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

Form 10-K

(Mark One)

☒ **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 Number 001-38735

ALPHA METALLURGICAL RESOURCES, INC.

(Exact name of registrant as specified in its charter)

Delaware	**81-3015061**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

340 Martin Luther King Jr. Blvd.
Bristol, Tennessee 37620
(Address of principal executive offices, zip code)
(423) 573-0300
(Registrant's telephone number, including area code)

Securities registered or to be 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 $0.01 per share	AMR	New York Stock Exchange

Securities registered or to be registered pursuant to Section 12(g) of the Act:
None
(Title of Class)

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 (or for such shorter period that the registrant was required to file such reports), 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 (Sec.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	☐	Accelerated filer	☒
Non-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 Common Stock held by non-affiliates of the registrant (excluding outstanding shares beneficially owned by directors, executive officers, and other affiliates) on June 30, 2021, was approximately $270 million based on the closing price of the Company's common stock as reported that date on the New York Stock Exchange of $25.63 per share. Such assumptions should not be deemed to be conclusive for any other purpose.

Number of shares of the registrant's Common Stock, $0.01 par value, outstanding as of February 28, 2022: 18,532,992

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates certain information by reference from the registrant's definitive proxy statement for the 2022 annual meeting of stockholders (the "Proxy Statement"), which will be filed no later than 120 days after the close of the registrant's fiscal year ended December 31, 2021.

TABLE OF CONTENTS

	Cautionary Note Regarding Forward-Looking Statements	5
	Part I	
Item 1.	Business	7
Item 1A.	Risk Factors	29
Item 1B.	Unresolved Staff Comments	50
Item 2.	Properties	50
Item 3.	Legal Proceedings	54
Item 4.	Mine Safety Disclosures	54
	Part II	
Item 5.	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	55
Item 6.	[Reserved]	55
Item 7.	Management's Discussion and Analysis of Financial Condition and Results of Operations	55
	Results of Operations	59
	Liquidity and Capital Resources	68
	Critical Accounting Policies and Estimates	73
Item 8.	Financial Statements and Supplementary Data	77
	Report of Independent Registered Public Accounting Firm (PCAOB ID: 49)	77
	Consolidated Statements of Operations for the Years Ended December 31, 2021 and 2020	79
	Consolidated Statements of Comprehensive Income (Loss) for the Years Ended December 31, 2021 and 2020	81
	Consolidated Balance Sheets as of December 31, 2021 and 2020	82
	Consolidated Statements of Cash Flows for the Years Ended December 31, 2021 and 2020	84
	Consolidated Statements of Stockholders' Equity for the Years Ended December 31, 2021 and 2020	86
	Notes to Consolidated Financial Statements	87
	(1) Business and Basis of Presentation	87
	(2) Summary of Significant Accounting Policies	88
	(3) Discontinued Operations	96
	(4) Revenue	98
	(5) Accumulated Other Comprehensive Loss	99
	(6) Net Income (Loss) per Share	99
	(7) Inventories, Net	100
	(8) Asset Impairment and Restructuring	101
	(9) Prepaid Expenses and Other Current Assets	103
	(10) Property, Plant, and Equipment, Net	103
	(11) Other Non-Current Assets	104
	(12) Leases	104
	(13) Accrued Expenses and Other Current Liabilities	106
	(14) Long-Term Debt	106
	(15) Acquisition-Related Obligations	109
	(16) Asset Retirement Obligations	110
	(17) Fair Value of Financial Instruments and Fair Value Measurements	110
	(18) Income Taxes	113
	(19) Employee Benefit Plans	116
	(20) Stock-Based Compensation Awards	126

	(21) Related Party Transactions	131
	(22) Commitments and Contingencies	132
	(23) Concentration of Credit Risk and Major Customers	134
	(24) Segment Information	135
	(25) Subsequent Events	137
Item 9.	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	138
Item 9A.	Controls and Procedures	138
Item 9B.	Other Information	138
Item 9C.	Disclosure Regarding Foreign Jurisdictions that Prevent Inspections	138
	Part III	
Item 10.	Directors, Executive Officers and Corporate Governance	139
Item 11.	Executive Compensation	139
Item 12.	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	139
Item 13.	Certain Relationships and Related Transactions, and Director Independence	139
Item 14.	Principal Accounting Fees and Services	139
	Part IV	
Item 15.	Exhibits, Financial Statement Schedules	139

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This report includes statements of our expectations, intentions, plans and beliefs that constitute "forward-looking statements." These statements, which involve risks and uncertainties, relate to analyses and other information that are based on forecasts of future results and estimates of amounts not yet determinable and may also relate to our future prospects, developments and business strategies. We have used the words "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "plan," "predict," "project," "should" and similar terms and phrases, including references to assumptions, in this report to identify forward-looking statements, but these terms and phrases are not the exclusive means of identifying such statements. These forward-looking statements are made based on expectations and beliefs concerning future events affecting us and are subject to uncertainties and factors relating to our operations and business environment, all of which are difficult to predict and many of which are beyond our control, that could cause our actual results to differ materially from those expressed in or implied by these forward-looking statements.

The following factors are among those that may cause actual results to differ materially from our forward-looking statements:

- the financial performance of the company;
- our liquidity, results of operations and financial condition;
- our ability to generate sufficient cash or obtain financing to fund our business operations;
- our indebtedness and potential future indebtedness;
- depressed levels or declines in coal prices;
- the effects of the COVID-19 pandemic on our operations and the world economy;
- changes in domestic or international environmental laws and regulations, and court decisions, including those directly affecting our coal mining and production, and those affecting our customers' coal usage, including potential climate change initiatives;
- worldwide market demand for coal, steel, and electricity, including demand for U.S. coal exports, and competition in coal markets;
- our ability to consummate financing or refinancing transactions, and other services, and the form and degree of these services available to us, which may be significantly limited by the lending, investment and similar policies of financial institutions and insurance companies regarding carbon energy producers and the environmental impacts of coal combustion;
- our ability to obtain or renew surety bonds on acceptable terms or maintain our current bonding status;
- our ability to meet collateral requirements;
- the imposition or continuation of barriers to trade, such as tariffs;
- reductions or increases in customer coal inventories and the timing of those changes;
- our production capabilities and costs;
- disruptions in delivery or changes in pricing from third-party vendors of key equipment and materials that are necessary for our operations, such as diesel fuel, steel products, explosives, tires and purchased coal;
- inflationary pressures on supplies and labor and significant or rapid increases in commodity prices;
- railroad, barge, truck and other transportation availability, performance and costs;
- inherent risks of coal mining, including those that are beyond our control;
- changes in the ownership of our equity, which may significantly further reduce the annual amount of the net operating loss and other carryforwards available to be utilized;
- changes in, interpretations of, or implementations of domestic or international tax or other laws and regulations, including the Tax Cuts and Jobs Act and its related regulations;
- our ability to self-insure certain of our black lung obligations without a significant increase in required collateral;
- our relationships with, and other conditions affecting, our customers, including the inability to collect payments from our customers if their creditworthiness declines;
- changes in, renewal or acquisition of, terms of and performance of customers under coal supply arrangements and the refusal by our customers to receive coal under agreed-upon contract terms;
- our ability to obtain, maintain or renew any necessary permits or rights, and our ability to mine properties due to defects in title on leasehold interests;
- attracting and retaining key personnel and other employee workforce factors, such as labor relations;
- funding for and changes in employee benefit obligations;
- cybersecurity attacks or failures, threats to physical security, extreme weather conditions or other natural disasters;
- reclamation and mine closure obligations;
- utilities switching to alternative energy sources such as natural gas, renewables and coal from basins where we do not operate;
- our assumptions concerning economically recoverable coal reserve estimates;

- failures in performance, or non-performance, of services by third-party contractors, including contract mining and reclamation contractors; and
- disruption in third-party coal supplies.

