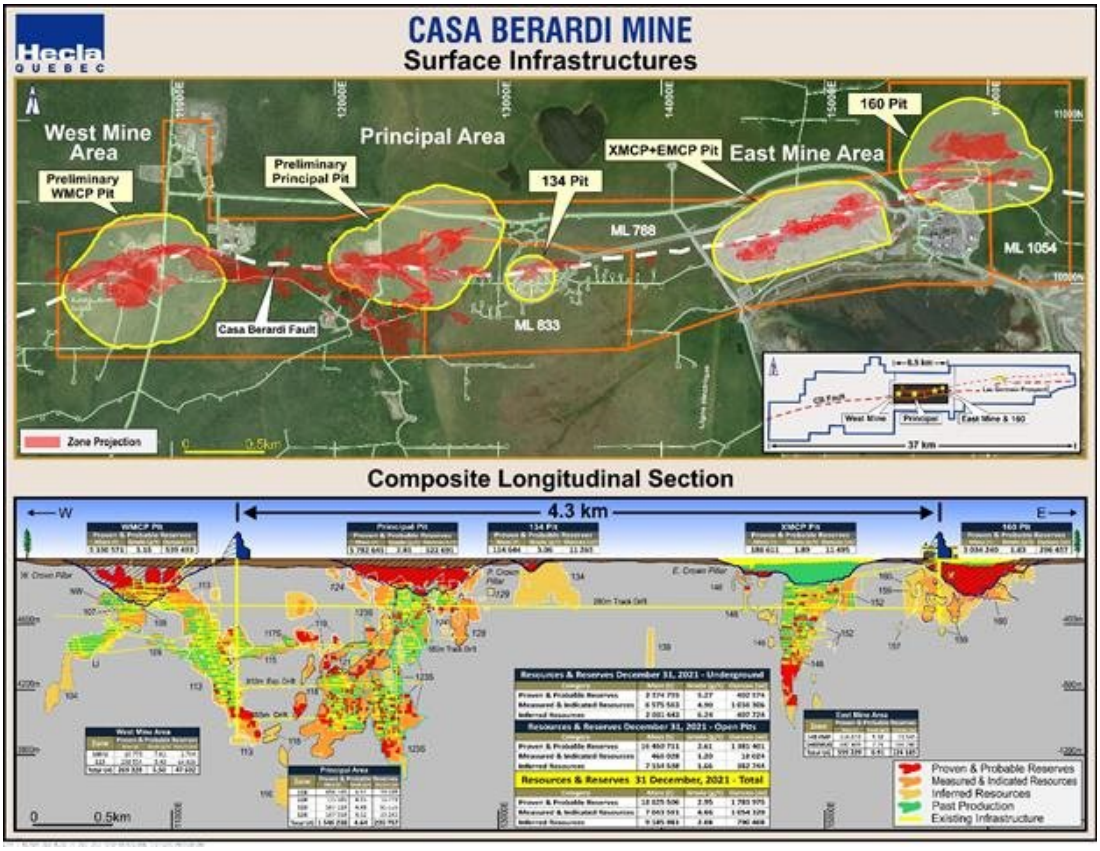


Figure 11-1: Mine Plan View Infrastructure with Composite Longitudinal Section

Casa Berardi Mineral Resources were estimated using block model grade interpolation techniques, effectuated by the mine staff.

Table 11-3 compares the December 31, 2021 and December 31, 2020 Mineral Resource estimates. Gains and losses are a result of:

- Geological reinterpretation of mineralized zones after drilling programs.
- Conversion of Inferred Mineral Resources into Indicated or Indicated into Measured Mineral Resources.
- Conversion of Mineral Resources into Mineral Reserves.
- Mining depletion.
- Subtraction of low grade Mineral Resources (below cut-off grade).

Table 11-3: Comparison of December 31, 2021 versus December 31, 2020 Mineral Resources
Hecla Mining Company – Casa Berardi Mine

Classification and Mine Zone	December 31, 2021 Tonnes (t)	December 31, 2021 Grade (g/t Au)	December 31, 2021 Contained Metal (oz Au)	December 31, 2020 Tonnes (t)	December 31, 2020 Grade (g/t Au)	December 31, 2020 Contained Metal (oz Au)	Gain (Loss) Tonnes (t)	Gain (Loss) Ounces (oz Au)
Measured								
Underground								
100 Lower Inter	105,885	5.35	18,196	98,915	5.35	17,018	6,970	1,178
101 North West	41,556	6.41	8,564	41,556	6.41	8,564	-	-
107	286,130	4.03	37,090	291,750	4.01	37,642	(5,620)	(552)
109	14,899	5.25	2,514	14,339	6.14	2,829	560	(315)
111	-	-	-	13,025	4.21	1,764	(13,025)	(1,764)
113	428,701	6.11	84,213	356,785	6.31	72,360	71,916	11,853
115	16,592	7.31	3,899	13,684	5.35	2,352	2,908	1,547
117	5,908	4.3	816	5,908	4.30	816	-	-
118	336,660	4.89	52,928	267,752	4.65	40,049	68,908	12,879
121	-	-	-	6,498	4.85	1,013	(6,498)	(1,013)
123	322,479	4.66	48,276	399,206	4.45	57,052	(76,727)	(8,776)
124	229,356	4.50	33,171	236,082	4.60	34,937	(6,726)	(1,766)
148	261,408	7.17	60,268	261,953	6.22	52,347	(543)	7,921
152	11,361	4.09	1,494	16,887	3.92	2,127	(5,526)	(633)
Total Underground	2,060,934	5.30	351,430	2,024,339	5.08	330,869	36,595	20,561
Open Pit								
WMCP	83,375	1.34	3,592	710,357	2.92	66,598	(626,982)	(63,006)
Principal	1,041	1.28	43	37,019	3.49	4,151	(35,978)	(4,108)
EMCP	43	1.37	2	-	-	-	43	2
160	2,968	0.98	93	-	-	-	2,968	93
Total Open Pit	87,427	1.33	3,730	747,376	2.94	70,749	(659,949)	(67,019)
Total Measured	2,148,361	5.14	355,160	2,771,715	4.51	401,618	(623,354)	(46,458)
Indicated								
Underground								
100 Lower Inter	77,006	5.02	12,436	76,663	5.09	12,556	343	(120)

Classification and Mine Zone	December 31, 2021			December 31, 2020			Gain (Loss)	
	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)	Tonnes (t)	Ounces (oz Au)
107	150,982	3.93	19,086	165,436	3.85	20,493	(14,454)	(1,407)
109	81,928	7.68	20,227	63,530	7.85	16,042	18,398	4,185
111	-	-	-	128,785	4.96	20,541	(128,785)	(20,541)
113	516,550	4.51	74,840	441,288	4.99	70,792	75,262	4,048
115	28,719	5.57	5,148	36,614	5.60	6,596	(7,895)	(1,448)
118	1,341,480	4.64	200,333	1,457,174	4.51	211,422	(115,694)	11,089
119	95,366	4.86	14,899	189,121	4.98	30,273	(93,755)	(15,374)
121	19,538	4.16	2,614	7,860	4.57	1,155	11,678	1,459
123	690,802	4.46	98,977	722,314	4.66	108,333	(31,512)	(9,356)
124	697,697	4.65	104,259	815,520	4.69	123,070	(117,823)	(18,811)
128	100,561	4.49	14,502	107,017	4.41	15,173	(6,456)	(671)
148	194,039	5.59	34,865	267,870	5.34	45,979	(73,831)	(11,114)
152	101,875	4.75	15,552	117,656	4.57	17,289	(15,781)	(1,737)
159	91,583	5.61	16,526	41,800	5.10	6,851	49,783	9,675
160	326,503	4.82	50,612	282,106	4.79	43,431	44,397	7,181
Total Underground	4,514,629	4.72	684,875	4,920,753	4.74	749,996	(406,124)	(65,121)
Open Pit								
WMCP	41,105	1.34	1,770	191,050	2.08	12,763	(149,945)	(10,993)
Principal	174,190	1.28	7,177	1,029,073	2.14	70,755	(881,883)	(63,578)
134	1,014	1.29	42	14,176	2.29	1,044	(13,162)	(1,002)
EMCP	10,515	1.36	459	-	-	-	10,515	459
160	153,776	0.98	4,845	236,610	1.62	12,310	(82,834)	(7,465)
Total Open Pit	380,600	1.17	14,294	1,470,909	2.05	96,872	(1,090,309)	(82,578)
Total Indicated	4,895,230	4.44	699,169	6,391,662	4.12	846,868	(1,496,432)	(147,699)
Total Measured and Indicated	7,043,591	4.66	1,054,329	9,163,378	4.24	1,248,486	(2,119,787)	(194,157)
Inferred								
Underground								
100 Lower Inter	5,240	13.78	2,322	4,800	14.77	2,279	440	43
104	147,040	4.74	22,397	115,135	6.62	24,505	31,905	(2,108)
113	90,727	5.13	14,978	138,938	5.42	24,218	(48,211)	(9,240)

Classification and Mine Zone	December 31, 2021			December 31, 2020			Gain (Loss)	
	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)	Tonnes (t)	Ounces (oz Au)
116	215,995	13.18	91,505	223,105	12.86	92,218	(7,110)	(713)
118	273,712	4.92	43,297	404,580	4.85	63,097	(130,868)	(19,800)
119	108,000	4.15	14,417	164,123	5.60	29,545	(56,123)	(15,128)
121	571	4.25	78	17,066	3.50	1,923	(16,495)	(1,845)
123	234,942	5.72	43,183	308,710	5.36	53,213	(73,768)	(10,030)
124	182,547	5.39	31,617	214,737	5.33	36,821	(32,190	(5,204)
129	39,385	6.69	8,467	39,385	6.69	8,467	-	-
139	120,677	6.24	24,206	120,677	6.24	24,206	-	-
146	69,522	6.44	14,404	81,876	5.98	15,734	(12,354)	(1,330)
148	140,687	6.47	29,251	157,970	6.16	31,292	(17,283)	(2,041)
152	27,300	7.04	6,179	28,570	6.88	6,319	(1,270)	(140)
157	9,131	5.49	1,613	9,131	5.49	1,613	-	-
159	247,702	5.09	40,571	50,631	4.72	7,685	207,131	32,886
160	118,267	5.06	19,239	140,722	4.79	21,663	(22,455)	(2,424)
Total Underground	2,031,443	6.24	407,724	2,220,156	6.23	444,798	(188,713)	(37,074)
Open Pit								
WMCP	53,289	2.10	3,591	154,618	2.37	11,774	(101,329)	(8,183)
Principal	482,334	3.03	47,028	509,620	2.98	48,747	(27,286)	(1,719)
134 (in reserve pit shell)	2,684	2.91	251	2,684	2.91	251	-	-
134 (below reserve pit shell)	938,077	1.86	56,232	830,176	1.96	52,193	107,901	4,039
160 (in reserve pit design)	197,060	2.05	12,993	331,523	2.66	28,341	(134,463)	(15,348)
160 (below reserve pit design)	5,481,094	1.49	262,649	6,543,678	1.74	366,540	(1,062,584)	(103,891)
Total Open Pit	7,154,538	1.66	382,744	8,372,299	1.89	507,846	(1,217,761)	(125,102)
Total Inferred Mineral Resources	9,185,981	2.68	790,468	10,592,455	2.80	952,644	(1,406,474)	(162,176)

Notes:

1. Classification of Mineral Resources is in accordance with the S-K 1300 classification system.
2. Underground and open pit Mineral Resources were estimated by Hecla Québec and reviewed and accepted by SLR.
3. Underground Mineral Resources are estimated at cut-off grades ranging from 3.11 g/t Au to 4.00 g/t Au.
4. Open pit Mineral Resources are estimated at cut-off grades ranging from 0.86 g/t Au to 1.33 g/t Au.

5. Underground and open pit Mineral Resources are estimated using an average long term gold price of US$1,700 /oz Au and a US$/C$ exchange rate of 1.275.
6. A minimum mining width of three metres was used.
7. Mineral Resources are exclusive of Mineral Reserves and do not have demonstrated economic viability.
8. Totals may not represent the sum of the parts due to rounding.
9. Mineral Resources are 100% attributable to Hecla.

The SLR QP is of the opinion that with consideration of the recommendations summarized in in this section, any issues relating to all relevant technical and economic factors likely to influence the prospect of economic extraction can be resolved with further work.

11.2 Database

The current Mineral Resource estimate is based on data available as of October 31, 2021. Gemcom 6.8 was used for the preparation of Mineral Resources. The Mineral Resource solids, dilution envelopes and block models were built by using the diamond drill hole and chip sample workspaces, "Drill Holes" and "RAINURE", respectively. Both have the same structure, as detailed in Table 11-4. The database was created by merging files from various sources (Hecla Québec /Aurizon, Inco Gold, and TVX).

Table 11-4: Database Structure
Hecla Mining Company – Casa Berardi Mine

Table	Description	Main Fields
Header	Main table	Hole Name, Easting, Northing, Elevation, Azimuth, Dip, Length, Hole Type, Date Started, Date Finished, Logged By
Survey	Deviation tests	Distance, Azimuth, Dip, MAG Azimuth, Type of survey, Mag, Mag dip, gravity
RQD	RQD survey	From, To, Length, RQD%
Litho_0	Geology main table	From, To, Rock_type, Tittle, Rockcode, Description, Level, Veins, Colour, Deformation, Alteration, Mineralization
Litho_1	Geology sub-table	From, To, Rock_type, Tittle, Rockcode, Description, Level, Veins, Colour, Deformation, Alteration, Mineralization
Litho_2	Geology sub-table	From, To, Rock_type, Tittle, Rockcode, Description, Level, Veins, Colour, Deformation, Alteration, Mineralization
Assays	Gold assay results and density	From, To, Sample No, Certificate no, Certificate date, OR_TRA (gold assays), lab duplicates from pulp and rejects, Density, Rock_Code, Block_Code, Solid Name, AU_COUPE (gold capped)
Qc_assay	Quality checks for assays	DISTANCE, Sample No, Certificate no, Certificate date, OR_TRA (gold assays), lab duplicates from pulp and rejects, primary and secondary labs, Density, standard used
XRF	X-ray Fluorescence (XRF) assays	From, To, Sample no, Certificate date, As, Fe, S…
Inters_Grp	Underground intersects for block models	From, To, LOCATION (X,Y,Z), LENGTH, AU,ROCK_CODE,COMP_ID, SOLID_NAME, BLOCK_CODE, LONG_AU, DENSITE,LONG_DENS,AU_NS, LONG_AU_NS,AS,LONG_AS, AU_COUPE, DATE
Inters_Pit	Open Pit intersects for block models	From, To, LOCATION (X,Y,Z), LENGTH, AU,ROCK_CODE,COMP_ID, SOLID_NAME, BLOCK_CODE, LONG_AU, DENSITE,LONG_DENS,AU_NS, LONG_AU_NS,AS,LONG_AS, AU_COUPE, DATE

11.3 Density Determination

11.3.1 Methodology of Density Determinations on Drill Core

From 1991 to 1997, TVX used a density of 2.77 t/m^3 for Mineral Reserve estimation, with the same density factor used for the TVX mill operation. Since 1999, several density testing programs have been carried out. Density determinations were conducted on sections of whole core prior to crushing for assaying using the water immersion method. As rocks at Casa Berardi are non-porous, no wax coating was applied to core samples. Tests were effectuated at different laboratories and determined the densities for mineralized and non-mineralized rock in various lithologies and most of the mineralized lenses. The density database contains approximately 7,914 records, including a total of 3,151 that were taken within the mineralized lenses.

Table 11-5 presents a summary of the density determinations by zone.

Table 11-5: Density Determinations by Zone
Hecla Mining Company – Casa Berardi Mine

Open Pit Zone	Number	Mean (t/m³)	Minimum (t/m³)	Maximum (t/m³)
105	46	2.68	2.57	2.84
123	29	2.78	2.57	3.10
124	472	2.83	2.35	3.73
134	39	2.66	2.19	3.47
146	46	2.68	2.55	2.80
148	200	2.68	2.13	2.99
152	47	2.77	2.55	2.93
159	19	2.77	2.66	2.97
160	333	2.69	2.38	3.03
Total	1,231	2.74	2.13	3.73
Underground Zone	**Number**	**Mean (t/m³)**	**Minimum (t/m³)**	**Maximum (t/m³)**
107	15	2.69	2.58	2.84
109	106	2.72	2.55	3.04
111	17	2.65	2.57	2.8
113	449	2.73	2.37	3.78
115	115	2.67	2.16	2.99
118	429	2.38	2.51	4.15
119	82	3.01	2.59	4.6
121	93	2.86	2.52	4.31
123	226	2.89	2.46	4.17
124	241	2.86	2.35	3.45
148	4	2.61	2.56	2.64
152	5	2.83	2.78	2.87
160	88	2.70	2.45	3.03
100 Lower Inter	50	2.67	2.51	2.92
Total	1,920	2.79	2.16	4.6
Total Open Pit and Underground	3,151	2.77	2.13	4.6

11.4 Geological Interpretation

Hecla carried out the geological interpretation and correlation of lenses on 1:250 scale vertical sections spaced 15 m, 20 m, 25 m, or 50 m, apart and on plan views spaced 10 m and 20 m apart. Drill hole spacing ranges from 10 m to 50 m. In general, the drill hole spacing is sufficiently dense to confidently interpret and correlate the mineralized systems from section to section. Drill holes and chip sample data, along with underground mapping were used to build the solids. Once modeled, the lenses are projected onto various levels to verify their continuity and to check the interpretations. Adjustments on sections and plans are made, as necessary, in order to have a consistent interpretation.

11.4.1 Minimum Width and Cut-off Grade Used for Interpretation

The Mine staff created mineralized envelopes based on a general 4.0 g/t Au cut-off grade for the underground Mineral Resources and 1.0 g/t Au cut-off for the open pit Mineral Resource evaluation, using, in both cases, a minimum true width of three metres. Some lower grade areas were incorporated to preserve continuity, however, most of the assay results from drill holes and chips samples are higher than the cut-off grades. In addition to often being stratigraphically constrained, sharp contacts between economic and non-economic grades are noted. The open pit Mineral Resource envelopes are usually wider and can contain several underground envelopes. The open pit Mineral Resource envelopes are usually modeled from surface to a depth of 350 m (4,650 MASL) while the underground Mineral Resources are modeled from surface with no lower limit. To avoid duplication of tonnage and grade, the pit shell is used to discriminate the open pit from the underground envelopes.

11.4.2 West Mine Underground

West Mine underground Mineral Resources were modeled between sections 11,350E and 11,600E. Zones mined with remaining Mineral Resources are the Lower Inter, Inter, South West (SW), 109, 113, and 115 zones. The 111 Zone was integrated in the 113 Zone.

11.4.2.1 Lower Inter Zone

Mineralization at the Lower Inter (100) Zone occurs between sections 10,350E and 10,825E and between 4,400 MASL and 4,600 MASL and is constrained to south of the Casa Berardi Fault. The Lower Inter Zone is characterized by two envelopes, a high grade core based on a 4.0 g/t Au cut-off grade which is sub-divided into several domains for grade interpolation due to changes in dip and strike and an outer low grade envelope based on a 1.0 g/t Au cut-off grade.

The 104 Zone (two lenses) occurs from 10,200E to 10,400E and from elevation 4,050 MASL to 4,450 MASL, in the plunge of the Lower Inter Zone, and is open up dip and downdip.

11.4.2.2 109, 111, 113, and 115 Zones

Mineralization at the 109, 111, 113, and 115 zones occurs between sections 10,825E and 11,600E and from surface to 3,800 MASL and is constrained to south of the Casa Berardi Fault. Six mineralized lenses were interpreted for the 109 Zone, nine for the 113 Zone (including the 111 Zone), and eight lenses for the 115 Zone.

11.4.2.3 SW Zone

In the SW Zone, mineralization occurs between sections 10,600E and 10,900E and between 4,600 MASL to 4,900 MASL and is associated with the South Fault as well as a secondary graphitic fault south of the Casa Berardi Fault. Five lenses were modeled in the 107 and 108 zones.

11.4.3 West Mine Crown Pillar

Mineralization at the WMCP occurs between sections 10,340E and 11,450E and between 4,650 MASL to the 5,000 MASL. Six lenses were modeled which include parts of the upper levels of the 111, 113, SW, and Inter zones as well as where the northwest and northeast zones meet the Casa Berardi Fault.

The lenses 105_01, 105_06, and 114_01 regroup most of the mineralized zones at the Casa Berardi Fault, 105_04 contains all of the 'Inter' zones within the secondary graphitic faults and 105_02 captures all of the mineralization associated with the South Fault.

11.4.4 Principal Mine Underground

The Principal Mine consists of the 116, 117, 118, 119, 123, and 124 zones.

11.4.4.1 116 Zone

The 116 Zone occurs between section 11,630E and 11,730E from 3,510 MASL to 3,670 MASL, and consists of a single lens north of the Casa Berardi Fault.

11.4.4.2 117 Zone

The 117 Zone occurs between section 11,680E and 11,770E from 4,470 MASL to 4,530 MASL and consists of a single lens associated with the South Fault.

11.4.4.3 118 Zone

The 118 Zone occurs between section 11,565E and 12,465E and from 3,730 MASL to 4,650 MASL, and consists of 31 lenses associated with the Casa Berardi Fault.

11.4.4.4 119 Zone

The 119 Zone occurs between section 11,700E and 12,100E and from 4,390 MASL to 4,810 MASL. The 119 Zone consists of seven lenses associated with a secondary graphitic fault splay south of, and rejoining, the 123 Zone.

11.4.4.5 123 Zone

The 123 Zone (including the 121 and 128 zones) occurs between section 12,000E and 12,800E and from 3,750 MASL to 4,850 MASL. The123 Zone contains 17 lenses located south of the Casa Berardi Fault.

11.4.4.6 124 Zone

The 124 Zone occurs between 11,940E and 12,930E and from the bedrock surface to 4,400 MASL. The 124 Zone contains 29 lenses north and south of the Casa Berardi Fault, associated with a secondary graphitic fault.

11.4.5 Principal Pit

Mineralization in the Principal Pit area occurs between sections 11,950E and 13,000E and 4,650 MASL to the bedrock surface. Thirty-one lenses were modeled in the Principal Pit area and include almost all of the 122 and 124 zones that were remodeled at a 1.0 g/t Au cut-off grade.

11.4.6 134 Pit

Mineralization in the 134 Pit occurs between sections 13,100E and 13,440E and from 4,710 MASL to the bedrock surface. Seven lenses were modeled to the east of the Principal Pit associated with the Casa Berardi Fault.

11.4.7 East Mine Underground

East Mine underground mineralization occurs from section 13,100E to 13,440E between 4,710 MASL to the bedrock surface. Thirty-three lenses were modeled with the 146, 148 and 152 zones (30 lenses) occurring along the Casa Berardi Fault and the 157 Zone (three lenses) occurring south of the Casa Berardi Fault.

11.4.8 EMCP Pit

Mineralization in the EMCP Pit occurs from section 14,400E to 15,440E from 4,710 MASL to the surface bedrock. Twenty-three lenses were modeled to assess the EMCP. This assessment locally included zones from the underground Mineral Resource.

11.4.9 160 Open Pit

Mineralization at the 160 Pit occurs from section 15,480E to 16,320E and from 4,650 MASL to the bedrock surface. Ten lenses were modeled in the 160 Pit area, including the 159 and 160 zones. The 159 Zone is associated with the Casa Berardi Fault, while the 160 Zone is located north of the Casa Berardi Fault.

11.4.10160 Underground

Mineralization of the 159 and 160 zones occurs from section 15,400E to 16,300E and from 4,500 MASL to the bedrock surface. Eleven lenses were modelled north of the Casa Berardi Fault.

11.5 Cut-Off Grade for Reporting Mineral Resources

11.5.1 Underground Mineral Resources

Metal prices used for Mineral Resources are based on consensus, long term forecasts from banks, financial institutions, and other sources.

The cut-off grade used by Hecla for underground Mineral Resources are based on the following parameters and presented in Table 11-6:

- Gold PriceUS$1,700/oz Au
- Exchange RateUS$1.000 = C$1.275
- Mill RecoverySpecific by Zone
- Operating CostC$181.25/t or C$198.48/t (US$142.16/t or 155.67 US$/t)
- The cut-off grade is therefore calculated by the following equations:
    - Gold price: US$1,700/oz Au x C$1.275/US$1.00 = C$2,167.5/oz Au
    - Revenue per unit gold: C $2,167.5/oz Au ÷ 31.1035 g/oz Au = C$69.69/g x Mill recovery
    - Cut-off grade = Operating costs / Revenue per unit gold

Table 11-6: Underground Mineral Resource Cut-Off Grades by Zone
Hecla Mining Company – Casa Berardi Mine

Zone	Mill Recovery (%)	Cut-Off Grade (g/t Au)	Gold Price (US$/oz Au)	Operating Cost (C$)	Operating Cost (US$)
100	83.73%	3.11	1,700	181.25 $	142.16
104	83.73%	3.11	1,700	181.25 $	142.16
107	83.73%	3.11	1,700	181.25 $	142.16
108	83.73%	3.11	1,700	181.25 $	142.16
109	83.73%	3.11	1,700	181.25 $	142.16
111	83.73%	3.11	1,700	181.25 $	142.16
113	83.73%	3.11	1,700	181.25 $	142.16
115	76.48%	3.40	1,700	181.25 $	142.16
117	76.48%	3.40	1,700	181.25 $	142.16
118	76.48%	3.40	1,700	181.25 $	142.16
119	83.73%	3.11	1,700	181.25 $	142.16
121	76.48%	3.40	1,700	181.25 $	142.16
123	76.48%	3.40	1,700	181.25 $	142.16
124	83.73%	3.11	1,700	181.25 $	142.16
128	76.48%	3.40	1,700	181.25 $	142.16
129	78.02%	3.33	1,700	181.25 $	142.16
139	78.02%	3.65	1,700	198.48 $	155.67
148	78.02%	3.65	1,700	198.48 $	155.67
159	84.77%	4.00	1,700	198.48 $	155.67
160	84.77%	4.00	1,700	198.48 $	155.67

Notes:

1. Underground cut-off grades for 159 and 160 rounded up to 4.0 g/t Au.

Cut-Off Grade for Reporting Open Pit Mineral Resources

Cut-off grades ranging from 0.95 g/t Au to 1.33 g/t Au were used to estimate open pit Mineral Resources constrained by an open pit resource shell. Open pit Mineral Resources were estimated using an average long term gold price of US$1,700/oz Au and a US$/C$ exchange rate of 1.275 (Table 11-7).

Table 11-7: Open Pit Mineral Resource Cut-Off Grades by Pit
Hecla Mining Company – Casa Berardi Mine

Pit	Mill Recovery (%)	Cut-Off Grade Mill Recovery (%)	Cut-Off Grade (g/t Au)	Gold Price (US$/oz Au)	Operating Cost (C$)	Operating Cost (US$)
160	89.7	84.3	0.95	1,700	47.97 $	37.62
WMCP	80.5	60.7	1.31	1,700	47.65 $	37.37
Principal	81.8	62.4	1.25	1,700	47.59 $	37.33
134	82.7	62.2	1.25	1,700	47.22 $	37.04
EMCP/XMCP	75.7	62.9	1.33	1,700	48.84 $	38.31

11.6 Block Modeling and Mineral Resource Estimation

Grade capping was carried out to minimize the impact of very high grade assays on the Mineral Resource estimate. Each zone was treated separately and assigned different high grade capping values. Statistical distributions of assays within the mineralized envelopes were tabulated and plotted in the form of histograms. The capping levels were determined by Hecla from histograms and statistics.

Capping levels were applied to raw assays prior to compositing. Table 11-8 presents the open pit (PIT) and underground (UG) capping levels used in the various estimates.

Table 11-8: Capping Levels
Hecla Mining Company – Casa Berardi Mine

Zone	Location	Lens Numbers	Core Capping Levels (g/t Au)	Chip Capping Levels (g/t Au)
104	UG	03, 04	No capping	No capping
107	UG	02, 03	18.5	42
Inter	UG	01, 02, 04	18	18
105	PIT	01	46	46
105	PIT	02	51	51
105	PIT	03	11	11
105	PIT	04	19	19
105	PIT	06	No capping	No capping
114	PIT	01	16	16
Lower Inter	UG	01	120	120
109	UG	01, 02, 03, 04, 05, 06	45	45

Zone	Location	Lens Numbers	Core Capping Levels (g/t Au)	Chip Capping Levels (g/t Au)
113	UG	Main, 05, 07	175	100
113	UG	04	35	35
113	UG	06	50	50
113	UG	12	14	14
113	UG	41, 42, 43, 44	17	17
113	UG	61	No capping	No capping
115	UG	01	100	100
115	UG	02, 03, 04, 05, 06	50	50
116	UG	01	No capping	No capping
117	UG	Main	35	35
118	UG	82,83	14	14
118	UG	09, 34	15	15
118	UG	05	19	19
118	UG	11, 12, 13, 41, 42	24	24
118	UG	47	25	25
118	UG	62, 63, 64	34	34
118	UG	07	40	40
118	UG	10	43	36
118	UG	06	45	45
118	UG	20, 21, 22, 27	50	40
118	UG	31	51	50
118	UG	43, 44, 45	65	65
118	UG	14,15,16,17,18,81	No capping	No capping
119	UG	01	20	20
119	UG	02	No capping	No capping
119	UG	03, 04	14	No capping
119	UG	05	11	11
119	UG	06	13	13
119	UG	07	12	12
121	UG	01, 02	30	30
123	UG	09	12	12
123	UG	10, 14	14	14
123	UG	15, 16	16	16

Zone	Location	Lens Numbers	Core Capping Levels (g/t Au)	Chip Capping Levels (g/t Au)
123	UG	19	22	22
123	UG	12	32	27
123	UG	05	39	40
123	UG	04	42	42
123	UG	03	64	40
123	UG	01	68	68
123	UG	02	70	68
123	UG	17,18	No Capping	No Capping
123	PIT	23	06	06
123	PIT	21	08	08
123	PIT	09	13	13
123	PIT	05	39	39
123	PIT	17, 18, 22, 24,25	No Capping	No Capping
124	UG	52, 61	15	15
124	UG	30	20	20
124	UG	17	30	20
124	UG	86	30	30
124	UG	40, 41, 42 ,43	35	35
124	UG	81, 82, 87	45	45
124	UG	83	45	48
124	UG	84	45	16
124	UG	85	45	20
124	UG	12	64	64
124	UG	13	64	17
124	UG	22	66	66
124	UG	15, 16	75	75
124	UG	11, 18, 19, 32, 33, 35, 36, 37	No Capping	No Capping
124	PIT	32	6	6
124	PIT	31, 36	7	7
124	PIT	33, 37 51, 52	9	9
124	PIT	14, 20 35, 38	10	10
124	PIT	11	11	11

Zone	Location	Lens Numbers	Core Capping Levels (g/t Au)	Chip Capping Levels (g/t Au)
124	PIT	87	12	12
124	PIT	86	17	17
124	PIT	15	18	18
124	PIT	30	20	20
124	PIT	41, 43	33	33
124	PIT	81	46	46
124	PIT	13	66	66
124	PIT	22	67	67
124	PIT	62	No Capping	No Capping
128	UG	01	18	18
129	UG	01	No capping	No capping
134	PIT	02	9	9
134	PIT	01	16	16
134	PIT	05	17	17
134	PIT	4	19	19
134	PIT	08, 09, 10	No Capping	No Capping
139	UG	01	No capping	No capping
146	UG	08	8	8
146	UG	09	14	14
146	UG	01, 03, 05, 06, 07, 10	No Capping	No Capping
146	PIT	01	No Capping	No Capping
146	PIT	03, 04	8	8
148	UG	19, 20	8	8
148	UG	21, 22	9	9
148	UG	24	11	11
148	UG	10	13	13
148	UG	09	14	14
148	UG	05, 25	18	18
148	UG	01	54	-
148	UG	08	20	20
148	UG	01, 02, 03, 04, 05, 07	50	50
148	UG	18	No Capping	No Capping

Zone	Location	Lens Numbers	Core Capping Levels (g/t Au)	Chip Capping Levels (g/t Au)
148	PIT	14, 16	3	3
148	PIT	11	5	5
148	PIT	07, 08	12	12
148	PIT	09	14	14
148	PIT	03	20	20
148	PIT	01, 04	36	36
148	PIT	02, 06, 12, 13	50	50
148	PIT	17	No Capping	No Capping
152	UG	05	8	8
152	UG	01	20	13
152	UG	02, 03	20	20
152	UG	09	No Capping	No Capping
152	UG	06	10	10
152	PIT	08	3.7	3.7
152	PIT	02	5.3	5.3
152	PIT	01, 03, 06	10	10
152	PIT	07	50	50
157	UG	01, 02, 03	12	12
159	UG	03	12	12
159	UG	01	15	15
159	UG	04	No capping	No capping
159	PIT	03, 06	8	8
159	PIT	04, 05	12	12
159	PIT	01	15	15
159	PIT	02	18	18
160	UG	05, 09	12	12
160	UG	01, 03	17	17
160	UG	04	22	22
160	PIT	06	7	7
160	PIT	03	16	16
160	PIT	01	23	23
160	PIT	07	27	27
160	PIT	04	28	28

11.6.1 Mineral Resource Estimation Methodology

The resource block models are built using the 3D open pit and underground mineralization wireframes, the main graphitic Casa Berardi Fault, the overburden, and the mining voids (development and as-built stopes using designs and cavity monitoring surveys (CMS)). Block models used for underground Mineral Resources are undiluted and the block models for pit evaluation are diluted. The procedure used to generate the capping levels and the composites for the open pit and underground block models are the same.

11.7 Underground Extraction Data and Compositing

After validation of the solids from the database, extraction of the intersects is performed to determine the capping and to composite the sample grade. Capping of the grade is performed in the ASSAYS table in the field AU_COUPE. The gold value for the total vein intersect is calculated to be archived in the INTERS_GRP table in a later process, with the rock code, solid name, and block code. At the definition and stope drilling stage, information can be duplicated, and part of the previous drilling is excluded in the on-going Mineral Resource process. The duplicated diamond drill holes are archived in a key index to permit the exclusion of the outdated data during the Mineral Resource process.

11.8 Underground Block Models

All underground block models have the same block dimensions: 2.5 m for column size, 1.25 m for row size and five metres for level size.

11.9 Underground Mineral Resource Methodologies

Initially, all interpreted mineral zone solids are loaded to verify that they are contained within the block model limits. Blocks within the model are tagged with the block code from each solid, the percent of each block within the solid evaluated, and the density associated with the block code of the solid. Evaluation of the grade is completed by the interpolation of the gold composites stored as points in the GEMS point area databases. The block model attributes, MeanDist and number of points used for the estimate 'NB_COMPS' are automatically assigned to the blocks during the interpolation runs and used for resource classification. The interpolation method used for gold grade estimation is inverse distance squared (ID^2) with oriented ellipsoids and spheres. A total of 206 ellipsoids and spheres were used to interpolate the underground Mineral Resources.

11.10 Open Pit Extraction Data and Compositing

After validation of the solids and surfaces used for the open pit model areas, extraction of drill hole intersects is performed for the Mineral Resource and dilution envelopes to determine capping values and to composite the sample grades. The solids and surfaces used to code the model include the 1.0 g/t Au cut-off envelopes for Mineral Resources, the 10 m dilution shells surrounding the mineral lenses, the Casa Berardi Fault, the topographic surface, and till, clay, and bedrock surfaces.

Only drill holes are used for grade estimation in the open pit block models to avoid over estimation with the underground chip samples. Precedence is given to the Mineral Resource envelopes. The rock codes, solid names, and block codes are extracted into the assay table. Grade capping is performed in the assay table and used for sample compositing. Duplicated diamond drill holes are archived in a key index to permit the exclusion of the outdated data during the Mineral Resource estimation process.

11.11 Open Pit Block Models

Diluted open pit block models are used for Mineral Resource estimation, except for the Principal Pit. The WMCP, 134, EMCP and 160 pits have block dimensions of 2.5 m x 2.5 m x 2.5 m, while the Principal Pit block model uses a block size of 2.5 m x 2.5 m x 5.0 m. The diluted block models have three folders: one for the diluted mineralized material (Rock), one for the mining excavation including the previous underground mining voids (Excavation), and one for the overburden materials (Overburden).

11.12 Open Pit Mineral Resource Methodologies

Initially, all the solids and surfaces used to code the open pit model are loaded to verify that they are all contained within the block model limits. For the estimation of the open pit Mineral Resources, a vertical limit for block modeling was established to limit the assessment of an open pit shell to depth. For the WMCP and 134 pits, the lower limit is 4,677 MASL, for the EMCP Pit, the lower limit is 4,702 MASL, and for the 160 Pit, the lower limit is 4,552 MASL. Blocks within the block model are tagged with the block code from solids, the percent of blocks within the solid evaluated, and the density associated with the block code of the solid. Evaluation of the grade is completed by the interpolation of the gold content from the point area composite files, mainly the field 'AU_COUPE ', the results being saved in the field 'AuCut' of the block models. Evaluation of the fields MeanDist and NB_COMPS is also written to the blocks to assist with resource classification. The interpolation method used for grade estimation is ID^2 with oriented ellipsoids and spheres. A total of 64 ellipsoids and spheres were used to interpolate the open pit Mineral Resources. XRF was included in the block models to assess the arsenic content of the different lenses where data was available.

11.13 Principal Pit

The block model for the Principal Pit was built by the mine staff and is updated with the latest information from drilling. A total of 38 mineralized zones were modelled in the Principal area of the West Mine by the mine staff. The mineralized system extends towards the overburden-rock interface and the mineralized zones are close enough to each other to allow for open pit mining. The block size is five metres east-west (X) by five metres north-south (Y) by 7.5 m vertical (Z).

11.14 Cavity Monitoring Surveys of Mined-Out Stopes in GEMS Database

Volumes of mined-out stopes are evaluated from a CMS system by the engineering department. The determination of dilution rates and mining extraction factors on a stope by stope basis is based on the CMS. This work is carried out by the Casa Berardi geology department using Promine software. In order to determine tonnes and grades of underbreak, overbreak, and dilution material in one system, all CMS data is imported into GEMS, adjusted where needed to create valid solids, and used to update the mined-out stope percentages to the block models and for engineering and reconciliation studies.