The factors identified above are not exhaustive. We caution readers not to place undue reliance on any forward-looking statements, which are based on information currently available to us and speak only as of the dates on which they are made. When considering these forward-looking statements, you should keep in mind the cautionary statements in this report. We do not undertake any responsibility to publicly revise these forward-looking statements to take into account events or circumstances that occur after the date of this report. Additionally, except as expressly required by federal securities laws, we do not undertake any responsibility to update you on the occurrence of any unanticipated events, which may cause actual results to differ from those expressed or implied by the forward-looking statements contained in this report.

Part I

Item 1. *Business*

Unless otherwise indicated or the context otherwise requires, references in this "Item 1. Business" section to "the combined company," "we," "us" and other similar terms refer to Alpha Metallurgical Resources, Inc. and its consolidated subsidiaries (previously Contura Energy, Inc. and its consolidated subsidiaries). Disclosures in this "Item1. Business" section should be read in conjunction with "Item 1A. Risk Factors" for further discussion of factors impacting our business. Effective February 1, 2021, we changed our corporate name from Contura Energy, Inc. to Alpha Metallurgical Resources, Inc. to more accurately reflect our strategic focus on the production of metallurgical coal. Following the effectiveness of our name change, our ticker symbol on the New York Stock Exchange changed from "CTRA" to "AMR" effective on February 4, 2021.

Our Company

We are a Tennessee-based mining company with operations in Virginia and West Virginia. With customers across the globe, high-quality reserves and significant port capacity, we reliably supply metallurgical coal products to the steel industry. We operate highly productive, cost-competitive coal mines across the Central Appalachia ("CAPP") coal basin. Our portfolio of mining operations consists of 13 underground mines, seven surface mines and eight coal preparation plants. We own a 65.0% interest in Dominion Terminal Associates ("DTA"), a coal export terminal in Newport News, Virginia. DTA provides us with the ability to fulfill a broad range of customer coal quality requirements through coal blending, while also providing storage capacity and transportation flexibility.

We predominantly produce metallurgical ("met") coal, which is shipped to domestic and international steel and coke producers. Although our strategic focus is on the production of met coal, we also produce thermal coal which is primarily sold to the domestic power generation industry. Refer to Notes 23 and 24 to the Consolidated Financial Statements for geographical information about our coal sales and additional segment information.

We have a substantial reserve base of 351.1 million tons of proven and probable reserves as of December 31, 2021. Our reserve base consists of 335.8 million tons of proven and probable metallurgical reserves, and 15.3 million tons of proven and probable thermal reserves. Additionally, we have approximately 381.7 million tons of in situ bituminous coal resources as of December 31, 2021.

Through our operations across the CAPP coal basin in Virginia and West Virginia, we are able to source coal from multiple mines to meet the needs of a long-standing global customer base, many of which have been served by us or our predecessors for decades. We are continuously evaluating opportunities to strategically cultivate current relationships to drive new business in our target growth markets. Additionally, the trade tensions between China and Australia have not yet been resolved and China's ban on Australian coal remains in place, creating opportunities for other producers to fulfill China's need for high quality metallurgical coal. Although there is little certainty about when circumstances may change between China and Australia, we have been pleased to expand our customer base in 2021 and hope to continue cultivating relationships that could develop into long-term contracts. We are also strategically expanding our marketing efforts to grow Alpha's metallurgical sales opportunities throughout other parts of Asia. In addition, our experienced management team regularly analyzes potential acquisitions, joint ventures and other opportunities that would be accretive and synergistic to our existing asset portfolio.

During 2020, our Kepler, Marfork, and Aracoma mining complexes began production at newly developed mines Road Fork 52, Black Eagle, and Lynn Branch. Production at these mines increased in 2021. Road Fork 52 and Lynn Branch produce Low-Vol. and High-Vol. B met coal, respectively, while the Black Eagle mine produces High-Vol A met coal.

Our History

We were formed in 2016 to acquire and operate certain of Alpha Natural Resources, Inc.'s former core coal operations, as part of the Alpha Natural Resources, Inc. Plan of Reorganization. We entered into various settlement agreements with the Debtors, their bankruptcy successor, and third parties as part of the Debtors' bankruptcy reorganization process. We assumed acquisition-related obligations through those settlement agreements, which became effective on July 26, 2016, the effective date of the Debtors' Plan of Reorganization. Refer to Note 15 to the Consolidated Financial Statements for further information on our acquisition-related obligations.

On December 8, 2017, we closed a transaction with Blackjewel L.L.C. ("Blackjewel") to sell our Eagle Butte and Belle Ayr mines (the "Western Mines") located in the Powder River Basin ("PRB"), Wyoming, along with related coal reserves, equipment, infrastructure and other real properties. On October 4, 2019, we closed on a transaction with Eagle Specialty

Materials ("ESM"), the ESM Transaction, in connection with Blackjewel's subsequent bankruptcy filing. On May 29, 2020, certain of our subsidiaries (Contura Coal West, LLC and Contura Wyoming Land, LLC), one of which held the mining permits for the Western Mines, were merged with certain subsidiaries of ESM to become wholly-owned subsidiaries of ESM and to complete the permit transfer process in connection with the ESM Transaction.

On November 9, 2018, we merged with Alpha Natural Resources Holdings, Inc. and ANR, Inc. Upon the consummation of the transactions contemplated by a definitive merger agreement (the "Merger Agreement"), our common stock began trading on the New York Stock Exchange under the ticker "CTRA." Previously, our shares traded on the OTC market under the ticker "CNTE."

On December 10, 2020, we closed on a transaction with Iron Senergy Holdings, LLC, to sell our thermal coal mining operations located in Pennsylvania consisting primarily of our Cumberland mining complex and related property (our former Northern Appalachia ("NAPP") operations). This transaction accelerated our strategic exit from thermal coal production to shift our focus to met coal production. The former NAPP operations' results of operations and financial position are reported as discontinued operations in the Consolidated Financial Statements. Refer to Note 3 to the Consolidated Financial Statements for further information on discontinued operations.

Effective February 1, 2021, we changed our corporate name from Contura Energy, Inc. to Alpha Metallurgical Resources, Inc. to more accurately reflect our strategic focus on the production of met coal. Following the effectiveness of our name change, our ticker symbol on the New York Stock Exchange changed from "CTRA" to "AMR" effective on February 4, 2021.

Our Mining Operations and Properties

The following table provides a summary of information regarding our material and active mining complexes as of December 31, 2021 (see also "Item 2. Properties" for further information):

(Amounts in thousands, except for mine data)

Mining Complex	Location	Acquired	Mines [1]	Equipment [2]	Rail [3]	Tons Sold [4] 2021	Tons Sold [4] 2020	Tons Sold [4] 2019	Carrying Value [5]	Reserves [6]
Met										
Aracoma	WV	2018	3	CM	CSX	2,221	1,564	1,775	$ 170,593	44,181
Kepler	WV	2018	1	CM	CSX/NS	1,571	800	912	$ 234,003	48,611
Kingston	WV	2018	4	CM/S/H	CSX	2,348	2,040	1,410	$ 21,256	32,489
Marfork	WV	2018	5	CM/S/H	CSX	4,032	3,394	3,446	$ 288,551	145,741
McClure/Toms Creek	VA	2016	5	CM/S/H	CSX/NS	4,033	3,706	3,891	$ 47,873	80,077

[1] Number of active mines as of December 31, 2021.
[2] Equipment: S = Shovel/Excavator/Loader/Trucks; CM = Continuous Miner; H = Highwall Miner
[3] CSX = CSX Transportation; NS = Norfolk Southern Railway Company
[4] Tons of coal purchased from third parties and not processed are not included.
[5] Net book value of property, plant and equipment and owned and leased mineral rights as of December 31, 2021.
[6] Proven and probable reserves as of December 31, 2021. Refer to Item 2. Properties for further information.