11.15 Mineral Resource Classification

Definitions for Mineral Resource categories used in this TRS are those defined by the SEC in S-K 1300 and excerpted below. Mineral Resources are classified into Measured, Indicated, and Inferred categories.

Mineral Resource is a concentration or occurrence of material of economic interest in or on the Earth's crust in such form, grade or quality, and quantity that there are reasonable prospects for economic extraction. A Mineral Resource is a reasonable estimate of mineralization, considering relevant factors such as cut-off grade, likely mining dimensions, location or continuity, that, with the assumed and justifiable technical and economic conditions, is likely to, in whole or in part, become economically extractable. It is not merely an inventory of all mineralization drilled or sampled.

Measured Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of conclusive geological evidence and sampling. The level of geological certainty associated with a Measured Mineral Resource is sufficient to allow a QP to apply modifying factors, as defined in this section, in sufficient detail to support detailed mine planning and final evaluation of the economic viability of the deposit. Because a Measured Mineral Resource has a higher level of confidence than the level of confidence of either an Indicated Mineral Resource or an Inferred Mineral Resource, a Measured Mineral Resource may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

Indicated Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of adequate geological evidence and sampling. The level of geological certainty associated with an Indicated Mineral Resource is sufficient to allow a QP to apply modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Because an Indicated Mineral Resource has a lower level of confidence than the level of confidence of a Measured Mineral Resource, an Indicated Mineral Resource may only be converted to a Probable Mineral Reserve.

Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. The level of geological uncertainty associated with an Inferred Mineral Resource is too high to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. Because an Inferred Mineral Resource has the lowest level of geological confidence of all Mineral Resources, which prevents the application of the modifying factors in a manner useful for evaluation of economic viability, an Inferred Mineral Resource may not be considered when assessing the economic viability of a mining project and may not be converted to a Mineral Reserve.

The classification of each lens in the open pit and underground block models are based on the density and quality of drill hole data, the continuity of the auriferous zones, and production experience. The classification of Casa Berardi Mineral Resources is guided by the drill hole spacing, which ranges from 15 m to 50 m and by the ranges of variograms, which are between 10 m and 60 m. It also considers the distance of drill hole composites to block centers which is an attribute generated in the GEMS software at the time of grade interpolation (MeanDist).

Generally, for each lens, a polygon was manually created around blocks that were estimated based on drill hole composites with an average MeanDist of 25 m. The Mineral Resources were classified as follows:

1. **Measured Mineral Resources**: blocks inside the 25 m MeanDist polygon with nearby underground development that confirmed the continuity of mineralization.

2. **Indicated Mineral Resources**: blocks inside the 25 m MeanDist polygon.

3. **Inferred Mineral Resources**: blocks outside the 25 m MeanDist polygon, up to generally a maximum of 35 m MeanDist, and rarely up to 50 m MeanDist.

The open pit block models are diluted to whole block models using scripts in Gemcom. For the open pit diluted block models, only blocks with more than 25% of mineralized material were classified, the remaining blocks with less than 25% of mineralized material were not classified and excluded from the resource estimate.

The SLR QP has considered the following factors that may affect the uncertainty associated with each class of Mineral Resources:

1. Reliability of sampling data:
    a. Drilling, sampling, sample preparation, and assay procedures follow industry standards and best practices.
    b. Data verification and validation work confirm drill hole and chip sample databases are reliable.
    c. No significant biases observed in QA/QC analysis results.
    d. Sufficient density tests are available to estimate accurate mineralization and waste bulk density values.
2. Confidence in the interpretation and modelling of geological and estimation domains:
    a. Individual mineralization lenses are interpreted manually in cross-sections and cleaned-up in plan views by a highly experienced team of geologists.
    b. Good agreement between the drill holes, underground sampling, and mineralization wireframe shapes, which are snapped to the sample data.
    c. The mineralization wireframe shapes are well defined by sample data in areas classified as Measured and Indicated.
    d. Some surface drill holes are excluded if significant spatial discrepancies with underground drill holes and/or underground sampling occur.
3. Confidence in block grade estimates:
    a. Measured and Indicated block grades correlate well with composite data, statistically and spatially, locally and globally, as well as with production reconciliation.
4. Production experience:
    a. Extensive deposit specific experience has been gained over decades of production.
    b. Good production reconciliation performance validates the quality of sample data and block model grade and density estimates in Measured and Indicated areas.

11.16 Mineral Resource Validation

Hecla personnel conduct on-screen visual inspection of block models with diamond drill hole assays and composites on plans and vertical sections after interpolation and classification of the block models. All interpolation reports are saved to validate the interpolation and to verify the blocks not interpolated. To avoid duplication when estimating Mineral Resources, only underground Mineral Resources outside of an open pit design are considered underground Mineral Resources and only open pit Mineral Resources within the open pit design are considered open pit Mineral Resources. The blocks from the underground block models are evaluated to assess the percentage of each block within the open pit design. Where no underground Mineral Resources were evaluated below the open pit, the Mineral Resource below the pit are reported as open pit Mineral Resources.

11.17 Risk Factors That May Affect the Mineral Resource Estimate

The SLR QP is of the opinion that the Casa Berardi Measured and Indicated Mineral Resources and the underground Inferred Mineral Resources have been prepared to industry best practices and conform to the resource categories defined by the SEC in S-K 1300. The SLR QP notes that the open pit Inferred Mineral Resources situated at the 134 and 160 pits are not constrained by a resource pit shell and that the elevation datums used to limit the open pit resources at depth are optimistic and should be replaced with resource shells in the future. Notwithstanding, the SLR QP is of the opinion that this is not a significant issue because this material represents approximately 9% of the total reserve and resource ounces at Casa Berardi, it is all classified as Inferred, and none of it is included in the LTP.

The SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant technical and economic factors that would materially affect the Mineral Resource estimate.

12.0 MINERAL RESERVE ESTIMATES

Underground Mineral Reserves were estimated by Hecla Québec and reviewed by SLR. Estimates were prepared for the Lower Inter and 113 zones of the West Mine, and the 118, 119, 123, and 124 zones of the Principal Mine, the East Mine, and several other smaller zones. A longhole stoping mining method without pillars, using a primary-secondary stoping sequence, is assumed for all of the estimates. All stopes are backfilled after mining using paste fill, cemented rock fill (CRF), or unconsolidated waste rock.

Open Pit Mineral Reserves were estimated by Hecla and reviewed by SLR, for the WMCP, Principal, 134, EMCP, XMCP, and 160 pits.

Measured and Indicated Mineral Resources were converted to Proven and Probable Mineral Reserves, respectively. Inferred Mineral Resources were not converted to Mineral Reserves. Mineral Reserves as of December 31, 2021 are summarized in Table 12-1.

Table 12-1: Summary of Mineral Reserves – December 31, 2021
Hecla Mining Company – Casa Berardi Mine

Reserve Category	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)	Metallurgical Recovery (%)
		Underground		
Proven	836,930	5.33	143,294	-
Probable	1,537,865	5.24	259,279	-
Proven + Probable	**2,374,795**	**5.27**	**402,574**	**85.6**
		Open Pit		
Proven	4,321,010	3.26	452,992	-
Probable	12,129,701	2.38	928,409	-
Proven + Probable	**16,450,711**	**2.61**	**1,381,401**	**82.9**
		Total		
Proven + Probable	**18,825,506**	**2.95**	**1,783,975**	**83.5**

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Underground and open pit Mineral Reserves were estimated by Hecla Québec and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla.
4. Underground Mineral Reserves are estimated at a cut-off grade of 3.27 g/t Au for 100, 113,119 and 124 zones. A cut-off grade of 3.57 g/t Au for the 115, 118, 121, 123 and 128 zones. A cut-off grade of 3.83 g/t Au for the 146 and 148 zones, and a cut-off grade of 3.54 g/t for the 159 and 160 zones.
5. Open pit Mineral Reserves are estimated at a cut-off grade of 1.01 g/t Au for the 160 pits. A cut-off grade of 1.37 g/t Au for the WMCP. A cut-off grade of 1.31 g/t Au for the Principal Pit. A cut-off grade of 1.30 g/t Au for the 134 Pit. A cut-off grade of 1.39 g/t Au for the EMCP and XMCP.
6. Underground and open pit Mineral Reserves are estimated using an average long term gold price of US$1,600/oz Au and a US$/C$ exchange rate of 1.275.
7. A minimum mining width of three metres was used.
8. Totals may not represent the sum of the parts due to rounding.

Underground and open pit Mineral Reserves by zone are presented in Table 12-2.

Table 12-2: Mineral Reserves by Zone – December 31, 2021
Hecla Mining Company – Casa Berardi Mine

Zone	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)
Underground – Proven			
Lower Inter	7,065	8.49	1,928
113	94,045	4.45	13,460
118	133,400	4.47	19,185
123	265,587	4.96	42,333
124	77,723	4.26	10,657
East Mine UG	259,110	6.69	55,731
Total Underground – Proven	836,930	5.33	143,294
Underground – Probable			
Lower Inter	3,709	6.50	776
113	164,510	5.95	31,468
118	522,765	4.52	76,000
119	125,585	4.15	16,773
123	331,532	4.99	53,222
124	89,646	4.37	12,586
East Mine UG	300,119	7.09	68,454
Total Underground – Probable	1,537,865	5.24	259,279
Total Underground Proven + Probable	2,374,795	5.27	402,574
Open Pit – Proven			
WMCP	4,034,194	3.31	429,078
EMCP	4,969	2.78	444
Principal	142,400	3.25	14,888
160	139,447	1.91	8,582
Total Open Pit – Proven	4,321,010	3.26	452,992
Open Pit – Probable			
WMCP	1,296,377	2.65	110,415
Extension	183,642	1.87	11,051
Principal	5,640,245	2.80	507,803
134	114,644	3.06	11,265
160	4,894,793	1.83	287,875

Zone	Tonnes (t)	Grade (g/t Au)	Contained Metal (oz Au)
Total Open Pit – Probable	12,129,701	2.38	928,409
Total Open Pit Proven + Probable	16,450,711	2.61	1,381,401
Grand Total			
Proven	5,157,940	3.60	596,287
Probable	13,667,566	2.70	1,187,688
Proven + Probable	18,825,506	2.95	1,783,975

Notes:

1. Classification of Mineral Reserves is in accordance with the S-K 1300 classification system.
2. Underground and open pit Mineral Reserves were estimated by Hecla Québec and reviewed and accepted by SLR.
3. Mineral Reserves are 100% attributable to Hecla.
4. Underground Mineral Reserves are estimated at a cut-off grade of 3.27 g/t Au for 100, 113,119 and 124 zones. A cut-off grade of 3.57 g/t Au for the 115, 118, 121, 123 and 128 zones. A cut-off grade of 3.83 g/t Au for the 146 and 148 zones, and a cut-off grade of 3.54 g/t for the 159 and 160 zones.
5. Open pit Mineral Reserves are estimated at a cut-off grade of 1.01 g/t Au for the 160 pits. A cut-off grade of 1.37 g/t Au for the WMCP. A cut-off grade of 1.31 g/t Au for the Principal Pit. A cut-off grade of 1.30 g/t Au for the 134 Pit. A cut-off grade of 1.39 g/t Au for the EMCP and XMCP.
6. Underground and open pit Mineral Reserves are estimated using an average long term gold price of US$1,600/oz Au and a US$/C$ exchange rate of 1.275.
7. A minimum mining width of three metres was used.
8. Totals may not represent the sum of the parts due to rounding.

The SLR QP is not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

12.1 Underground Mineral Reserves

Underground Mineral Reserves have increased since the December 31, 2020 Mineral Reserve estimate. The open pit Mineral Reserves increased substantially with the addition of the WMCP Pit and the Principal Pit.

Mineral Reserve estimates are based on the Mineral Resource 3D block models. Stope shapes are created based on individual zone and lens geometries. Stope designs, based on 15 m spaced sections extrapolated along strike, are built to allow a preliminary economic assessment of the areas to be mined. The Mineral Resources within the stope shapes are exported to MS Excel and dilution and extraction factors are applied. Mining engineers then assess the economic prospects for each stope. Based on engineering considerations, lower grade blocks may be included in stope designs if their development is proposed in conjunction with other blocks. While the low grade block alone would not support the required development, it is considered economic if it can be developed with other blocks. Similarly, the evaluation of the extraction method or ground conditions may result in lower grade blocks being included in the Mineral Reserve estimate.

Underground zones containing Mineral Reserves are described below.

The 118 Zone consists of several lenses and mining is in progress in the 27 and 31 lenses using transverse and longitudinal stoping. Current production is situated between the 830 m and 1,050 m levels. From the 790 m level, the 118 Zone's internal ramp system and mining levels are accessible. The 118_06 and 118_10 lenses are being developed and mined by longitudinal stoping. Paste fill is available in the 118 Zone.

The 123 Zone lies approximately 250 m to the south of the 118 Zone. The 123 Zone is accessed via an internal ramp system and mining levels from the 790 m level. The 123 Zone consists of several sub-parallel lenses. Paste fill is also available in the 123 Zone below the 470 m level. An internal ramp which connects the upper and lower levels of the 123 Zone.

The 124 Zone is in the upper portion of the West Mine, and consists of several sub-parallel lenses, which are currently mined from the underground, below the 150 m level. The upper portion of the 124 Zone, extending from surface to the 185 m level, is planned for open pit mining. Paste fill is not available in the Principal Pit area of the West Mine. Stopes are backfilled with CRF and uncemented rock fill in this area.

The 113 Zone is located to the west of the West Shaft. Currently, there is no active mining in the 113 Zone. Drilling is underway to define the 113 Zone at depth (i.e., below the 950 m level). Ground conditions are poor. Paste fill is available in the 113 Zone below the 570 m level.

For the 113, Lower Inter, 118, 119, 121, 123, and 124 zones, the mineralized envelopes were divided into 20 m high and 15 m long stopes. Hanging wall and footwall stope limits were defined by the mineralized envelope. Tonnage and grade were calculated for each stope, including ore development within the stope outline. Dilution and extraction factors were applied on a stope by stope basis based on a review of stope conditions and planned mining.

After rehabilitation of the access, the East Mine underground mining will begin with the recovery of stopes between the 570 m and 500 m levels. The East Mine underground Mineral Reserves are based on the recovery of the stopes and pillars remaining in the upper 570 m level, as well as stopes below the 570 m level, which is a new mining horizon. Currently mining is in progress from the 500 m to 650 m levels and the ramp to access the lower levels is being excavated.

The mining method used is the longitudinal method. In the future, Hecla proposes using the transverse method in the lower levels of the East Mine to increase mining flexibility in this area. The use of state of the art mine planning and geology software packages allows direct access to the Mineral Resource block models, which makes mine design review and revision processes more efficient.

12.2 Open Pit Mineral Reserves

Since 2013, the number of Casa Berardi open pit projects has grown from two to six, with the addition of the XMCP, 134, 160, and WMCP pits. In addition to these new open pit Mineral Reserves, the Mineral Reserves for the Principal Pit have more than doubled since the original 2011 Mineral Reserve statement.

12.2.1 EMCP/XMCP Pit

The EMCP Pit has been fully mined, and only the XMCP Pit remains in operation. Currently, the bottom of the XMCP Pit is 4,922.5 MASL. Once completed, the final elevation will reach approximately 4,892.5 MASL by approximately Q2 2024. The XMCP Pit has been placed on hold until July 2023 to maximize the 160 Pit. Production is planned to commence again at a rate of 926 tpd.

12.2.2 134 Pit

The 134 Pit is located to the southeast of the Principal Pit. The 134 Pit will not intersect any underground workings and is independent of the Principal Pit. A dewatering program will be required to control water inflow from runoff and from the rock mass. Overburden removal for the 134 Pit is planned for 2034 and mining will begin in 2035. The overburden and waste rock will be used to backfill the Principal Pit.

12.2.3 160 Pit

The 160 Pit is located northeast of the mill. The 159 and 160 lens (both included in the 160 Pit) are currently the most easterly identified lens on the Property. The 160 Pit is divided in four phases. Currently, Phase 2 is being mined and overburden removal is expected to continue until Q4 2024. The final phase of the 160 Pit will reach 4,777.5 MASL and be completely mined in 2028. The average planned tonnage is 2,450 tpd. The 160 Pit will not intersect any underground workings.

12.2.4 WMCP Pit

The WMCP Pit is the most westerly pit in the Casa Berardi Mineral Reserves. Prior to commencing this project, surface infrastructure (e.g., a cement plant and access roads) will have to be redesigned and/or relocated and environmental considerations will have to be addressed. The WMCP Pit will intersect multiple underground excavations. The development of the WMCP Pit is planned to coincide with the end of underground mining in the West Mine area. If the start date is advanced, underground infrastructure will have to be relocated to mitigate geotechnical risks. Overburden removal is planned to commence in 2028 and will take three years. The WMCP Pit Mineral Reserve will be mined between 2031 and 2035, at a rate of 4,384 tpd. According to the most recent pit shell, the bottom of the WMCP will reach 4,715 MASL.

12.2.5 Principal Pit

Overburden removal in the Principal Pit area is planned to begin in 2025 whereas ore mining is planned to begin in 2028 at an average rate of 4,384 tpd until 2031. Environmental and engineering challenges regarding pumping are being addressed and is still in progress. The Principal Pit will intercept underground workings (in the lower part of the pit). According to the most recent pit shell, the bottom of the Principal Pit will reach 4,780 MASL.

12.3 Cut-Off Grade

The cut-off grade used for reporting Mineral Reserves is based on the following parameters:

- Gold price: US$1,600/oz Au.
- Exchange rate of C$1.275/US$1.00.
- Metallurgical recovery by zone as presented in Table 12-3.
- The underground and open pit cut-off grades are presented in Table 12-3.

Table 12-3: Underground and Open Pit Reserve Cut-Off Grades
Hecla Mining Company – Casa Berardi Mine

Area	Metallurgical Recovery (%)	Cut-Off Grade Mill Recovery (%)	Cut-Off Grade (g/t Au)
Underground Zones			
113 Inf	84.4		3.27
118	77.5		3.57
123	77.5		3.57
100 (Lower Inter)	84.4		3.27
121	77.5		3.57
124	84.4		3.27
160	85.4		3.54
148 (East UG)	79.0		3.83
128	77.5		3.57
119	84.4		3.27
Open Pits			
Principal	81.8	63.6	1.15
EMCP/XMCP	75.7	64.2	1.17
134	82.7	63.5	1.14
160	89.7	84.9	0.86
WMCP	80.5	61.9	1.18

When the grade of the Mineral Reserves is close to the cut-off grade, a more detailed review is completed considering the anticipated costs and revenues.

Individual stopes were evaluated using the cut-off grade for the applicable zone, after dilution and extraction factors had been applied.

Hecla reviewed supply and demand projections for gold, as well as consensus long term (ten year) metal price forecasts. SLR verified that Hecla's selected gold price for estimating Mineral Reserves is consistent with independent forecasts from banks and other lenders.

12.4 Dilution and Extraction

12.4.1 Underground Mining

For underground mining, internal dilution is defined as material below the cut-off grade included within a mining block. Internal dilution represents areas included within the Mineral Resource envelopes for continuity and areas outside of the Mineral Resource envelope required to optimize the mining geometry. Internal dilution is intended to be mined with the ore and is included in the Mineral Reserve estimate of a stope.

External dilution is defined as unplanned and uneconomic material coming from the periphery of a mining block. It includes material from the hanging wall or footwall and from exposure of backfill in adjacent stopes. The estimation of underground external dilution is based on the 12 years of underground operating experience at the mine and is expressed as a percentage, calculated as:

Dilution % = (waste tonnes / ore tonnes) x 100.

The average total dilution from internal and external sources for the underground Mineral Reserves is 35% (Table 12-4).

Extraction is the proportion of the diluted Mineral Reserve which is expected to be extracted by mining. The extraction by zone is presented in Table 12-4.

Average extraction is estimated to be 94.5%. Timely placement of backfill and other measures to control stope deterioration are key to achieving high extraction rates in this pillarless mining scenario.

Dilution has been estimated on a stope by stope basis considering the planned mining and conditions in the given areas. The dilution estimates reflect the expected conditions in the mature mining areas. For new zones, the estimates are based on historical data from similar mining conditions. The East Mine dilution estimate is based on historical mining in the East Mine from 2020 to 2021.

A review of drill hole and block model grades immediately outside stope outlines indicates that mineral boundaries are generally gradational, ranging from 0.5 g/t Au to 1.0 g/t Au at stope boundaries, instead of being sharply cut. A grade of 0.5 g/t Au has been applied to hanging wall/footwall dilution in all zones.

For the East Mine, extraction factors of 92.5% are applied for longhole stopes.

Table 12-4: Dilution and Extractions Estimates – Underground
Hecla Mining Company – Casa Berardi Mine

Zone	Dilution (%)		Extraction (%)	
	Longitudinal	Transverse	Longitudinal	Transverse
113	30.7	49.6	100	75.6
Lower Inter	30.7	49.6	100	75.6
148	40	40	94.4	92.9
118	27.3	32.9	94.4	92.9
119	27.3	32.9	94.4	92.9
123	28	15.1	94.4	92.9
124	40.3	18.7	94.4	92.9

12.4.2 Open Pit Mining

For open pit mining, internal dilution is defined as material below the cut-off grade within the Mineral Resource envelope. Internal dilution can also be partially estimated by comparing the envelope geometry to bench geometry, as benches are square vertical blocks and the mineral zones dip at angles of between 45° and 70°.

External dilution in open pit mining is defined as material below the cut-off grade that is mixed with ore during the blasting process or picked up by the excavators at the contact between the mineralized package and the waste matrix.

The EMCP/XMCP Pit has been operating since January of 2016. The dilution estimates for the XMCP Pit are based upon this recent mining experience. For subsequent pits, dilution estimates will reflect the historical values and experience from the EMCP Pit.

Extraction by zone is presented in Table 12-5.

For open pit mining, an extraction factor between 93% and 95% is used. These factors are supported by reconciliation numbers.

Table 12-5: Dilution and Extractions Estimates – Open Pit
Hecla Mining Company – Casa Berardi Mine

Pit	Dilution (%)	Extraction (%)
WMCP	22	94
XMCP	27	95
Principal	20	95
134	20	93
160	27	93

12.5 Estimation Methodology – Open Pit Projects

For each of the open pit projects described in the following subsections, optimized pit shells based on the block models prepared by Hecla Québec's geology department were used. Surpac scripts were used to code materials and surfaces within the block model (i.e., overburden material types and bedrock contact). The pit shells were generated using Whittle. Implicit average diluted cut-off grades ranging from 0.86 g/t Au to 1.18 g/t Au were used. Slope angles and other design criteria are discussed in Section 13 (Mining Methods) of this TRS. The open pit cut-off grade mill recoveries below are solely used to calculate the cut-off. They represent the estimated metallurgical recoveries in the vicinity of the open pit gold cut-off grades and are significantly lower than the metallurgical recoveries related to the average mill fee gold grades.

12.5.1 EMCP Pit

The EMCP Pit is completely mined and as such has no mineral value, however, it has emerged as a backfilling solution. Early studies and feasibility plans revealed an economic value in backfilling the EMCP with waste rock and overburden from the 160 and XMCP pits. Operational, geotechnical, and permitting issues are being addressed in order to move forward with the backfilling plan.

12.5.2 Principal Pit

In 2021, the Principal Pit Mineral Reserves were recalculated using updated economic parameters, based on a block model developed by Hecla Québec (geology) department. A pit optimization was run by Hecla.

Mineral Reserves were estimated for this pit shell based on an implicit average diluted cut-off grade of 1.15 g/t Au, and the following inputs:

- Operating costs of C$47.59/t ore (US$37.33/t).
- Cut-off grade mill recovery of 63.6%.
- Gold price of US$1,600/oz Au.
- Dilution of 20%.

12.5.3 XMCP Pit

In Q4 2021 Hecla estimated what remains of the XMCP Pit Mineral Reserves, using updated economic parameters and an updated block model developed by the Hecla Québec mine geology department.

Mineral Reserves were estimated for this pit design based on an implicit diluted cut-off grade of 1.17 g/t Au, and the following inputs:

- Operating costs of C$48.84/t ore (US$37.33/t).
- Cut-off grade mill recovery of 64.2%.
- Gold price of US$1,600/oz Au.
- Dilution of 27%.

12.5.4 134 Pit

In Q4 2021, Hecla updated the 134 Pit Mineral Reserves, using updated economic parameters, and an updated block model developed by the Hecla Québec mine geology department. A pit shell optimization was also run by Hecla.

Mineral Reserves were estimated for this pit shell based on an implicit diluted cut-off grade of 1.14 g/t Au, and the following inputs:

- Operating costs of C$47.22/t ore (US$37.04/t).
- Cut-off grade mill recovery of 63.5%.
- Gold price of US$1,600/oz Au.
- Dilution of 20%.

12.5.5 160 Pit

In Q4 2021, Hecla estimated the 160 Pit Mineral Reserves, using updated economic parameters and an updated block model developed by the Hecla Québec mine geology department. A new pit design has been created around this optimized pit shell.

Mineral Reserves were estimated for this pit design based on an implicit diluted cut-off grade of 0.86 g/t Au, and the following inputs:

- Operating costs of C$47.97/t ore (US$37.62/t).

- Cut-off grade mill recovery of 84.9%.
- Gold price of US$1,600/oz Au.
- Dilution of 27%.

12.5.6 WMCP Pit

In Q4 2021, Hecla estimated the WMCP Pit Mineral Reserves, using updated economic parameters and an updated block model developed by the Hecla Québec mine geology department. A pit shell optimization was also run by Hecla.

Mineral Reserves were estimated for the WMCP Pit shell based on an implicit diluted cut-off grade of 1.18 g/t Au, and the following inputs:

- Operating costs of C$47.65/t ore (US$37.37/t).
- Cut-off grade mill recovery of 61.9%.
- Gold price of US$1,600/oz Au.
- Dilution of 22%.

12.6 Comparison to Previous Estimates

The December 31, 2021 Mineral Reserve estimate represents an overall increase of 3,611,459 t and 242,022 oz Au as compared to the December 31, 2020 Mineral Reserve estimate.

A summary of gains and losses is presented in Table 12-6.

From 2020 to 2021, Mineral Reserves underground decreased due to mining in the Lower Inter, 118, and 124 zones. Underground Mineral Reserves were expanded in the 113, 119 and 123 zones. Over the same period, Mineral Reserves increased in all of the open pits, except the XMCP Pit.

Table 12-6: Change in Mineral Reserves 2020 to 2021
Hecla Mining Company – Casa Berardi Mine

Zone	December 31, 2021			December 31, 2020			Change	
	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonne (000 t)	Contained Metal (000 oz Au)
Proven								
Lower Inter	7	8.5	1.9	14	6.9	3.1	(7)	(1.2)
107(SW)				19	4.4	2.6	(19)	(2.6)
113	94	4.5	13.5	8	5.0	1.3	86	12.2
118	133	4.5	19.2	192	4.7	29.0	(59)	(9.8)
119	-	-	-	-	-	-	-	-
121	-	-	-	-	-	-	-	-
123	266	5.0	42.3	375	4.9	58.9	(109)	(16.6)
124	78	4.3	10.7	75	4.5	10.8	3	(0.1)

Zone	December 31, 2021			December 31, 2020			Change	
	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonne (000 t)	Contained Metal (000 oz Au)
East Mine U/G (148)	259	6.7	55.7	258	6.3	52.1	1	3.6
WMCP Pit	4,034	3.3	429.1	3,721	3.2	379.9	313	49.2
EMCP + Ext. Pit	5	2.8	0.4	92	2.6	7.7	(85)	(7.3)
Principal Pit	142	3.3	14.9	213	3.2	21.9	(71)	(7.6)
134 Pit	-	-	-	-	-	-	-	-
160 Pit	139	1.9	8.6	-	-	-	139	8.6
Total Proven Mineral Reserves	5,158	3.6	596.3	4,967	3.6	567.4	191	28.9
Probable								
Lower Inter	4	6.5	0.8	4	5.0	0.7	0	0.1
107(SW)	-	-	-	-	-	-	-	-
113	165	6.0	31.5	-	-	-	165	31.5
118	523	4.5	76.0	609	4.8	93.5	(86)	(17.5)
119	126	4.2	16.8	-	-	-	126	16.8
121	-	-	-	19	4.4	2.7	(19)	(2.7)
123	332	5.0	53.2	215	4.7	32.5	117	20.7
124	90	4.4	12.6	170	4.4	23.9	(80)	(11.3)
East Mine U/G (148)	300	7.1	68.5	360	6.6	75.9	(60)	(7.4)
WMCP Pit	1,296	2.7	110.4	1,027	2.6	84.1	269	26.3
EMCP + Ext. Pit	184	1.9	11.1	388	1.9	24.2	(204)	(13.1)
Principal Pit	5,640	2.8	507.8	5,041	2.9	468.4	599	39.4
134 Pit	115	3.1	11.3	86	3.4	9.4	29	1.9
160 Pit	4,895	1.8	287.9	2,314	2.1	157.5	2,581	130.4
Total Probable Mineral Reserves	12,130	2.4	928.4	10,247	3.0	974.6	1,883	(46.2)
Proven and Probable								
Total Proven and Probable Mineral Reserves	18,826	3.0	1,784.0	15,214	3.2	1,542.0	3,612	242.0

12.7 Reconciliation

Tonnage and grade reconciliations between Mineral Reserves, mine plans, and mill production are carried out by Hecla on an individual stope by stope basis and reported on a monthly and annual basis. The annual results for 2006 to 2021, and the comparisons between the mill production and Mineral Reserves and mill production and planned mining are presented in Table 12-7 and Table 12-8. The same information on a monthly basis for 2021 is shown in Table 12-9 and Table 12-10.

Tonnes, gold grades, and gold ounces for the block model estimates and the final design plans are compared to mill production.

On an annual basis, the reconciliation between the mill production, Mineral Reserves, and mine plans with respect to tonnage, grade, and contained gold is very consistent, with 78 of the 132 data points within ±5%.

Table 12-7: Mine-Mill Reconciliation – 2006 to 2021
Hecla Mining Company – Casa Berardi Mine

Year	Mineral Reserves			Planned Reserves			Mill		
	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
2021 PIT	643.3	1.8	36.7	753.2	1.9	46.9	748.5	1.9	46.7
2021 U/G	639.0	5.0	102.0	618.5	5.3	104.7	637.9	5.5	111.8
2020 PIT	560.3	2.1	37.3	563.4	2.2	39.9	578.3	2.1	38.5
2020 U/G	655.1	5.6	116.8	588.4	5.7	107.8	586.8	5.9	111.5
2019 PIT	540.0	1.9	35.6	540.6	2.0	36.7	558.1	1.9	36.3
2019 U/G	661.6	5.7	122.1	652.9	5.8	121.0	692.1	5.8	128.6
2018 PIT	475.4	2.2	31.1	498.8	2.0	29.5	547.7	2.0	32.1
2018 U/G	738.6	6.7	158.1	689.9	6.4	142.8	700.3	6.9	154.8
2017 PIT	342.9	2.8	29.9	440.8	2.8	38.7	445.2	2.9	41.0
2017 U/G	649.8	6.4	133.1	702.8	6.0	134.4	730.7	5.9	139.4
2016 PIT	83.5	2.5	5.3	121.8	2.6	8.9	121.7	2.3	7.4
2016 U/G	686.9	6.0	132.3	728.6	6.1	141.9	783.3	6.3	159.1
2015 U/G	701.6	6.0	136.1	736.7	5.9	139.1	765.8	6.0	146.7
2014 U/G	653.9	6.6	138.6	725.2	5.9	138.2	750.8	5.9	142.4
2013 U/G	571.2	6.3	115.0	583.0	5.8	108.7	590.6	6.2	117.0
2012 U/G	632.2	7.8	157.5	685.5	6.7	148.2	693.9	6.8	151.1
2011 U/G	735.1	8.0	188.2	726.9	7.5	175.3	698.1	8.0	179.5
2010 U/G	683.4	6.8	150.0	670.4	6.7	144.2	722.7	6.8	157.1
2009 U/G	719.6	7.5	173.7	684.6	7.1	155.4	688.7	7.8	172.0
2008 U/G	662.1	8.5	181.7	706.7	8.1	183.0	654.4	8.2	171.6
2007 U/G	548.1	10.4	183.4	579.5	10.2	190.2	545.3	9.8	171.4
2006 U/G	64.0	9.2	18.9	66.6	8.9	19.0	68.5	8.6	18.9
Total	**12,647.8**	**5.9**	**2,383.7**	**13,064.9**	**5.6**	**2,354.3**	**13,309.3**	**5.7**	**2,434.9**

Table 12-8: Mine-Mill Reconciliation – 2006 to 2021
Hecla Mining Company – Casa Berardi Mine

Year	Mill versus Planned Reserve (%)			Mill versus Mineral Reserve (%)		
	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces
2021 PIT	116%	110%	128%	99%	100%	100%
2021 U/G	100%	110%	110%	103%	104%	107%
2020 PIT	104%	100%	104%	103%	93%	96%
2020 U/G	90%	107%	95%	100%	104%	103%
2019 PIT	104%	99%	102%	103%	96%	99%
2019 U/G	105%	101%	105%	106%	100%	106%
2018 PIT	115%	90%	103%	109%	98%	107%
2018 U/G	95%	103%	98%	102%	107%	108%
2017 PIT	128%	104%	133%	101%	104%	105%
2017 U/G	112%	93%	105%	104%	100%	104%
2016 PIT	140%	90%	127%	100%	87%	87%
2016 U/G	114%	105%	120%	108%	104%	112%
2015 U/G	109%	99%	108%	104%	102%	106%
2014 U/G	115%	90%	103%	104%	100%	103%
2013 U/G	103%	98%	102%	101%	106%	108%
2012 U/G	110%	87%	96%	101%	101%	102%
2011 U/G	95%	100%	95%	96%	107%	102%
2010 U/G	106%	99%	105%	108%	101%	109%
2009 U/G	96%	103%	99%	101%	110%	111%
2008 U/G	99%	96%	94%	93%	101%	94%
2007 U/G	99%	94%	93%	94%	96%	90%
2006 U/G	107%	94%	100%	103%	96%	99%
Total	**105%**	**97%**	**102%**	**102%**	**102%**	**103%**

Table 12-9: Mine-Mill Reconciliation – 2021
Hecla Mining Company – Casa Berardi Mine

Month	Mineral Reserves			Planned Reserves			Mill		
	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Jan Pit	34.2	2.9	3.2	55.0	2.5	4.4	62.6	2.6	5.1
Jan U/G	50.0	4.6	7.3	53.6	4.9	8.5	54.1	4.9	8.5
Feb Pit	25.3	1.6	1.3	56.3	2.0	3.6	61.1	2.0	3.9
Feb U/G	57.2	4.8	8.9	55.0	5.1	9.0	63.0	5.9	12.0
Mar Pit	32.9	2.1	2.3	51.2	2.1	3.4	44.4	2.1	3.0
Mar U/G	63.2	5.4	11.0	59.2	5.7	10.9	63.4	6.3	12.9
Apr Pit	40.3	2.4	3.1	66.4	2.0	4.3	59.7	2.0	3.9
Apr U/G	63.9	4.9	10.1	60.1	5.4	10.4	64.9	5.4	11.2
May Pit	40.0	1.7	2.1	60.2	2.0	3.9	60.4	2.2	4.3
May U/G	48.4	4.6	7.1	41.0	4.8	6.4	42.3	5.0	6.4
June Pit	95.9	1.4	4.3	60.9	1.5	3.0	64.1	1.5	3.1
June U/G	43.9	3.9	5.5	40.5	4.5	5.9	44.4	4.8	6.8
July Pit	43.3	1.5	2.1	76.9	1.2	3.0	71.4	1.2	2.8
July U/G	44.8	5.2	7.5	44.3	4.9	7.0	51.1	4.6	7.5
Aug Pit	77.9	1.4	3.6	61.9	1.4	2.8	62.7	1.3	2.7
Aug U/G	58.1	5.0	9.4	50.4	5.9	9.6	51.1	6.0	9.8
Sept Pit	70.8	1.4	3.1	74.2	1.3	3.2	74.1	1.3	3.1
Sept U/G	49.2	4.9	7.7	54.9	5.2	9.1	53.0	5.2	8.8
Oct Pit	68.8	1.8	4.0	62.9	2.1	4.2	62.0	2.1	4.1
Oct U/G	49.1	5.3	8.4	51.4	5.8	9.5	50.3	6.6	10.7
Nov Pit	55.7	2.1	3.7	69.4	2.9	6.4	67.5	2.8	6.0
Nov U/G	51.4	4.8	7.9	48.0	5.3	8.1	43.2	4.8	6.7
Dec Pit	58.3	2.1	4.0	57.8	2.4	4.7	58.5	2.5	4.8
Dec U/G	59.9	5.9	11.4	60.1	5.3	10.3	57.0	5.4	9.9
Total	**1,282.3**	**3.4**	**138.7**	**1,371.7**	**3.4**	**151.6**	**1,386.4**	**3.6**	**158.6**

Table 12-10: Mine-Mill Reconciliation – 2021
Hecla Mining Company – Casa Berardi Mine

Month	Mill vs. Planned Reserve			Mill vs. Mineral Reserve		
	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)	Tonnes (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Jan Pit	183%	88%	161%	114%	103%	117%
Jan U/G	108%	108%	116%	101%	100%	101%
Feb Pit	242%	124%	299%	108%	100%	108%
Feb U/G	110%	123%	136%	114%	117%	133%
Mar Pit	135%	100%	135%	187%	103%	89%
Mar U/G	100%	117%	118%	107%	110%	118%
Apr Pit	148%	184%	125%	90%	101%	91%
Apr U/G	102%	110%	111%	108%	101%	108%
May Pit	151%	133%	200%	100%	109%	109%
May U/G	87%	110%	96%	103%	104%	107%
June Pit	67%	108%	72%	105%	98%	103%
June U/G	102%	124%	135%	110%	106%	116%
July Pit	165%	82%	135%	93%	100%	93%
July U/G	114%	88%	101%	115%	93%	107%
Aug Pit	80%	93%	75%	101%	93%	94%
Aug U/G	88%	119%	105%	101%	101%	102%
Sept Pit	105%	95%	99%	100%	97%	97%
Sept U/G	108%	106%	114%	97%	100%	96%
Oct Pit	90%	114%	103%	98%	100%	98%
Oct U/G	102%	125%	128%	98%	115%	112%
Nov Pit	121%	132%	160%	97%	96%	94%
Nov U/G	84%	101%	85%	90%	92%	82%
Dec Pit	100%	123%	123%	101%	101%	102%
Dec U/G	95%	91%	87%	95%	101%	96%
Total	**108%**	**106%**	**114%**	**101%**	**104%**	**105%**

The annual and monthly reconciliation charts for tonnage, grade, and contained ounces are provided in Figure 12-1 to Figure 12-3, respectively. The monthly variance between the mill production, Mineral Reserves, and mine plan has a larger range than the annual average, as demonstrated in Table 12-10 and in Figure 12-1 to Figure 12-3.

The SLR QP is of the opinion that there is good reconciliation between the Mineral Reserves, mine planning, and the actual production. The annual and monthly reconciliation reports allow the reconciliation over time on a stope by stope basis and/or on a zone by zone basis to be examined. Based upon the reconciliation results, Hecla is of the opinion that the Mineral Reserve estimation and mine planning are reliable.

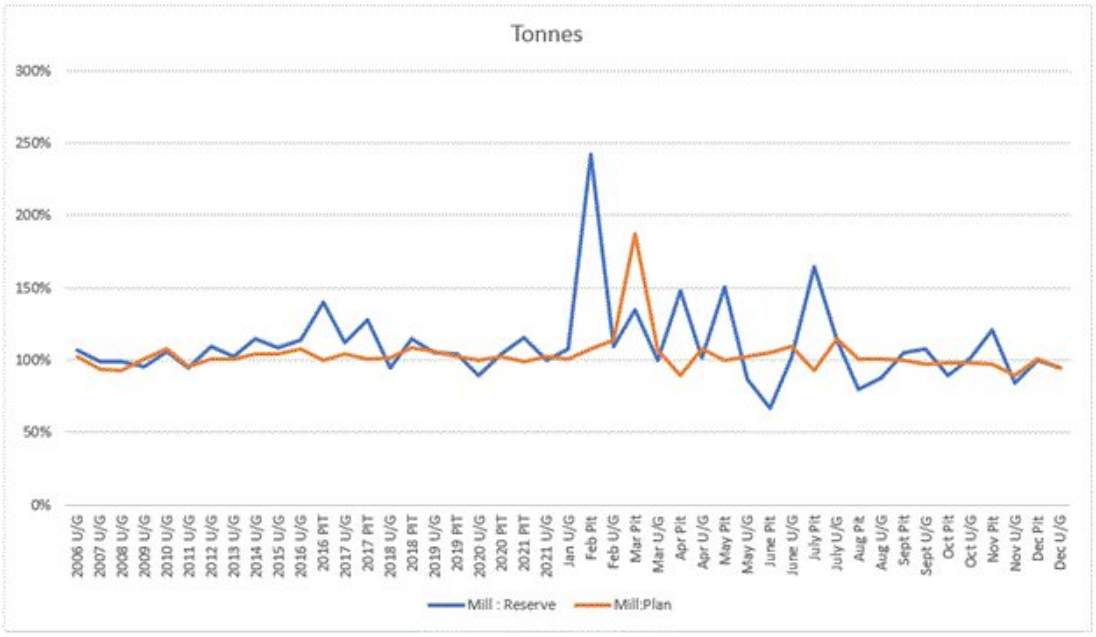


Figure 12-1: Tonnage Reconciliation 2006 to 2021 Annual and 2021 by Month

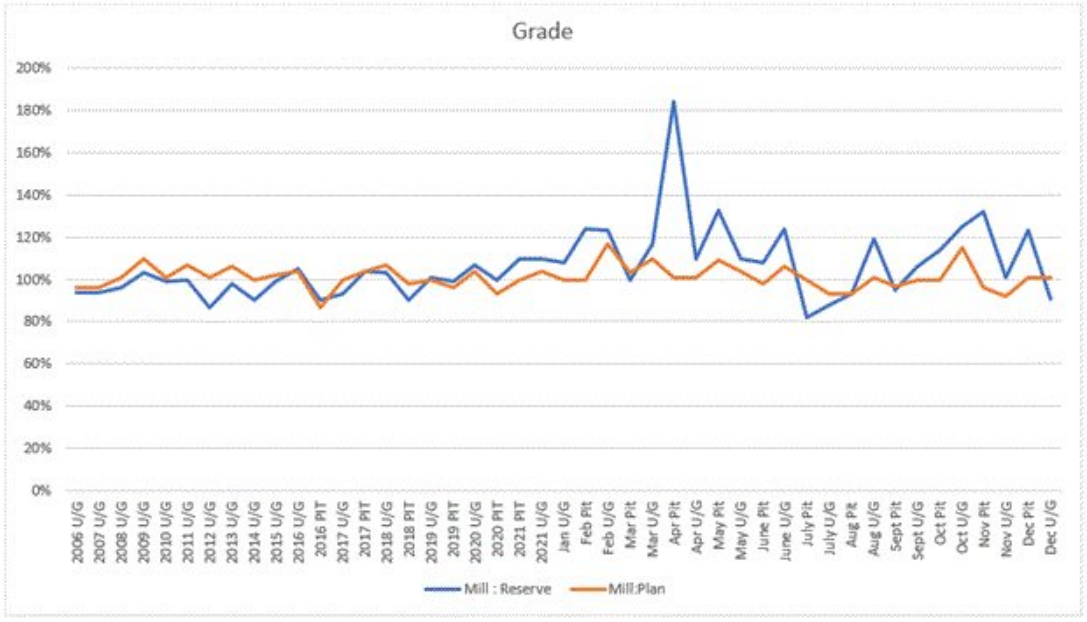


Figure 12-2: Grade Reconciliation 2006 to 2021 Annual and 2021 by Month

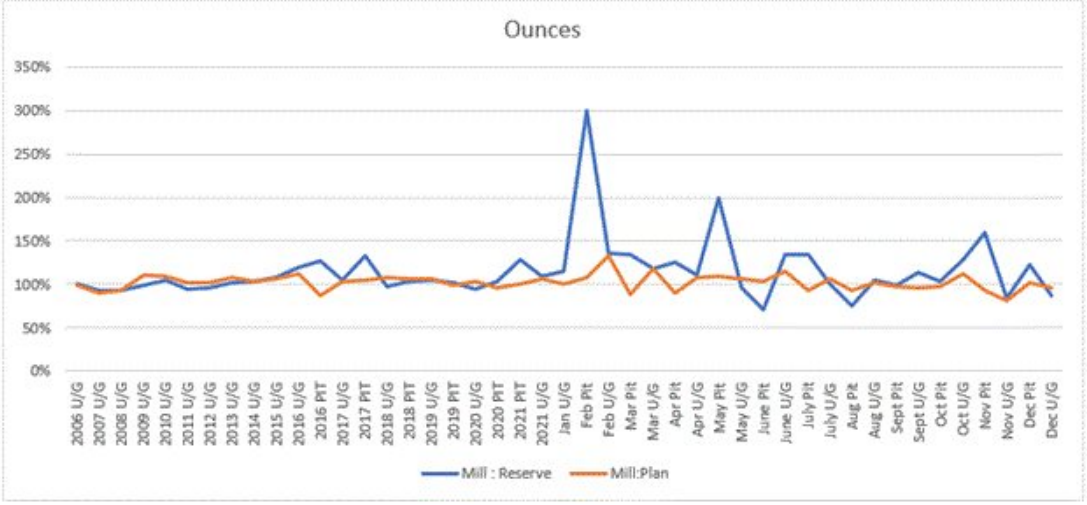


Figure 12-3: Contained Gold Reconciliation 2006 to 2021 Annual and 2021 by Month

In the opinion of the SLR QP, Casa Berardi Mineral Reserves have been estimated using industry best practices, and in accordance with the S-K 1300 classification system. The SLR QP is not aware of any risk factors associated with, or changes to, any aspects of the modifying factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

13.0 MINING METHODS

13.1 Mining Operations – Underground

Inco Gold operated the East Mine from 1988 to 1991. From 1991 to 1997, TVX operated the East and West underground mines. In 2006, Aurizon, now known as Hecla Québec, restarted underground operations at the West Mine, and in late 2017 Hecla began the rehabilitation of the East Mine.

Initially, both mines were developed as trackless operations, with all material transported to surface via ramps. In 1995, a track drift and the East Shaft were completed to connect the East and West Mines.

In 2006, the 5.5 m diameter West Shaft was sunk to the 795 m level, and ramp and level development were completed to access mining zones. In 2013, the West Shaft was deepened to the 1,080 m level.

As of December 2021, the majority of future underground mining will come from the 118, 123, 124 and 148 zones, which will account for 39%, 16%, 15%, and 14% of underground production, respectively. These four zones also represent the bulk of the underground Mineral Reserves.

13.1.1 Mine Design

The mine design and planning processes reflect the past mining experience at the West and East Mines. The following design criteria are used by Hecla Québec:

- 2021 cut-off grade varies by zone from 3.27 g/t Au to 3.83 g/t Au.
- Production rate: target approximately 1,900 tpd of ore.
- Production and development crews work two ten-hour shifts, seven days per week, 365 days per year. The crew rotation is seven days on, seven days off.
- The mill operates two 12-hour shifts, seven days per week, 365 days per year.
- Crews work 7 days in and 7 days off on rotation.
- Ramp and shaft access to the mining areas.
- Ramp dimensions: 4.5 m wide x 4.5 m high.
- Sublevel spacing: 20 m.
- Standard stope dimensions: 20 m high, 15 m strike-length, up to 20 m thick.
- Minimum mining width of three meters.
- Haulage drift dimensions: 4.5 m wide x 4.5 m high.
- 2.7 m diameter ore and waste passes.
- 2.4m and 3.3 m diameter ventilation raises.

13.1.2 West Mine and Principal Area

The current Mineral Reserves at Casa Berardi comprise seven zones in the West Mine including the Principal area. These zones are spread out over a distance of 200 m perpendicular to strike, 1,500 m to 2,000 m along strike and from surface to 1,090 m below surface. The 118, 123, 124, and 148 zones comprise the majority of the Mineral Reserve tonnage.

The zones vary in thickness, ranging from over 50 m to less than three metres (e.g., minimum mining width). In general, the zones are subvertical (e.g., 55° to 85°).

A combination of longitudinal and transverse blasthole stoping is used at Casa Berardi, depending on mineral zone geometry (width and attitude) and development requirements. While timely delivery of backfill plays a crucial role in controlling dilution and maintaining the short stoping cycle, since 2006 this mining approach since 2006 has been implemented safely and reliably.

13.1.3 Transverse Method

The transverse mining method is used in areas with wide mineralization, 10 m wide or more, and good access from nearby development such as haulage drift and multiple draw points. In wide areas, greater than 20 m, stopes are subdivided into smaller panels and mined in sequence from the hanging wall to the footwall.

Stopes are nominally 15 m long by 20 m high, floor to floor, oriented in a transverse manner to the strike of the ore, and are mined using an alternating primary and secondary sequence (Figure 13-1). Overcut and undercut draw points provide access to the top and bottom of the stope. Secondary support in the form of Super Swellex and 0-gauge mine straps is installed in the back and sidewalls of the overcut. Support patterns vary based on sequence and adjacent mining (e.g., primary versus secondary stopes). Ring drilling is carried out using a production 75 mm top hammer longhole drill. A Machines Roger V-30 boring head is used to drill 30 in. bore holes as slot raises in the stopes. The long hole drill pattern is designed to contour the stope geometry by using smooth blasting techniques to control wall sloughing and dilution.

After blasting, broken ore is removed from the stope through the undercut drift using a remote controlled load-haul-dump (LHD) unit and loaded into a truck or trammed to an ore pass. When mining is completed, the stope is backfilled with paste fill or CRF for primary stopes and unconsolidated waste rock for secondary stopes. Stope sequencing varies depending on zone.

The transverse method allows a variety of mining activities to occur in a series of closely grouped primary and secondary stopes simultaneously. The stopes are in different stages of the cycle, from production drilling, blasting, and mucking through to the final backfill placement.

Full utilization of the transverse method requires at least three to four production sublevels to be fully developed and operational to avoid production bottlenecks. To allow for the CRF and paste backfill to adequately cure, the primary stopes are mined at least two lifts ahead of the secondary stopes.

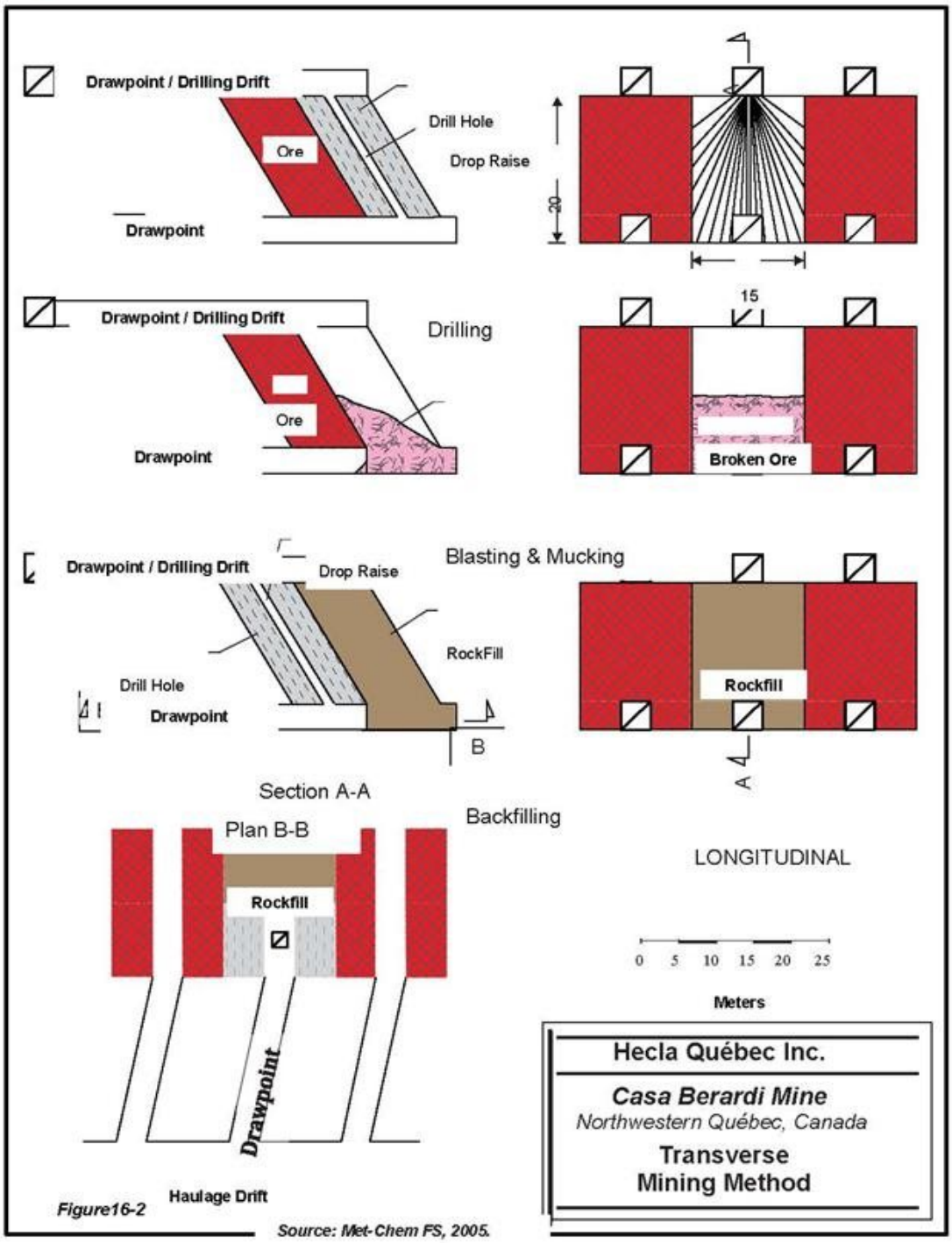


Figure 13-1: Transverse Mining Method

13.1.4 Longitudinal Method

The blasthole longitudinal mining method is used in areas with narrow mineralization or minimal development infrastructure, such as sill development. Oriented along strike, longitudinal stoping is mined in retreat back towards the access point. Once a stope is mined, it is backfilled with paste fill or a combination of CRF and unconsolidated waste. For stopes mined using the AVOCA method, unconsolidated waste or rock fill is used as backfill.

Waste development requirements for the longitudinal method are lower than those for the transverse method, as accesses are within the ore on each level, and serve as overcuts and end-muck draw points for subsequent stopes. When compared to the transverse method productivity per level, as measured by sequence and access flexibility, is much lower since only one (i.e., abutment access) or two (i.e., central access) stopes can be mined simultaneous.

13.1.5 Stope Size

In general, stope dimensions reflect standard development practices such as draw points on 15 m centres and 20 m sublevel spacing. When necessary, stope dimensions at Casa Berardi have been reduced in response to local ground conditions, as has been implemented in the 113 Zone, to mitigate sequencing/operational issues and to avoid exposing unconsolidated rock fill.

The average stope size for the various zones is presented in Table 13-1. With an average stope size of 4,039 t, a large number of workplaces, approximately 12 stopes per month, are required to sustain the 2,000 tpd production rate. Mine planning for these stopes must consider the full stoping cycle, including providing time for backfill curing. The underground mining operations rely on production from multiple levels and stopes in several zones at any given time.

Table 13-1: Tonnage per Stope
Hecla Mining Company – Casa Berardi Mine

Zone	Tonnes (t)	Number of Stope Blocks	Tonnes per Stope (t/stope)
Lower Inter	10,800	3	3,600
113	258,600	72	3,592
118	656,200	148	4,434
119	125,600	30	4,187
123	597,100	152	3,928
124	167,400	41	4,083
East Mine UG	442,400	113	3,915
Total	2,258,000	559	4,039

The typical stoping cycle for Casa Berardi is summarized in Table 13-2.

Table 13-2: Typical Stope Delays and Activity Duration
Hecla Mining Company – Casa Berardi Mine

Description	Delay/Duration
Stope Preparation	8 to 10 days
Stope Drilling	2 x 300 m (drill) / 3 to 5 days
Stope Blasting & Mucking	3 to 5 days
Stope Filling	7 to 10 days
Stope Curing	14 days (minimum)

13.1.6 East Mine Mining Method

The East Mine is accessed by a decline from surface to the 650 m level. At the 300 m level, a track drift connects the East and West mines. The East Shaft is used for a portion of underground services, the hoist has been removed and access via the manway is not currently possible.

In 1997, a partial failure of the Dynatec Plug at the 275 m level occurred and resulted in a chimney failure of the Casa Berardi Fault to surface. Following the failure, a ruling from the Commission de la Santé et de la Sécurité au Travail (CSST) suspended underground mining activities at the East Mine. In 2017, based on a technical report and mining plan presented to the CSST, mining activities restarted. Activities included the rehabilitation of the ramp from surface to the 550 m level, development of two exploration drifts at the 300 m and 485 m levels, diamond drilling of the 148 and 160 zones, ramp development below the 550 m level, and stope preparation between the 500 m and 550 m levels.

In 1992, chimney failures along the Casa Berardi Fault resulted in the creation of two craters on surface. Underground, in the 148 Zone mining beneath these craters was isolated by a series of hydrostatic barricades installed between the 90 m and 300 m levels. Historically, the containment of overburden and surface water from the area surrounding the craters was the primary challenge preventing resumption of underground production from the East Mine.

Mining of the overlying EMCP Pit has eliminated the risk of overburden inflow and of the accumulation of surface water in the craters. The SLR QP notes, however, that the overburden stripping and exposure of sand and rock filled stopes has significantly decreased the delay required for the transmission of surface water (e.g., intense rainfall events and spring thaw) to the underground East Mine. Surface and ground water infiltrating into the East Mine drains primarily via the unconsolidated sand and rock fill of the mined stopes. Since 2017, measures have been implemented to control the drainage and pump the water to maintain a dewatered condition. There are a total of 23 barricades in the East Mine and six in the West Mine. Water valves and pressure gauges are installed on the hydrostatic barricades and monthly inspections are carried out to check for water ingress.

13.2 Ground Stability

A history of ground instability and incidents related to mining in proximity to the Casa Berardi Fault at the East and West mines has highlighted the importance of addressing rock mechanics issues for mining at Casa Berardi. Further details regarding specific incidents are described in previous technical reports (Table 13-8).

13.2.1 Ground Conditions

Ground instability is primarily related to the Casa Berardi Fault system. Lithologies south of the Casa Berardi Fault are composed of relatively weak sediments with a frequent occurrence of schistose and graphitic rocks exhibiting weak contacts. Generally, the rock types vary from massive to fractured and heavily deformed in areas where the mineralization occurs along or near the main structural discontinuities.

13.2.2 Ground Testing and Analysis

RQD estimation is systematically carried out on all core from diamond drilling and development faces in mineralized material are mapped by the Casa Berardi geology department. The design and approval process for all development headings and stopes includes the analysis of these data on a individual basis.

In situ stress measurements, measured at level 360 and level 430 and carried out in 1999 by Canada Centre for Mineral and Energy Technology, fall within the lower range of the regional trends measured in other hard rock mines of the Abitibi district. Given the relatively weak nature of the rock units at Casa Berardi (i.e., uniaxial compressive strengths of less than 100 MPa) there is little evidence of high stress related failures. At depth and in specific zones, such as the 118-06 Zone, however, there is evidence of convergence or squeezing ground deformation. In general, ground stability issues are related to poor ground conditions near faults and gravity-driven wedge failures.

13.2.3 Operating Practices

Hecla has responded to concerns pertaining to safety and stability of mine openings with the following actions:

- Minimizing the open stope time, with mucking followed immediately by backfilling. Prioritizing critical stopes for rapid mucking out to minimize exposure of the Casa Berardi Fault. The cement slurry and paste fill plants operate year-round to supply CRF to the mine.
- Limiting development in the Casa Berardi Fault, particularly the graphite and graphic sediments, by developing perpendicular rather than parallel to the fault.
- Using pre-support, such as spilling, and support, such as, fibre-reinforced shotcrete arches with mine straps, Super Swellex, and Super Split Set, with shortened development specifically adapted to fault conditions.
- Installing recessed cable bolts for hanging wall support, if required, due to ground conditions or development stope geometry.
- Implementing proactive bolting of walls and intersections using long Super Swellex bolts or cable bolts with mesh straps where required by poor ground conditions or large spans.
- Controlling of development length (transverse stoping) and heading size (longitudinal stoping) to minimize the creation of overhangs relative to mineral zone geometry in stope top cuts and undercuts.
- Modifying production drilling for narrow (less than five metre widths) using 2.5 in. diameter drill holes with a 1.5 m x 1.5 m drill pattern.
- Changing the drift back profile to an arch configuration to improve the stability of the back.
- Using standard stope dimensions (average of 15 m strike length, 20 m high, and up to 20 m thick) and based on past experience and industry best practices.

- Applying of tight fill. The stope sequence is from the bottom towards the top of each mining horizon / zone, leaving no voids.
- Locating permanent infrastructure in more stable ground, such as in massive volcanic rocks located to north of the Casa Berardi Fault.

The Casa Berardi ground support measures to maintain drift stability are in accordance with commonly accepted practices. The selected typical stope size and sublevel spacing are conservative, reflect historical best practices, and help maintain stability and minimize dilution. Secondary support is evaluated on a stope by stope basis to mitigate unravelling and exposing faults and weaker lithologies or dilution problems. Different types of instruments are installed to monitor the stability of the excavations. These include five metres, 10 m, and 15 m extensometers (MBPX), SMART cables to monitor the amplitude and depth of rock movement and Sloughmeters, which detect the crack locations following rock displacement.

13.3 Underground Development

Development openings have been sized to meet safety and regulation standards, accommodate selected mining equipment, and meet the ventilation network requirements.

- Ramp dimensions: 4.5 m wide x 4.5 m high.
- Haulage drift dimensions: 4.5 m wide x 4.5 m high.

13.3.1 Ground Support

Ground control measures are applied systematically to ensure safe workplaces, limit dilution and overbreak, and stabilize weak rock masses, particularly in the vicinity of the main fault zones.

The following ground control measures are applied:

- Cable bolting or connectable Super Swellex bolts are used in intersections and large spans to provide long term ground stability.
- Intersections are limited to three way intersections and the creation of four way intersections is avoided.
- Development parallel to major structures or faults (i.e., silling out along the fault) is minimized by developing perpendicular to major structure wherever possible.
- Test holes are used to confirm the position and width of the Casa Berardi Fault. Based on these test holes zones requiring the installation of spiling and shortened development round support with fibre-reinforced shotcrete are identified. This support is applied an additional two metres before and beyond the Casa Berardi Fault.
- Test holes, shotcrete, spiling and other specialized ground support requirements are integrated in the weekly mine planning to ensure that potentially unstable conditions are supported in a rapid and timely manner.

Casa Berardi mine personnel identify potentially unstable joints and abnormal conditions as they are exposed. These situations are evaluated on an individual basis and where required the ground support is modified to stabilize the potential instability. Information regarding ground conditions is communicated daily through the ground control logbook.

13.3.2 Development Performance

Mine development performance has fallen short of the plan in recent years. In the 2018 LTP, the failure to meet development targets was identified as a significant issue. While development has remained at 2018 levels for the past two years it has been sufficient to sustain underground production levels. The SLR QP is of the opinion that while this could impact the final years of the underground operations by prolonging undergrounding mining past the current planned end date of 2027, this should not have a material impact.

The 2011 to 2021 Mine development performance is presented in Table 13-3.

Table 13-3: 2011 to 2021 Development Performance
Hecla Mining Company – Casa Berardi Mine

Year	Plan (m)	Actual (m)
2011	11,881	8,330
2012	11,727	8,681
2013	12,542	11,182
2014	14,374	11,417
2015	13,292	11,764
2016	12,959	11,812
2017	11,382	11,556
2018	10,070	8,851
2019	9,374	8,836
2020	10,240	8,454
2021	11,647	8,692

13.4 Backfill

Backfill is required to maximize mineral extraction and maintain stope stability. Three types of backfill are used at Casa Berardi: i) unconsolidated waste (rock fill), ii) CRF, and iii) paste fill. Rock fill is used in secondary stopes and for AVOCA longitudinal mining. CRF and paste fill are used primarily in stopes for initial mining horizons which will be eventually redeveloped through the paste fill.

Development waste material is used for rock fill and CRF. Transport of the rock fill to the stopes is by LHDs or trucks. In addition to the stability provided by the rock fill, the use of waste material allows for optimization of the hoisted waste tonnage and equipment utilization by coordinating backfilling in proximity to development areas.

CRF is available throughout the West Mine, including areas above the 470 m level where paste fill is not available. A surface plant produces the cement slurry in batches, which is transferred underground via a series of boreholes and lateral piping to either a portable cement mixer or directly to the mix pit location.

There is no paste fill in the East Zone, backfilling of the East Mine stopes is therefore only completed with CRF or rock fill.

The CRF is mixed and placed using special mobile equipment. This equipment prepares the cement pulp necessary for the designed CRF mixture.

A continuous, gravity-driven paste fill plant was constructed in 2013. The paste fill network can supply paste to the 113 (lower), 118, and 123 zones, below the 470 m level.

The advantages of paste fill include:

- Reducing the use of mobile equipment for fill transportation.
- Allowing better development performance through backfill.
- Providing better flexibility in the mining sequence.
- Allowing recovery and subsequent filling of caved stopes.

13.5 Mine Equipment

There is an extensive underground fleet of production, development, and support equipment and fixed plant equipment used at Casa Berardi.

The major equipment is summarized in Table 13-4.

Table 13-4: Underground Mine Equipment List
Hecla Mining Company – Casa Berardi Mine

Unit	2022	2023	2024	2025	2026	2027
MT426 haul truck	1	1	1	1	1	-
Sandvik TH540	2	2	2	2	2	2
AD30 Caterpillar haul truck	12	12	12	12	12	8
LHD R1600	13	13	13	13	11	9
Sandvik 6vg3	1	1	1	1	1	1
LHD R1300 3.5 yd3	2	2	2	2	2	2
LHD EJC 210	1	1	1	1	1	1
Jumbo 2 boom	5	5	5	5	5	2
Jumbo single boom	2	2	2	2	2	1
Long hole drills	5	5	5	5	5	3
Cement/service/utility	21	21	21	20	18	13
Lift deck units	11	11	11	10	10	3
Tractors and land cruisers	44	47	47	45	40	26
Locomotives	0	0	0	0	0	0
Grader	2	2	2	2	2	2

13.6 Mine Infrastructure

Mine infrastructure is located in two main areas, the West and East mines. The production and ventilation shafts, shops, WRFs and ore stockpiles, cement plant, paste fill plant, and ramp portal are located at the West Mine. The mill and administration building, crusher, East Shaft (not currently in use), warehouse, and shops are located at the East Mine. Figure 13-2 and Figure 13-3 illustrate each location.

13.6.1 West Mine Shaft

Prior to restarting operations in 2006, the shaft at the West Mine was developed. The West Shaft is positioned outside the faults and beyond the zone of stress influence due to mining. The West Shaft design was deepened to the 1,080 m level in 2013 and has been operational since 2015.

The West Shaft is a circular 5.5 m diameter shaft with a 42 m deep concrete shaft collar anchored in bedrock. Shaft stations are located at the 280 m, 550 m, 690 m, 795 m, 880 m, 1,010 m, and 1,030 levels. There are three skip loading stations at the 720 m, 835 m, and 1,055 m levels, a loading pocket at the 880 m level and a spill pocket at 1,080 m level.

The West Shaft is concrete-lined and equipped with a steel structure that divides the shaft into four compartments. Two compartments are allocated for the 12 t skips, each with a cage at the top. The third compartment intended for a service cage for personnel and material is not currently in use. The fourth compartment consists of a manway and a service area for pipes and electrical cables. The headframe is of conventional steel construction, 57 m high, incorporating a skip dump arrangement with ore and waste storage bins. The ore bin capacity is 1,200 t and the waste bin capacity is 370 t.

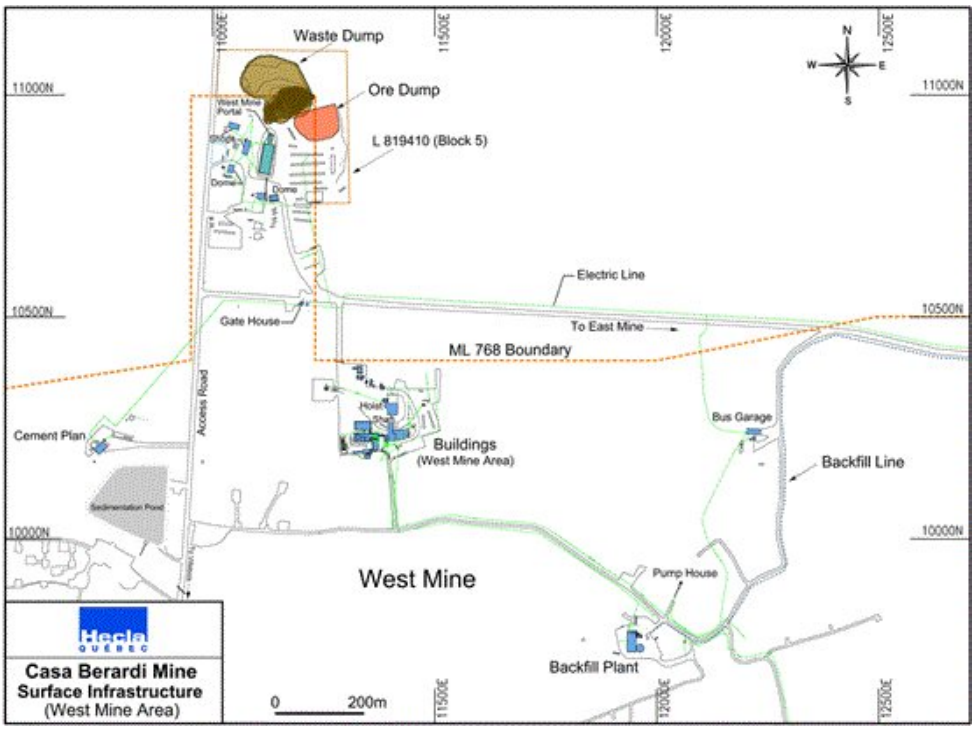


Figure 13-2: West Mine Surface Infrastructure

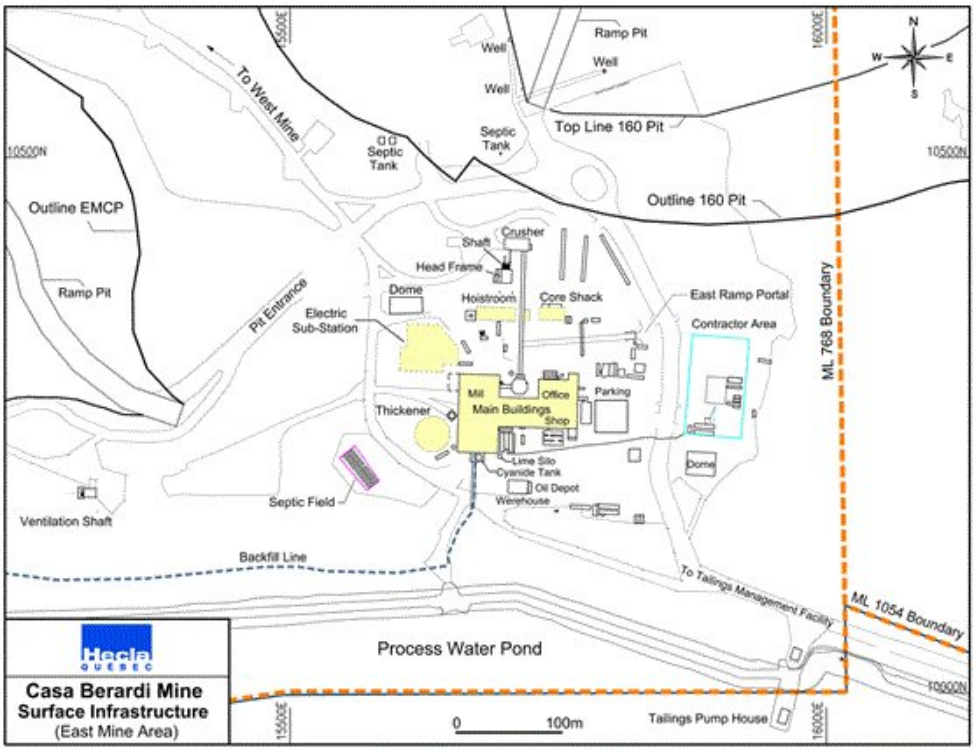


Figure 13-3: East Mine Surface Infrastructure

13.6.2 Ore and Waste Pass Systems

The ore and waste pass systems were sized and located according to the production requirements of the 113 and Lower Inter zones. Ore and waste passes are 2.4 m in diameter. The Lower Inter Zone ore and waste pass system terminates on the 570 m level, where ore and waste are transferred by truck to the 113 Zone ore and waste handling system. The ore and waste pass systems in the 113 Zone terminate at a chute on the 690 m level, where material is transferred by truck to a rock breaker grizzly. Grizzly discharge passes through a surge bin into the 720 m level loading pocket of the West Shaft and is hoisted to surface. A rock breaker grizzly for ore and waste is in operation on the 795 m level and feeds a loading pocket on the 835 m level. For the 124 Zone, all the material is brought to the surface by trucks. Ore and waste are transported to their respective dumps by LHD. Oversize material is handled by a rock breaker or moved to a suitable location for secondary blasting.

For the 118 and 123 zones, ore and waste passes terminate on the 985 m level automated drift. The ore pass connection in the 123 Zone (550 m to 985 m levels) was completed in 2019. Two automated trucks transport material from the automated chutes to automated rock breaker on 985 m level which is controlled from surface. The ore and waste pass systems on the 985 m level terminate at the 1,055 m level loading pocket. From the 1,055 m level loading pocket, ore and waste are skipped to surface.

13.6.3 Ventilation

The ventilation network design was based on physical mine configurations and accounts for the production rate, installed horsepower on diesel equipment, number of personnel, and simultaneous activities underground. The East Mine is ventilated from the West Mine via the track drift that connects the mines on the 280 m level.

The main ventilation raises for mine air distribution system are 3.35 m in diameter, excavated by a raise climber (Alimak) from the lower levels of each zone and connected with main airways. Raise ventilation access drifts (up to 10 m long) are excavated on each level/sublevel during raise development and connected to the main haulage drifts when accessed later. A ventilation schematic circuit is presented in Figure 13-4 and Figure 13-5.