Aracoma – Aracoma is a mining complex located in Logan, Mingo, and Boone counties, West Virginia. The complex has three active underground mines which produce primarily High-Vol. B quality met coal from the Upper Chilton, Upper Cedar Grove, and No. 2 Gas coal seams. Mine lives range from 5 to 17 years. Coal is processed at the Bandmill Preparation Plant and loaded onto CSX rail for delivery to customers.

Kepler – Kepler is a mining complex located in Wyoming, McDowell, and Raleigh counties, West Virginia. The complex has one active underground mine (with an estimated life of 30 years) which produces primarily Low-Vol. quality met coal from the Pocahontas No. 3 coal seam. Coal is processed at the Kepler Preparation Plant and either loaded onto NS rail or trucked to the Feats Loadout and loaded onto the CSX rail for delivery to customers.

Kingston – Kingston is a mining complex located in Fayette and Raleigh counties, West Virginia. The complex has one active underground mine which produces primarily Mid-Vol. quality met coal from the Douglas coal seam. The complex also has three active surface mines which produced High-Vol. A quality met coal as well as some thermal quality coal as a by-product of mining from multiple coal seams. Mine lives range from 2 to 21 years. Coal from the underground mine is processed at the Kingston Preparation Plant and trucked to the Pax Loadout to be loaded onto CSX rail for delivery to customers. Coal from the

surface mines may be processed through the Kingston Preparation Plant, trucked to and processed through the Mammoth or Marfork Preparation Plants, or trucked directly to the Pax Loadout or Marmet Dock for delivery to customers.

Marfork – Marfork is a mining complex located in Raleigh, Boone, Kanawha, and Fayette counties, West Virginia. The complex has three active underground mines which produce High-Vol. A quality met coal from the Eagle coal seam. The complex also has two active surface mines which produce High-Vol. A quality met coal as well as some thermal quality coal as a by-product of mining from multiple coal seams. Mine lives range from 1 to 35 years. Coal from the underground mines is processed at the Marfork Preparation Plant and loaded onto the CSX rail for delivery to customers. Coal from the surface mines may be processed through the Marfork Preparation Plant or trucked directly to the Pax Loadout or the Marmet Dock for delivery to customers.

McClure/Toms Creek – McClure/Toms Creek is a mining complex located in Dickenson, Buchanan, Russell, and Wise counties, Virginia. The complex has three active underground mines which produce High-Vol. A and Mid-Vol. quality met coal from the Upper Banner, Lower Banner, and Jawbone coal seams. The complex also has two active surface mines which produce High-Vol. A and Mid-Vol quality met coal as well as some thermal quality coal as a by-product of mining from multiple coal seams. Mine lives range from 3 to 42 years. Coal is processed at either the McClure Preparation Plant or the Toms Creek Preparation Plant and loaded on the CSX or NS rail, respectively for delivery to customers.

Equipment

Our plant and equipment, including underground and surface equipment, are of varying age, in good operational condition, and are regularly maintained and serviced by a dedicated maintenance workforce and third-party suppliers, including scheduled preventive maintenance.

Preparation Plants, Loadouts, and Docks

The following is a summary of information regarding our active preparation plants as of December 31, 2021:

Preparation Plant	Year Constructed/Upgraded	Processing Capacity (Tons per hour)	Utilization %	Power Source
Met				
Bandmill	2010	1,200	60%	American Electric Power
Kepler	1967	900	51%	American Electric Power
Kingston	1974	700	58%	American Electric Power
Marfork	1994/2019	2,400	54%	American Electric Power
McClure	1979/2019	1,100	61%	American Electric Power
Toms Creek	1980/2004	1,100	39%	American Electric Power

The following is a summary of information regarding our active loadouts and docks as of December 31, 2021:

Loadout/Dock	Year Constructed	Loading Capacity (Tons per hour)
Pax Loadout	2006	3,500
Feats Loadout	1975	3,500
Marmet Dock	1986	1,600

Export Terminal

The following is a summary of information regarding DTA (in which we own a 65% interest) as of December 31, 2021:

Export Terminal	Year Constructed	Loading Capacity (Tons per hour)	Storage Capacity (Net tons)
DTA	1984	Up to 6,500	1.7 million

Coal Mining Techniques

We use four different mining techniques to extract coal from the ground: room-and-pillar mining, truck-and-shovel mining and truck and front-end loader mining, contour mining, and highwall mining. We do not use mountaintop removal mining and currently have no plans to do so in the future.

Room-and-Pillar Mining

Certain of our mines in CAPP use room-and-pillar mining methods. In this type of mining, main airways and transportation entries are developed and maintained while remote-controlled continuous miners extract coal from the seam, leaving pillars to support the roof. Shuttle cars or battery coal haulers are used to transport coal from the continuous miner to the conveyor belt for transport to the surface. This method is more flexible than longwall mining and often used to mine smaller coal blocks or thinner seams of coal. Ultimate seam recovery of in-place reserves is less than that achieved with longwall mining. All of this production is also processed in preparation plants to remove rock and impurities before it becomes saleable clean coal.

Truck-and-Shovel Mining and Truck and Front-End Loader Mining

We utilize truck/shovel and truck/front-end loader mining methods at some of our CAPP surface mines. These methods are similar and involve using large, electric or hydraulic-powered shovels or diesel-powered front-end loaders to remove earth and rock (overburden) covering a coal seam which is later used to refill the excavated coal pits after the coal is removed. The loading equipment places the coal into trucks for transportation to a preparation plant or loadout area. Ultimate seam recovery of in-place reserves on average exceeds 90%. Depending on geology and market destination, surface-mined coal may need to be processed in a preparation plant before sale. In the case of some metallurgical grade coals, as much as 80% of surface mined coal may need to be processed in a preparation plant to enhance the sales value of the coal. Productivity depends on overburden and coal thickness (strip ratio), equipment utilized and geologic factors.

Contour Mining

We use contour mining at certain of our CAPP surface mines, which limits the overburden removal from above a coal seam or series of coal seams. In contour mining, surface mining machinery follows the contours of a coal seam or seams around a ridge, excavating the overburden and recovering the coal seam or seams as a “contour bench” around the ridge is created. This contour bench is then backfilled and graded in accordance with an approved reclamation plan. Highwall mining methods are used in connection with some contour mining operations. Depending on geology and market destination, coal mined by contour mining may need to be processed in preparation plants to remove rock and impurities before it becomes a saleable clean coal.

Highwall Mining

We utilize highwall mining methods at certain of our CAPP surface mines. A highwall mining system consists of a remotely controlled continuous miner, which extracts coal and conveys it via augers or belt conveyors to the surface. The cut is typically a rectangular, horizontal opening in the highwall (the unexcavated face of exposed overburden and coal in a surface mine) 9-feet or 11-feet wide and reaching depths of up to 1,000 feet. Multiple parallel openings are driven into the highwall, separated by narrow pillars that extend the full depth of the hole. All of the coal mined at our highwall mining operations is processed in preparation plants to remove rock and impurities before it becomes saleable clean coal.

Financial Information About Reportable Segments and Geographic Areas

Refer to “Item 7. Management’s Discussion and Analysis of Financial Condition—Results of Operations” and Notes 23 and 24 to the Consolidated Financial Statements for financial information about our reportable segment and geographic areas.

Marketing, Sales and Customer Contracts

We market coal produced at our operations and purchase and resell coal mined by others. We have coal supply commitments with a wide range of steel and coke manufacturers, industrial customers, and electric utilities. Our marketing efforts are centered on meeting customer needs and requirements. By offering coal of various grades, we are able to provide the

specific qualities relevant to our customers and to serve a global customer base. Through this global platform, our coals are shipped to customers on five continents. Our broad customer and product base allows us to adjust to changing market conditions. Many of our larger customers are well-established steel manufacturers and public utilities.

Our coal volumes include coal produced and processed by us, our "captive coal," as well as small volumes purchased from third-party producers to blend with our produced coal in order to meet customer specifications. These volumes are processed by us, meaning that we washed, crushed or blended the coal at one of our preparation plants or loading facilities prior to resale. Our coal volumes within our Met segment operations also include met coal volumes purchased from domestic third-party producers and sold into international markets.

Our export shipments serviced customers in 25 and 23 countries during the years ended December 31, 2021 and 2020, respectively. Asia was our largest export market for the year ended December 31, 2021, with coal sales to Asia accounting for approximately 49% of export coal revenues and 37% of coal revenues. For the year ended December 31, 2021, coal sales to Europe accounted for approximately 23% of export coal revenues and 17% of coal revenues. Europe was our largest export market for the year ended December 31, 2020, with coal sales to Europe accounting for approximately 34% of export coal revenues and 22% of coal revenues. For the year ended December 31, 2020, coal sales to Asia accounted for approximately 28% of export coal revenues and 18% of coal revenues. All of our sales are conducted in U.S. dollars. Refer to Note 23 to the Consolidated Financial Statements for additional export coal revenue information.

Our met coal sales are typically made with customers with whom we have a long-term relationship. Domestic met customers typically enter into one-year agreements with a fixed price for the entire contract year. Any longer-term agreement would generally have a renegotiation of price each subsequent contract year. Export sales are generally made on an annual, quarterly, or spot cargo basis. Annual and quarterly agreements typically have market-indexed pricing that changes with the market monthly. Any export agreement with a term greater than one year would generally have a renegotiation of pricing terms for each subsequent contract year. Volume for future years is generally contingent on both parties agreeing to a pricing mechanism to cover the contract year.

We often enter into long-term contracts with our thermal coal customers. Terms of these agreements may address coal quality requirements, quantity parameters, flexibility and adjustment mechanisms, permitted sources of supply, treatment of environmental constraints, options to extend, force majeure, suspension, termination and assignment issues, the allocation between the parties of the cost of complying with future governmental regulations and many other matters.

Generally, our long-term thermal coal agreements contain committed volumes and fixed prices for a period or a certain number of periods pursuant to which thermal coal will be delivered under these agreements. After a fixed price period elapses, the long-term agreement may provide for a price negotiation/determination period prior to the commencement of the pending unpriced contract period. The price negotiations generally consider either then current market prices and/or relevant market indices. Provisions of this sort increase the difficulty of predicting the exact prices a coal supplier will receive for its coal during the course of the long-term agreement. During the years ended December 31, 2021 and 2020, approximately 76% and 71%, respectively, of our thermal coal sales volume were delivered pursuant to long-term contracts.

Distribution and Transportation

Coal consumed domestically is usually sold at the mine and transportation costs are normally borne by the purchaser. Export coal is usually sold at the loading port, with purchasers responsible for further transportation.

For our export sales, we negotiate transportation agreements with various providers, including railroads, trucks, barge lines, and terminal facilities to transport shipments to the relevant loading port. We coordinate with customers, mining facilities and transportation providers to establish shipping schedules that meet each customer's needs. Our captive coal is loaded from our preparation plants, loadout facilities, and in certain cases directly from our mines. The coal we purchase is loaded in some cases directly from mines and preparation plants operated by third parties or from an export terminal. Virtually all of our coal is transported from the mine to our preparation plants by truck or belt conveyor systems. It is transported from preparation plants and loading facilities to the customer by means of railroads, trucks, barge lines, and lake-going and ocean-going vessels from terminal facilities. We depend upon rail, barge, trucking and other systems to deliver coal to markets. In the years ended 2021 and 2020, our produced coal was transported from the mines and to the customer primarily by rail, with the main rail carriers being CSX Transportation and Norfolk Southern Railway Company. Rail shipments constituted approximately 82% and 80% of total shipments of coal volume from our mines during the years ended 2021 and 2020, respectively. The balance was shipped from our preparation plants, loadout facilities or mines via truck or barge. Our export sales are primarily shipped to DTA and Pier 6 (Lambert's Point) shipping ports in the Hampton Roads area of Virginia. We may ship limited export quantities through other U.S. ports when warranted by logistics and economics.

Procurement

Principal goods and services used in our business include mining equipment, replacement parts and materials such as explosives, diesel fuel, tires, conveyance structure, ventilation supplies, lubricants, steel, magnetite and other raw materials, maintenance and repair services, electricity, and roof control and support items. We rely on third-party suppliers to provide mining materials and equipment. Although there continues to be consolidation, which has resulted in a limited number of suppliers for certain types of equipment and supplies, we believe that adequate substitute suppliers are available.

We incur substantial expenses each year to procure goods and services in support of our respective business activities in addition to capital expenditures. We use suppliers for a significant portion of our equipment rebuilds and repairs, as well as construction and reclamation activities.

We have a centralized sourcing group, which sets sourcing policy and strategy focusing primarily on major supplier contract negotiation and administration, including but not limited to the purchase of major capital goods in support of the mining operations. We promote competition between suppliers and seek to develop relationships with suppliers that focus on lowering our costs while improving quality and service. We seek suppliers who identify and concentrate on implementing continuous improvement opportunities within their area of expertise.

Competition

The coal industry is highly competitive, both in the U.S. and internationally. In the met coal market, of the approximately 64.3 million tons produced in the U.S. in 2021, we produced approximately 13.8 million tons, or 21%. A significant portion of U.S. met coal production is shipped internationally, where it competes directly with international sources of production. Approximately 69% of our met coal tons sold were shipped internationally in 2021.

In the thermal market, of the approximately 512.3 million tons produced in the U.S. in 2021, we produced approximately 2.5 million tons, or less than 1%. Only a small portion of overall U.S. thermal production is shipped internationally, but there is strong competition in the domestic market. Approximately 20% of our thermal coal tons sold were shipped internationally in 2021. We compete for U.S. sales with numerous coal producers in the Appalachian region and the Illinois basin, and in some cases with western coal producers.

Demand for met coal and the prices that we are able to obtain for it depend to a large extent on the demand and price for steel in the U.S. and internationally. This demand is influenced by factors beyond our control, including overall economic activity and the availability and relative cost of substitute materials. In the export met coal market, we compete with producers from Australia and Canada and with other international producers on many of the same factors as in the U.S. market. Competition in the export market is also affected by fluctuations in relative foreign exchange rates and costs of inland and ocean transportation, among other factors.