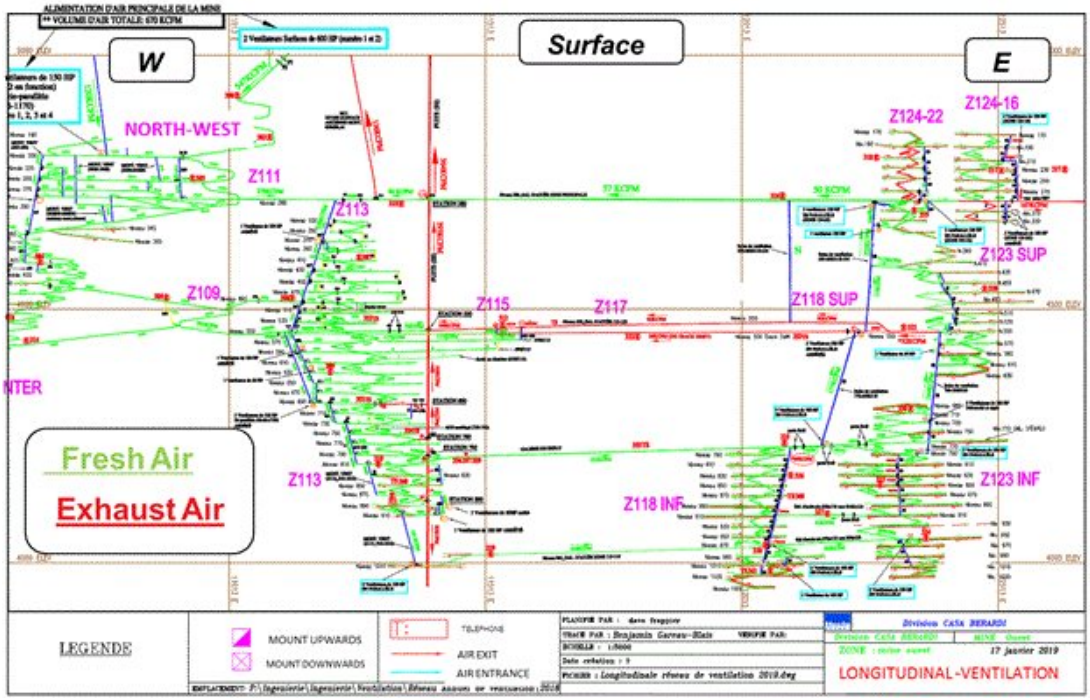


Figure 13-4: West Mine - Ventilation Schematic Circuit

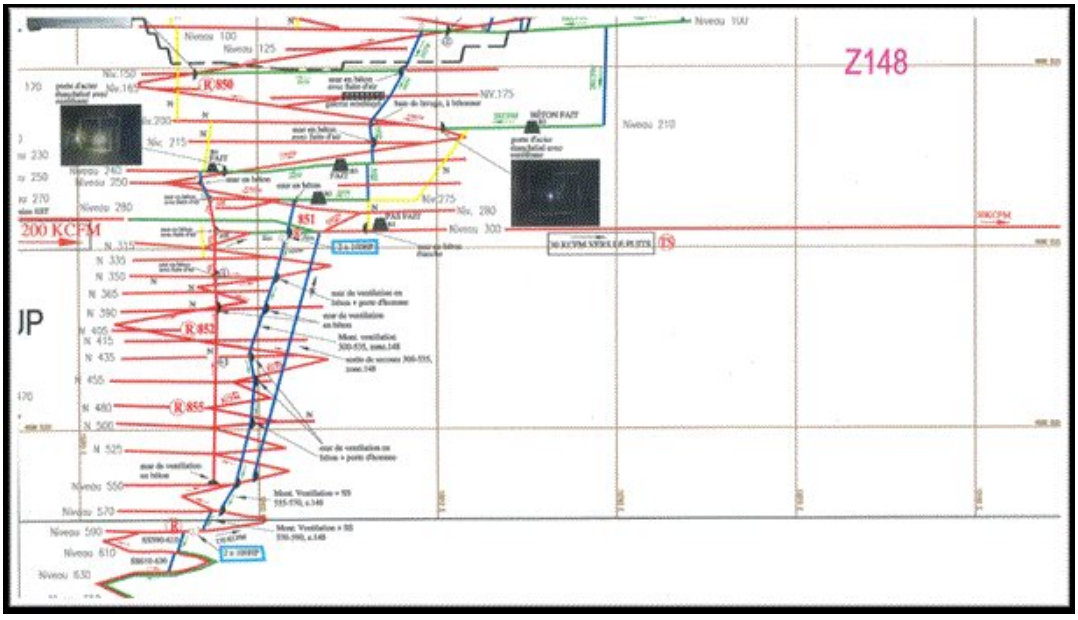


Figure 13-5: East Mine - Ventilation Schematic Circuit

The Mine requires 220 m3/s of air (465,000 cfm) at full production capacity. The ventilation network installations at the mine consist of:

- The fresh air intake system, which is comprised of two fans in parallel installed at the West Mine portal. These fans deliver 600,000 cfm of fresh air through the West Mine principal ramp with an air lock system. The operating static pressure is 6.5 in of water.
- The West Mine exhaust air points are the shaft, an old backfill raise, and the East Mine.
- Part of the air exhausted from the West Mine is reused for the ventilation of the East Mine activities and exhausted by the East Mine ramp.
- Numerous installed airflow regulators, booster fans, and ventilation raises.
- Due to broken fans the second fresh air intake system was downgraded, however, it remains an option to increase flexibility and the capacity of ventilation if needed. The second fresh air system had the potential of four 150 hp fans, and could provide 260,000 cfm airflow at an operating static pressure of 8.5 in of water.
- Study are in progress to improve the ventilation of the East Mine with a supply of fresh air.

13.6.4 Maintenance Facilities

The main fixed equipment, both on surface or underground, such as the hoist, compressors, ventilators, GEHO pumps, and cement plant, are covered by an integrated preventive maintenance program. Daily maintenance and parts replacement is completed on site. Major equipment overhauls are conducted off site in specialized maintenance shops.

The maintenance of mobile equipment, used on surface and underground, is conducted in a building located near the mill at the East Mine. This building includes a maintenance shop, warehouse, offices, a change room, and a communications system. The existing surface shop is well equipped (compressed air, lifting equipment, cranes, and welding facilities) and large enough to accommodate equipment employed at the site.

The warehouse is located nearby and facilitates the delivery of parts and materials for maintenance and repairs. Spare tires are stored on a nearby pad. The change room and sanitation facilities are located on the second floor of the building.

To improve the maintenance time and displacement of equipment, Hecla Québec installed an underground garage on the 550 Level, in 2010.

Another underground garage was completed in 2014 on the 810 Level, close to the 118 and 123 zones.

In 2022, another underground garage in the East Mine will be built to facilitate maintenance.

In 2024, a surface garage is planned to be built for the open pit equipment.

13.6.5 Power

Electrical power is supplied to site by Hydro-Québec through a 120 kV line from the town of Normetal (55 km to the southwest). Two main transformers are installed in the main substation, located at the East Mine site. The East Mine site is supplied by a 120 kV/4.16 kV – 16 MVA transformer (T1) and the West Mine site is supplied by a 120 kV/25 kV – 20 MVA transformer (T2) as presented on the electrical single-line diagram (Figure 13-6).

The East Mine site distribution network supplies the mill, East Mine, EMCP Pit and the East Mine facilities and garage.

The West Mine site employs a 25kV line network supplies the West Mine portal main ventilation fan, the headframe, hoist, shaft collar, and compressor buildings, West Mine facilities, and a 5 kV transformer to supply 1,000 kVA to underground substations in the mining areas. A 25 kV underground station supplies 1,000 kVA to substations in the 118 and 123 zones.

Underground power distribution is via cables installed in the West shaft or in the ramp. Power supply in Québec is very reliable. Hecla provides backup power for the West Mine headframe (135 kW), the surface garage (350 kW), the mill (525 kW), and the West Mine backfill plant (200 kW).

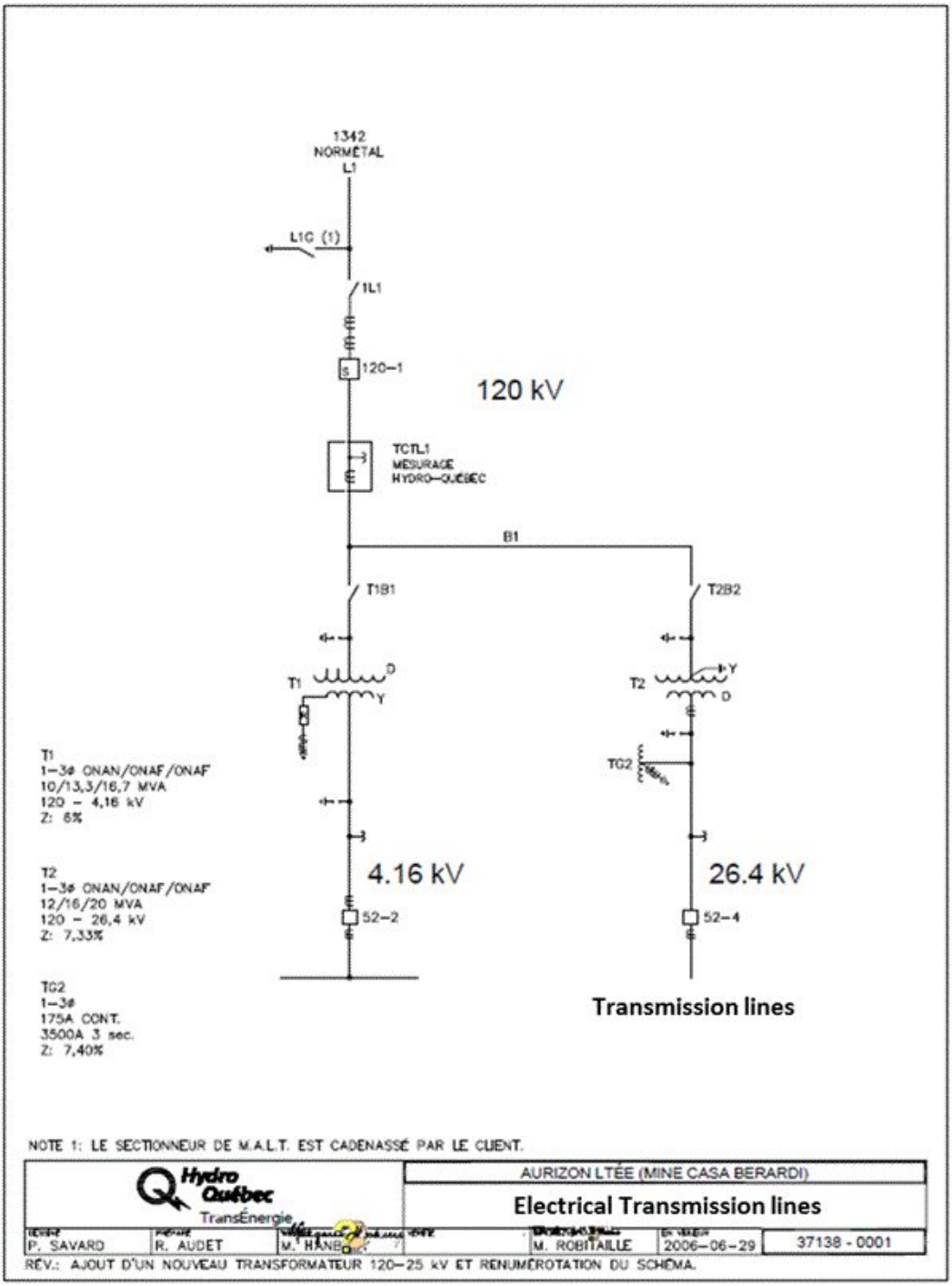


Figure 13-6: Casa Berardi Main Station 120 kV Flowsheet

13.6.6 Personnel

The Casa Berardi workforce consists of company personnel and contractors. The Hecla personnel and contractor lists for mining operations at Casa Berardi are presented in Table 13-5.

The number of Hecla employees required for the Casa Berardi mining operation is not expected to change significantly in the foreseeable future. The number of contractors varies month to month depending on labour requirements at the mine.

Underground production and lateral development is carried out by Hecla personnel, while contractors conduct vertical raise development. Open pit mining, currently operated by a contractor is planned to be converted to Owner operator status in 2024. Some contractor personnel are utilized in the processing plant. Operators and technical staff work a schedule consisting of seven days of dayshift, seven days of nightshift, and seven days off. General staff work on a four day on, three day off shift cycle.

Table 13-5: Mine Personnel List
Hecla Mining Company – Casa Berardi Mine

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
West Mine UG	253	248	248	248	166	89	0	0	0	0	0	0	0	0
East Mine UG	72	72	72	72	32	14	0	0	0	0	0	0	0	0
Mechanical	130	130	153	175	178	138	80	82	83	82	83	84	77	28
Electrical	48	48	48	48	45	32	5	5	5	5	5	5	5	5
Plant	96	99	99	99	97	97	95	92	91	91	91	88	87	41
Open Pits	15	154	150	131	131	131	139	151	156	139	139	139	131	82
Admin. Casa	4	4	4	4	4	4	4	4	4	4	4	4	4	0
Purchasing	12	12	12	12	12	12	10	10	10	10	10	10	10	4
IT- Computing	2	2	2	2	2	2	2	2	2	1	1	1	1	1
H.R.	7	7	7	7	7	6	5	4	3	3	3	3	3	1
Health & Safety	15	15	15	15	14	10	7	6	6	6	6	6	6	3
Engineering	32	32	32	32	31	25	18	16	16	16	16	16	13	6
Environment	6	6	5	5	5	4	3	3	3	3	3	3	3	3
Geology-Expl.	32	32	32	31	18	10	9	9	9	7	6	5	5	4
Admin. Val d'Or	15	15	15	15	15	11	11	11	11	11	11	11	11	6
Total	877	875	893	894	755	583	387	394	398	377	377	374	355	183

13.7 Open Pit Mining Operations

Open pit operations at Casa Berardi began in January 2016, in the EMCP Pit. In addition to the EMCP Pit, this TRS considers the planned Principal, 160 Zone, 134 Zone, XCMP, and WMCP pits. These open pits involve both the recovery of crown pillars above underground mining (i.e., EMCP, WMCP, and Principal pits) and mining of zones that have not been exploited underground (i.e., 134, 160, and XCMP pits).

13.7.1 Mining Method

The current mining method used in the XCMP and 160 Zone pits is described in the following paragraphs. This method will be used for the mining of subsequent open pits. Mining method and design considerations that are specific to the other planned pits are discussed later. Material is mined using conventional open pit mining methods, based on a truck/shovel operation. The rock is drilled, blasted, and loaded by hydraulic shovels into trucks, which deliver the material to a stockpile located near the primary crusher. Distances from the top of the ramp to the ore stockpile range from 300 m (160 Zone) to 5000 m (WMCP).

Waste materials generated by mining include overburden (i.e. peat, clay, till and sand), waste rock (i.e. clean and low-grade mineralized) and backfill from stopes intercepted during mining (i.e. unconsolidated sand and rock fill). The overburden material is removed and hauled to the Mixed WRF, while peat is stored separately for restoration-revegetation. Higher quality clay has been used for tailings dams, isolation levees and reclamation projects (e.g. cover of tailings in preparation for revegetation). Clean waste rock is used for surface infrastructure work such as roads, levees, tailings dams and foundations for civil engineering constructions. A portion of the clean waste rock is crushed and screened to provide aggregates for roadway construction and maintenance, and for use as abrasives in icy weather conditions. Low-grade material (below cut-off grade) is stockpiled in a different location than the ore. Stope backfill is hauled to the Mixed WRF.

13.7.2 Open Pit Design

Pit designs employ 7.5 m high mining benches, with a catch berm positioned every two benches (i.e., 15 m). This allows greater flexibility in regards to blast tonnage and control on pre-shear blasting and excavation of final pit walls. The option of using 10 m high mining benches is being studied to achieve even greater results on production and stability. The 160 Zone pit is planned in phases, with additional overburden stripping and pushbacks.

13.7.3 Slope Parameters – Overburden

Overburden slope parameters are based on recommendations from previous geotechnical and mining studies (Golder, 2009) and (BBA, 2011). A new study regarding slope parameters has begun in 2021 specifically for the 160 Zone; these parameters will be used in the final phase of the pit. The overburden slope parameters vary as function of material type:

- Slopes in clay: 4H:1V (14.1°) – 3H:1V (18.4°).
- Slopes in till: 2H:1V (26.6°).

In 2018, Hecla re-evaluated the 4H:1V slope angle in the clay material based on in situ observations and data from previous geotechnical characterizations using Rocscience's Slide 7.0 software (Hecla, 2018). Based on this analysis, the use of 4H:1V slopes in clay were demonstrated to be conservative and 3H:1V slopes were proved to be stable. As a result, the east and south overburden slopes of the EMCP Pit were excavated according to Golder Associates Inc.'s (Golder) (2009) recommendation of 4H:1V in clay. The north and west slopes, however, were excavated using a 3H:1V slope in clay. Inclinometers and prisms installed in the overburden confirm the stability of 3H:1V slope in the clay material. A part of the slopes in the EMCP Pit are covered with one metre of waste rock to prevent erosion.

Experience gained from the excavation of overburden in the EMCP Pit has demonstrated that information related to the bedrock-overburden contact was limited to drill hole locations. Although, the surface topography is relatively flat, the bedrock contact varies significantly across the site and particularly above the Casa Berardi Fault. At this location the bedrock forms a valley which varies from approximately 40 m below surface at the west end of the mine site to 50 m below surface at the east end. On either side of the Casa Berardi Fault, the bedrock elevation is higher, rising to 20 m below surface on the south side. The variation in the expected contact position (i.e., overburden thickness and topographic bench elevation) has required the Casa Berardi engineering personnel to modify the design in order to compensate for higher or lower pit wall positions.

The overburden slope parameters, for the XMCP Pit are identical to those used in the EMCP Pit, including the 3H:1V (18.4°) slope in clay, expect that the clay slopes were not covered with any waste rock but the till has been covered. For the 134, 160, WMCP, and Principal projects, the designs are based on a 3H:1V (14.1°) to 3.5H:1V (15.9°) slope in the clay and sand, and a 2H:1V (26.6°) in the till.

13.7.4 Slope Parameters - Rock

The slope parameters for the final pit wall in the rock are:

- An Inter Ramp Angle (IRA) of 52.5°.
- A Bench Face Angle (BFA) of 75°, over a 15 m height or two 7.5 m high benches.
- A 7.5 m wide catch berm every 15 m in elevation.

The rock slope parameters, used in the EMCP Pit, are identical to those of the other pits.

13.7.5 Ramp Design

Ramps for the EMCP and XMCP pits were designed with a nominal 10% centerline gradient. Switchbacks were designed with a centerline gradient of 8% to prevent the inside curvature gradient from becoming excessive. Ramp widths assume the use of rigid-body haul trucks with a width of 5.6 m, although articulated trucks are planned to be used for overburden and may be used in other areas as needed. A 22.0 m width was used for ramps with two-way traffic. This provides for a running width of three times the truck operating width and includes a 1.1 m high safety berm. In the lower portions of the pit designs, where the stripping ratio is minimal, ramps were narrowed to 17.0 m for one-lane traffic use.

Same parameters apply for the 160 Zone, Principal, WMCP, except for the width. The ramps have 26.5m width because they are designed for 150t rigid-body with a operating width of 7.0 m and includes a 1.45 m high safety berm.

The 134 Zone pit is also designed with these parameters, but with a one-lane ramp with a width of 17.0 m.

13.7.6 Underground Workings

The EMCP Pit has intercepted underground openings in the pit floor. These openings include unfilled drifts and raises, as well as backfilled stopes. Stope backfill is unconsolidated sand and rock fill. These excavations are largely isolated from the accessible areas of the underground East Mine by a series of hydrostatic barricades. The same types of openings will be encountered in the Principal and WMCP pits.

Procedures are in place for the definition of safety perimeters for specific mining activities, such as drilling, loading, and excavating, and for the movement of vehicles and personnel in proximity to these excavations or their remaining crown pillars. The use of C-ALS surveys and production drilling data (e.g., breakthrough locations) are used confirm the survey data and 3D models of the underground excavation. To date, no issues have been encountered related to the underground excavations. An incremental ore mining cost has been planned to cover the cost of excavating the backfill.

The XMCP, 134 and 160 pit projects will not intersect any underground excavations. These open pits are considered to have no impact on simultaneous underground operations and do not require any special precautions to be taken.

The WMCP Pit project will intercept underground infrastructure such as drifts, ramp, raises, and backfilled stopes. The West Mine underground decline will be intercepted. The SLR QP notes that special precautions will have to be taken as the openings might create rock mechanics issues. There will also be underground openings daylighting near the bottom of the WMCP Pit (infrastructures and stopes), which will create a need to manage geotechnical perimeters. The SLR QP notes, however, that Hecla personnel are already mitigating these types of challenges in the EMCP Pit. Underground operations will be completed prior to open pit operations disrupting underground infrastructures.

The Principal Pit project will intersect underground excavations in the bottom of the pit.

13.7.7 Open Pit Mining Equipment

Mining equipment is currently operated and maintained by a contractor until 2024. The current equipment fleet is summarized in Table 13-6. The projected Owner equipment fleet is summarized in Table 13-7.

Table 13-6: Mine Equipment List Open Pit
Hecla Mining Company – Casa Berardi Mine

Unit	Number
Cat 740 Articulated Trucks	10
Cat 773 Rigid-body Trucks	10
Komatsu 1250 Excavator	1
Komatsu 800 Excavator	2
Cat 365 Excavator	1
Cat 349 Excavator (Rock Breaker)	2
Cat 336 Excavator	2
Cat D8 Bulldozer	1
Cat D6 Bulldozer	1

Unit	Number
Cat 14H Grader	1
DX 800 Drill	3
DX 1500 Drill	1
Cat 980 Loader	1
Cat 966 Loader	1
Manitou Telescopic Handler	1
Water Truck	1
Fuel Truck	1
Blasting Cube Truck	1
Light Tower	5

Table 13-7: Project Owner Equipment Flee
Hecla Mining Company – Casa Berardi Mine

Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Excavator CAT 6020	1	1	1	1	1	2	2	2	2	1	1	-
Excavator CAT 6015	2	2	2	2	3	3	2	1	1	2	-	-
Truck CAT 785	-	-	-	-	-	-	3	8	15	16	10	-
Truck CAT 775	4	11	9	9	9	11	12	6	-	3	-	2
Truck CAT 745	3	5	7	11	11	10	7	1	-	-	-	-
Drill DX800	3	3	3	3	3	3	3	6	6	6	3	3
Loader CAT980	-	-	1	1	1	1	1	1	1	1	1	1
Bull CAT D8	3	3	3	3	4	4	4	4	4	3	2	1
Bull CAT D6	1	1	1	1	1	1	1	1	1	1	1	1
Grader CAT 16M	1	1	1	1	2	2	2	2	2	2	2	2
Water Truck CAT 775	0	1	1	1	1	1	1	1	1	1	1	1
Loader CAT 914	0	1	1	1	1	1	1	1	1	1	1	1
Manitou 2350	0	1	1	1	1	1	1	1	1	1	1	1
Pickup F250	6	6	6	6	6	6	6	6	6	6	6	6
School Bus	-	1	1	1	1	1	1	1	1	1	1	1
Fuel/Lube CAT 775	1	1	1	1	1	1	1	1	1	1	1	1
Service Truck F550	2	2	2	2	2	2	2	2	2	2	2	2
Tower Lights	5	8	8	8	8	12	12	12	12	12	12	12
Flagro Trailer (Heater)	1	1	1	1	1	1	1	1	1	1	1	1
Lifting Platform JLG600SJ	1	1	1	1	1	1	1	1	1	1	1	1
Manitou 2150	1	1	1	1	1	1	1	1	1	1	1	1
Main Lift CAT 2C5000	1	1	1	1	1	1	1	1	1	1	1	1
Lifting Platform JLG1930es	1	1	1	1	1	1	1	1	1	1	1	1

Unit	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Tools Trailer Truck	1	1	1	1	1	1	1	1	1	1	1	1
Lunch Room Trailer	-	-	-	1	1	1	1	1	1	1	1	1
Washroom Trailer	-	1	1	1	1	1	1	1	1	1	1	1
Scaling Excavator CAT349 Long Boom	1	1	1	1	1	1	1	1	1	1	1	1
Casting Excavator CAT349	-	2	2	2	2	2	2	2	2	2	2	2
Cleaning Excavator CAT349	-	1	1	1	1	1	1	1	1	1	1	1
Loader CAT 980	-	1	1	1	1	1	1	1	1	1	1	1
Excavator CAT 336	-	1	2	2	2	2	2	2	2	2	2	2

13.7.8 Geotechnical/Hydrogeological Considerations

Of the planned pit projects, the Principal Pit requires the analysis of additional considerations. The Principal Pit is located in the vicinity of an esker surrounded by wetlands. Hecla retained the services of Golder (2010) to perform a geotechnical investigation to provide a slope stability analysis of the overburden in the Principal Pit sector.

The general soil stratigraphy encountered in the boreholes varies from east to west, grading from an esker, composed predominately of granular material, to a stratified cohesive deposit over glacial till. The esker has been identified over more than 75 km, with a north-south orientation. The geotechnical study (Golder, 2010) confirmed the occurrence of the esker within the vicinity of the preliminary Principal Pit, where the thickness may reach more than 50 m. Golder (2010) did not, however, allow for the identification of the esker limits, nor the variations of the lithologies and hydraulic properties within the esker.

The presence of the esker in the vicinity of the preliminary Principal Pit may result in large inflows and potential groundwater contamination of the esker during project operations. The primary source of potential contamination being the leaching of metals into groundwater, primarily arsenic, from the waste rock pile.

During 2021, SRK Consulting (Canada) Inc. (SRK), carried out a program of numerical groundwater modelling of the Principal Pit for passive inflow predictions and made recommendations to manage expected inflow rates during mining. One of the key recommendations proposed was to commence pumping approximately 18 months prior to the start of mining to reduce the ongoing pumping rate during the mining operations. Stripping of the Principal Pit is schedule to commence in 2024. The final eight years of mine production will come from the Principal Pit followed by the WMCP Pit and it will be essential to maintain efficient dewatering during this period.

The fieldwork program to address these groundwater control options includes:

- Seismic-refraction survey.
- Monitoring well installation and pumping tests.

- Hydrogeology characterization.
- Conceptual and numerical hydrological model.
- Estimate passive inflow rates into the Principal Pit.
- Dewatering requirements

Planning for mining of the remaining open pits is ongoing.

The list of studies carried out for the Casa Berardi underground mines to address geotechnical, geomechanical, hydrological, and hydrogeological conditions are indicated in Table 13-8. Similar studies carried out for the surface open pit mines are summarized in Table 13-9.

Table 13-8: Geotechnical, Geomechanical, Hydrological and Hydrogeological Studies (Underground Mines)
Hecla Mining Company – Casa Berardi Mine

Study	Year	By	Type	Objective	Results Summary	Report Reference Name
				West Mine		
1	1999	CANMET	Geomechanics	In situ stress measurements	Stress measurements were taken at two locations in the West Mine, providing the regional stress tensor.	Canmet (1999)
2	2017	Hydro-Resources	Hydrogeology	Crown Pillar	Determined hydrological properties in the WMCP situated above the underground principal zone, and identified prominent water bearing faults.	Hydro-Resources Inc. (2017)
3	2019	Hecla	Geomechanics	Ground Control Management Plan (GCMP)	Establishes common procedures developed for identifying, evaluating, communication and monitoring geotechnical risks (developed by Hecla).	Hecla Québec (2019)
4	2019	Hecla	Geomechanics	Backfill	Demonstrated the backfilling requirements for plug and mass strengths.	Alcott et al. (2019)
				East Mine		
1	2015	Hecla	Geomechanics	Reopening East Mine Operations	Demonstrated the impact of mining the lower East Mine on the surface.	Hecla Québec (2015)
2	2019	Hecla	Geomechanics	GCMP	Establishes common procedures developed for identifying, evaluating, communication and monitoring geotechnical risks (developed by Hecla).	Hecla Québec (2019)

Table 13-9: Geotechnical, Geomechanical, Hydrological and Hydrogeological Studies (Open Pit Mines)
Hecla Mining Company – Casa Berardi Mine

Study	Year	By	Type	Objective	Results Summary	Report Reference Name
				EMCP Pit		
1	2020	Itasca	Geomechanics	Slope Angle In Rock	Determined the optimal slope angles in rock, based on oriented core drilling/logging and additional rock laboratory tests.	Itasca (2020)
2	2017	Hydro-Resources	Hydrogeology	Water Table	Established the water state in/near the EMCP, demonstrating the draining capability of the East Mine (under draining the clay overburdens).	Hydro-Resources Inc. (2017)
3	2018	Hecla	Soil	Slope Angles in Overburden	Confirmed slope angles in overburden based on operational observations, recalibrated to numerical modeling response.	Hecla Québec (2018)
4	2019	Hecla	Geotechnical	GCMP	Establishes common procedures developed for identifying, evaluating, communication and monitoring geotechnical risks (developed by Hecla).	Hecla Québec (2019)
				160 Pit		
1	2013	Golder	Geomechanics	Slope Angle in Rock	Determined the preliminary slope angles in rock, based on oriented core drilling/logging and numerical modeling.	Golder (2013)
2	2019	Hecla	Geotechnical	GCMP	Establishes common procedures developed for identifying, evaluating, communication, and monitoring geotechnical risks (developed by Hecla).	Hecla Québec (2019)
3	2021	ConeTec	Soil	Determining Soil Strength Properties	Factual report establishing soil strength properties thru seismic piezocone penetration testing (SCPTU).	ConeTec (2021)
4	2020	Itasca	Soil	Slope Angles in Overburden	Numerical analysis of slope angle in clay, for saturated overburden conditions.	Itasca (2020)

Study	Year	By	Type	Objective	Results Summary	Report Reference Name
5	2020	Hydro-Resources	Hydrogeology	Water Table	Preliminary assessment of the water table near the 160 Pit, with a crude assessment of well locations to depressurize the till overburden layer.	Hydro-Resources Inc. (2020)
6	2021	SRK	Hydrogeology	Gap Analysis for Hydrology and Hydrogeology	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021a)
7	2021	SRK	Soil	Gap Analysis for Geotechnical Soil and Stratigraphy	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021e)
8	2021	SRK	Rock	Gap Analysis for Geomechanical Rock Stability	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021g)
9	2021	SRK	Hydrogeology	Hydrogeology in Rock	Determined the permeability of the rockmass.	SRK (2021f)
				Principal Pit		
1	2011	Golder	Soil	Slope Angles in Overburden	Initial numerical analysis of slope angle in clay, for saturated overburden conditions.	Golder (2011)
2	2020	Geophysiqhe Sigma	Soil	Overburden Thickness and Stratigraphy	Established, thru geophysics, overburden thickness/stratigraphy in the Principal zone.	Geophysiqhe Sigma (2020)
3	2021	ConeTec	Soil	Determining Soil Strength Properties	Factual report establishing soil strength properties thru SCPTU.	ConeTec (2021)
4	2021	SRK	Hydrogeology	Evaluate the Passive Ground Water Inflow into the Principal Pit	Established the esker's hydrological characteristic (drawdown and zone of influence) thru long term pump tests and evaluated the preliminary pumpability performance. Related the observation to numerical modeling to forecast passive inflows of groundwater into the Principal Pit, per extraction phase.	SRK (2021a)

Study	Year	By	Type	Objective	Results Summary	Report Reference Name
5	2021	SRK	Hydrogeology	Gap Analysis for Hydrology and Hydrogeology	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021b)
6	2021	SRK	Soil	Gap Analysis for Geotechnical Soil and Stratigraphy	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021e)
7	2021	SRK	Rock	Gap Analysis for Geomechanical Rock Stability	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021g)
8	2021	SRK	Hydrogeology	Hydrogeology in Rock	Determined the permeability of the rockmass.	SRK (2021d)
				WMCP Pit		
1	2020	ConeTec	Soil	Determining Soil Strength Properties	Factual report establishing soil strength properties thru SCPTU.	ConeTec (2021)
2	2021	SRK	Hydrogeology	Gap Analysis for Hydrology and Hydrogeology	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021a)
3	2021	SRK	Soil	Gap Analysis for Geotechnical Soil and Stratigraphy	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021h)

Study	Year	By	Type	Objective	Results Summary	Report Reference Name
4	2021	SRK	Rock	Gap Analysis for Geomechanical Rock Stability	Performed a gap analysis, reviewing all relevant past studies, to establish future requirements to meet permitting and/or feasibility level designs.	SRK (2021g)
5	2021	SRK	Hydrogeology	Hydrogeology in Rock	Determined the permeability of the rockmass.	SRK (2021d)

13.7.9 Material Management

Over the LOM, open pit operations will generate over 262 Mt of material. This material will be comprised of overburden, ore, low grade material, clean waste and back fill, will be extracted from up to three different open pits at any one time at different stages of development. Some pits will be in the stripping phase, while others will be extracting ore and rock waste. Mature pit projects will see clean waste rock production diminish as the strip ratios decrease towards the bottom of the pits.

Owing to the complexity associated with handling different types of material with different properties, a robust production plan needs to be supported with a robust waste management program. Casa Berardi's LTP has been built to manage the infrastructure material quantities. Shortage in any type of material could have negative effects on the mine plan if critical infrastructure cannot be put into place in a timely manner. Correcting these shortages, will also result in increased costs which would be difficult to control. Accordingly, the construction of WRF infrastructure has been scheduled to start when building materials are available, as opposed when a need for storage arises. At this time, different scenarios are being studied regarding the waste rock disposal. Multiple sequences and westward WRFs (WRF #F) are being investigated. Some scenarios explore the possibility of backfilling either the Principal or WMCP pits to reduce environmental impacts and costs related to waste management.

13.7.10Waste Rock Characterization

Maxxam Analytical Laboratory performed the following tests on waste rock samples:

- Acid generation potential.
- Metal content (partial digestion).
- Leaching according to EPA-1311 test method (acetic acid).
- Leaching according to EPA-1312 test method (nitric and sulphuric acid – acid rain).
- Leaching according to CTEU-9 test method (water).

Based on these analyses, the waste rock has been identified as non-acid generating but has been classified as leachable according to the Québec Directive 019 criteria. The SLR QP notes, however, that the contents measured are below the criteria for the classification as a high-level risk mining waste.

The waste rock has been classified in two distinct categories, clean and low grade mineralized. Clean waste rock can be used for construction, however, low grade mineralized material cannot. Low grade mineralized material is defined as the 10 m envelope of material surrounding mineralization. This material must be buried with either clay or clean waste rock, at the Mixed WRF, to prevent it from being in contact with the air.

13.7.11Waste Rock Facility Locations and Construction

The following criteria have been used for the selection of potential waste rock and overburden storage sites:

- Avoid material storage over the esker area.
- Avoid material storage over wetlands (loading capacity).
- Avoid material storage in streams and surface water bodies.
- Limit transport distance within the mining pit.

The Mixed WRFs #1, #2, and #3 have been designed as an engineered waste disposal complex capable of containing low cohesive materiel such as clay materials. The Mixed WRF uses a crown shape infrastructure, that acts as recipient for the clays. Low grade mineralized waste rock and till are used to build containment cells within the crown. Each cell is accessed by a series of temporary roadways and dumping fronts, constructed using waste rock. These temporary infrastructures are ultimately buried in clay or covered by clean waste rock, as the WRF is finally caped, in the last step before full reclamation. The construction of the Mixed WRF is strictly controlled to allow for uniform deposition of waste materials in one metre lifts over its entire footprint.

In addition to the existing Mixed WRFs #1,#2, and #3, located to the southeast of the EMCP Pit, preliminary Mixed WRF facilities are planned, in the vicinity of the preliminary WMCP and Principal pits. Final locations, capacity, and configurations have not been finalized and will depend on future long term mine plans.

Figure 13-7 presents a general plan of the Casa Berardi site and indicates the location of the actual WRF complex (i.e., Mixed WRFs #1, #2, and #3) and the preliminary WRF sites (i.e., Mixed WRF #F). Whenever possible, waste will be used to backfill the open pits that have been exhausted. The plan is to fill the EMCP Pit starting in 2022 and the Principal Pit by 2032. Approximately 53 Mt of material extracted from the WMCP Pit will be used to backfill the Principal Pit. Backfilling of the open pits will depend on the timing of their completion and on the haulage distances between the WRF site and the active pit. Table 13-10 describes the dumping sequence as a function of material type for each open pit projects.

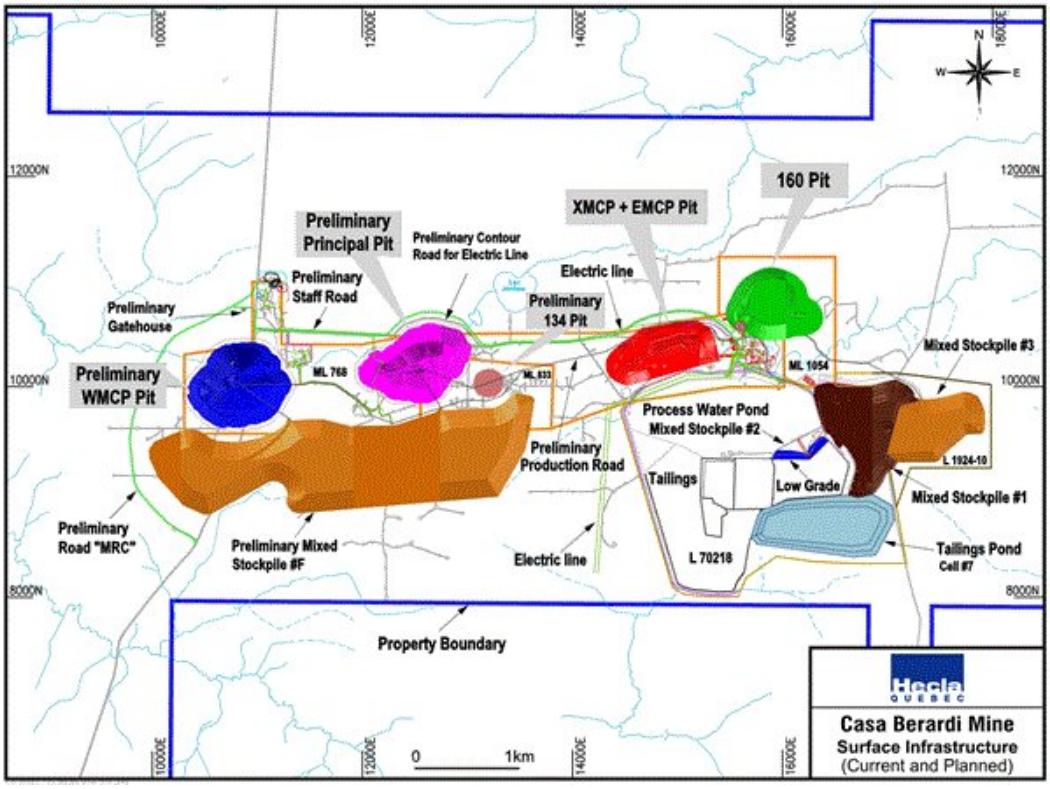


Figure 13-7: Open Pit and Waste Rock Locations

Table 13-10: Dumping Sequencing
Hecla Mining Company – Casa Berardi Mine

Area	Material	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
EMCP-EXP	Overburden														
	Rock Waste		MH3/EMCP fill	EMCP fill											
F134	Overburden														
	Rock Waste														
F160	Overburden	MH3/EMCP fill	MH3/EMCP fill	EMCP fill											
	Rock Waste	MH3/EMCP fill	MH3/EMCP fill	EMCP fill	MHF/EMCP fill	MHF/EMCP fill	MHF	MHF							
WMCP	Overburden							MHF	MHF	MHF	MHF				
	Rock Waste							MHF	MHF	MHF	MHF	PRIN fill	PRIN fill	PRIN fill	PRIN fill
PRINCIPAL	Overburden				MHF	MHF	MHF	MHF							
	Rock Waste					MHF	MHF	MHF	MHF	MHF	MHF				

The design criteria for the WRFs are to:

- Maximize capacity based on the bearing capacity of the ground, to reduce the environmental impact of the WRF footprints to the site.
- Whenever possible, backfill completed open pits. It must be noted that hauling distances have a major impact on the economic viability of the open pit projects. Some open pits will be left unfilled, owing to uneconomical hauling distances.
- Optimize pit scheduling to allow waste materials generated by mining to be used for the dump site infrastructure (e.g., access roads).
- When backfilling open pits that intersect underground excavations, where possible use only free-draining materials. If overburden is used for backfill, ensure a free-draining area (drain) from the top to the bottom of the pit.