Demand for thermal coal and the prices that we are able to obtain for it are closely linked to coal consumption patterns of the domestic electric generation industry. These coal consumption patterns are influenced by many factors beyond our control, including the demand for electricity, which is significantly dependent upon summer and winter temperatures, and commercial and industrial outputs in the U.S., environmental and other government regulations, technological developments and the location, availability, quality and price of competing sources of power. These competing sources include natural gas, nuclear, fuel oil and increasingly, renewable sources such as solar and wind power. Demand for thermal coal and the prices that we are able to obtain for it are affected by each of the above factors.

Human Capital Resources

As of December 31, 2021, we had approximately 3,500 employees, all of which were full-time employees, with 73% of our total workforce being hourly workers. Our employees were almost entirely located in the United States, with three employees located outside the United States. Approximately 97% of our total workforce was union-free as of December 31, 2021. Certain of our subsidiaries have wage agreements with the United Mine Workers of America ("UMWA") representing 3% of our workforce. Certain of our subsidiaries have wage agreements with the UMWA that are subject to termination by either the employer or the UMWA, without cause, on July 31, 2025 and one on February 28, 2026. Relations with organized labor are important to our success, and we believe that we have good relations with our employees.

As of December 31, 2021, we had approximately 3,270 employees working at our mining operations across Central Appalachia in Virginia and West Virginia, while the remainder of our personnel were employed at our headquarters in Bristol, Tennessee, in Julian, West Virginia, or at other administrative offices throughout the region. As of December 31, 2021,

approximately 45% of our total workforce had at least ten years of service with our Company, while nearly 28% had fifteen or more years of service with our Company.

Employee Compensation and Benefits

We require a skilled workforce with mining experience and proficiency as well as qualified managers and supervisors to run our business. In addition, we depend on the experience and industry knowledge of our officers and other key employees to design and execute our business plans. We, along with the mining industry generally, face a shortage of skilled and experienced employees. Therefore, we offer employees competitive compensation and benefits to attract and retain a skilled and qualified workforce. We offer our employees competitive fixed base pay; a bonus incentive program for administrative positions tied to company safety, environmental stewardship, and financial performance; an operations bonus incentive program tied to site-specific safety, environmental stewardship and production goals; retention programs; paid time-off including holidays; a comprehensive benefits package that includes medical, dental, and vision coverage; disability and life insurance coverages; and a 401(k) retirement savings program with an employer match. To help retain key employees in certain positions, our long-term incentive program awards cash or equity grants with time-based and performance-based vesting conditions. Certain key employees are also eligible to participate in our non-qualified deferred compensation plan.

Employee Training and Development

At Alpha, we strive to maintain a diverse and inclusive workforce and a positive culture where employees can contribute their best work, take pride in doing the right thing, and work to improve and strengthen the organization. To have a successful operation, we endeavor to establish and maintain relationships with and among our employees that are built upon mutual respect, trust, and appreciation.

We frequently provide training opportunities for operations employees to obtain certifications for Emergency Medical Technician (“EMT”), Mechanical Engineering Technology (“MET”), foreman and supervisory certifications, and electrical certifications in addition to providing apprentice miner training and supervisor training programs.

In addition to various training programs that we require employees in certain skilled positions to complete, all of our employees are provided with employee handbooks and are expected to follow policies and procedures concerning employment matters at Alpha and our affiliates including, but not limited to: anti-harassment, workplace violence, code of business ethics, drug and alcohol policies, safety policies and vehicle policies.

Employee Safety

Safety is one of our core values and is the foundation for how we manage every aspect of our business. Our employees are empowered with the skills, training, resources, and responsibility to perform their jobs in a safe manner and are accountable for their own safety as well as the safety of their co-workers. Every employee has a voice in the safety process at each of our mines and other operating sites. Our behavior-based safety process empowers employees to engage in the elimination of at-risk behaviors in the workplace and in incident prevention and continuous improvement. In recognition of the interdependence between safety and operations, our “Safe Production” process promotes the effective utilization of procedures, developing safety action plans at each operating group and sharing of best practices, safety alerts and lessons learned across the entire organization.

Safety leadership and training programs are based upon the concepts of situational awareness and observation, changing behaviors and, most importantly, employee involvement. The core elements of our safety training include identification of critical behaviors and the frequency of those behaviors, employee feedback, and removal of barriers for continuous improvement. All employees are empowered to champion the safety process and are challenged to identify hazards and initiate prompt corrective actions. All levels of the organization are expected to be proactive and commit to continuous improvement and implementation of new safety processes that promote a safe and healthy work environment.

Based on available data for the first three quarters of 2021, we achieved an overall NFDL (Non-fatal days lost) safety incident rate that was 30% better than the U.S. industry average NFDL safety incident rate per 200,000 hours worked.

Alpha’s mine operations routinely collaborate with academic institutions as well as federal and state agencies to facilitate testing of new concepts and technologies and to utilize them whenever possible to provide the best safety and protection for our employees.

We also believe in taking precautions to avoid incidents and prevent them from occurring. Our Incident Response Plan and Mine Emergency Response Drills have been developed and widely disseminated to appropriate operations and corporate personnel to lay the framework for a prompt and coordinated response in the event an incident occurs. Alpha's award-winning mine rescue teams undergo highly specialized training and compete in regional and national mine rescue events to test their skills in first aid, firefighting, mine ventilation, and critical decision-making.

As posted on our Company website, several of our mine operations have been recognized on numerous occasions for outstanding performance and have received several awards in the areas of safety and mine rescue.

Refer to Exhibit 95 Mine Safety Disclosure included in this Annual Report on Form 10-K for additional mine safety information.

Employee Health and Welfare

In the first quarter of 2020, the COVID-19 virus was declared a pandemic by the World Health Organization. During 2021, our Company experienced an increase in employee absences due to COVID-19-related matters such as precautionary quarantining, waiting on COVID-19 test results, testing positive for COVID-19, receiving a vaccination, or providing care for a family member. In response to the COVID-19 pandemic, we implemented policies, procedures, and prevention measures to protect the safety and health of our employees. These include, but are not limited to, employee communications on COVID-19 monitoring and precautionary measures, enhanced cleaning and sterilization practices, and remote work arrangements. We will continue to evaluate these policies, procedures, and precautionary measures in light of further developments as necessary or appropriate.

In the first half of 2020 and in response to uncertainty and anticipated negative impacts to our business at the onset of the pandemic, we temporarily furloughed some employees at certain mine operations, suspended employer 401(k) contributions, and implemented wage reductions across the company. As conditions improved in 2021, we were able to reinstate the employer 401(k) contributions, lift the 2020 wage reductions as well as award additional wage increases company-wide.

Legal Proceedings

We could become party to legal proceedings from time to time. These proceedings, as well as governmental examinations, could involve various business units and a variety of claims, including, but not limited to, contract disputes, personal injury claims, property damage claims (including those resulting from blasting, subsidence, trucking and flooding), environmental and safety issues, and employment matters. While some legal matters may specify the damages claimed by the plaintiffs, many seek an unquantified amount of damages. Even when the amount of damages claimed against us or our subsidiaries is stated, (i) the claimed amount may be exaggerated or unsupported; (ii) the claim may be based on a novel legal theory or involve a large number of parties; (iii) there may be uncertainty as to the likelihood of a class being certified or the ultimate size of the class; (iv) there may be uncertainty as to the outcome of pending appeals or motions; and/or (v) there may be significant factual issues to be resolved. As a result, if such legal matters arise in the future we may be unable to estimate a range of possible loss for matters that have not yet progressed sufficiently through discovery and development of important factual information and legal issues. We record accruals based on an estimate of the ultimate outcome of these matters, but these estimates can be difficult to determine and involve significant judgment.

ENVIRONMENTAL AND OTHER REGULATORY MATTERS

Federal, state and local authorities regulate the U.S. coal mining industry and the industries it serves with respect to matters such as employee health and safety, permitting and licensing requirements, air quality standards, water quality, plant and wildlife protection, the reclamation of mining properties after mining has been completed, the discharge of materials into the environment, surface subsidence from underground mining, and the effects of mining on groundwater quality and availability. These laws and regulations, which are extensive, subject to change, and have tended to become stricter over time, have had, and will continue to have, a significant effect on our production costs and our competitive position relative to certain other sources of electricity generation. Future legislation, regulations or orders, as well as future interpretations and more rigorous enforcement of existing laws, regulations or orders, may require substantial increases in equipment and operating costs to us and delays, interruptions, or a termination of operations, the extent of which we cannot predict. In particular, the new presidential administration and congressional majorities have expressed support for policies that may result in stricter environmental, health and safety standards applicable to our operations and those of our customers. We intend to continue to comply with these regulatory requirements as they evolve by timely implementing necessary modifications to facilities or operating procedures. Future legislation, regulations, orders or regional or international arrangements, agreements or treaties, as well as efforts by private organizations, including those relating to global climate change, may continue to cause coal to become more heavily regulated.

We endeavor to conduct our mining operations in compliance with all applicable federal, state, and local laws and regulations. We have certain procedures in place that are designed to enable us to comply with these laws and regulations. However, due to the complexity and interpretation of these laws and regulations, we cannot guarantee that we have been or will be at all times in complete compliance, and violations are likely to occur from time to time. None of the violations or the monetary penalties assessed upon us have been material. Future liability under or compliance with environmental and safety requirements could, however, have a material adverse effect on our operations or competitive position. Under some circumstances, substantial fines and penalties, including revocation, denial or suspension of mining permits, may be imposed under the laws described below.

Monetary sanctions, expensive compliance measures and, in severe circumstances, criminal sanctions may be imposed for failure to comply with these laws.

As of December 31, 2021, we had accrued $164.2 million for reclamation liabilities and mine closures, including $32.2 million of current liabilities.

Mining Permits and Approvals

Numerous governmental permits or approvals are required for mining operations pursuant to certain federal, state and local laws applicable to our operations. When we apply for these permits and approvals, we may be required to prepare and present data to federal, state or local authorities pertaining to the effect or impact that any proposed production or processing of coal may have upon the environment and measures we will take to minimize and mitigate those impacts. The requirements imposed by any of these authorities may be costly and time consuming and may delay commencement or continuation of mining operations.

In order to obtain mining permits and approvals from federal and state regulatory authorities, mine operators, including us, must submit a reclamation plan for restoring, upon the completion of mining operations, the mined property to its prior or better condition, productive use or other permitted condition. Typically, we submit the necessary permit applications several months, or even years, before we plan to begin mining a new area. Mining permits generally are approved months or even years after a completed application is submitted. Therefore, we cannot be assured that we will obtain future mining permits in a timely manner.

Permitting requirements also require, under certain circumstances, that we obtain surface owner consent if the surface estate has been severed from the mineral estate. This requires us to negotiate with third parties for surface rights that overlie coal we control or intend to control. These negotiations can be costly and time-consuming, lasting years in some instances, which can create additional delays in the permitting process. If we cannot successfully negotiate for surface rights, we could be denied a permit to mine coal we already control.

On October 4, 2019, the Bankruptcy Court entered an order approving the sale by Blackjewel of the Belle Ayr and Eagle Butte mines located in the PRB (the “Western Assets”) to Eagle Specialty Materials, LLC (“ESM”). The closing of the ESM acquisition (the “ESM Transaction”) occurred on October 18, 2019. We were the former owner of the Western Assets, having sold them to Blackjewel in December 2017 (the “2017 Blackjewel Sale”). As the mine permit transfer process relating to our sale of the Western Assets to Blackjewel had not been completed prior to Blackjewel’s and certain of its affiliates’ filing

petitions for relief under chapter 11 of title 11 of the U.S. Code (the "Bankruptcy Code"), we remained the permitholder in good standing for both mines. In connection with ESM's acquisition of the Western Assets from Blackjewel, on October 18, 2019, we and ESM finalized an agreement that provided, among other items, for the eventual transfer of the Western Asset permits from us to ESM and replacement by ESM of our surety bonds associated with these properties. In furtherance of certain objectives contemplated under that agreement, we and ESM agreed to the merger of two of our now-former subsidiaries, *i.e.*, Contura Coal West, LLC ("CCW"), which held and still holds the Western Asset permits, and Contura Wyoming Land, LLC ("CWL"), with certain entities formed by ESM for purposes of acquiring CCW and CWL. The ESM entities involved in the mergers were ESM Coal West SPV, LLC ("First Merging Entity") and ESM Wyoming Land SPV, LLC ("Second Merging Entity"). The mergers were consummated effective May 29, 2020, with the First Merging Entity merging with and into CCW, with CCW as the surviving entity (the "First Surviving Entity"), and the Second Merging Entity merging with and into CWL, with CWL as the surviving entity (the "Second Surviving Entity"). Upon the mergers becoming effective, each of the First Surviving Entity and the Second Surviving Entity became wholly-owned subsidiaries of ESM. As such, the Western Asset permits are still held by the same entity, Contura Coal West, LLC, but said entity is no longer a subsidiary of ours, and we no longer have surety bonds associated with these permits and properties.

Surface Mining Control and Reclamation Act

SMCRA, which is administered by the Office of Surface Mining Reclamation and Enforcement ("OSM"), establishes mining, environmental protection, reclamation, and closure standards for all aspects of surface mining as well as many aspects of underground mining that effect surface expressions. Mine operators must obtain SMCRA permits and permit renewals from the OSM or from the applicable state agency if the state agency has obtained primary control of administration and enforcement of the SMCRA program, or primacy. A state agency may obtain primacy if OSM concludes that the state regulatory agency's mining regulatory program is no less stringent than the federal mining program under SMCRA. States where we have active mining operations have achieved primacy and issue permits in lieu of OSM. OSM maintains oversight of how the states administer their programs.

SMCRA permit provisions include a complex set of requirements which include: coal prospecting; mine plan development; topsoil or growth medium removal, storage and replacement; selective handling of overburden materials; mine pit backfilling and grading; protection of the hydrologic balance, including outside the permit area; subsidence control for underground mines; surface drainage control; mine drainage and mine discharge control and treatment; and re-vegetation and reclamation.

The mining permit application process is initiated by collecting baseline data to adequately characterize the pre-mine environmental condition of the permit area. This work includes, but is not limited to, surveys of cultural and historical resources, soils, vegetation, wildlife, assessment of surface and ground water hydrology, climatology, and wetlands. In conducting this work, we collect geologic data to define and model the soil and rock structures associated with the coal that we will mine. We develop mining and reclamation plans by utilizing this geologic data and incorporating elements of the environmental data. The mining and reclamation plan incorporates the provisions of SMCRA, the state programs, and the complementary environmental programs that affect coal mining. Also included in the permit application are documents defining ownership and agreements pertaining to coal, minerals, oil and gas, water rights, rights of way and surface land, and documents required of the OSM's Applicant Violator System ("AVS"), including the mining and compliance history of officers, directors and principal owners of the entity.