13.7.12Overview of Pit Projects

13.7.12.1 XMCP Pit

The XMCP Pit project design is based on:

- Slopes in clay: 3H:1V (18.4°).
- Slopes in till: 2H:1V (26.6°).
- Slopes in rock: IRA of 52.5°.
- No underground excavations will be intercepted.
- Geotechnical considerations: Casa Berardi Fault will intersect the final North Wall.
- Mining to be carried out in two phases.
- The EMCP ramp will be used to reduce travelling length and enable greater depth in the XMCP Pit.

An isometric view of the ultimate EMCP (right) and XMCP (left) pits is presented in Figure 13-8.

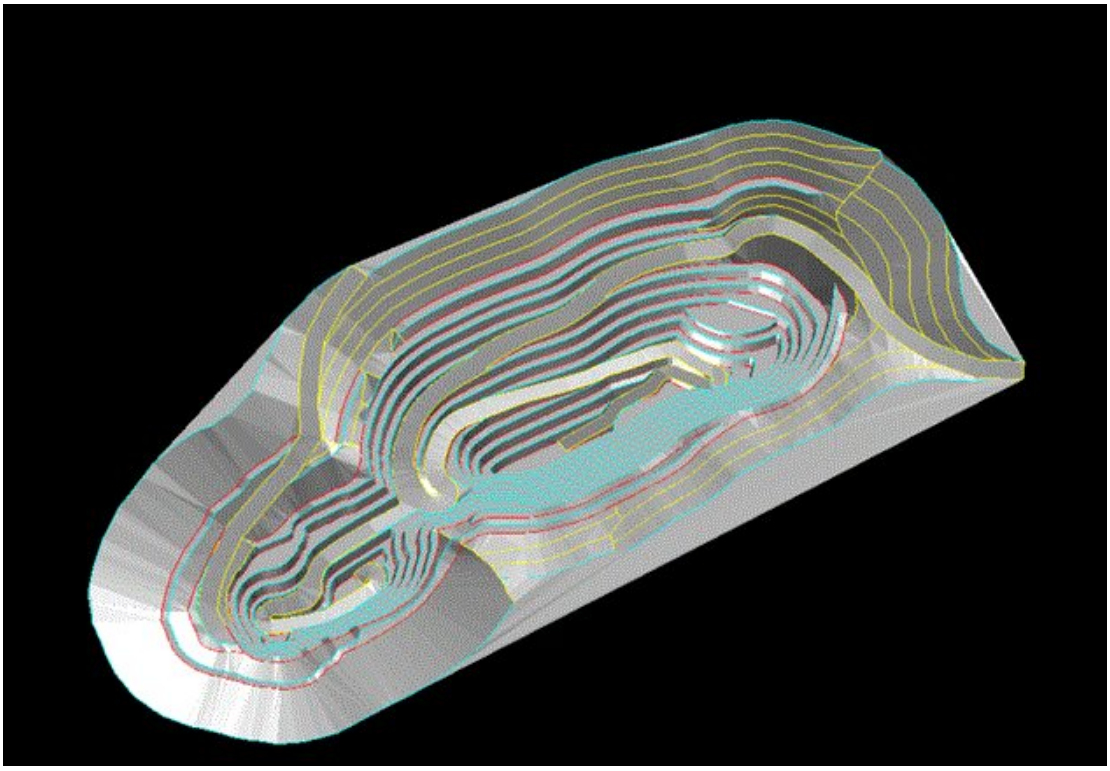


Figure 13-8: Isometric View of the EMCP Pit and XMCP Pit Project (Ultimate Pit Shell)

The remainder of the XMCP Pit will be mined from 2023 to 2024, this represents approximately 188,611 t.

13.7.12.2 160 Pit

The 160 Pit project design is based on:

- Slopes in clay: 3H:1V (18.4°) to 3.5H:1V (15.9°).
- Slopes in till: 2H:1V (26.6°).
- Slopes in rock: Inter Ramp Angle (IRA) of 52.5°.
- No underground excavations will be intercepted.
- Mining to be carried out in a four phases (Mining 3rd phase as of Q1 2022).

An isometric view of the ultimate 160 Pit is presented in Figure 13-9.

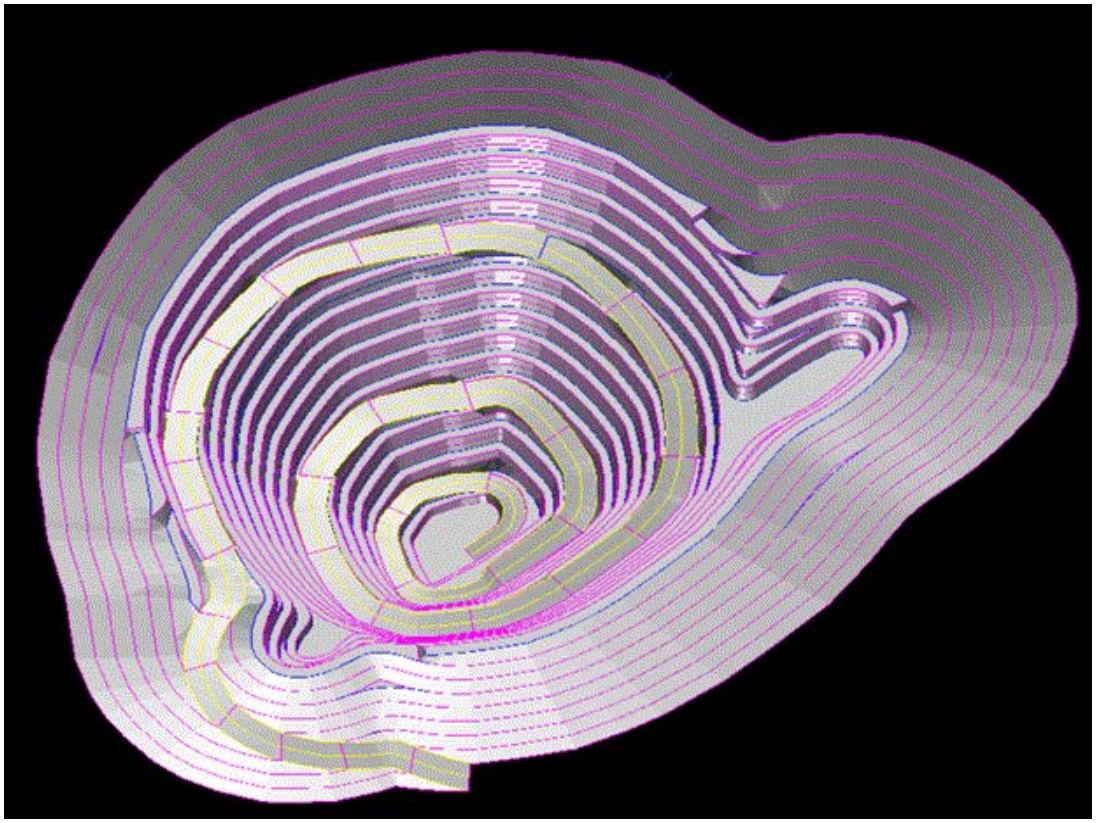


Figure 13-9: Plan View of the 160 Pit Project

The 160 Pit is planned for mining over the period from 2022 to 2028 and includes a total estimated 5.03 Mt of ore during which the underground mine will be producing at an average rate of 719,000 tpa ore.

13.7.12.3 134 Pit

The 134 Pit project design is based on:

- Slopes in clay: 3H:1V (18.4°).
- Slopes in till: 2H:1V (26.6°).
- Slopes in rock: IRA of 52.5°.
- No underground excavations will be intercepted.
- Mining to be carried out in a single phase.

An isometric view of the ultimate 134 Pit is presented in Figure 13-10.

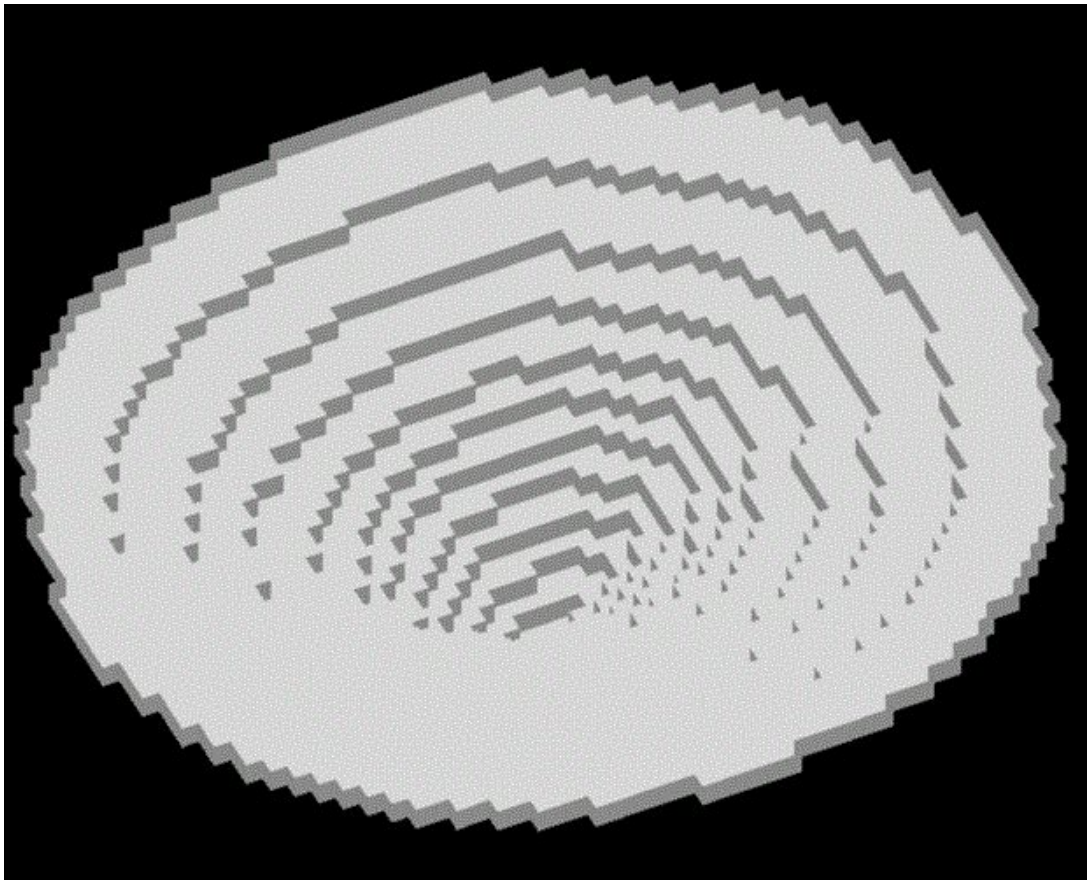


Figure 13-10: Isometric View of the 134 Pit Project (Ultimate Pit Shell)

The 134 Pit is planned to be mined from 2034 to 2035, and contained approximately 115,000 t of ore.

13.7.12.4 WMCP Pit

The WMCP Pit project design is based on:

- Slopes in clay: 3H:1V (18.4°).
- Slopes in till: 2H:1V (26.6°).
- Slopes in rock: IRA of 52.5°.
- Underground excavations, including the main ramp, will be intercepted in the east and north walls.
- Geotechnical considerations: Casa Berardi and Auxiliary Faults will intersect the final west and north-east wall.
- Stripping of this pit is to occur following the completion of underground mining (2028).

The isometric view of the optimized WMCP Pit is presented in Figure 13-11.

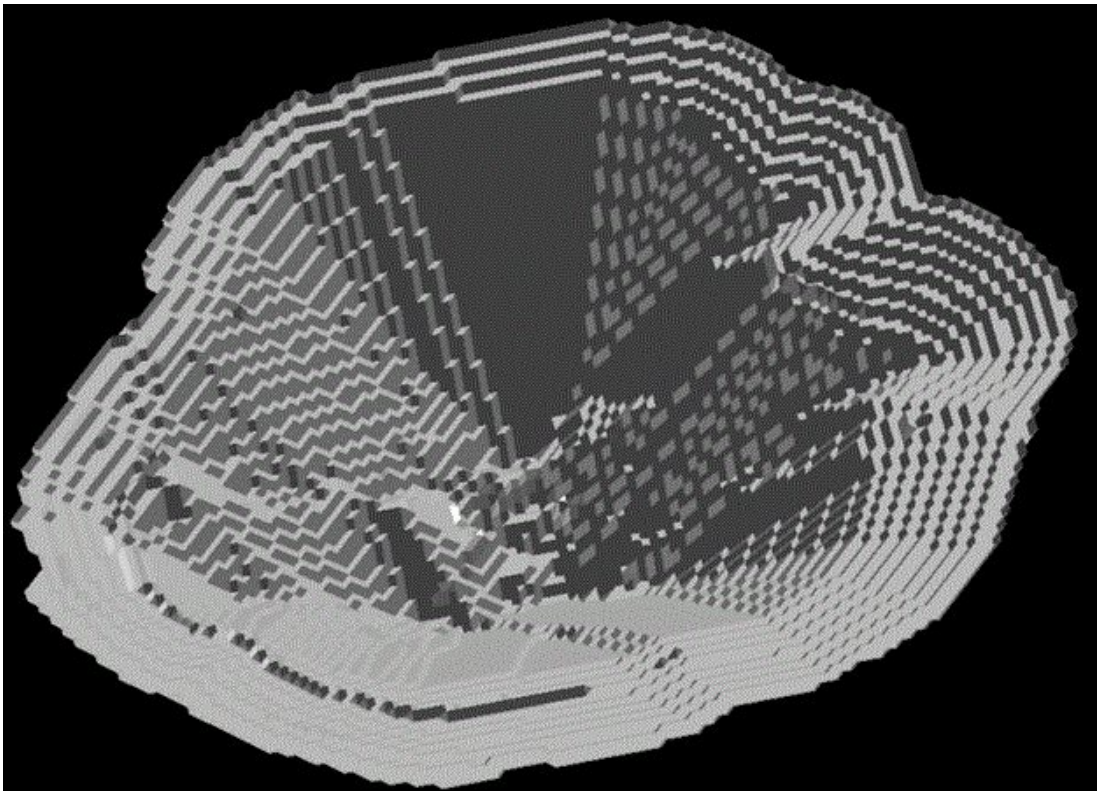


Figure 13-11: Isometric View of the WMCP Pit Project (Ultimate Pit Shell)

The WMCP Pit is planned to be mined in the final LOM years. Overburden stripping will commence in 2028 whereas ore mining will occur from 2032 until 2035 for a total of 5.33 Mt ore. The design has not yet been updated with the new pit shell.

13.7.12.5 Principal Pit

The Principal Pit project design is based on:

- Slopes in clay and sand: 3H:1V (18.4°).
- Slopes in till: 2H:1V (26.6°).
- Slopes in rock: IRA of 52.5°.
- Underground excavations will be intercepted in the pit bottom.
- Geotechnical considerations: excavation in proximity to an esker; inflow and contamination controls.

The isometric view of the optimized Principal Pit is presented in Figure 13-12.

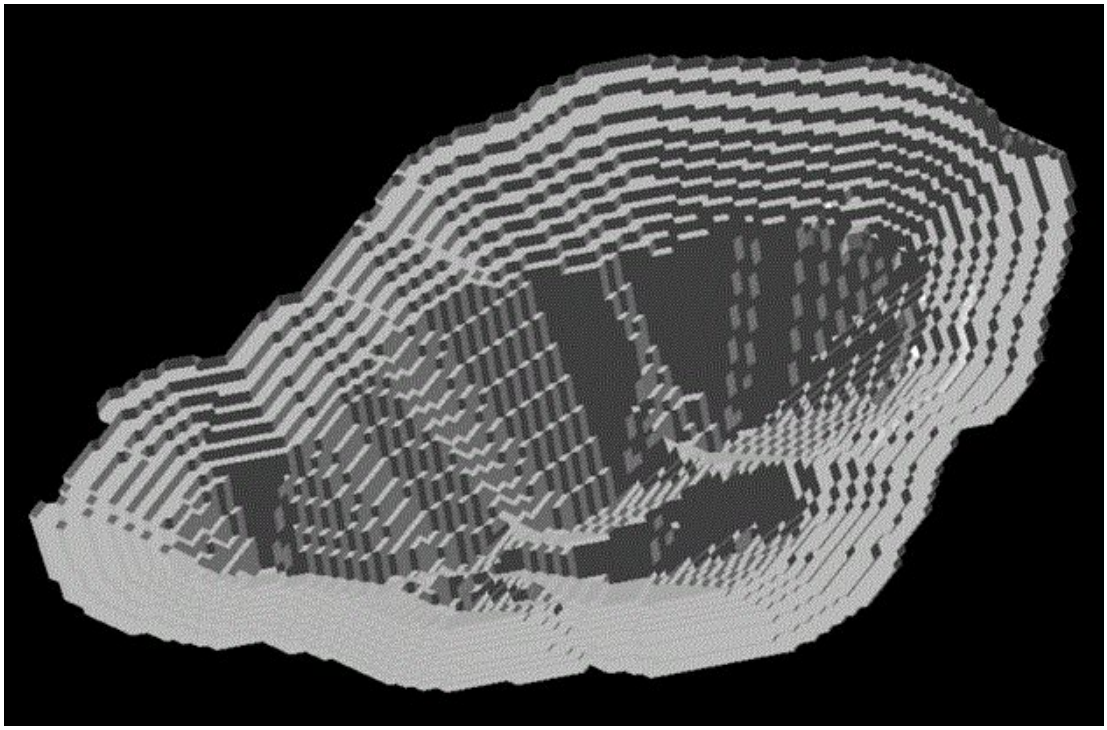


Figure 13-12: Isometric View of the Principal Pit Project (Ultimate Pit Shell)

The Principal Pit is planned to be mined over the period from 2028 to 2031 for a total of 5.78 Mt. During this period the Principal Pit will be the only producing area of the mine operation. The design has not yet been updated with the new pit shell.

13.8 Long Term Plan

Hecla's planning practice includes the development of an LTP. The LTP is based upon the Mineral Reserves plus a portion of the Mineral Resources. It is an internal Hecla document and is used a guide for management's long term production planning and expectations. The LTP includes operating cost requirements for the additional tonnes mined (i.e., Mineral Resources), as well as capital provisions for development, mine infrastructure and equipment for exploitation of the Mineral Reserve, and for conversion of the Mineral Resources that were included within the LTP. If mine production does not extend beyond the known Mineral Reserves, these costs would be less than the amount included in the LTP. The LTP is updated every year with the new information available.

13.9 Life of Mine Plan

The LOM plan for Casa Berardi is the LTP with the Inferred Mineral Resources removed to ensure that only Mineral Reserves have been included for the economic analysis. The LOM plan includes 2.4 Mt grading 5.27 g/t Au from underground and 16.5 Mt grading 2.61 g/t Au from open pits, that will result in total recovered gold of 1.49 Moz Au over the LOM.

Underground production is forecasted to average approximately 1,100 tpd for the six year period from 2022 to 2027 while the open pits will average approximately 3,250 tpd over a fourteen year period from 2022 to 2035 under the present operating plan (Table 13-11). A production increase for the open pit is planned in 2028 which will level out at 1.6 Mtpa in 2029 until the end of the mine life. Production will be provided from the open pits only starting in 2028 until 2035.

The processing plant will average a throughput of 3,700 tpd over the LOM period based on 360 days per year.

Silver production is estimated as 24% of the gold production based upon operating records and the silver revenue is included in the LOM plan financial analysis.

Table 13-11: LOM Production Forecast
Hecla Mining Company – Casa Berardi Mine

Description	Units	Total	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Days	Day	4,860	360	360	360	360	360	360	360	360	360	360	360	360	360	360
UG Production	000 t	2,375	469	469	423	419	355	240	-	-	--	-	-	-	-	-
OP Production	000 t	16,451	607	579	706	860	945	1,081	1,518	1,562	1,562	1,563	1,627	1,627	1,627	585
OP Waste & OB	000 t	245,641	6,197	9,443	14,488	17,639	19,055	18,918	20,981	24,687	24,687	24,687	24,623	24,623	13,383	2,223
Processing	000 t	18,826	1,076	1,048	1,129	1,280	1,300	1,321	1,518	1,562	1,562	1,563	1,627	1,627	1,627	585
Grade UG	g/t Au	5.27	5.60	5.59	5.03	5.01	5.15	5.07	-	-	-	-	-	-	-	-
Grade OP	g/t Au	2.61	1.64	1.54	2.20	1.75	1.91	1.79	2.78	3.23	2.80	2.24	3.40	3.02	3.10	2.80
Grade UG + OP	g/t Au	2.95	3.36	3.35	3.26	2.82	2.80	2.39	2.78	3.23	2.80	2.24	3.40	3.02	3.10	2.80
Gold Contained	000 oz Au	1,784	116	113	118	116	117	102	136	162	140	113	178	158	162	53
Mill Recovery	%	84%	87%	87%	87%	87%	87%	88%	84%	83%	82%	79%	81%	80%	80%	80%
Gold Production	000 oz Au	1,490	101	98	103	101	102	89	114	135	115	88	145	126	130	42

The LOM underground development schedule is shown in Table 13-12.

Table 13-12: LOM Development Schedule
Hecla Mining Company – Casa Berardi Mine#

Description	Units	Total	2022	2023	2024	2025	2026	2027
Days		2,190	365	365	365	365	365	365
Operating Development Ore								
Principal Zone	m	6,247	1,072	795	1,271	1,487	1,198	424
Satellite Zones	m	327	-	-	110	129	44	44
Sub-Total	m	6,574	1,072	795	1,381	1,617	1,241	467
Operating Development Waste								
Principal Zone	m	8,533	2,132	1,525	1,476	1,667	1,431	301
Satellite Zones	m	-	-	158	148	61	61	-
Sub-Total	m	8,961	2,132	1,683	1,624	1,728	1,492	301
Capital Development(No Ramp)								
Principal Zone	m	9,597	1,948	1,724	1,822	1,960	1,725	418
Satellite Zones	m	-	-	-	-	-	-	-
Sub-Total	m	9,597	1,948	1,724	1,822	1,960	1,725	418
Ramp Development								
Principal Zone	m	6,165	1,201	1,852	1,458	1,179	474	-
Satellite Zones	m	-	-	-	-	-	-	-
Sub-Total	m	6,165	1,201	1,852	1,458	1,179	474	-
Capex Horiz. Dev. Total	m	23,382	4,671	5,305	4,866	4,657	3,262	621
Exploration Dev.	m	2,123	690	607	586	101	140	-
Total Horiz. Dev.	m	31,297	6,354	5,897	6,294	6,572	4,932	1,248
Total Horiz. Dev.+ Expl.	m	33,420	7,043	6,504	6,880	6,672	5,072	1,248
Horiz. Dev. Total	mpd	14	17	16	17	18	14	3
Horiz. + Expl. Dev.	mpd	15	19	18	19	18	14	3

14.0 PROCESSING AND RECOVERY METHODS

14.1 Introduction

Gold extraction from the mill feed will be performed in the current operating mill. Historical operation and performance data for the mill is summarized in Section 10 of this TRS. This information in combination with metallurgical test results is used to predict mill recovery performances. These performances are based on the current plant as of December 31, 2021. A description of the overall process plant is presented in the following subsections.

14.2 Process Description

The Casa Berardi processing facility consists of a 3,836 tpd mill, with the ability to process 4,100 tpd, and a CIL process to recover gold from the ore. This process has been chosen because some mill feed contains graphitic carbon that has a preg-robbing effect. To lower the effect of preg-robbing, gold leaching is completed in the presence of activated carbon, as is the case for a CIL circuit. Figure 14-1 below presents the flowsheet of the mill and gold operation.

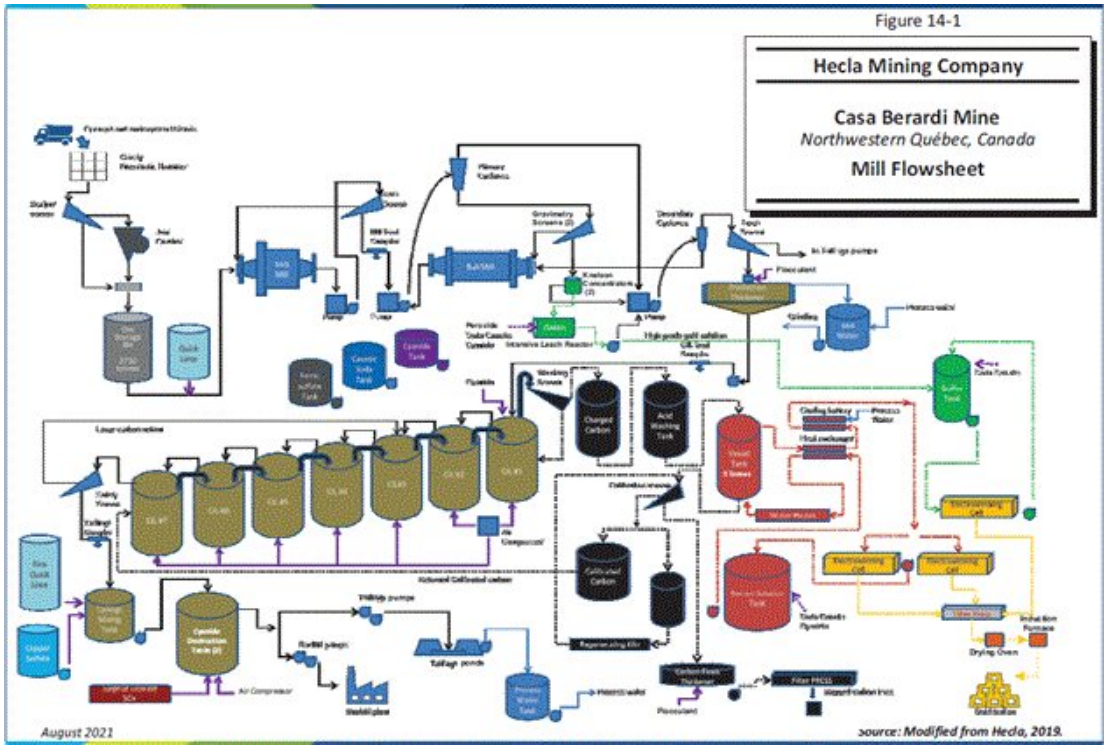


Figure 14-1: Mill Flowsheet

14.2.1 Crushing

Ore is hauled by truck from the West Mine headframe complex to the crusher dump pocket, which is equipped with a static grizzly and a pneumatic hammer to break any oversize material. Ore passing the grizzly is screened again on the scalping screen. Oversize ore is fed to a jaw crusher and its discharge rejoins the scalping screen undersize. Ore coming from the open pit is pre-crushed by a mobile crusher. Casa Berardi plans to build it's own pre-crusher in 2022. The crushed ore is stored in the ore storage bin.

14.2.2 Grinding

Ore is conveyed from the storage bin to the SAG mill. The SAG mill feed conveyor is equipped with a scale to monitor and control the ore supply to the SAG mill. Dry quick lime is added from a bin onto the SAG mill feed conveyor for downstream pulp pH control, and mill water is added to the mill feed to pulp the ore. The SAG mill operates in closed circuit with the SAG screen, discharging into the SAG screen pump box and pumping onto the SAG screen. SAG screen oversize material is returned to the SAG mill for further reduction and screen undersize flows to the primary cyclone pump box. The mill feed is sampled on the SAG screen undersize stream.

The ball mill operates in closed circuit with the primary and secondary cyclones. The ball mill discharges in the primary cyclones pump box, and the primary cyclone pump box pulp is pumped to the primary cyclone for a first size separation. The totality of the primary cyclone underflow feeds the gravity circuit. The primary cyclone overflow discharges into the secondary cyclone pump box with the gravity concentrator tailings. The secondary cyclones pump box pulp is pumped to the secondary cyclones for the final size separation. The secondary cyclones overflow reports to the trash screen to remove debris and the underflow is directed back to the ball mill. Trash screen oversize is sent to the tailings pump and the undersize feeds the production thickener.

14.2.3 Gravity Circuit

The gravity circuit feed, which is fed from the primary cyclone underflow, is split to feed two parallel gravity circuits. Each circuit consists of a vibrating screen and a gravity concentrator. The screen oversize from each circuit reports back to the ball mill and the screen undersize feeds a gravity concentrator. The concentrator's tailings are pumped to the secondary cyclones pump box. The gravity concentrate flows to an intensive leach reactor (ILR) for leaching. To promote gold leaching and control the pH, oxygen peroxide, cyanide, and caustic soda are added to the ILR unit from their respective tanks using dosing pumps. The high grade pregnant gold solution from the ILR unit is pumped to the electrowinning buffer tank and the tailings report to the secondary cyclones pump box.

14.2.4 CIL Circuit

The production thickener is fed the milled ore pulp from the trash screen. Mill water from the thickener overflows in the mill water tank, and process water from the tailings pond is added to the mill water tank depending on the demand. The thickener underflow is pumped to the first CIL tank. CIL feed is sampled on the production thickener underflow stream. A CIL circuit is used to recover gold instead of a carbon-in-pulp circuit to hinder preg-robbing due to graphite in the ore and to maximize gold recovery by placing the gold in solution in contact with activated carbon immediately. The circuit comprises seven CIL tanks in series. The pulp overflows from the #1 CIL tank to the #7 CIL tank.

To promote gold leaching, a cyanide solution is added to the #1 CIL tank and compressed air is added to each CIL tank. Gold is leached from the ore and adsorbed onto activated carbon. Carbon is added in the #7 CIL tank and is pumped periodically in counter-current fashion from the #7 CIL tank to the #1 CIL tank. Screens at the discharge of each CIL tank prevent carbon from overflowing from tank to tank with the pulp. The #7 CIL tank overflows onto a safety screen to recover any fugitive carbon. The safety screen undersize is sampled and reports to the mixing tank. Fine quicklime and copper sulphate are added to the mixing tank to prepare for cyanide destruction. Residual pulp from the CIL mixing tank is pumped to the cyanide destruction tank to which sulphur dioxide and compressed air is added to destroy residual cyanide with agitation. After cyanide destruction, the treated pulp is pumped to the paste backfill plant or the tailings pond. Ferric sulphate is also added to this material in order to reduce arsenic content in the solution.

14.2.5 Carbon Circuit

The carbon, elution, and electrowinning circuits operate in batches unlike the CIL continuous process. Loaded carbon is pumped periodically from the #1 CIL tank onto a washing screen. Loaded carbon from the washing screen falls into the loaded carbon tank while the pulp and residual cyanide solution return to the #1 CIL tank or #2 CIL tank. When carbon collection is completed, loaded carbon is transferred to the acid washing tank. Hydrochloric acid is added in the acid washing tank and carbon is soaked for two hours to remove inorganic contaminants. When the acid wash is completed, the loaded carbon is rinsed with process water to return to a neutral pH before being transferred to the elution vessel. After elution, eluted carbon is screened and sent either to the calibrated carbon tank or the regenerating kiln. Calibration screen undersize is sent to the carbon fines thickener where flocculant is added. Carbon fines are recovered at the underflow, filtered using a filter press, and bagged. At the regenerating kiln, the carbon is heated to burn organic contaminants. The kiln discharges in a quench tank and carbon is pumped back onto the calibration screen. Calibrated carbon is pumped back into the #7 CIL tank from the calibrated carbon tank. Fresh activated carbon is also added to the CIL circuit using the calibration screen after being processed via an attrition tank. Carbon moves in the circuit using a water eductor system.

14.2.6 Elution and Electrowinning Circuits

The elution circuit uses the Zadra process, where by caustic soda and cyanide are added to process water in the barren solution tank to prepare for elution. The barren solution is pumped through a heat exchanger and a water heater before arriving at the bottom of the elution vessel. Under the correct pressure and temperature conditions in the elution vessel, gold desorbs from the loaded carbon and dissolves in the elution solution. The pregnant solution flows from the top of the elution vessel through the heat exchanger and cooling battery toward the electrowinning cells. The heat exchanger recovers heat from the pregnant solution to warm up the barren solution. The cooling battery completes the pregnant solution cooling to a safe temperature and pressure for electrowinning using process water at an ambient temperature.

Two electrowinning cells recover dissolved gold from the pregnant solution by deposition on its cathodes plates to form a gold sludge. Barren elution solution is pumped from the electrowinning cells to the barren solution tank. During an elution cycle, elution solution flows continuously through the circuit. A third electrowinning cell, in loop with the ILR buffer tank, is dedicated to the ILR gold solution. When an elution cycle is over, gold sludge is recovered from the electrowinning cells, filtered, and dried before being smelted in the induction furnace and poured into gold doré at the gold room.

14.2.7 Major Equipment List

Table 14-1 presents a list of major equipment and the characteristics of each equipment.

Table 14-1: Major Equipment List
Hecla Mining Company – Casa Berardi Mine

Equipment	Characteristics
Crushing	
Grizzly Screen	Static, 5 m x 4.2 m with 500 mm x 500 mm opening
Rock Breaker	Hydraulic hammer
Scalping Screen	Vibrating, 1.5 m x 2 m with 89 mm opening and 11.2 kW motor
Jaw Crusher	762 mm x 1400 mm opening with 150 hp motor
Ore Storage Bin	14 m diameter, 19 m high with 3,000 t capacity
Grinding	
SAG Mill	5.5 m diameter x 2.7 m EGL with 1,130 kW motor
SAG Screen	Vibrating, 1.8 m x 2.9 m with 5 mm x 16 mm opening and 2 x 3.7 kW motors
Ball Mill	4.0 m diameter x 5.3 m length with 1,325 kW motor
Primary cyclone	660 mm diameter Tega/Krebs, one operating, one standby unit
Secondary cyclones	250 mm diameter Tega, five operating, three standby units
Trash Screen	Vibrating, 1.2 m x 2.4 m with 20 mesh opening and 3.7 kW motor
Gravity Circuit	
Gravity screens	Vibrating, 1.2 m x 3.66 m with 1.5 mm x 8.8 mm opening and 2 x 3 kW motors
Gravity Concentrators	Two 762 mm diameter Knelson concentrators
Intensive Leach Reactor	2.27 m larger X 4.4 m length Gekko Leach unit with tanks
Gravity Electrowinning cell	3.26 m³ cells with eight cathodes
CIL	
Production Thickener	34 m diameter with high rate type feedwell
CIL Tanks	Seven 700 m³ capacity tanks
CIL Agitators	One 3.45 m diameter double impeller with 37 kW motor for each tank
CIL Screens	Two Westech 4 m² and three Westech 3.8 m² screens

Equipment	Characteristics
Safety Screen	Vibrating, 1.2 m X 2.4 m with 20 mesh opening and 3.7 kW motor
Tailings Mixing Tank	One 27m³ capacity tank with 30 kW agitator
Cyanide Destruction Tank	One 322 m³ capacity tank with 149 kW agitator
Carbon Circuit	
Loaded Carbon Washing Screen	Vibrating, 1.2 m X 2.4 m with 20 mesh opening and 3.7 kW motor
Loaded Carbon Tank	One 5.5 t of carbon capacity
Acid Washing Tank	One 5.5 t of carbon capacity
Carbon Calibration Screen	Vibrating, 1.2 m X 2.4 m with 16 mesh opening and 3.7 kW motor
Carbon Calibrated Carbon Tank	One 15.8 m³ capacity tank
Regenerating Kiln	0 76 m diameter, 7 3 m length with 350 kW of heating capacity
Carbon Fines Thickener	One 5 m diameter with high rate type feedwell
Carbon Fines Filter Press	One 23.5 m of filtration with 20 chambers
Elution	
Elution Vessel	One 1.68 m diameter tank 5.5 t carbon capacity
Water Heater	870 kW capacity water heater
Barren Solution Tank	One 153 m³ capacity tank
Electrowinning Cells	Two 4.53 m³ cells with 12 cathodes each
Refinery	
Filter Press	One 24.8 m² of filtration with 21 chambers
Induction Furnace	One 750 lbs capacity with 125 kW

14.3 Energy, Water, and Process Materials Requirements

Power requirements for the processing facilities are not anticipated to change significantly in the foreseeable future from the current power requirements (approximately 7 MW).

Make-up water is supplied from the process water pond. Water consumption is not expected to change significantly from the recent historical annual water usage (2.3 million m³) and no supply concerns have been noted.

Key reagents used in the process include quick lime, cyanide, caustic soda, ferric sulphate, fine quick lime, copper sulphate, hydrochloric acid, and sulphur dioxide. Reagent consumption is presented in Table 14-2.

Table 14-2: Reagent Consumption 2021
Hecla Mining Company – Casa Berardi Mine

Reagent	kg/t
Hydrochloric acid	0.068
Caustic soda	0.248
Copper sulfate	0.223
Iron sulfate	1.651
Sulfide dioxide	0.947
Lead nitrate	0.200
Carbon	0.031
Sodium cyanide	0.582
Fine Limestone	0.593
Coarse Limestone	0.956
Hydrogen peroxide	0.042
Flocculent	0.004

14.4 Personnel

The total processing plant personnel number is 96 (29 salaried employees and 67 hourly employees).

15.0 INFRASTRUCTURE

Casa Berardi is in operation and has developed infrastructure to support the operations. There are well maintained gravel and paved roads that access the site and there is a network of roads on the site to service the mine areas and various facilities. The Mine has developed water sources for the operation and power is supplied from the grid. The current surface and underground infrastructure at Casa Berardi, including both the West and East mines, is presented and discussed in Section 5.

15.1 Roads and Logistics

The 38 km all season gravel road to Casa Berardi branches off from the paved road linking La Sarre and the Selbaie Mine approximately 21 km north of the village of Villebois, passing through the village.

On the Property, a gravel road links the East and West mines, and several exploration roads provide access to the rest of the Property to the east and west. A production road and a staff road are in use as discussed in Section 5. The staff road is proposed to be relocated to the south side of the future WMCP Pit in 2023 (as presented in Figure 15-1).

15.2 Mine Layout

The current and preliminary major infrastructure areas are presented in Figure 15-1.