Regulations under SMCRA and its state analogues provide that a mining permit or modification can, under certain circumstances, be delayed, refused or revoked if we or any entity that owns or controls us or is under common ownership or control with us have unabated permit violations or have been the subject of permit or reclamation bond revocation or suspension. These regulations define certain relationships, such as owning over 50% of stock in an entity or having the authority to determine the manner in which the entity conducts mining operations, as constituting ownership and control. Certain other relationships are presumed to constitute ownership or control, including being an officer or director of an entity or owning between 10% and 50% of the mining operator. This presumption, in some cases, can be rebutted where the person or entity can demonstrate that it in fact does not or did not have authority directly or indirectly to determine the manner in which the relevant coal mining operation is conducted. Thus, past or ongoing violations of federal and state mining laws by us or by coal mining operations owned or controlled by our significant stockholders, directors or officers or certain other third-party affiliates could provide a basis to revoke existing permits and to deny the issuance of additional permits or modifications or amendments of existing permits. This is known as being "permit-blocked." In recent years, the permitting required for coal mining has been the subject of increasingly stringent regulatory and administrative requirements and extensive litigation by environmental groups.

Once a permit application is prepared and submitted to the regulatory agency, it goes through a completeness review and technical review. Public notice of the proposed permit is given that also provides for a comment period before a permit can be issued. Some SMCRA mine permits take over a year to prepare, depending on the size and complexity of the mine and may

take months or even years to be issued. Regulatory authorities have considerable discretion in the timing of the permit issuance and the public and other agencies have rights to comment on and otherwise engage in the permitting process, including through intervention in the courts.

The Abandoned Mine Land Fund, which is part of SMCRA, requires a fee on all coal produced. The proceeds are used to reclaim mine lands closed or abandoned prior to SMCRA's adoption in 1977. The current fee, which is effective through September 30, 2034, is $0.224 per ton on surface-mined coal and $0.096 per ton on deep-mined coal. The previous fee, which was effective through September 30, 2021, was $0.28 per ton on surface-mined coal and $0.12 per ton on deep-mined coal. For the years ended December 31, 2021 and 2020, we recorded $2.5 million and $2.3 million, respectively, of expense related to these fees.

While SMCRA is a comprehensive statute, SMCRA does not supersede the need for compliance with other major environmental statutes, including the Endangered Species Act; Clean Air Act; Clean Water Act; Resource Conservation and Recovery Act ("RCRA") and Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA" or "Superfund").

Surety Bonds

Federal and state laws require us to obtain surety bonds or other approved forms of security to cover the costs of certain long-term obligations, including mine closure or reclamation costs under SMCRA, federal and state workers' compensation costs, coal leases and other miscellaneous obligations. As of December 31, 2021 and 2020, our posted third-party surety bond amount in all states where we operate was approximately $176.1 million and $351.6 million, respectively, including portions attributable to discontinued operations of $30 thousand and $134.2 million, respectively, which was used to primarily secure the performance of our reclamation and lease obligations.

Posting of a bond or other security with respect to the performance of reclamation obligations is a condition to the issuance of a permit under SMCRA. Under the terms of agreements we and Alpha Natural Resources, Inc. entered into in connection with the Alpha Natural Resources, Inc. Restructuring, we and Alpha Natural Resources, Inc. were required to replace Alpha Natural Resources, Inc.'s self-bonds with surety bonds, collateralized bonds, or other financial assurance mechanisms, over time and under applicable regulations. Self-bonding may not be available to us as a means to comply with our reclamation bonding obligations for the foreseeable future. In August 2016, OSM announced its decision to pursue a rulemaking to evaluate self-bonding for coal mines, including eligibility standards. OSM has not yet issued a proposed rule to address this issue.

Clean Air Act

The Clean Air Act and comparable state laws that regulate air emissions affect coal mining operations both directly and indirectly. Direct impacts on coal mining and processing operations include Clean Air Act permitting requirements and emission control requirements relating to particulate matter, which may include controlling fugitive dust. The Clean Air Act indirectly affects coal mining operations by extensively regulating air emissions of particulate matter, sulfur dioxide, nitrogen oxides, mercury and other compounds emitted by coal-fired electricity generating plants or the use of met coal in connection with steelmaking operations. In recent years, Congress has considered legislation that would require increased reductions in emissions of sulfur dioxide, nitrogen oxide, and mercury. The general effect of emission regulations on coal-fired power plants could be to reduce demand for coal.

In addition to the greenhouse gas ("GHG") issues discussed below, the air emissions programs that may materially and adversely affect our operations, financial results, liquidity, and demand for coal, directly or indirectly, include, but are not limited to, the following:

- *Acid Rain.* Title IV of the Clean Air Act requires reductions of sulfur dioxide emissions by electric utilities. Affected electricity generators have sought to meet these requirements by, among other compliance methods, switching to lower sulfur fuels, installing pollution control devices, reducing electricity generating levels or purchasing or trading sulfur dioxide emission allowances. We cannot accurately predict the effect of these provisions of the Clean Air Act on us in future years.
- *NAAQS for Criteria Pollutants.* The Clean Air Act requires the EPA to set standards, referred to as National Ambient Air Quality Standards ("NAAQS"), for six common air pollutants, including nitrogen oxide, sulfur dioxide, particulate matter, and ozone. Areas that are not in compliance (referred to as "non- attainment areas") with these standards must take steps to reduce emissions levels. Over the past several years, the EPA has revised its NAAQS for nitrogen oxide, sulfur dioxide, particulate matter and ozone, in each case making the standards more stringent. As a result, some states will be required to amend their existing individual state implementation plans ("SIPs") to achieve compliance with the new air quality standards. Other states will be required to develop new plans for areas that were previously in

"attainment," but do not meet the revised standards. On December 7, 2020, the EPA announced the agency's final decision to retain the existing National Ambient Air Quality Standards for particulate matter (PM) set by the Obama-Biden Administrations without changes.

In October 2015, the EPA finalized the NAAQS for ozone pollution and reduced the limit to 70 parts per billion (ppb) from the previous 75 ppb standard. The EPA made the majority of area designations related to this rule on November 16, 2017 and June 4, 2018 and finalized designations for the remaining regions of the country on July 25, 2018. Under the revised NAAQS for ozone in particular, significant additional emissions control expenditures may be required at coal-fired power plants. The final rules and new standards may impose additional emissions control requirements on our customers in the electric generation, steelmaking, and coke industries. Although coal mining and processing operations may emit certain criteria pollutants, we operate in material compliance with our permits. However, our operations could be affected if the attainment status of the areas in which we operate changes in the future.

A suit by industry challenging the EPA's 2015 Ozone NAAQS (*Murray Energy Corp. v. EPA)* is currently pending in the D.C. Circuit. In April 2017, the D.C. Circuit Court granted the EPA's motion to indefinitely delay any decision on the challenges pending the EPA's possible reconsideration of the rule. In July 2018, the D.C. Circuit Court returned the matter to its active docket and in August 2018, the EPA indicated to the court that it would not be revising the 2015 standards at this time. In August 2019, the D.C. Circuit upheld the rule with the exception of the secondary NAAQS standards addressing protection of animals, crops and vegetation, which were sent back to the EPA for further consideration. On December 23, 2020, the EPA announced its decision to retain, without changes, the 2015 ozone National Ambient Air Quality Standards set by the Obama- Biden Administration.

- *NOx SIP Call.* The NOx SIP Call program was established by the EPA in October of 1998 to reduce the transport of nitrogen oxide and ozone on prevailing winds from the Midwest and South to states in the Northeast, which said they could not meet federal air quality standards because of migrating pollution. The program is designed to reduce nitrogen oxide emissions by one million tons per year in 22 eastern states and the District of Columbia. As a result of the program, many power plants have been or will be required to install additional emission control measures, such as selective catalytic reduction devices. Installation of additional emission control measures will make it more costly to operate coal-fired power plants, potentially making coal a less attractive fuel. On February 26, 2019, the EPA published a final rule amending the NOx SIP Call regulations to allow states to establish alternative monitoring and reporting requirements for certain sources.