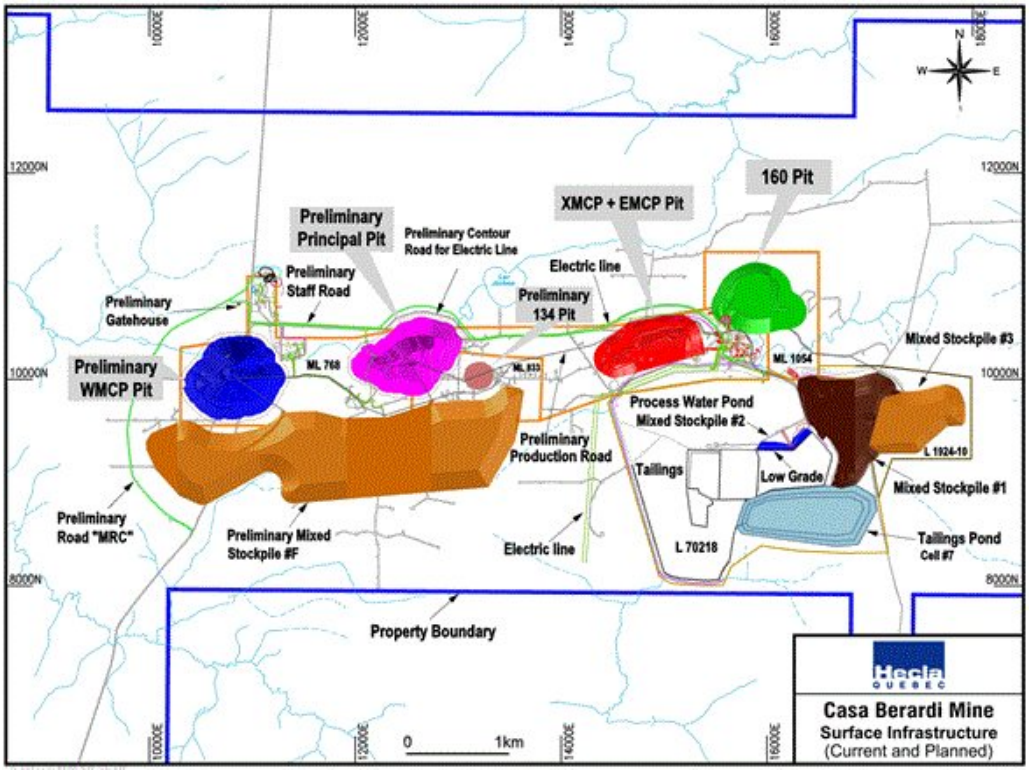


Figure 15-1: Surface Infrastructure (Current and Preliminary)

15.2.1 Tailings Management and Facilities

The site includes an existing TSF with four tailings cells, a polishing pond, a sedimentation pond for settling iron arsenate precipitates, and a process water pond (Figure 15-2).



Figure 15-2: Surface Plan Tailings and Waste Rock Facilities

Approximately 5% of the mine tailings are used in the mine backfill cycle. Tailings that are not used for mine backfill are placed on the surface at the TSF. Permits are in place for mine water management and operation of the TSF. The monitoring system associated with the TSF includes surface and groundwater monitoring, water level monitoring, geochemical and geotechnical monitoring, and inspections. An operation, maintenance, and surveillance (OMS) manual has been developed for the TSF.

Tailings deposition is currently ongoing in Cell #7. Cells #1, #2, and #3 are no longer used for deposition, being at their design capacity and currently in the process of progressive reclamation.

In 2010, Cell #4 was built through the construction of a dike. Dike enhancements were required as part of the previous LOM plans and the first enhancement of Cell #4 was made in 2012. Since that time, many enhancements and raises were completed for Cell #4, with the last lift completed in 2020. At the moment, a stability analysis is in progress to establish the final capacity of Cell #4. Since June 2021, the tailings produced have been stored in Cell #7.

To accommodate LOM tailings and water management, a new Cell #7 was constructed in 2019. To accommodate the current LOM, a raise of Cell #7 was completed in 2021. Another raise for the Cell #7 is planned in 2022.

After the revision of the tailing's deposition and fill plan for the cells in the existing TSF (including Cell #7) by Wood Canada Limited (Wood) in 2019 based on the LOM, it has been concluded that an additional cell may be required in 2028 for tailings management. Filling the 160 Pit at the end of the operation is currently being studied. Given the permitting history at Casa Berardi and the high standards of practice followed by Hecla, the company believes that obtaining necessary permits for expanding the required TSFs will not present any issues.

15.2.2 Waste Rock Management and Stockpiles

Waste rock is stored on surface, and its ongoing characterization since 2008 has indicated that it is not acid generating. The Mine has a certificate of authorization for the storage of waste rock on surface. Based upon the large demand for rock fill at the site, a large portion of underground waste rock is disposed of underground for use as backfill material for mining operations, with limited amounts brought to surface and used for construction of drilling accesses in swampy terrains or in construction projects such as dams and roads.

Although, waste rock produced from open pit operations is, and will continue to be, stored on surface, waste rock and overburden (till, clay, and organics) from EMCP Pit are stored on surface at two locations, in Mixed Stockpiles #1 and #2 stockpiles (Figure 15-1 and Figure 15-2). These will not likely have sufficient capacity to store the volume of waste rock produced by all of the open pits in the current LOM. Mixed Stockpile #3 has been built to accommodate additional waste material (Figure 15-2). Potential waste rock and overburden stockpile locations are indicated in Figure 15-1 and Figure 15-2 for possible future mining of the WMCP and/or Principal pits. Additional locations may be required for the current LOM. One other possible mixed stockpile #F is presented in Figure 15-1.

Given the mine permitting history at Casa Berardi and the high standards of practice followed by Hecla, the company believes that obtaining permits to expand waste rock as may be required for the LOM will not present any material issues. Hecla is considering the use of open pits for waste rock management to reduce surface storage requirements, should potential future open pits require additional waste rock storage.

15.2.3 Other Wastes

All other wastes (hazardous materials) produced at the site are disposed of in accordance with regulatory requirements and legislation. No addition or modification will be necessary for future operations.

15.2.4 Water Supply

Water management (mine, surface, and tailings) and effluent treatment are presented in Section 17.

Fresh water supply is from groundwater production wells and groundwater collected in a series of underground seep collection areas.

15.2.5 Water Use

Groundwater is utilized for underground operations at the East and West mines, in the paste backfill plant, and the cement plant. It is also used as potable water at the plant site facilities.

The primary source of water for plant operations is the reclaim water from the process water pond (recycled water). Fresh water has limited use at the plant.

15.2.6 Power and Electrical

Electrical power is supplied to the site by a 55 km, 120 kV power line from the town of Normétal. The electrical line will be relocated south of the future WMCP Pit in 2023.

15.2.7 Fuel

Three fuel tanks are located near the EMCP Pit as discussed in Section 5. They will be moved closer to the eventual WMCP and Principal pits in 2023 to optimize operational functionality and cost.

16.0 MARKET STUDIES

Casa Berardi is in operation and has been operating steadily since 2006 producing gold and silver in doré bars.

16.1 Markets

16.1.1 Overview

Gold supply is approximately 165 million ounces, with mine production contributing 75% of gold supply and recycling accounting for the remaining 25%. In terms of gold demand, jewelry fabrication accounts for approximately 55% of total demand while Investment in physical bars, coins and Exchange Traded Funds is at 25% of overall demand. Gold's use in technology applications was around 11 million ounces, or 8% of total demand in 2021, according to the World Gold Council. Accommodative fiscal and monetary policies globally due to COVID-19 lent support to investment demand for gold in 2020 as gold prices reached record levels in 2020.

Silver demand is primarily composed of Industrial demand, which accounts for 50% of total silver demand of 1 billion ounces. Investment demand (physical and exchange traded products) and jewelry and silverware account for 25% share each respectively. Silver has the highest electrical conductivity of all metals and this property positions silver as a unique metal for multitude of uses in electronic circuitry in automotive and electronics. Silver's use in photovoltaic cells has also seen a rapid expansion in the past five years and is expected to be one of the key growth areas in green energy.

16.1.2 Commodity Price Projections

Metal prices used in the estimation of Mineral Resources and Mineral Reserves is determined by Hecla's corporate office in Coeur d'Alene, Idaho, USA. Casa Berardi Mineral Reserves are estimated using a price of US$1,600/oz Au, while gold Mineral Resources are estimated using a price of US$1,700/oz Au. The difference in prices is the result of a longer historical period used as the basis for the Mineral Resource estimation.

Table 16-1 shows the realized metal prices Hecla has received for sales of its products.

Table 16-1: Hecla Historical Average Realized Metal Prices
Hecla Mining Company – Casa Berardi Mine

Metal Prices	2019	2020	2021	3 Year Avg.
Silver ($/oz)	16.65	21.15	25.24	21.01
Gold ($/oz)	1.413	1,757	1,796	1,655

The economic analysis performed in the LOM plan assumes a constant gold price of US$1,650/oz Au and US$21.00/oz Ag based upon analysis of consensus metal price forecasts by financial institutions. Based on macroeconomic trends, the SLR QP is of the opinion that Hecla's realized metal pricing will remain at least at the current three -year trailing average or above for the next five years.

16.2 Contracts

16.2.1 Refining

Hecla currently has a refining agreement with Asahi Refining Canada (Asahi) whereby the refined gold and silver is refined and credited to Hecla's account at Asahi. The doré bars produced at Casa Berardi are refined at Asahi's facilities in Brampton, Ontario, Canada.

Gold and silver bullion is sold through commercial banks or metal traders via a sale contract at spot prices. Settlement of funds from bullion sales occurs two business days after the contract date.

The terms and conditions of the refining and bullion sales contracts are typical and consistent with standard industry practice and would be similar to contracts for the supply of gold elsewhere in North America.

16.2.2 Other Contracts

Casa Berardi is in operation and has been operating steadily since 2006. There are numerous contracts in place for items including the operation of the 160 Pit, service contracts related to the operation, underground mine development contracts, and contracts for supplies. These are usual contracts for an operating mine.

17.0 ENVIRONMENTAL STUDIES, PERMITTING, AND PLANS, NEGOTIATIONS, OR AGREEMENTS WITH LOCAL INDIVIDUALS OR GROUPS

17.1 Environmental Considerations

Casa Berardi is an operating mine and was previously the subject of environmental baseline studies and reviews prior to the start of operations. Additional studies for the 160 Pit include a hydrogeology study in 2019, a bird and amphibian study in 2017, and a fish habitat water quality and sediment study in 2017. The primary mine waste products produced by the Casa Berardi Mine are tailings and waste rock. Tailings and waste rock disposal are discussed in Section 18 of this TRS.

Hecla is committed to operating in compliance with all regulations and standards of good practice for environmental, health, and safety. To uphold this commitment Hecla has developed and approved corporate policies for environmental and health and safety practices and has prepared a detailed management plan to facilitate the continuous improvement of its environment and health and safety performance. An Environmental Management System (EMS) is currently in place and audited annually.

Hecla participates in the Towards Sustainable Mining (TSM) initiative of the Mining Association of Canada and Québec Mining Association. In 2016, the Québec Mining Association evaluated the sustainable mining development initiative at the Property. An action plan has been put in place for the six protocols of the initiative, including tailings management, Aboriginal and community outreach, biodiversity conservation management, energy use and greenhouse gas (GHG) emissions management, health and safety, and crisis management planning. Since 2016, Hecla has continued to work on the implementation and improvement of management systems. SLR understands that an external audit is planned for the end of 2023, with the objective of improving performance while ensuring that primary mining risks are managed responsibly at the mine facilities.

The mine design meets current standards and the implementation of the proposed environmental and health and safety practices ensures that the Casa Berardi Mine is prepared to meet future challenges. The preliminary design is flexible and allows for modifications to improve performance when and where necessary.

In addition to the EMCP Pit, the current LOM plan includes additional preliminary pits.

17.2 Water Management and Effluent Treatment

17.2.1 Water Management

Casa Berardi has a positive water balance and discharges surplus water as effluent into Kaakakosig Creek. Site water is managed and handled in the TSF and then released to the environment via the PWP.

Figure 17 presents a simplified illustration of the mine site water management system.

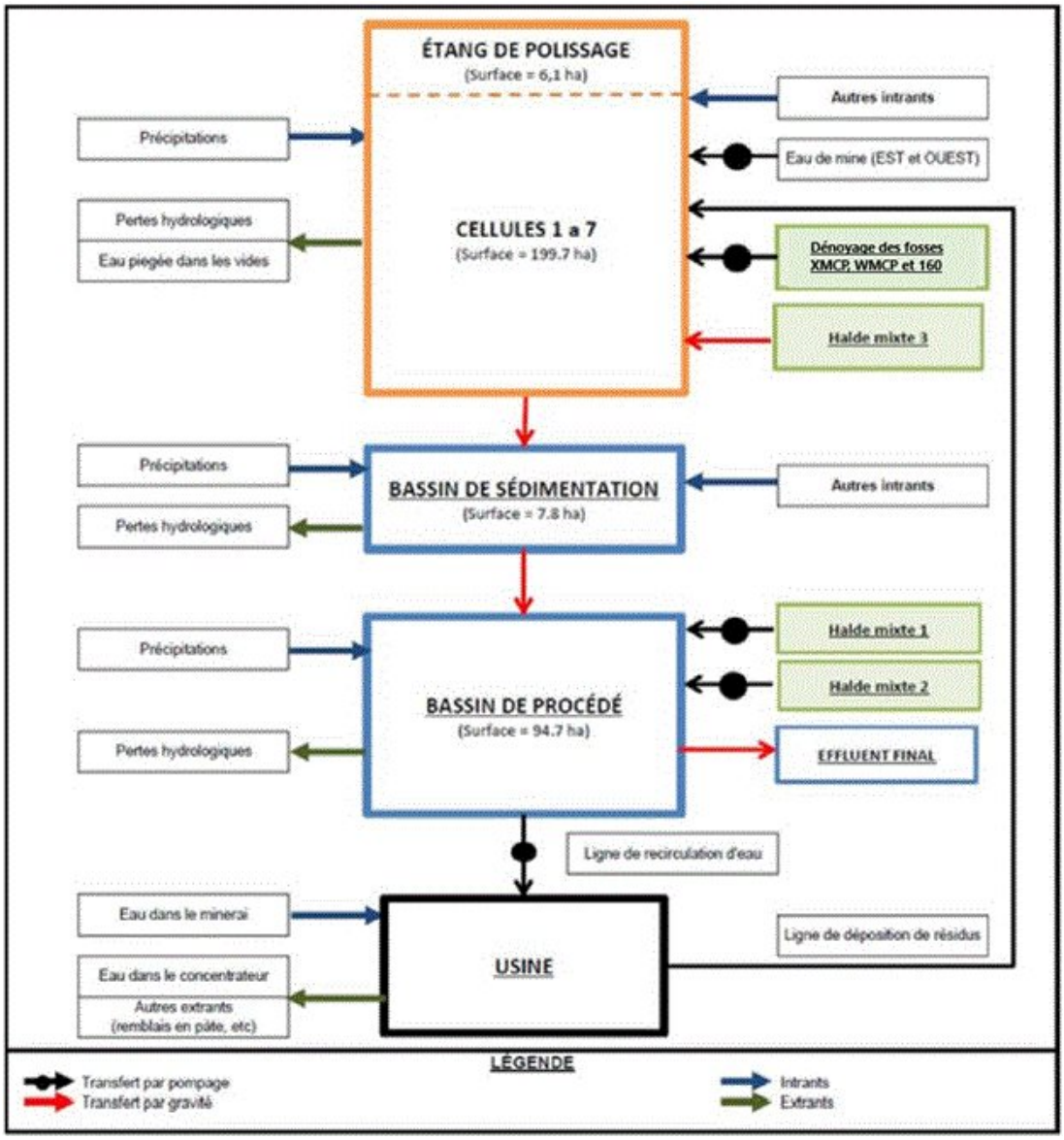


Figure 17-1: Water Management

17.2.2 Mine Water Management

Mine water from the east and west underground mine dewatering systems is pumped to the surface and treated with ferric sulphate to precipitate arsenic prior to being discharged into the TSF cells.

The EMCP Pit currently drains to the east underground mine where it is pumped to the surface.

The mixed stockpile contact water is collected and pumped to the TSF.

Where practical, the non-contact water is diverted from the site by ditches.

17.2.3 TSF Water Management

Tailings slurry may contain elevated levels of cyanide, cyanide metal complexes, cyanide degradation products (cyanate (CNO), thiocyanate (CNS), and ammonia (NH_3)), and arsenic. The primary concern with discharge is elevated levels of these constituents, which could exceed effluent standards and/or cause effluent toxicity.

Casa Berardi uses the SO_2/air process for cyanide destruction in the slurry discharge prior to release to the TSF. Ferric sulphate is added in the slurry at the exit of the SO_2/air process, effectively eliminating soluble arsenic, cyanide, and cyanide metal complexes from the discharge. While the SO_2/air process does, produce elevated levels of CNO, this compound is not likely to be present in toxic amounts, because as the compound naturally degrades in the tailings pond, ammonia is formed. Storage of the water in the tailing ponds, polishing pond, and PWP assists in nitrification of the water to reduce ammonia levels.

Hecla is permitted to discharge treated water year-round with no volume limitations. Actual treated water discharge is typically limited to the spring and late fall due to freezing conditions in winter and the demand for process water in summer. Approximately two to three million cubic metres of process pond water that is not recycled at the mill is discharged annually into Kaakakosig Creek.

The final Mine effluent meets Canada Metal and Diamond Mining Effluent Regulations (MDMER) and the limits outlined in Québec Directive 019 for mining industry discharge. A monitoring program is in place for surface and underground water. Regular monthly monitoring of acute toxicity during periods of discharge of final effluent is carried out as required by applicable regulations.

17.2.4 Environmental Effects of Treated Effluent

As required by MDMER, Environment Effect Monitoring (EEM) studies are conducted on a regular basis. Monitoring studies began in 2007 and are still in progress. Studies are conducted every three years until the end of mine life.

17.3 Regulatory Change and Environmental Permits

17.3.1 Regulatory Change

As of August 2018, the Québec territory north of the 49th Parallel is no longer subject to the regulation regarding compensation for adverse effects on wetlands and bodies of water under the Environmental Quality Act (R.S.Q., c. Q-2) (the EQA).

17.3.2 Environmental Permits

All necessary regulatory permits required for the operation of the Casa Berardi Mine since its construction, that have been transferred or issued to Hecla, are listed in Table 17-1.

A depollution attestation was issued by the MELCC in November 2011, which is updated and renewed every five years.

Table 17-1: Existing Environmental Permits
Hecla Mining Company – Casa Berardi Mine

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
20-HQUE-00110 - 2021-020	Fisheries Act authorization	Fisheries Act/Sections 34.4(2)b) and 35(2)b)	Divert a section of Kaackakosig creek (1400 m) to operate 160open pit	Hecla Québec	2021-07-26	160 Pit
7470-10-01-00006-00	Construction of access road in a humid area	EQA / Section 22	Construction of access and pads for drilling in humid area	Aurizon Mines Ltd	2010-01-14	West Mine
7470-10-01-00006-03	Construction of access road in a humid area	EQA / Section 22	Construction of access and pads for drilling in humid area	Aurizon Mines Ltd	2012-02-24	West Mine
7470-10-01-00006-04	Construction of access road in a humid area	EQA / Section 22	Construction of access and pads for drilling in humid area	Hecla Québec	2013-06-28	West Mine
7610-10-01-70016-00	Clay borrow pit	EQA / Section 22	Clay borrow pit exploitation	Les Mines Casa Berardi	1995-09-18	Casa Berardi Site
7610-10-01-70016-09	Storage for dangerous waste	EQA / Section 22	Storage for dangerous waste transferred to TVX gold and Golden Knight Resources on June 19 1992	TVX Gold and Golden Knight Resources	1992-06-19	Casa Berardi Site
7610-10-01-70016-21	Diversion of Kaackakosig creek	EQA / Section 22	Diversion of Kaackakosig creek Casa Berardi East, transferred to Aurizon mines on September 14 1998, transferred to Hecla on February 5 2014	Aurizon Mines Ltd	1998-09-14	Casa Berardi Site
7610-10-01-70016-21	Diversion of Kaackakosig creek	EQA / Section 22	Diversion of Kaackakosig creek Casa Berardi East	Inco Gold	1990-02-19	Casa Berardi Site
7610-10-01-70016-22	Storage for dangerous waste	EQA / Section 22	Storage for dangerous waste	Les Mines Casa Berardi	1991-01-18	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 30	Cell#7 increasing dyke (Modification)	Hecla Québec	2021-08-20	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 30	Adding a tank and a compressor at the cyanide destruction	Hecla Québec	2019-09-11	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 30	Increase tonnage at the mill (Modification)	Hecla Québec	2019-04-04	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 122.2	Increase tonnage at the mill (Modification)	Hecla Québec	2017-08-25	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 122.2	Increase tonnage at the mill (Modification)	Hecla Québec	2016-10-17	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 122.2	Increase tonnage at the mill (Modification)	Hecla Québec	2016-08-03	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 122.2	Tailing pond filing plan cell# 1, 2 and 3	Aurizon Mines Ltd	2007-12-19	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 122.2	Increase process water pond dyke	Aurizon Mines Ltd	2006-09-14	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 122.2	Increase tonnage at the mill (Modification)	Aurizon Mines Ltd	2001-09-10	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 24	Ore extraction and processing ore transferred to Aurizon mines ltd	Aurizon Mines Ltd	1998-09-14	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 22	Ore extraction and processing ore (Modification)	TVX Gold and Golden Knight Resources	1998-02-19	Casa Berardi Site
7610-10-01-70016-23	Ore extraction and processing ore	EQA / Section 22	Ore extraction and processing ore	TVX Gold and Golden Knight Resources	1992-12-23	Casa Berardi Site
7610-10-01-70016-24	Clay borrow pit	EQA / Section 24	Clay borrow pit exploitation (transferred)	Aurizon Mines Ltd	1998-09-14	Casa Berardi Site
7610-10-01-70016-24	Clay borrow pit	EQA / Section 22	Clay borrow pit exploitation	TVX Gold	1995-08-07	Casa Berardi Site
7610-10-01-70016-25	Quarry	EQA / Section 22	Quarry exploitation	Aurizon Mines Ltd	2013-05-10	Casa Berardi Site
7610-10-01-70016-25	Quarry	EQA / Section 24	Quarry exploitation (transferred)	Aurizon Mines Ltd	1998-09-14	Casa Berardi Site
7610-10-01-70016-25	Quarry	EQA / Section 22	Quarry exploitation (transferred)	TVX Gold	1995-08-07	Casa Berardi Site
7610-10-01-70016-26	Clay borrow pit	EQA/Section 24	Clay borrow pit exploitation (transferred)	Aurizon Mines Ltd	1998-09-14	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70016-26	Clay borrow pit	EQA/Section 22	Clay borrow pit exploitation	TVX Gold	1995-09-18	Casa Berardi Site
7610-10-01-70016-28	Operation of a concrete plant	EQA/Section 122.2	Operation of a concrete plant (transferred)	Hecla Québec	2014-02-05	Casa Berardi Site
7610-10-01-70016-30	Pipe installation in Koababikawi creek	EQA/Section 32	Installation of 2 pipes in Koababikawi creek for fire station and industrial water modified on February 5 2014	Aurizon Mines Ltd	2004-11-10	Mine Est
7610-10-01-70016-31	Installation of a fire station	EQA/Section 32	Installation of a fire station in «Lac Sans Nom» (modified)	Aurizon Mines Ltd	2005-09-22	Casa Berardi Site
7610-10-01-70016-31	Installation of a fire station	EQA/Section 32	Installation of a fire station in «Lac Sans Nom» modified on February 5 2014	Aurizon Mines Ltd	2005-07-04	Casa Berardi Site
7610-10-01-70016-32	Installation of a humid dust collector and a dust collector	EQA/Section 48	Installation of a humid dust collector and a dust collector modified on February 5 2014	Aurizon Mines Ltd	2008-04-07	Casa Berardi Site
7610-10-01-70016-33	Oil and water separator	EQA/Section 22	Installation of a oil and water separator in mechanical shop at East mine (modification)	Aurizon Mines Ltd	2009-12-18	Casa Berardi Site
7610-10-01-70016-33	Oil and water separator	EQA/Section 22	Installation of a oil and water separator in mechanical shop at East mine modified on 05-02-2014	Aurizon Mines Ltd	2008-06-26	Casa Berardi Site
7610-10-01-70016-36	Treatment for domestic waste water	EQA/Section 32	Treatment for domestic waste water Bionest est modified on February 5 2014	Aurizon Mines Ltd	2009-11-03	Casa Berardi Site
7610-10-01-70016-37	Ore extraction and processing ore	EQA/Section 22	Tailing pond cell#4 construction (modification)	Aurizon Mines Ltd	2011-11-21	Casa Berardi Site
7610-10-01-70016-37	Ore extraction and processing ore	EQA/Section 22	Tailing pond cell#4 construction modified on February 5 2014	Aurizon Mines Ltd	2010-07-29	Casa Berardi Site
7610-10-01-70016-38	Underground water collection	Règlement sur le captage des eaux souterraines/Section 31.75	Underground water collection at East mine	Aurizon Mines Ltd	2012-04-02	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70016-39	Oil and water separator	EQA/Section 122.2	Treatment of oily water transferred to Hecla	Hecla Québec	2014-02-05	Casa Berardi Site
7610-10-01-70016-39	Oil and water separator	EQA/Section 22	Treatment of oily water modification	Aurizon Mines Ltd	2013-06-07	Casa Berardi Site
7610-10-01-70016-39	Oil and water separator	EQA/Section 22	Treatment of oily water	Aurizon Mines Ltd	2011-08-26	Casa Berardi Site
7610-10-01-70016-39	Bekosplit	EQA/Section 22	Operation of a Bekosplit unit	Aurizon Mines Ltd	2011-06-17	Casa Berardi Site
7610-10-01-70016-40	Bekosplit	EQA/Section 32	Installation of a Bekosplit unit	Aurizon Mines Ltd	2011-06-17	Casa Berardi Site
7610-10-01-70016-41	Tailing pond	EQA/Section 122.2	Raise north dyke of cell#4 and water process pond pumping station redevelopment (modification)	Hecla Québec	2015-10-21	Casa Berardi Site
7610-10-01-70016-41	Tailing pond	EQA/Section 122.2	Raise internal dyke in southern part of cell#4 (Modification)	Hecla Québec	2015-08-12	Casa Berardi Site
7610-10-01-70016-41	Tailing pond	EQA/Section 22	Raise and extension of cell# 4 dyke modified on February 5 2014	Aurizon Mines Ltd	2012-05-09	Casa Berardi Site
7610-10-01-70016-42	Dewatering and backfill a pond	EQA/Section 22	Dewatering and backfill a man-made pond	Hecla Québec	2014-01-14	Casa Berardi Site
7610-10-01-70016-43	Increase water collection	EQA/Section 31.75	Increase underground water collection a East mine	Hecla Québec	2014-11-28	Casa Berardi Site
7610-10-01-70016-44	Construction of access road in a humid area	EQA/Section 22	Construction of access road in a humid area	Aurizon Mines Ltd	2013-03-14	Casa Berardi Site
7610-10-01-70016-45	Construction access and pads for drilling in humid area	EQA/Section 22	Construction access and pads for drilling in humid area	Hecla Québec	2013-12-19	Casa Berardi Site
7610-10-01-70016-46	Construction of 8 pads for drilling in humid area	EQA/Section 22	Construction of 8 pads for drilling in humid area	Hecla Québec	2014-12-15	Casa Berardi Site
7610-10-01-70016-47	Dewatering EMCP	Règlement sur le captage des eaux souterraines/Section 31.75 and 31.95	Dewatering EMCP and installation of the pumping station	Hecla Québec	2016-01-12	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70016-48	Raise of the water process pond dyke	EQA/Section 30	Raise of the water process pond dyke (Modified)	Hecla Québec	2020-09-04	Casa Berardi Site
7610-10-01-70016-48	Raise of the water process pond dyke	EQA/Section 22	Raise of the water process pond dyke	Hecla Québec	2016-06-23	Casa Berardi Site
7610-10-01-70016-49	Crushing and screening of waste rock	EQA/Section 22	Crushing and screening of waste rock	Hecla Québec	2016-02-25	Casa Berardi Site
7610-10-01-70016-50	Use of leachable waste rock for construction in stockpile #1 and in tailing pond	EQA/Section 22	Use of leachable waste rock for construction in stockpile #1 and in tailing pond	Hecla Québec	2017-01-13	Casa Berardi Site
7610-10-01-70016-51	Raise of internal dyke cell#4	EQA/Section 30	Raise internal dyke in cell#4 third step (Modified)	Hecla Québec	2020-03-27	Casa Berardi Site
7610-10-01-70016-51	Raise of internal dyke cell#4	EQA/Section 30	Construction of filter dams in cell#1 (Modified)	Hecla Québec	2020-03-11	Casa Berardi Site
7610-10-01-70016-51	Raise of internal dyke cell#4	EQA/Section 30	Raise internal dyke in cell#4 works 2018-2019 (Modified)	Hecla Québec	2018-12-19	Casa Berardi Site
7610-10-01-70016-51	Raise of internal dyke cell#4	EQA/Section 22	Raise internal dyke in cell#4	Hecla Québec	2017-04-05	Casa Berardi Site
7610-10-01-70016-53	Closure of cell#2	EQA/Section 22	Construction of a clay cover on cell#2	Hecla Québec	2017-12-19	Casa Berardi Site
7610-10-01-70016-54	Expansion of tailing pond cell#7	EQA/Section 22	Construction of cell#7	Hecla Québec	2019-02-27	Casa Berardi Site
7610-10-01-70016-55	Extension of EMCP	EQA/Section 22	XMCP open pit	Hecla Québec	2019-05-15	Casa Berardi Site
7610-10-01-70016-56	Ore crushing	EQA/Section 30	Ore crushing on Casa Berardi site (Modified)	Hecla Québec	2020-07-14	Casa Berardi Site
7610-10-01-70016-56	Ore crushing	EQA/Section 30	Ore crushing on Casa Berardi site (Modified)	Hecla Québec	2019-10-16	Casa Berardi Site
7610-10-01-70016-56	Ore crushing	EQA/Section 22	Ore crushing on Casa Berardi site	Hecla Québec	2019-06-25	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70016-57	Dewatering open pit 160	EQA/Section 30	Installation of 12 dewatering wells at the perimeter of 160 pit (Modified)	Hecla Québec	2021-02-24	Casa Berardi Site
7610-10-01-70016-61	Open pit 160	EQA/Section 22	Construction of 160 open pit in Humid area	Hecla Québec	2020-09-16	Casa Berardi Site
7610-10-01-70016-57	Dewatering of open pit 134	EQA/Section 22	Dewatering 134	Hecla Québec	2020-05-27	Casa Berardi Site
7610-10-01-70016-58	Construction and operation of open pit 134 in humid area	EQA/Section 22	Construction and operation of open pit 134 and stockpile #3 in humid area	Hecla Québec	2020-05-27	Casa Berardi Site
7610-10-01-70017-00	Casa Berardi west mine exploitation	EQA/Section 22	Casa Berardi mine west mine exploitation transferred to Hecla Québec on February 5 2014	Hecla Québec	1992-07-02	Casa Berardi Site
7610-10-01-70017-07	Attestation d'assainissement en milieu industriel (permit of operation)		Attestation d'assainissement en milieu industriel	Aurizon Mines Ltd	2011-11-11	Casa Berardi Site
7610-10-01-70017-07	Attestation d'assainissement en milieu industriel (permit of operation)		Attestation d'assainissement en milieu industriel (modified)	Hecla Québec	2015-01-12	Casa Berardi Site
7610-10-01-70017-07	Attestation d'assainissement en milieu industriel (permit of operation)		Attestation d'assainissement en milieu industriel (modified)	Hecla Québec	2020-01-09	Casa Berardi Site
7610-10-01-70017-21	Treatment for domestic waste water at Golden Pond West	EQA/Section 32	Treatment for domestic waste water at Golden Pond West	TVX Gold and Golden Knight Resources	1987-07-26	Casa Berardi Site
7610-10-01-70017-22	Treatment for domestic waste water (projet C)	EQA/Section 32	Treatment for domestic waste water (projet C)	TVX Gold and Golden Knight Resources	1987-09-10	Casa Berardi Site
7610-10-01-70017-25	Casa Berardi west mine exploitation	EQA/Section 122.2	Casa Berardi west mine exploitation (Modification)	Aurizon Mines Ltd	2001-02-21	Casa Berardi Site
7610-10-01-70017-25	Casa Berardi west mine exploitation	EQA/Section 122.2	Casa Berardi west mine exploitation (Modification)	Aurizon Mines Ltd	2000-10-27	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70017-25	Casa Berardi west mine exploitation	EQA/Section 24	Casa Berardi west mine exploitation (transferred)	Aurizon Mines Ltd	1998-09-14	Mine Ouest
7610-10-01-70017-26	Installation of a power line of 25 kV	EQA/Section 22	Installation of a power line 25kV in a humid area modified on February 5 2014	Aurizon Mines Ltd	2006-01-26	Mine Ouest
7610-10-01-70017-27	Treatment for domestic waste water	EQA/Section 122.2 and 122.3	Treatment for domestic waste (Modification)	Aurizon Mines Ltd	2008-05-29	Casa Berardi Site
7610-10-01-70017-27	Treatment for domestic waste water	EQA/Section 32	Treatment for domestic waste	Aurizon Mines Ltd	2006-08-15	Casa Berardi Site
7610-10-01-70017-28	Oil and water separator	EQA/Section 122.2	Oil and water separator (transferred to Hecla Québec)	Hecla Québec	2014-02-05	Casa Berardi Site
7610-10-01-70017-28	Oil and water separator	EQA/Section 22	Oil and water separator west mine	Aurizon Mines Ltd	2007-10-17	Casa Berardi Site
7610-10-01-70017-29	Construction of access road in a humid area	EQA/Section 22	Construction of access road in a humid area	Aurizon Mines Ltd	2007-07-20	Casa Berardi Site
7610-10-01-70017-30	Construction of access road in a humid area	EQA/Section 22	Construction of access road in a humid area	Aurizon Mines Ltd	2008-04-09	Casa Berardi Site
7610-10-01-70017-31	Oil and water separator West mine	EQA/Section 22	Operation of an oil and water separator West mine Garage Gabriel Aubé	Aurizon Mines Ltd	2009-01-13	Casa Berardi Site
7610-10-01-70017-32	Oil and water separator West mine	EQA/Section 32	Installation of an oil and water separator West mine Garage Gabriel Aubé	Aurizon Mines Ltd	2009-01-13	Casa Berardi Site
7610-10-01-70017-33	Construction of access road in a humid area	EQA/Section 22	Construction of access road in a humid area	Aurizon Mines Ltd	2009-07-17	Casa Berardi Site
7610-10-01-70017-34	Expansion of the ore stock pile at west mine	EQA/Section 122.2	Expansion of the ore stockpile at west mine (Modification)	Hecla Québec	2016-12-20	Casa Berardi Site
7610-10-01-70017-34	Ore stockpile at west mine	EQA/Section 22	Ore stockpile at west mine	Aurizon Mines Ltd	2010-06-30	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70017-35	Construction of access road and pad for drilling in a humid area	EQA/Section 22	Construction of access road and pad for drilling in a humid area	Aurizon Mines Ltd	2010-12-17	Casa Berardi Site
7610-10-01-70017-36	Operation of a Bekosplit unit	EQA/Section 122.2	Operation of a Bekosplit unit (Modification)	Hecla Québec	2013-11-21	Casa Berardi Site
7610-10-01-70017-38	Treatment for domestic waste water	EQA/Section 32	Treatment for domestic waste water (Bionest west mine)	Aurizon Mines Ltd	2011-09-21	Casa Berardi Site
7610-10-01-70017-39	Underground water collection at west mine	Règlement sur le captage des eaux souterraines/Section 31	Underground water collection at west mine	Aurizon Mines Ltd	2012-04-02	Casa Berardi Site
7610-10-01-70017-40	Operation of a paste backfill plant	EQA/Section 122.2	Construction and operation of a paste backfill plant (Modification)	Aurizon Mines Ltd	2013-03-07	Mine Ouest
7610-10-01-70017-40	Operation of a paste backfill plant	EQA/Section 22	Construction and operation of a paste backfill plant transferred on 05-02-2014	Aurizon Mines Ltd	2012-10-29	Casa Berardi Site
7610-10-01-70017-41	Operation of cement plant	EQA/Section 122.2	Operation of a cement plant transferred to Hecla Québec	Hecla Québec	2014-02-05	Casa Berardi Site
7610-10-01-70017-41	Operation of cement plant	EQA/Section 22	Operation of a cement plant	Aurizon Mines Ltd	2012-09-26	Casa Berardi Site
7610-10-01-70017-43	Open pit 160 (construction and operation)	EQA/Section 30	Open pit 160 (construction and operation)	Hecla Québec	2020-09-15	Casa Berardi Site
7610-10-01-70017-43	Open pit 134	EQA/Section 30	Open pit 134 (construction and operation) and stockpile #3	Hecla Québec	2020-05-27	Casa Berardi Site
7610-10-01-70017-43	Open pit EMCP	EQA/Section 30	Ore stockpile #2	Hecla Québec	2019-09-13	Casa Berardi Site
7610-10-01-70017-43	Open pit EMCP	EQA/Section 22	Open pit EMCP (construction and operation)	Hecla Québec	2015-10-29	Casa Berardi Site
7610-10-01-70017-44	Underground water collection at west mine	EQA/Section 31.75	Increasing the capacity of the water collection	Hecla Québec	2014-12-18	Casa Berardi Site
7610-10-01-70017-45	Drinking water distribution	EQA/Section 32	Drinking water distribution	Hecla Québec	2014-12-18	Casa Berardi Site

Permit #	Permit Title	Pursuant	Description	Issued To	Issuance (YYYY-MM-DD)	Zone
7610-10-01-70017-46	Underground water collection at west mine	EQA/Section 31.75	Installation of a new well and water collection at west mine	Hecla Québec	2014-12-18	Casa Berardi Site
7610-10-01-86019-00	Operation of cement plant	EQA/Section 22	Operation of a cement plant transferred to Aurizon Mines Ltd on September 14, 1998 (761010-01-70016-28)	TVX Gold	1995-11-06	Casa Berardi Site
7610-70049-00	Exploitation and operation of Casa Berardi west	EQA/Section 22	Exploitation and operation of Casa Berardi west	Inco Gold	1990-06-29	Casa Berardi Site

17.4 Mine Reclamation and Closure

The last restauration and closure plan was submitted on October 2019 and accepted on September 2020. This restoration plan cover the global restoration of the mine site, including the restoration of the XMCP, 134 and 160 Pit. It also includes the restoration of the Mixed Stockpiles #3, so the last authorized infrastructure on the Casa Berardi property. The next review of the restoration and closure plan is planned to be submitted in November 2024. SLR understands Hecla will be submitting a review of the Casa Berardi restoration and closure plan before the end of 2024.

The Casa Berardi reclamation and closure plan includes:

- Decommissioning of the surface infrastructure.
- Dismantling of all surface structures, with sales/recycling of assets and disposal of wastes.
- Grading and revegetation of all disturbed areas.
- Capping/sealing of all mine access points in accordance with regulatory standards.
- Grading of the tailing dikes followed by direct vegetation of the tailings dams.
- Description of the financial guarantee, the amount of which corresponds to the anticipated costs of the restoration work.
- The closure period, which will include five years of monitoring activities.

Since August 2013, mining regulations require that financial guarantees cover all the restoration costs including dismantling of the headframes and buildings and sealing of all openings. The amount of this guarantee, which is in the form of a surety bond, corresponds to the total estimated costs for the restoration of the entire actual mine site. The guarantee must be provided in three instalments within two years of the date of reclamation plan approval.

The estimated costs for reclamation and closure costs for Casa Berardi are C$29,107,940 (US$22,829,757). The current amount of the bond is $25,758,032 (US$20,202,378), requiring a final instalment of $3,349,908 (US$2,627,379) due September 21, 2022.

This cost estimate covers the existing operations and current infrastructures but does not include future open pits rehabilitation/closure costs.

17.5 Community and Social Aspects

The Abitibi region is a well established and mature mining region, with the mining industry being a key component of the regional economic development. The region has a wealth of trained miners, and redevelopment of the mine is viewed by most residents as a positive activity providing employment and tax revenue for the region. For instance, Hecla contributed over C$450,000 (US$350,000) in donations and sponsorships in 2021 to various organizations in the region (Table 17-2).

Hecla has developed community engagement and integrated social responsibility policies and has a good relationship with stakeholders. Since January 2019, Hecla has established a liaison committee composed of stakeholders from a variety of areas, including municipal, Aboriginal, economic, environmental, and educational communities.

Table 17-2:Total Contributions from 2018 to 2021
Hecla Mining Company – Casa Berardi Mine

Year	Total Contributed (C$)	Total Contributed (US$)
2021	463,892	363,837
2020	449,899	352,862
2019	518,131	406,377
2018	598,102	469,100

There are no significant First Nations issues related to the Casa Berardi operation or regional exploration activities. The Casa Berardi property is situated on the territory of the Abitibiwinni First Nation, more precisely the community of Pikogan. In November 2018, Hecla and the Council of the Abitibiwinni First Nation signed a memorandum of understanding (MOU) regarding Hecla's exploration and mining activities in the Casa Berardi area. Pursuant to the MOU, the parties have started and concluded a negotiation process for a collaboration on December the 9th 2020. The agreement impact various topics, such as employment, training, and business opportunities for members of the Abitibiwinni First Nation.

17.6 Comments on Environmental Studies, Permitting, and Community Impact

The SLR QP is of the opinion that the environmental, permitting, and social aspects of the Property are being appropriately managed and planned to support the current LOM plan to 2035.

In the opinion of the SLR QP:

- Hecla has sufficiently addressed the environmental impact of the operation, and subsequent closure and remediation requirements such that Mineral Resources and Mineral Reserves can be declared, and the mine plan be deemed appropriate and achievable. Closure provisions are appropriately considered and monitoring programs are in place.
- Hecla has developed a communities' relations plan to identify and ensure an understanding of the needs of the surrounding communities and to determine appropriate programs for addressing those needs. Hecla appropriately monitors socio-economic trends, community perceptions, and mining impacts.
- Permits held by Hecla for the Property are sufficient to ensure that mining activities are conducted within the regulatory framework required by regulations.
- There are currently no known environmental, permitting, or social/community risks that could impact the Mineral Resources or Mineral Reserves.

18.0 CAPITAL AND OPERATING COSTS

18.1 Capital Costs

Unless otherwise noted, all dollar amounts are presented in United States dollars based on a US$/C$ exchange rate of 1.275, and all other measurements are metric values.

Casa Berardi uses the LOM plan as the planning guide for the Casa Berardi operation. The LOM capital costs total US$347.2 million and include mine development (contractor and Owner), mine infrastructure, open pit costs, equipment costs, plant expansion, and tailings management (Table 18-1). The SLR QP is of the opinion that the estimated capital costs for Casa Berardi are reasonable.

Table 18-1: LOM Capital Costs
Hecla Mining Company – Casa Berardi Mine

Area	Total	2022-27	2028	2029	2030	2031	2032	2033	2034	2035-37
Mine Capital US$(000)										
Underground Infrastructure and Development	50,917	50,917	-	-	-	-	-	-	-	-
Open Pit	41,894	15,872	2,918	7,743	8,496	5,859	0	0	1,005	-
Process Plant	37,563	28,495	6,563	1,191	390	402	413	37	37	37
Administration Casa	5,888	5,712	-	-	-	176	-	-	-	-
Hedging Gain	(182)	(182)								
Site Services (Mechanical & Electrical)	199,430	108,193	14,862	33,573	24,033	24,172	13,183	0	2,312	-20,897
Definition Drilling	11,730	11,730	-	-	-	-	-	-	-	-
Mine Capital Total	**347,239**	**220,735**	**24,344**	**42,506**	**32,919**	**30,608**	**13,595**	**37**	**3,355**	**(20,860)**

Capital development will include approximately 23.3 km of ramps and drifts up to 2027. The capital costs under Mechanical will include approximately 37% for mine equipment, 42% for stripping, and the remainder to construct roads and waste pads as well as dewatering and miscellaneous items. Definition diamond drilling will be continued throughout the underground mine life.

The capital costs are based on updates from equipment suppliers and verified with engineering companies providing services to Casa Berardi. The capital costs accuracy would be considered equivalent or better than AACE Class 1 with an expected accuracy range of -3% to -10% on the low side and +3% to +15% on the high side.

Mine development costs are based upon operating experience, current development contracts, and the LOM development schedule. Open pit costs include mobilization of the open pit contractor and capitalized stripping costs. In year 2035 there is a salvage value of approximately US$20.9 million for mine and other equipment that can be sold.

Working capital costs, composed of accounts receivable, accounts payable, and product and supplies inventories, are included in the Casa Berardi Mine cash flow and net to zero over the LOM. Accounts receivable balances fluctuate based upon period-end sale amounts and the average duration of time between shipments and receipt of payment. Accounts payable vary over time based upon the average portion of a period's expenditures that are typically unpaid at the end of the period. Inventory values fluctuate based upon the estimated quantities of product produced and the average duration of time between production and sale of products. Depending on the assumptions in the LOM, the working capital variation at the end of the mine life can be positive or negative. In the case of the Casa Berardi Mine, Hecla expects the end-of-life sums received from sales of inventories to be greater than the other working capital items, such that an estimated $9.6 million cash inflow is expected, which will result in working capital to draw down to zero.

18.2 Operating Costs

The operating costs for the Casa Berardi Mine for 2020 and 2021 are presented in Table 18-2. Production in 2020 was lower than budgeted while in 2021 it was higher than budget. The SLR QP notes that the 2020 operating costs were negatively impacted due to the COVID-19 pandemic. The SLR QP is of the opinion that the actual operating costs support the LOM operating costs.

Table 18-2: 2020 and 2021 Operating Cost Data
Hecla Mining Company – Casa Berardi Mine

Item	Operating Cost UUS$/t milled)_	
	2020	**2021**
Tonnes Processed	1,165,050	1,386,416
Gold Produced (oz.)	121,492	134,511
UG Mine (West)	26.73	25.99
UG Mine (East)	3.50	4.71
Site Services (Mech & Elect.)	21.14	21.98
G&A Casa Berardi and Val-d'Or		
Administration	10.59	11.26
Environment	2.23	1.68
Geology	1.67	1.4
Engineering	1.77	1.77
Underground Services		
Health and Safety	3.38	1.75
Sub-Total	71.00	70.58
Open Pit - EMCP	16.83	7.69
Open Pit - 160	-	4.88
Mill	25.96	27.44
Backfill Paste Plant	0.91	0.95
Total Operating Costs	**114.67**	**111.53**

18.2.1 LOM Operating Costs

The LOM operating costs and unit operating costs are presented in Table 18-3 and Table 18-4, respectively. The mining cost decreases substantially after 2027 when only open pit mining will be conducted for the balance of the LOM period ending in 2035. The LOM operating costs compare well with the recent and current operating costs. While the summary column indicates the average for 2022 to 2027, the LOM cash flow presents the annual costs in detail.

Table 18-3: LOM Operating Costs
Hecla Mining Company – Casa Berardi Mine

Item	Units	Total	Total (2022-2027)	2028	2029	2030	2031	2032	2033	2034	2035
Tonnes Milled	000 t	18,826	7,154	1,518	1,562	1,562	1,563	1,627	1,627	1,627	585
Hedging Gain	US$000	(4,871)	(4,871)	-	-	-	-	-	-	-	-
Mining	US$000	381,955	275,355	12,309	7,772	9,861	12,745	20,520	20,537	14,626	8,232
Processing	US$000	377,483	145,723	30,146	31,022	31,022	31,037	32,306	32,306	32,306	11,613
Administration	US$000	235,892	89,642	19,024	19,576	19,576	19,586	20,386	20,386	20,386	7,328
Site Services	US$000	309,050	125,933	23,819	24,511	24,511	24,523	25,526	25,526	25,526	8,416
Total	**US$000**	**1,299,509**	**631,782**	**85,298**	**82,881**	**84,970**	**87,890**	**98,739**	**98,756**	**92,845**	**36,349**

Table 18-4: LOM Unit Operating Costs
Hecla Mining Company – Casa Berardi Mine

Item	Units	Total	Annual Avg. (2022-2027)	2028	2029	2030	2031	2032	2033	2034	2035
Hedging Gain	US$/t	(0.26)	(0.68)	-	-	-	-	-	-	-	-
Mining	US$/t	20.29	38.49	8.11	4.97	6.31	8.15	12.61	12.62	8.99	14.07
Processing	US$/t	20.05	20.37	19.86	19.86	19.86	19.86	19.86	19.86	19.86	19.86
Administration	US$/t	12.53	12.53	12.53	12.53	12.53	12.53	12.53	12.53	12.53	12.53
Site Services	US$/t	16.41	17.61	15.69	15.69	15.69	15.69	15.69	15.69	15.69	15.69
Total	**US$/t**	**69.03**	**88.31**	**56.18**	**53.05**	**54.39**	**56.23**	**60.69**	**60.70**	**57.07**	**62.15**

19.0 ECONOMIC ANALYSIS

The economic analysis contained in this TRS is based on the Casa Berardi Proven and Probable Mineral Reserves material only, economic assumptions, and capital and operating costs provided by Hecla's technical team in its LOM plan model and reviewed by SLR. All costs in this section are expressed in US dollars and all measurements are in metric values. Unless otherwise stated, all costs in this section of the TRS are expressed without allowance for escalation or currency fluctuation. All costs received from Hecla's site technical team in its Casa Berardi LOM 2022 Reserves only model were quoted in Canadian dollars and were converted to US dollars at an exchange rate of US$1 = C$1.275.

A summary of the key project criteria is provided in the subsequent subsections.

19.1 Economic Criteria

19.1.1 Physicals

- Mine life: 14 year LOM (between years 2022 and 2035)
- Open Pit operations
  - Open pit mine life: 14 years (between years 2022 and 2035)
  - Total ore tonnes mined: 16.45 Mt at 2.61 g/t Au
  - Waste tonnes: 245.64 Mt
  - Maximum mining rate: 72,000 tpd (ore + waste) in year 2029
- Underground operations
  - Underground mine life: 6 years (between years 2022 and 2027)
  - Total ore tonnes mined: 2.37 Mt at 5.27 g/t Au
  - Maximum mining rate: 1,300 tpd
- Processing of Mineral Reserves:
  - Total Ore Feed to Plant: 18.83 Mt
    - Gold grade: 2.95 g/t Au
    - Silver grade: 0.71 g/t Ag
    - Silver/Gold ratio: Ag = 23.99% of Au
  - Maximum milling rate: 4,500 tpd
  - Contained Metal
    - Gold: 1.78 Moz Au
    - Silver: 0.428 Moz Ag
  - Average LOM Plant Recovery 83.50%
  - Recovered Metal
    - Gold: 1.49 Moz Au
    - Silver: 0.358 Moz Ag

19.1.2 Revenue

- SLR conduct a preliminary economic analysis using flat Mineral Reserve pricing of US$1,600/oz Au and US$21/oz Ag and confirmed the mine was economic at those prices.
- For the purposes of this economic analysis described in this section, revenue is estimated over the LOM with a flat long term price of US$1,650/oz Au and US$21/oz Ag, respectively. SLR considers this price to be aligned with latest industry consensus long term forecast prices. Transportation, insurance and refining charges are estimates at US$4.31/oz Au over the LOM. Payable metals in the Casa Berardi LOM 2022 plan are estimated at 99.9% for gold and 99.0% for silver. These rates are based on actual figures for refining losses.
- LOM net revenue is US$2,456 million (after Refining Charges).

19.1.3 Capital Costs

- Total sustaining capital costs total US$347.2 million
- Capital costs in years 2024 and 2025, are higher than the LOM average to prepare infrastructure needed to achieve full production in the open pits.
- Salvage value of $22.8 million credit in last year of operation.
- Closure costs of US$22.9 million are included in the analysis at the end of the LOM.

19.1.4 Operating Costs

- Open Pit mining: US$15.50/t ore mined
- Underground mining: US$53.43/t ore mined
- Processing (includes paste fill plant): US$20.05/t ore milled
- Site Services - Mechanical & Electrical: US$16.42/t ore milled
- Hedging Operating Costs Savings: (US$0.26/t ore milled)
- G&A US$12.53/t ore milled
- Total unit operating costs US$69.03/t ore milled
- LOM total operating costs US$1,300 million
- Excludes financing and corporate overhead costs

19.1.5 Taxation and Royalties

- Royalties: The current production zones as well as any in the 2022 LOM are not subject to an NSR or royalty to a third party / previous landowner.
- Income tax is payable to the Federal Government of Canada, pursuant to the Income Tax Act (Canada). The applicable Federal income tax rate is 15% of taxable income.
- Income tax is payable to the Province of Québec at a tax rate of 11.5% of taxable income.
- No income taxes are payable until 2029 as Hecla uses their current tax pools and net operating loss carry forwards. Beginning in 2029 the effective tax rate used is 26.5% (combined federal and provincial)
- Québec Mining Tax base rate is 16%

19.2 Cash Flow Analysis

SLR has reviewed the Hecla's "Casa Berardi LOM 2022 Reserves only model" and has prepared its own unlevered after-tax LOM cash flow model based on the information contained in this TRS to confirm the physical and economic parameters of the Casa Berardi Mine.

The Casa Berardi economics have been evaluated using the discounted cash flow method by considering annual processed tonnages and grade of ore. The associated process recovery, metal prices, operating costs, refining and transportation charges, and sustaining capital expenditures were also considered.

The full annual cash flow model is presented in Table 19-1 in US dollars with no allowance for inflation, show a pre-tax and after-tax NPV, using a 5% discount rate, of $514 million and $396 million, respectively. The SLR QP is of the opinion that a 5% discount/hurdle rate for after-tax cash flow discounting of long lived precious/base metal operations in a politically stable region is reasonable and appropriate and commonly used. For this cash flow analysis, the internal rate of return (IRR) and payback are not applicable as there is no negative initial cash flow (no initial investment to be recovered) since Casa Berardi has been in operation for a number of years.

Table 19-1: Annual Cash Flow Model
Hecla Mining Company – Casa Berardi Mine

Commercial Production Timeline in Years		US$ & Metric Units	LRP Avg / Total	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Market Prices																			
Gold		US$/oz	**$1,690**	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650	1,650
Silver		US$/oz	**$21.00**	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Physicals																			
Total OP Ore Mined		000 t	18,450	807	979	706	380	565	1,081	1,518	1,982	1,982	1,565	1,827	1,827	1,827	585	-	-
Total OP Waste Mined		000 t	245,653	6,357	9,645	14,488	17,889	19,055	18,903	20,981	28,687	24,687	28,688	26,623	24,623	15,588	2,223	-	-
Total OP Material Mined		000 t	262,084	6,804	10,622	15,194	18,499	20,000	19,999	22,499	28,249	26,249	28,249	28,250	26,250	15,010	2,808	-	-
Waste Ore Ratio		W:O	14.99	10.21	10.30	20.52	20.50	20.17	17.49	13.82	15.80	15.80	15.79	15.13	15.13	8.23	3.80	-	-
Total UG Ore Mined		000 t	2,575	485	499	423	423	355	280	-	-	-	-	-	-	-	-	-	-
Total UG Material Mined		000 t	2,575	485	499	423	423	355	280	-	-	-	-	-	-	-	-	-	-
Total Ore Processed		000 t	18,826	1,076	1,048	1,129	1,280	1,000	1,221	1,518	1,982	1,982	1,565	1,827	1,827	1,827	585	-	-
Gold Grade, Processed		g/t	2.96	3.36	3.35	3.26	2.82	2.80	2.89	2.78	3.29	2.80	2.28	3.40	3.02	3.10	2.80	-	-
Silver Grade, Processed		g/t	0.71	0.81	0.80	0.78	0.68	0.67	0.57	0.67	0.78	0.67	0.54	0.82	0.72	0.74	0.67	-	-
Contained Gold, Processed		oz	1,788,975	116,357	113,007	118,480	115,882	116,589	101,901	169,805	162,954	160,484	112,543	177,977	157,899	182,289	52,690	-	-
Contained Silver, Processed		oz	428,186	27,900	27,121	28,486	27,798	23,044	24,399	42,592	48,966	44,730	27,030	42,714	47,335	48,948	12,864	-	-
Average Recovery, Gold		%	88.5%	87.1%	86.8%	86.9%	87.1%	87.4%	87.8%	86.2%	85.4%	81.7%	78.5%	81.9%	80.0%	80.9%	79.7%	-	-
Average Recovery, Silver		%	88.5%	87.1%	86.8%	86.9%	87.1%	87.4%	87.8%	86.2%	85.4%	81.7%	78.5%	81.9%	80.0%	80.9%	79.7%	-	-
Recovered Gold		oz	1,650,180	101,278	97,902	103,000	100,848	102,102	89,570	146,327	139,353	131,707	88,350	144,709	126,291	130,330	42,017	-	-
Recovered Silver		oz	357,928	24,306	23,496	24,759	24,259	24,564	21,530	37,437	42,684	37,598	21,213	34,753	38,309	35,284	10,278	-	-
Payable Gold	99.90%	oz	1,648,529	101,176	97,804	102,897	100,747	102,000	89,489	146,213	139,222	131,623	88,269	144,574	126,165	130,200	41,975	-	-
Payable Silver	99.00%	oz	354,052	24,062	23,261	24,472	23,963	24,258	21,317	37,063	42,260	37,260	21,001	34,406	30,006	30,965	9,983	-	-
Cash Flow																			
Gold Gross Revenue	99.1%	US$'000s	2,456,337	166,961	161,377	169,779	166,233	168,300	146,502	238,451	229,117	189,327	145,701	238,567	208,172	214,830	69,259	-	-
Silver Gross Revenue	0.9%	US$'000s	7,435	505	488	518	503	509	445	570	675	572	441	722	650	650	230	-	-
Gross Revenue Before By-Product Credits	**100.0%**	**US$'000s**	**2,463,772**	**167,466**	**161,865**	**170,298**	**166,736**	**168,810**	**146,946**	**239,022**	**229,792**	**189,900**	**146,142**	**239,289**	**208,822**	**215,480**	**69,489**	-	-
Gold Gross Revenue		US$'000s	2,456,337	166,961	161,377	169,779	166,233	168,300	146,502	238,451	229,117	189,327	145,701	238,567	208,172	214,830	69,259	-	-
Silver Gross Revenue		US$'000s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gross Revenue After By-Product Credits		**US$'000s**	**2,456,337**	**166,961**	**161,377**	**169,779**	**166,233**	**168,300**	**146,502**	**238,451**	**229,117**	**189,327**	**145,701**	**238,567**	**208,172**	**214,830**	**69,259**	-	-
OP Mining Cost		US$'000s	(259,060)	(30,795)	(29,958)	(45,447)	(25,235)	(20,255)	(16,889)	(12,209)	(7,772)	(9,861)	(12,743)	(20,620)	(20,537)	(14,628)	(3,232)	-	-
UG Mining Cost		US$'000s	(126,899)	(25,201)	(25,251)	(22,640)	(22,087)	(18,974)	(12,481)	-	-	-	-	-	-	-	-	-	-
Process Cost		US$'000s	(377,488)	(22,050)	(23,515)	(23,082)	(26,059)	(26,160)	(26,662)	(30,148)	(33,022)	(31,022)	(33,037)	(32,306)	(32,306)	(32,306)	(11,631)	-	-
Mechanical & Electrical Costs		US$'000s	(309,090)	(18,511)	(18,129)	(22,000)	(24,529)	(25,999)	(29,184)	(29,039)	(28,513)	(26,513)	(28,529)	(25,529)	(25,529)	(25,529)	(9,179)	-	-
Operating Costs Savings due to Hedging		US$'000s	4,871	2,228	1,388	837	40	-	-	-	-	-	-	-	-	-	-	-	-
G&A Cost		US$'000s	(255,899)	(13,479)	(13,157)	(14,145)	(16,054)	(16,285)	(16,557)	(19,030)	(19,578)	(19,578)	(19,588)	(20,557)	(20,587)	(20,557)	(7,523)	-	-
Offsite Freight & Refining Cost		US$'000s	(6,433)	(457)	(422)	(444)	(455)	(440)	(385)	(455)	(584)	(455)	(583)	(824)	(545)	(562)	(181)	-	-
Subtotal Cash Costs Before By-Product Credits		US$'000s	(1,305,938)	(106,051)	(104,544)	(126,946)	(104,499)	(96,114)	(86,062)	(85,790)	(89,654)	(85,465)	(88,272)	(99,862)	(99,900)	(93,588)	(36,590)	-	-
By-Product Credits		US$'000s	7,435	505	488	518	503	509	445	570	675	572	441	722	650	650	230	-	-
Total Cash Costs After By-Product Credits		**US$'000s**	**(1,298,502)**	**(105,546)**	**(104,056)**	**(126,428)**	**(103,996)**	**(95,604)**	**(85,618)**	**(85,221)**	**(82,979)**	**(84,892)**	**(87,830)**	**(99,140)**	**(98,678)**	**(92,757)**	**(36,360)**	-	-
Operating Margin	47%	US$'000s	1,157,835	61,415	57,321	43,350	62,237	72,696	60,883	153,231	146,138	104,435	57,870	139,426	109,502	122,073	32,898	-	-

Commercial Production Timeline in Years	US$ & Metric Units	LRP Avg./ Total	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
EBITDA	US$'000s	1,157,895	61,355	47,328	43,199	62,297	72,456	69,889	103,231	140,328	104,235	57,890	139,900	109,562	122,079	32,588	-	-
Depreciation/Amortization Allowance	US$'000s	(733,081)	(45,007)	(46,713)	(55,184)	(64,077)	(68,520)	(61,496)	(51,754)	(57,382)	(53,932)	(49,389)	(67,972)	(59,475)	(54,900)	(2,051)	-	-
Earnings Before Taxes	US$'000s	409,754	16,389	608	(11,825)	(1,779)	3,676	(612)	51,476	82,945	50,329	8,501	71,934	50,027	67,179	30,807	-	-
Provincial Mining Tax	US$'000s	(123,995)	(3,892)	(3,558)	(3,823)	(3,581)	(3,701)	(2,741)	(20,693)	(27,670)	(20,464)	(2,703)	(37,897)	(13,782)	(17,852)	(9,003)	-	-
Income Tax Payable	US$'000s	(71,675)	-	-	-	-	-	-	-	(20,919)	(8,421)	-	(33,259)	(14,539)	(18,078)	(2,461)	-	-
Net Income	US$'000s	212,086	12,496	(2,950)	(15,648)	(5,361)	(185)	(3,360)	30,985	34,356	21,439	5,798	38,979	21,709	31,248	28,862	-	-
Non-Cash Add Back - Depreciation/Amortization	US$'000s	733,081	45,007	46,713	55,184	64,077	68,520	61,496	51,754	57,382	53,932	49,389	67,972	59,475	54,900	2,051	-	-
Working Capital	US$'000s	-	(1,324)	801	(680)	(1,177)	(1,434)	(309)	(1,498)	(2,896)	578	3,303	(2,486)	898	(896)	2,578	9,443	-
Operating Cash Flow	US$'000s	970,167	56,179	44,564	38,856	55,539	67,251	57,625	81,242	108,843	87,929	56,490	100,466	81,082	85,252	33,491	9,443	-
Capital (includes costs savings due to hedging)	US$'000s	(347,299)	(29,585)	(20,000)	(52,425)	(49,840)	(31,951)	(38,890)	(24,344)	(42,506)	(32,939)	(30,608)	(33,995)	(37)	(3,355)	20,860	-	-
Salvage Value	US$'000s	20,897	-	-	-	-	-	-	-	-	-	-	-	-	-	20,897	-	-
Closure/Reclamation Capital	US$'000s	(22,800)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(11,435)	(11,435)
Total Capital	US$'000s	(349,171)	(29,585)	(20,000)	(52,425)	(49,840)	(31,951)	(38,890)	(24,344)	(42,506)	(32,939)	(30,608)	(33,995)	(37)	(3,355)	41,757	(11,435)	(11,435)
LRP Metrics																		
Economic Metrics																		
a) Pre-Tax																		
Free Cash Flow	US$'000s	283,668	40,687	26,822	(9,768)	9,180	49,891	24,684	77,429	94,926	71,886	28,695	139,926	109,772	117,899	77,274	(3,772)	(13,435)
Cumulative Free Cash Flow	US$'000s		40,687	67,509	57,741	67,001	96,722	120,406	197,835	292,761	364,646	393,020	533,946	643,718	760,577	823,851	820,079	806,644
NPV @ 5%	US$'000s	514,998																
NPV @ 7%	US$'000s	494,276																
b) After-Tax																		
Free Cash Flow	US$'000s	620,996	26,994	23,264	(13,575)	5,699	35,900	20,956	68,930	88,337	55,030	25,581	86,971	81,455	80,929	70,748	(3,772)	(13,435)
Cumulative Free Cash Flow	US$'000s		26,994	50,258	36,679	42,378	78,278	99,233	168,163	232,488	287,498	313,080	400,050	481,505	562,434	634,183	630,411	616,976
NPV @ 5%	US$'000s	356,462																
NPV @ 7%	US$'000s	335,990																
Operating Metrics																		
Mine Life	Years	18																
Maximum Daily OP Mining Rate	tpd mined	73,000	18,900	27,840	43,584	51,387	55,555	55,554	61,479	72,915	72,935	72,934	73,721	72,917	43,894	23,898	-	-
Maximum Daily UG Mining Rate	tpd mined	1,300	1,302	1,303	1,175	1,185	900	867	-	-	-	-	-	-	-	-	-	-
Maximum Daily Processing Rate	tpd milled	4,500	2,988	2,952	3,085	3,564	3,621	3,670	4,148	4,340	4,340	4,342	4,445	4,539	4,539	4,539	-	-
OP Mining Cost	US$ /t ore mined	$ 15.50	$ 50.72	$ 48.56	$ 44.86	$ 17.71	$ 10.35	$ 6.62	$ 8.11	$ 4.97	$ 6.31	$ 8.25	$ 12.61	$ 12.62	$ 9.99	$ 14.07	-	-
UG Mining Cost	US$ /t ore mined	$ 56.43	$ 53.78	$ 53.02	$ 53.53	$ 53.39	$ 53.43	$ 53.93	-	-	-	-	-	-	-	-	-	-
Processing Cost	US$ /t ore milled	$ 20.05	$ 20.51	$ 20.52	$ 20.44	$ 20.17	$ 20.25	$ 20.18	$ 19.86	$ 19.86	$ 19.86	$ 19.86	$ 19.86	$ 19.86	$ 19.86	$ 19.86	-	-
Mechanical& Electrical Costs	US$ /t ore milled	$ 16.42	$ 16.16	$ 15.38	$ 15.69	$ 19.01	$ 18.46	$ 17.53	$ 15.69	$ 15.69	$ 15.69	$ 15.69	$ 15.69	$ 15.69	$ 15.69	$ 15.69	-	-
Operating Costs Savings due to Hedging	US$ /t ore milled	($0.26)	($0.07)	($0.73)	($0.72)	($0.68)	-	-	-	-	-	-	-	-	-	-	-	-
G&A Cost	US$ /t ore milled	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	$ 12.53	-	-
Total Site Operating Costs	US$ /t ore milled	$69.69	$ 98.18	$ 100.36	$ 112.08	$ 81.23	$ 73.76	$ 64.84	$ 56.15	$ 53.05	$ 54.39	$ 56.23	$ 60.69	$ 60.70	$ 57.07	$ 62.15	-	-

SLR's economic analysis confirmed that the Casa Berardi Mineral Reserves are economically viable at the assumed metal price forecast. The undiscounted pre-tax cash flow is US$809 million, and the undiscounted after-tax cash flow is US$621 million. The pre-tax NPV at an 5% base discount rate is US$514 million and the after-tax NPV at an 5% base discount is US$396 million.

19.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities on after-tax NPV at a 5% discount rate. The following parameters were examined:

- Gold head grade
- Gold metallurgical recovery
- Gold metal price
- US$/C$ Exchange Rate
- Operating costs
- Capital costs (Sustaining, salvage, and closure)

For the case that includes mine equipment capital leases, after-tax sensitivities have been calculated for -20% to +20% variations for gold grade, and gold price, -10% to +10% variations for gold recovery, and -10% to +15% for operating costs and capital costs to determine the most sensitive parameter of the Casa Berardi Mine. The sensitivities are presented in Table 19-2.

Table 19-2: Sensitivity Analysis Summary
Hecla Mining Company – Casa Berardi Mine

Variance From Base Case	Head Grade (g/t Au)	NPV at 5% (US$ M)
-20%	2.36	129
-10%	2.65	277
0%	**2.95**	**396**
10%	3.24	509
20%	3.54	614
Variance From Base Case	**Recovery (% Au)**	**NPV at 5% (US$ M)**
-10%	75.1	277
-5%	79.3	338
0%	**83.5**	**396**
5%	87.7	454
10%	91.8	509
Variance From Base Case	**Metal Prices (US$/oz Au)**	**NPV at 5% (US$ M)**
-20%	1,320	128
-10%	1,485	276
0%	**1,650**	**396**
10%	1,815	509
20%	1,980	615
Variance From Base Case	**Exchange Rate US$/C$**	**NPV at 5% (US$ M)**
-20%	1.02	128
-10%	1.15	276
0%	**1.28**	**396**
10%	1.40	509
20%	1.53	615
Variance From Base Case	**Operating Costs (US$/t)**	**NPV at 5% (US$ M)**
-10%	62.13	491
-5%	65.58	444
0%	**69.03**	**396**
7.5%	74.21	326
15%	79.38	255

Variance From Base Case	Capital Costs (US$ 000)	NPV at 5% (US$ M)
-10%	314	424
-5%	332	410
0%	**349**	**396**
7.5%	375	376
15%	402	355

A comparison of results for the various sensitivity cases using after-tax NPV at a 5% discount rate are presented in Figure 19-1.

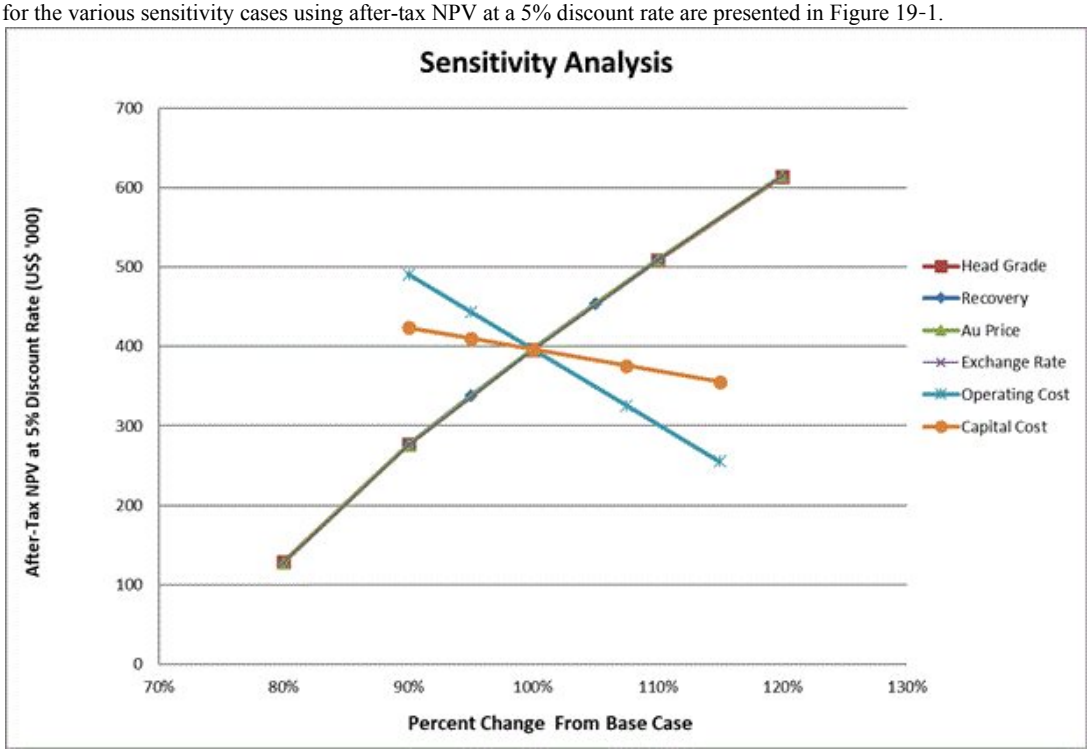


Figure 19-1: After-tax NPV at 5% Sensitivity Analysis

The Mine is most sensitive to changes in metal prices and US$/C$ exchange rate, then to head grade and metallurgical recoveries, followed by operating costs and capital costs.

20.0 ADJACENT PROPERTIES

Hecla controls a 37 km strike length of favorable geology for gold mineralization along the Casa Berardi Fault. There are no significant gold deposits located immediately adjacent to the Property's boundaries.

21.0 OTHER RELEVANT DATA AND INFORMATION

Cautionary Note: *This Section 21 of the Casa Berardi TRS contains information that is different than the Economic Analysis provided in Section 19 of the Casa Berardi TRS. Section 19 was prepared in accordance with specific SEC rules which require that only Proven and Probable Mineral Reserves (LOM plan) be used and disallow the inclusion of Inferred Mineral Resources in demonstrating the economic viability in support of a disclosure of a mineral reserve. See Item 1302(e)(6) of SEC Regulation S-K.*

The supplemental information in this Section 21 is not designed to replace the Economic Analysis disclosed in Section 19, but rather to provide additional, supplemental disclosure. This Section 21 supplements the disclosure contained in Section 19's Economic Analysis by inclusion of Inferred Mineral Resources as described below. You are cautioned not to rely on the economic analysis in this Section 21 instead of Section 19, as this supplemental information includes Inferred Mineral Resources that are not Mineral Reserves and do not have demonstrated economic viability. You should not assume that all or any part of Inferred Mineral Resources will ever be converted into Mineral Reserves. Further, Inferred Mineral Resources have a great amount of uncertainty as to their existence and as to whether they can be mined legally or economically, and are considered too speculative geologically to have modifying factors applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources may not be considered when assessing the economic viability of a mining project, and may not be converted to a Mineral Reserve. The percentage of the mineral resources used in the LTP cash flow analysis that was classified as Inferred Mineral Resources is approximately 7.5%. The LTP also includes approximately 3.5% of marginal Measured and Indicated Mineral Resources that might be eligible for inclusion with the Mineral Reserves in the future.

Supplemental Information: The Company develops LTPs to support the strategic direction of its mines. The LTPs are updated annually by the technical teams using the most current geologic information, mine designs, processing parameters, cost and price inputs, regulatory considerations, and financial analyses. The plans include some Inferred resources when those resources, in the judgement of the technical team and based on historical performance, have a reasonable probability of contributing positively to the economic performance of the mines. As such, the valuation of the mines as determined by the Company in its Long-Range Planning exceeds the valuation determined when only Reserves are analyzed. Experience has shown that the LTPs include in the order of 5% to 10% Inferred Mineral Resources.

An after-tax Cash Flow Projection has been generated from the LTP production schedule and capital and operating cost estimates, and is summarized in Table 21-1 along with the corresponding LOM plan (Mineral Reserves only presented in Section 19) metrics and the variances between the two plans.

Table 21-1: LTP versus LOM Plan
Hecla Mining Company – Casa Berardi Mine

Casa Berardi LTP	2022-2024	2025-2029	2030-2035	Total LTP
Operations				
Tonnes of Ore Milled (000 t)	4,300	8,000	8,600	20,900
Gold oz produced (000 oz)	400	675	650	1,725
Silver oz produced (000 oz)	100	150	150	400
Financial (in millions)				
Revenue	700	1,100	1,100	2,900
Cost of Goods Sold	600	800	800	2,200
Gross Profit	100	300	300	700
Less: Income Tax	20	50	80	150
Net Income	80	250	220	550
Cash Flow (in millions)				
Net Income	80	250	220	550
Depreciation, Depletion, and Amortization (DDA)	100	300	300	700
Working Capital and other non-cash changes	(10)	50	60	100
Cash Flow from Operations	170	600	580	1,350
Less: Capital Expenditures	100	200	100	400
Net Cash Flow	70	400	480	950
NPV (0%)				950
NPV (5%)				600

Casa Berardi LOM Cashflow	2022-2024	2025-2029	2030-2035	Total Reserve
Tonnes of Ore Milled (000 t)	3,300	7,000	8,600	18,900
Gold oz produced (000 oz)	300	540	650	1,490
Silver oz produced (000 oz)	70	130	160	360
Net Income US$ M	(6)	87	151	232
Cash Flow from Operations US$M	139	381	450	970
Net Cash Flow US$M	37	196	368	600
NPV (0%) US$ M				600
NPV (5%) US$ M				400
		Variances		
Tonnes Variance (000 t)	1,000	1,000	-	2,000
Gold oz produced Variance (000 oz)	100	135	-	235
Silver oz produced Variance (000 oz)	30	20	(10)	40
Tonnes % Variance	30%	14%	0%	11%
Gold Produced % Variance	33%	25%	0%	16%
Silver Produced % Variance	43%	15%	-6%	11%
Net Income % Variance	-1456%	189%	45%	137%
Cash Flow from Operations % Variance	22%	58%	29%	39%
Net Cash Flow % Variance	91%	104%	31%	58%
NPV (0%) Variance				58%
NPV (5%) Variance				50%

In the first six years, the increases in the LTP cash flows are essentially driven by the volume of gold extracted, which is inclusive of Mineral Resources. In the post-underground years, the main driver causing a significant difference between the variance in gold production (16%) and net income, operating cash flow, and net cash flow (137%, 39%, 53% respectively) is primarily driven by the significantly better margin on the open pit material in the LTP. This variance stems from the fact that the costs to extract the ounces in both plans are virtually the same because the same amount of rock must be handled whether Hecla includes resources or not. Essentially, in the LOM plan, the Mineral Resources are still extracted but are expensed as waste.

For non-cash costs and taxes, there are no significant differences in assumptions as globally the DDA expense variance is less than 5%, however, the timing of unit of production DDA is such that the depletion expense is more front-loaded in the LOM plan (by approximately $50 million). This variance is due to the lower depreciation base resulting from less underground Mineral Reserves being mined. Hence, the denominator being smaller but with a similar asset base, the depletion is "accelerated" in the first three years of the LOM plan.

22.0 INTERPRETATION AND CONCLUSIONS

SLR offers the following conclusions and observations by area:

22.1 Geology and Mineral Resources

- Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300. Total Measured and Indicated Mineral Resources, exclusive of Mineral Reserves, as of December 31, 2021, are estimated to be 7.04 Mt at 4.66 g/t Au containing 1,05 Moz Au. Inferred Mineral Resources total 9.18 Mt at 2.68 g/t Au for 0.79 Moz Au. The underground portion of Measured and Indicated Mineral Resources represent 98% of the total Measured and Indicated Mineral Resources.

- The Casa Berardi Measured and Indicated Mineral Resources and the underground Inferred Mineral Resources have been prepared to industry best practices and conform to the resource categories defined by the SEC in S-K 1300. The SLR QP notes that the open pit Inferred Mineral Resources situated at the 134 and 160 pits are not constrained by a resource pit shell and that the elevation datums used to limit the open pit resources at depth are optimistic and should be replaced with resource shells in the future. Notwithstanding, the SLR QP is of the opinion that this is not a significant issue because this material represents approximately 9% of the total reserve and resource ounces at Casa Berardi, it is all classified as Inferred, and none of it is included in the LTP.

- The Mineral Resources for Casa Berardi conform to the resource categories defined by the SEC in S-K 1300. Resource classification polygons were manually created for reach lens based on drill hole composites with average distances of up to 25 m for Measured and Indicated blocks. Measured blocks have the added requirement of having underground development nearby. Inferred blocks are located outside the 25 m average distance polygons and are based on average distances up to generally a maximum of 35 m and rarely up to 50 m.

- The open pit block models are diluted to whole block models using scripts in Gemcom. For the open pit diluted block models, only the blocks with more than 25% of mineralized material were classified, the remaining blocks with less than 25% of mineralized material are not classified and excluded from the resource estimate.

- From 1974 to 2021, surface and underground diamond drilling, totalling over 3.5 million metres, has been completed at Casa Berardi.

- Over the past few decades, the Casa Berardi geology team has developed an advanced understanding of the complex geology, lithology, structural, and alteration controls present at Casa Berardi.

- The mineralization style and setting are well understood and support the declaration of Mineral Resources and Mineral Reserves.

- The Casa Berardi sample preparation, analyses, QA/QC protocols, and security procedures are acceptable, meet industry standard practice, and are adequate for Mineral Resource estimation.

    - Sample collection and handling of core is undertaken in accordance with industry standard practices, with procedures implemented to limit potential sample losses and sampling biases.

  - Sample preparation for samples that support Mineral Resource estimation has followed a similar procedure since 1998. These preparation procedures are consistent with industry standard methods for gold deposits.
  - Core from exploration and infill diamond drilling programs are analyzed by independent and accredited laboratories using industry standard methods for gold and silver analyses. Current run of mine sample analyses are performed by the mine laboratory.
  - While limited information is available regarding the QA/QC procedures for the pre-1998 drill programs, sufficient reanalysis programs and vast amounts of more recent data support the use of pre-1998 data.

- The QA/QC program results indicate that the sample preparation and analytical procedures at the mine laboratory and Swastika are well aligned to generate reliable and accurate results.
  - Blank sample results imply minimal cross sample contamination.
  - Certified reference material (CRM) results demonstrate that assay values are sufficiently accurate to be used in Mineral Resource estimation and no significant biases are evident at the mine and Swastika laboratories.
  - Sequential insertion of duplicate samples has resulted in a relatively low proportion of duplicate results for mineralized samples.
  - External pulp and reject check assays suggest that the ALS gold assays may be biased high relative to the Swastika and Mine laboratory results.
- Sample security is regarded as very good. Samples are always attended or locked in the on site logging or sampling facilities. Chain of custody procedures consist of completing sample submittal forms that are sent to the laboratory with sample shipments and shipment tracking to ensure that all samples are received by the laboratory.
- The data verification programs undertaken on the data collected from the Project comply with industry standards and adequately support the geological interpretations, validate the analytical and database quality, and support the use of the data in Mineral Resource and Mineral Reserve estimation and in mine planning
- The SLR QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that would materially affect the Mineral Resource estimate.
- The Property is very large and covers a very favourable geological environment for gold mineralization including a 37 km strike length along the Casa Berardi Fault.
- The SLR QP is of the opinion that excellent exploration potential remains on the Property, both along strike and at depth in the immediate mine area and on the rest of the Property.
- Geophysics and drilling are the key exploration tools needed to make new discoveries under the thick layer of overburden that covers most of the Property.

22.2 Mining and Mineral Reserves

- Mineral Reserves have been classified in accordance with the definitions for Mineral Reserves in S-K 1300. Mineral Reserves as of December 31, 2021 total 18.82 Mt grading 2.95 g/t Au containing 1.78 Moz Au.

- Measured and Indicated Mineral Resources were converted to Proven and Probable Mineral Reserves, respectively. Inferred Mineral Resources were not converted to Mineral Reserves, however, are typically included in the Casa Berardi LTP and therefore are removed from the LOM cash flows to ensure economic confirmation of the Mineral Reserves.

- The mining methods at Casa Berardi are well established with many years of operating experience, providing the necessary expertise to, safely and economically, extract the Mineral Reserves.

- While both transverse and longitudinal longhole stoping methods are employed effectively challenging ground conditions require the use of various types of backfill to provide the necessary support.

- Underground mining will come predominantly from the West Mine with a minor amount from the East Mine. Mining from various open pits on surface represent the bulk of the Mineral Reserves to be mined, accounting for approximately 77% of the Casa Berardi Mineral Reserves.

- The current LOM period is estimated to be fourteen years ending in 2035. Underground Mineral Reserves totalling 2.4 Mt will be mined during the first six years while open pit Mineral Reserves totalling 16.5 Mt will be mined over the entire LOM period.

22.3 Mineral Processing

- Metallurgical and production models have been developed from extensive baseline sampling and are further adjusted annually to account for process and metallurgical improvements and changes.

- The test work performed on open pit material was used to estimate gold recovery, while operating data was used for underground material. Recent test work has been performed by an external laboratory on future open pit material (WMCP and Principal). WMCP test results were used to inform the long term mine plan. An update on data pertaining to the Principal Pit will be made once the test results are available.

- Test work programs, both internal and external, continue to be performed to support current operations and potential improvements.

- The current process facilities are appropriate for the mineralization types provided from the mine. The flowsheet, equipment, and infrastructure are expected to support the current LOM plan.

22.4 Infrastructure

- Hecla plans to build a new maintenance garage to handle the 150 t trucks.

- Hecla plans to build a new pre-crusher.

22.5 Environment

- Hecla has sufficiently assessed the environmental impact of the operation, and subsequent closure and remediation requirements such that Mineral Resources and Mineral Reserves can be declared, and the mine plan deemed appropriate and achievable. Closure provisions are appropriately considered and monitoring programs are in place.

- Hecla has developed a community relations plan to identify and ensure an understanding of the needs of the surrounding communities and to determine appropriate programs for addressing those needs. Hecla appropriately monitors socio-economic trends, community perceptions, and mining impacts.

- Permits held by Hecla for the Property are sufficient to ensure that mining activities are conducted within the regulatory framework required by regulations.

- There are currently no known environmental, permitting, or social/community risks that could impact the Mineral Resources or Mineral Reserves.

23.0 RECOMMENDATIONS

It is normal that there are not many recommendations for mature operations like Casa Berardi. SLR offers the following recommendations by area.

23.1 Geology and Mineral Resources

1. Continue drilling to expand the near mine open pit and underground Mineral Resources.
2. Convert open pit and underground Inferred Mineral Resources to Indicated, especially material in the LTP.
3. Continue to drill below the 134 and 160 pits.
4. Create resource open pit shells for 134 and 160.
5. Increase regional exploration activities to make new discoveries on the very large Property.
6. Consider changing QA/QC protocols related to pulp duplicate selection and sending rejects for external check assays.
7. Investigate the potential high gold assay bias at the secondary umpire laboratory.
8. Implement procedures that will help reduce CRM mislabelling or "swaps".

23.2 Mining and Mineral Reserves

1. Investigate the potential use of contractors, improved equipment performance, revised schedules and other incentives to complete the planned development.
    - While mining operations at Casa Berardi are being carried out in an appropriate fashion annual mine development to access future mining areas has fallen short of planned advance rates. Additional efforts will be required to meet production targets.
1. Continue conducting definition diamond drilling throughout the remainder of the underground mining operation until 2027.
    - Based on positive ongoing results consider increasing the drilling program.
2. Continue to convert Mineral Resources to Mineral Reserves to extend the underground operation past 2027 and extend open pit mining where possible.
3. Investigate adding marginal underground Measured and Indicated Mineral Resources to the Mineral Reserves.

23.3 Mineral Processing

1. Continue to conduct additional metallurgical testing to better understand the processing of mineralization from the Principal and WMCP pits. This will aid in projecting metallurgical recoveries for these pits and will indicate any variability in gold recovery and grindability of the material. SLR notes that testing was undertaken at an external laboratory in 2021 and some results were not available at the time of preparation of this TRS.

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25.0 RELIANCE ON INFORMATION PROVIDED BY THE REGISTRANT

This TRS has been prepared by SLR for Hecla. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this TRS,
- Assumptions, conditions, and qualifications as set forth in this TRS, and
- Data, reports, and other information supplied by Hecla and other third party sources.

SLR has not researched property title or mineral rights for Casa Berardi as we consider it reasonable to rely on Hecla's legal counsel who is responsible for maintaining this information.

SLR has relied on Hecla for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Property in the Executive Summary and Section 19. As the Property has been in operation for over 30 years, Hecla has considerable experience in this area.

The SLR QPs have taken all appropriate steps, in their professional opinion, to ensure that the above information from Hecla is sound.

Except for the purposes legislated under provincial securities laws, any use of this TRS by any third party is at that party's sole risk.

26.0 DATE AND SIGNATURE PAGE

This report titled “Technical Report Summary on the Casa Berardi Mine, Northwestern Québec, Canada” with an effective date of December 31, 2021 was prepared and signed by:

Signed *SLR International Corporation*

Dated at Bothell, WA
February 21, 2022

SLR International Corporation

27.0 APPENDIX 1

27.1 Claim Table

Table 27-1: Claim Table

Hecla Mining Company – Casa Berardi Mine

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Mine	Hecla Québec Inc.	BM	768	-	20220428	397.09	19880429	$20,963.35	$0.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	BM	833	-	20221217	84.35	19951218	$4,259.68	$0.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	BM	1054	-	20221005	92.56	20201006	$4,673.27	$0.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097901	-	20220509	55.85	20020911	$68.75	$2,500.00	$246,734.72
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097902	-	20220509	55.85	20020911	$68.75	$2,500.00	$165,603.11
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097903	-	20220509	55.85	20020911	$68.75	$2,500.00	$6,319.94
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097904	-	20220509	55.85	20020911	$68.75	$2,500.00	$13,519.94
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097905	-	20220509	55.85	20020911	$68.75	$2,500.00	$12,613.46
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097906	-	20220509	55.85	20020911	$68.75	$2,500.00	$13,519.94
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097930	-	20220509	55.84	20020911	$68.75	$2,500.00	$102,729.87
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097931	-	20220729	37.02	20020911	$68.75	$2,500.00	$9,914.09

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097932	-	20220509	55.85	20020911	$68.75	$2,500.00	$13,519.94
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097957	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.42
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097958	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097959	-	20220509	55.83	20020911	$68.75	$2,500.00	$12,008.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097960	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097961	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097962	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097963	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097964	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097965	-	20220729	43.25	20020911	$68.75	$2,500.00	$13,490.71
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097966	-	20220729	23.90	20020911	$35.25	$1,000.00	$632,965.95
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097967	-	20220729	41.75	20020911	$68.75	$2,500.00	$13,514.09

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097968	-	20220509	55.84	20020911	$68.75	$2,500.00	$13,514.09
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097991	-	20220509	55.82	20020911	$68.75	$2,500.00	$13,502.41
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097992	-	20220509	55.82	20020911	$68.75	$2,500.00	$13,502.41
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097993	-	20220509	55.82	20020911	$68.75	$2,500.00	$13,502.41
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097994	-	20220509	55.82	20020911	$68.75	$2,500.00	$13,502.41
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097995	-	20220509	55.82	20020911	$68.75	$2,500.00	$13,502.41
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097996	-	20220509	55.82	20020911	$68.75	$2,500.00	$13,502.41
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097997	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097998	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1097999	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098000	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098001	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098002	-	20220509	55.83	20020911	$68.75	$2,500.00	$13,508.25
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098041	-	20220509	55.86	20020911	$68.75	$2,500.00	$26,197.41
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098074	-	20220509	55.87	20020911	$68.75	$2,500.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098085	-	20220509	55.86	20020911	$68.75	$2,500.00	$439.31
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098086	-	20220509	55.86	20020911	$68.75	$2,500.00	$2,929.32
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098087	-	20220509	55.86	20020911	$68.75	$2,500.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098088	-	20220509	55.86	20020911	$68.75	$2,500.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098089	-	20220509	55.86	20020911	$68.75	$2,500.00	$350.90
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098090	-	20220509	55.86	20020911	$68.75	$2,500.00	$257.38
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098091	-	20220509	55.86	20020911	$68.75	$2,500.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098092	-	20220509	55.86	20020911	$68.75	$2,500.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098093	-	20220509	55.86	20020911	$68.75	$2,500.00	$0.00

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098094	-	20220509	55.86	20020911	$68.75	$2,500.00	$7,110.36
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098095	-	20220509	55.86	20020911	$68.75	$2,500.00	$11,992.29
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098109	-	20220509	42.75	20020911	$68.75	$2,500.00	$338,834.84
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098110	-	20220509	40.23	20020911	$68.75	$2,500.00	$2,895.73
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098111	-	20220509	40.48	20020911	$68.75	$2,500.00	$42,215.90
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098112	-	20220509	40.74	20020911	$68.75	$2,500.00	$617,564.86
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098113	-	20220509	42.26	20020911	$68.75	$2,500.00	$5,605.66
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098114	-	20220509	43.76	20020911	$68.75	$2,500.00	$529.18
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098115	-	20220509	51.18	20020911	$68.75	$2,500.00	$239,975.98
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098124	-	20220509	29.58	20020911	$68.75	$2,500.00	$523,848.24
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098125	-	20220509	4.98	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098126	-	20220509	20.03	20020911	$35.25	$1,000.00	$4,075.29

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098127	-	20220509	16.16	20020911	$35.25	$1,000.00	$1,801.54
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098128	-	20220509	13.40	20020911	$35.25	$1,000.00	$127,827.42
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098129	-	20220509	12.86	20020911	$35.25	$1,000.00	$39,892.15
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098130	-	20220509	12.32	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098131	-	20220509	0.16	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098132	-	20220509	9.35	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098133	-	20220509	5.78	20020911	$35.25	$1,000.00	$58,451.47
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098134	-	20220729	2.32	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098135	-	20220509	11.42	20020911	$35.25	$1,000.00	$60,185.51
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098136	-	20220729	14.22	20020911	$35.25	$1,000.00	$167,591.79
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098141	-	20220509	6.06	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098142	-	20220509	48.61	20020911	$68.75	$2,500.00	$9,282.24
Casa Berardi Mine	Hecla Québec Inc.	CDC	1098149	-	20220509	55.82	20020911	$68.75	$2,500.00	$0.00

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097832	-	20220509	55.89	20020911	$68.75	$2,500.00	$13,429.20
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097833	-	20220509	55.90	20020911	$68.75	$2,500.00	$12,890.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097834	-	20220509	55.90	20020911	$68.75	$2,500.00	$9,715.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097835	-	20220509	55.90	20020911	$68.75	$2,500.00	$9,715.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097836	-	20220509	55.90	20020911	$68.75	$2,500.00	$13,521.09
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097837	-	20220509	55.90	20020911	$68.75	$2,500.00	$11,715.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097840	-	20220509	55.89	20020911	$68.75	$2,500.00	$12,520.35
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097841	-	20220509	55.89	20020911	$68.75	$2,500.00	$11,209.20
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097842	-	20220509	55.89	20020911	$68.75	$2,500.00	$11,284.20

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097843	-	20220509	55.89	20020911	$68.75	$2,500.00	$9,709.20
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097844	-	20220509	55.89	20020911	$68.75	$2,500.00	$12,209.20
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097845	-	20220509	55.89	20020911	$68.75	$2,500.00	$12,657.33
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097846	-	20220509	55.89	20020911	$68.75	$2,500.00	$12,134.38
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097847	-	20220509	55.89	20020911	$68.75	$2,500.00	$7,807.12
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097848	-	20220509	55.89	20020911	$68.75	$2,500.00	$11,709.20
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097849	-	20220509	55.89	20020911	$68.75	$2,500.00	$11,709.20
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097851	-	20220509	55.88	20020911	$68.75	$2,500.00	$13,003.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097852	-	20220509	55.88	20020911	$68.75	$2,500.00	$11,703.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097853	-	20220509	55.88	20020911	$68.75	$2,500.00	$14,203.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097854	-	20220509	55.88	20020911	$68.75	$2,500.00	$14,203.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097855	-	20220509	55.88	20020911	$68.75	$2,500.00	$11,703.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097856	-	20220509	55.88	20020911	$68.75	$2,500.00	$9,800.55
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097857	-	20220509	55.88	20020911	$68.75	$2,500.00	$11,703.23

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097858	-	20220509	55.88	20020911	$68.75	$2,500.00	$11,760.18
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097859	-	20220509	55.88	20020911	$68.75	$2,500.00	$14,203.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097860	-	20220509	55.88	20020911	$68.75	$2,500.00	$14,203.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097861	-	20220509	55.88	20020911	$68.75	$2,500.00	$14,203.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097862	-	20220509	55.88	20020911	$68.75	$2,500.00	$14,203.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097863	-	20220509	55.88	20020911	$68.75	$2,500.00	$46,131.60
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097864	-	20220509	55.88	20020911	$68.75	$2,500.00	$25,078.52
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097865	-	20220509	55.88	20020911	$68.75	$2,500.00	$62,653.79
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097866	-	20220509	55.88	20020911	$68.75	$2,500.00	$8,203.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097867	-	20220509	55.87	20020911	$68.75	$2,500.00	$12,997.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097868	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097869	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097870	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097871	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097872	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097873	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097874	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097875	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097876	-	20220509	55.87	20020911	$68.75	$2,500.00	$2,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097877	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097878	-	20220509	55.87	20020911	$68.75	$2,500.00	$76,611.83
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097879	-	20220509	55.87	20020911	$68.75	$2,500.00	$14,197.27
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097880	-	20220509	55.86	20020911	$68.75	$2,500.00	$14,191.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097881	-	20220509	55.86	20020911	$68.75	$2,500.00	$14,191.31

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Casa Berardi Regional	Hecla Québec Inc.	CDC	1097882	-	20220509	55.86	20020911	$68.75	$2,500.00	$14,191.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097883	-	20220509	55.86	20020911	$68.75	$2,500.00	$14,191.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097884	-	20220509	55.86	20020911	$68.75	$2,500.00	$14,191.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097885	-	20220509	55.86	20020911	$68.75	$2,500.00	$46,927.36
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097886	-	20220509	55.86	20020911	$68.75	$2,500.00	$12,991.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097895	-	20220509	55.85	20020911	$68.75	$2,500.00	$11,785.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097896	-	20220509	55.85	20020911	$68.75	$2,500.00	$132,761.45
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097897	-	20220509	55.85	20020911	$68.75	$2,500.00	$618,164.67
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097898	-	20220509	55.85	20020911	$68.75	$2,500.00	$795,318.87
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097899	-	20220509	55.85	20020911	$68.75	$2,500.00	$1,171,947.26
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097900	-	20220509	55.85	20020911	$68.75	$2,500.00	$1,486,933.54
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097907	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34

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Casa Berardi Regional	Hecla Québec Inc.	CDC	1097908	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097909	-	20220509	55.86	20020911	$68.75	$2,500.00	$14,191.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097910	-	20220509	55.86	20020911	$68.75	$2,500.00	$19,353.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097911	-	20220509	55.86	20020911	$68.75	$2,500.00	$31,443.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097912	-	20220509	55.86	20020911	$68.75	$2,500.00	$34,509.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097913	-	20220509	55.86	20020911	$68.75	$2,500.00	$37,461.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097914	-	20220509	55.86	20020911	$68.75	$2,500.00	$27,594.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097915	-	20220509	55.86	20020911	$68.75	$2,500.00	$29,748.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097916	-	20220509	55.86	20020911	$68.75	$2,500.00	$27,315.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097917	-	20220509	55.86	20020911	$68.75	$2,500.00	$22,638.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097918	-	20220509	55.86	20020911	$68.75	$2,500.00	$30,115.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097919	-	20220509	55.86	20020911	$68.75	$2,500.00	$30,740.31

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Casa Berardi Regional	Hecla Québec Inc.	CDC	1097920	-	20220509	55.86	20020911	$68.75	$2,500.00	$32,216.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097921	-	20220509	55.86	20020911	$68.75	$2,500.00	$36,125.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097922	-	20220509	55.86	20020911	$68.75	$2,500.00	$35,301.31
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097925	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097926	-	20220509	55.84	20020911	$68.75	$2,500.00	$47,160.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097927	-	20220509	55.84	20020911	$68.75	$2,500.00	$28,575.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097928	-	20220509	55.84	20020911	$68.75	$2,500.00	$65,710.79
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097929	-	20220509	55.84	20020911	$68.75	$2,500.00	$56,338.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097933	-	20220509	55.85	20020911	$68.75	$2,500.00	$16,685.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097934	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097935	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097936	-	20220509	55.85	20020911	$68.75	$2,500.00	$28,185.34

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Casa Berardi Regional	Hecla Québec Inc.	CDC	1097937	-	20220509	55.85	20020911	$68.75	$2,500.00	$28,012.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097938	-	20220509	55.85	20020911	$68.75	$2,500.00	$27,061.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097939	-	20220509	55.85	20020911	$68.75	$2,500.00	$19,187.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097940	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097941	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097942	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097943	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097944	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097945	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097946	-	20220509	55.85	20020911	$68.75	$2,500.00	$14,185.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097947	-	20220509	55.85	20020911	$68.75	$2,500.00	$25,486.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097948	-	20220509	55.85	20020911	$68.75	$2,500.00	$26,577.34

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Casa Berardi Regional	Hecla Québec Inc.	CDC	1097949	-	20220509	55.85	20020911	$68.75	$2,500.00	$24,082.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097950	-	20220509	55.85	20020911	$68.75	$2,500.00	$17,336.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097951	-	20220509	55.85	20020911	$68.75	$2,500.00	$18,605.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097952	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097953	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097954	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097955	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097956	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097969	-	20220509	55.84	20020911	$68.75	$2,500.00	$127,487.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097970	-	20220509	55.84	20020911	$68.75	$2,500.00	$120,317.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097971	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097972	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37

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Casa Berardi Regional	Hecla Québec Inc.	CDC	1097973	-	20220509	55.84	20020911	$68.75	$2,500.00	$30,142.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097974	-	20220509	55.84	20020911	$68.75	$2,500.00	$83,651.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097975	-	20220509	55.84	20020911	$68.75	$2,500.00	$29,930.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097976	-	20220509	55.84	20020911	$68.75	$2,500.00	$26,565.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097977	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097978	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097979	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097980	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097981	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097982	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097983	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097984	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37

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Casa Berardi Regional	Hecla Québec Inc.	CDC	1097985	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097986	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097987	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097988	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1097989	-	20220509	55.84	20020911	$68.75	$2,500.00	$14,179.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098003	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098004	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098005	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098006	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098007	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098008	-	20220509	55.83	20020911	$68.75	$2,500.00	$154,575.24
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098009	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098010	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098011	-	20220509	55.83	20020911	$68.75	$2,500.00	$1,184,423.18
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098012	-	20220509	55.83	20020911	$68.75	$2,500.00	$2,216,269.23
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098013	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098014	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098015	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098016	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098017	-	20220509	55.83	20020911	$68.75	$2,500.00	$135,827.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098018	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098019	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098020	-	20220509	55.83	20020911	$68.75	$2,500.00	$23,193.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098021	-	20220509	55.83	20020911	$68.75	$2,500.00	$24,199.35

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098022	-	20220509	55.83	20020911	$68.75	$2,500.00	$23,379.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098023	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098024	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098025	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098026	-	20220509	55.83	20020911	$68.75	$2,500.00	$14,173.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098027	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098028	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098029	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098030	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098031	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098032	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098033	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098034	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098035	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098036	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098037	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098038	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098039	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098040	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098042	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098043	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098044	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098045	-	20220509	55.82	20020911	$68.75	$2,500.00	$14,167.46
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098061	-	20220509	29.17	20020911	$68.75	$2,500.00	$347.53

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098062	-	20220509	25.83	20020911	$68.75	$2,500.00	$307.74
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098063	-	20220509	25.11	20020911	$68.75	$2,500.00	$299.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098064	-	20220509	25.33	20020911	$68.75	$2,500.00	$301.78
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098065	-	20220509	25.36	20020911	$68.75	$2,500.00	$302.14
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098066	-	20220509	55.77	20020911	$68.75	$2,500.00	$14,137.63
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098067	-	20220509	55.88	20020911	$68.75	$2,500.00	$665.76
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098068	-	20220509	25.81	20020911	$68.75	$2,500.00	$307.50
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098069	-	20220509	27.82	20020911	$68.75	$2,500.00	$331.45
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098070	-	20220509	28.54	20020911	$68.75	$2,500.00	$340.03
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098071	-	20220509	38.86	20020911	$68.75	$2,500.00	$4,052.08
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098072	-	20220509	55.87	20020911	$68.75	$2,500.00	$3,757.90
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098076	-	20220509	4.89	20020911	$35.25	$1,000.00	$58.26

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098077	-	20220509	14.30	20020911	$35.25	$1,000.00	$878.87
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098078	-	20220509	16.88	20020911	$35.25	$1,000.00	$2,417.65
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098079	-	20220509	36.16	20020911	$68.75	$2,500.00	$2,441.73
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098080	-	20220509	38.65	20020911	$68.75	$2,500.00	$3,926.83
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098081	-	20220509	36.52	20020911	$68.75	$2,500.00	$2,656.44
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098082	-	20220509	36.82	20020911	$68.75	$2,500.00	$2,835.37
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098083	-	20220509	50.28	20020911	$68.75	$2,500.00	$10,863.25
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098084	-	20220509	55.86	20020911	$68.75	$2,500.00	$6,919.99
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098096	-	20220509	55.86	20020911	$68.75	$2,500.00	$665.52
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098104	-	20220509	25.51	20020911	$68.75	$2,500.00	$303.93
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098105	-	20220509	13.04	20020911	$35.25	$1,000.00	$70,240.52
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098106	-	20220509	5.21	20020911	$35.25	$1,000.00	$62.07

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098107	-	20220509	6.93	20020911	$35.25	$1,000.00	$82.56
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098108	-	20220509	40.38	20020911	$68.75	$2,500.00	$4,958.64
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098118	-	20220509	55.84	20020911	$68.75	$2,500.00	$130.44
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098119	-	20220509	55.84	20020911	$68.75	$2,500.00	$2,888.96
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098120	-	20220509	55.84	20020911	$68.75	$2,500.00	$5,218.82
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098121	-	20220509	55.84	20020911	$68.75	$2,500.00	$5,592.91
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098122	-	20220509	55.84	20020911	$68.75	$2,500.00	$12,034.22
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098123	-	20220509	55.84	20020911	$68.75	$2,500.00	$13,150.64
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098137	-	20220509	34.60	20020911	$68.75	$2,500.00	$2,475.22
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098138	-	20220509	9.95	20020911	$35.25	$1,000.00	$118.55
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098143	-	20220509	52.13	20020911	$68.75	$2,500.00	$10,666.63
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098144	-	20220509	43.22	20020911	$68.75	$2,500.00	$6,652.49

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098145	-	20220509	36.24	20020911	$68.75	$2,500.00	$2,489.44
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098146	-	20220509	7.95	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098147	-	20220509	9.91	20020911	$35.25	$1,000.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098150	-	20220509	55.82	20020911	$68.75	$2,500.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098151	-	20220509	55.82	20020911	$68.75	$2,500.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098152	-	20220509	55.82	20020911	$68.75	$2,500.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098153	-	20220509	55.82	20020911	$68.75	$2,500.00	$1,442.65
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098157	-	20220509	55.89	20020911	$68.75	$2,500.00	$665.88
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098158	-	20220509	55.89	20020911	$68.75	$2,500.00	$665.88
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098159	-	20220509	55.89	20020911	$68.75	$2,500.00	$1,297.35
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098160	-	20220509	36.25	20020911	$68.75	$2,500.00	$5,827.12
Casa Berardi Regional	Hecla Québec Inc.	CDC	1098161	-	20220509	30.31	20020911	$68.75	$2,500.00	$361.12

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133304	3%	20240111	26.71	20050902	$68.75	$2,500.00	$1,687.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133305	3%	20240111	30.05	20050902	$68.75	$2,500.00	$3,867.50
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133306	3%	20240111	30.76	20050902	$68.75	$2,500.00	$4,331.01
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133307	3%	20240111	30.55	20050902	$68.75	$2,500.00	$4,193.91
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133308	3%	20240111	30.52	20050902	$68.75	$2,500.00	$3,239.61
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133309	3%	20240111	0.10	20050902	$35.25	$1,000.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133310	3%	20240111	55.87	20050902	$68.75	$2,500.00	$51,425.74
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133311	3%	20240111	55.87	20050902	$68.75	$2,500.00	$20,723.53
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133312	3%	20240111	55.87	20050902	$68.75	$2,500.00	$86,865.34
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133313	3%	20240111	55.87	20050902	$68.75	$2,500.00	$17,074.89
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133314	3%	20240111	55.87	20050902	$68.75	$2,500.00	$47,406.41
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133315	3%	20240111	30.06	20050902	$68.75	$2,500.00	$3,874.03

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133316	3%	20240111	28.05	20050902	$68.75	$2,500.00	$2,561.84
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133317	3%	20240111	27.33	20050902	$68.75	$2,500.00	$2,091.80
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133318	3%	20240111	17.00	20050902	$35.25	$1,000.00	$4,798.08
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133319	3%	20240111	55.86	20050902	$68.75	$2,500.00	$20,717.01
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133320	3%	20240111	55.86	20050902	$68.75	$2,500.00	$49,623.47
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133321	3%	20240111	55.86	20050902	$68.75	$2,500.00	$44,620.43
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133322	3%	20240111	55.86	20050902	$68.75	$2,500.00	$20,717.01
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133323	3%	20240111	55.86	20050902	$68.75	$2,500.00	$20,717.01
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133324	3%	20240111	55.86	20050902	$68.75	$2,500.00	$54,254.45
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133325	3%	20240111	55.86	20050902	$68.75	$2,500.00	$40,729.17
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133326	3%	20240111	55.86	20050902	$68.75	$2,500.00	$66,578.22
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133327	3%	20240111	50.96	20050902	$68.75	$2,500.00	$17,518.14

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133328	3%	20240111	41.56	20050902	$68.75	$2,500.00	$47,931.54
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133329	3%	20240111	38.98	20050902	$68.75	$2,500.00	$17,618.74
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133330	3%	20240111	19.70	20050902	$35.25	$1,000.00	$24,627.26
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133331	3%	20240111	55.85	20050902	$68.75	$2,500.00	$20,710.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133332	3%	20240111	55.85	20050902	$68.75	$2,500.00	$20,710.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133333	3%	20240111	55.85	20050902	$68.75	$2,500.00	$20,710.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133334	3%	20240111	55.85	20050902	$68.75	$2,500.00	$20,710.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133335	3%	20240111	55.85	20050902	$68.75	$2,500.00	$20,710.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133336	3%	20240111	55.85	20050902	$68.75	$2,500.00	$20,710.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133337	3%	20240111	55.85	20050902	$68.75	$2,500.00	$20,710.48
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133338	3%	20240111	30.34	20050902	$68.75	$2,500.00	$4,056.82
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133339	3%	20240111	2.07	20050902	$35.25	$1,000.00	$0.00

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133340	3%	20240111	19.63	20050902	$35.25	$1,000.00	$6,515.03
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133341	3%	20240111	25.56	20050902	$68.75	$2,500.00	$215,928.07
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133342	3%	20240111	7.94	20050902	$35.25	$1,000.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133343	3%	20240111	55.87	20050902	$68.75	$2,500.00	$20,723.53
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133344	3%	20240111	55.87	20050902	$68.75	$2,500.00	$364,051.81
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133345	3%	20240111	7.93	20050902	$35.25	$1,000.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133346	3%	20240111	55.86	20050902	$68.75	$2,500.00	$20,717.01
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133347	3%	20240111	55.86	20050902	$68.75	$2,500.00	$20,717.01
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133348	3%	20240202	17.21	20050902	$35.25	$1,000.00	$118,933.76
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133349	3%	20240202	19.34	20050902	$35.25	$1,000.00	$28,391.61
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133350	3%	20240202	19.04	20050902	$35.25	$1,000.00	$27,853.47
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133351	3%	20240202	5.58	20050902	$35.25	$1,000.00	$3,709.27

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133352	3%	20240202	42.81	20050902	$68.75	$2,500.00	$141,785.02
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133353	3%	20240202	50.64	20050902	$68.75	$2,500.00	$246,914.38
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133354	3%	20240202	48.92	20050902	$68.75	$2,500.00	$143,711.71
Casa Berardi Regional	Hecla Québec Inc.	CDC	1133355	3%	20240202	15.49	20050902	$35.25	$1,000.00	$21,485.58
Casa Berardi Regional	Hecla Québec Inc.	CDC	1134230	-	20220509	7.97	20051104	$35.25	$1,000.00	$94.96
Casa Berardi Regional	Hecla Québec Inc.	CDC	1134231	-	20220509	5.78	20051104	$35.25	$1,000.00	$68.86
Casa Berardi Regional	Hecla Québec Inc.	CDC	2438781	-	20230329	55.82	20160330	$68.75	$1,200.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	2443561	-	20230426	7.99	20160427	$35.25	$500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	2449153	-	20230614	55.89	20160615	$68.75	$1,200.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491530	-	20220503	55.84	20170504	$68.75	$1,200.00	$665.28
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491531	-	20220503	55.81	20170504	$68.75	$1,200.00	$664.93
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491532	-	20220503	55.80	20170504	$68.75	$1,200.00	$664.81

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Casa Berardi Regional	Hecla Québec Inc.	CDC	2491533	-	20220503	55.80	20170504	$68.75	$1,200.00	$664.81
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491534	-	20220503	55.84	20170504	$68.75	$1,200.00	$665.28
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491535	-	20220503	55.84	20170504	$68.75	$1,200.00	$665.28
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491536	-	20220503	55.84	20170504	$68.75	$1,200.00	$665.28
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491537	-	20220503	55.84	20170504	$68.75	$1,200.00	$665.28
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491538	-	20220503	55.84	20170504	$68.75	$1,200.00	$665.28
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491539	-	20220503	55.83	20170504	$68.75	$1,200.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491540	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491541	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491542	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491543	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491544	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16

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Casa Berardi Regional	Hecla Québec Inc.	CDC	2491545	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491546	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491547	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491548	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491549	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491550	-	20220503	55.83	20170504	$68.75	$1,200.00	$665.16
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491551	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491552	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491553	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491554	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491555	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491556	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.05

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Casa Berardi Regional	Hecla Québec Inc.	CDC	2491557	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.05
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491558	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491559	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491560	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491561	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491562	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491563	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491564	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491565	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491566	-	20220503	55.82	20170504	$68.75	$1,200.00	$665.06
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491567	-	20220503	55.81	20170504	$68.75	$1,200.00	$664.94
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491568	-	20220503	55.81	20170504	$68.75	$1,200.00	$664.94

Project	Titleholder	Type of Title	Title No	NSR	Expiry Date (YYYYMMDD)	Area (ha)	Registration Date (YYYYMMDD)	Required Fees (C$)	Required Work (C$)	Excess Work (C$)
Casa Berardi Regional	Hecla Québec Inc.	CDC	2491569	-	20220503	55.81	20170504	$68.75	$1,200.00	$664.94
Casa Berardi Regional	Hecla Québec Inc.	CDC	48842	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48843	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48844	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48845	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48846	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48847	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48848	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48849	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48850	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Casa Berardi Regional	Hecla Québec Inc.	CDC	48851	-	20231215	55.89	20041216	$68.75	$2,500.00	$0.00
Totals		394				19,725.08		$55,504.55	$865,400.00	$17,291,526.46