- *Cross-State Air Pollution Rule.* In June 2011, the EPA finalized the CSAPR, which required 28 states in the Midwest and eastern seaboard of the U.S. to reduce power plant emissions that cross state lines and contribute to ozone and/or fine particle pollution in other states. Nitrogen oxide and sulfur dioxide emission reductions were scheduled to commence in 2012, with further reductions effective in 2014. However, implementation of CSAPR's requirements were delayed due to litigation. In October 2014, the EPA issued an interim final rule reconciling the CSAPR rule with the Court's order, which called for Phase 1 implementation in 2015 and Phase 2 implementation in 2017.

  In September 2016, the EPA finalized an update to the CSAPR ozone season program by issuing the Final CSAPR Update. The Final CSAPR Update rule is the subject of a pending legal challenge in the D.C. Circuit by five states. In September 2019, the D.C. Circuit concluded that the rule was valid in certain respects but that it failed to ensure that pollution from upwind states would not prevent downwind states from meeting air quality standards in a timely manner. The court directed the EPA to revise the rule to address this failure. For states to meet their requirements under CSAPR, a number of coal-fired electric generating units will likely need to be retired, rather than retrofitted with the necessary emission control technologies, reducing demand for thermal coal. On October 15, 2020, the EPA proposed the Revised Cross-State Air Pollution Rule Update in order to fully address 21 state's outstanding interstate pollution transport obligations for the 2008 ozone National Ambient Air Quality Standards. Starting in the 2021 ozone season, the proposed rule would require additional emissions reductions of nitrogen oxides from power plants in 12 states. The public comment period for the proposal closed on December 14, 2020. However, on January 20, 2021 the new presidential administration announced a freeze with respect to all pending rulemaking. Accordingly, the outcome of this rulemaking may result in stricter standards than those contained in the proposed rule.

- *Mercury and Hazardous Air Pollutants.* In February 2012, the EPA formally adopted a rule to regulate emissions of mercury and other metals, fine particulates, and acid gases such as hydrogen chloride from coal- and oil-fired power plants, referred to as "MATS." In March 2013, the EPA finalized reconsideration of the MATS rule as it pertains to new power plants, principally adjusting emissions limits for new coal-fired units to levels considered attainable by existing control technologies. In subsequent litigation, the U.S. Supreme Court struck down the MATS rule based on the EPA's failure to take costs into consideration. The D.C. Circuit allowed the current rule to stay in place until the EPA issued a new finding. In April 2016, the EPA issued a final finding that it is appropriate and necessary to set standards for emissions of air toxics from coal- and oil-fired power plants. However, in April 2017, the EPA indicated in a court filing that it may reconsider this finding, and on April 27, 2017, the D.C. Circuit stayed the litigation. In August 2018, the EPA stated that it plans on sending a draft proposal to the White House questioning the EPA's earlier finding and intends to reevaluate the MATS rule itself.

  On December 27, 2018, the EPA issued a proposed revised Supplemental Cost Finding for MATS, as well as the Clean Air Act required "risk and technology review." After taking account of both the cost to coal- and oil-fired power plants of complying with the MATS rule and the benefits attributable to regulating hazardous air pollutant (HAP) emissions from these power plants, the EPA proposed to determine that it is not "appropriate and necessary" to regulate HAP emissions from power plants under Section 112 of the Clean Air Act. The emission standards and other requirements of the MATS rule, first promulgated in 2012, would remain in place, however, since the EPA did not propose to remove coal- and oil-fired power plants from the list of sources that are regulated under Section 112 of the Act.

  On April 15, 2020, the EPA established a new subcategory in the MATS for electric utility steam generating units (EGU's) that burn eastern bituminous coal refuse (EBCR). Coal refuse includes low-quality coal mixed with rock, clay and other material. The EPA is also establishing emission standards from these facilities. The new subcategory and emission standards will affect six existing EGUs that burn EBCR.

  On May 22, 2020, the EPA published the completed reconsideration of the appropriate and necessary finding for the MATS. The EPA concluded that it is not "appropriate and necessary" to regulate electric utility steam generating units under Section 112 of the Clean Air Act. The EPA is also taking final action on the residual risk and technology review that is required by the CAA Section 112. The EPA states, "emissions of HAP have been reduced such that residual risk is at acceptable levels, that there are no developments in HAP emissions controls to achieve further cost-effective reductions beyond the current standard, and, therefore, no changes to the MATS rule are warranted".

  Apart from MATS, several states have enacted or proposed regulations requiring reductions in mercury emissions from coal-fired power plants, and federal legislation to reduce mercury emissions from power plants has been proposed. Regulation of mercury emissions by the EPA (and in particular, the reconsideration by the current EPA of any rulemaking relating to the MATS rule during the prior presidential administration), states, Congress, or pursuant to an international treaty may further decrease the demand for coal. Like CSAPR, MATS and other similar future regulations could accelerate the retirement of a significant number of coal-fired power plants, in addition to the significant number of plants and units that have already been retired as a result of environmental and regulatory requirements and uncertainties adversely impacting coal-fired generation. Such retirements would likely adversely impact our business.

- *Regional Haze, New Source Review and Methane.* The EPA's regional haze program is intended to protect and improve visibility at and around national parks, national wilderness areas and international parks. In December 2011, the EPA issued a final rule under which the emission caps imposed under CSAPR for a given state would supplant the obligations of that state with regard to visibility protection. In May 2012, the EPA finalized a rule that allows the trading programs in CSAPR to serve as an alternative to determining source-by-source Best Available Retrofit Technology ("BART"). This rule provides that states in the CSAPR region can substitute participation in CSAPR for source-specific BART for sulfur dioxide and/or nitrogen oxides emissions from power plants. This program may result in additional emissions restrictions from new coal-fueled power plants whose operations may impair visibility at and around federally protected areas. This program may also require certain existing coal-fueled power plants to install additional control measures designed to limit haze causing emissions, such as sulfur dioxide, nitrogen oxides, volatile organic chemicals and particulate matter. These limitations could result in additional coal plant closures and affect the future market for coal. A final Regional Haze rule was published on January 10, 2017.

In addition, the EPA's new source review program under certain circumstances requires existing coal-fired power plants, when modifications to those plants significantly change emissions, to install the more stringent air emissions control equipment required of new plants.

Litigation seeking to force the EPA to list coal mines as a category of air pollution sources that endanger public health or welfare under Section 111 of the CAA and establish standards to reduce emissions from sources of methane and other emissions related to coal mines was dismissed by the D.C. Circuit in May 2014. In that case, the Court denied a rulemaking petition citing agency discretion and budgetary restrictions, and ruled that the EPA has reasonable discretion to carry out its delegated responsibilities, which include determining the timing and relative priority of its regulatory agenda. In July 2014, the D.C. Circuit denied a petition seeking a rehearing of the case en banc. Litigation regarding these issues may continue and could result in the need for additional air pollution controls for coal-fired units and our operations.

Global Climate Change

Global climate change initiatives and public perceptions have resulted, and are expected to continue to result, in decreased coal-fired power plant capacity and utilization, phasing out and closing many existing coal-fired power plants, reducing or eliminating construction of new coal-fired power plants in the United States and certain other countries, increased costs to mine coal and decreased demand and prices for thermal coal.

There are three important sources of GHGs associated with the coal industry: first, the end use of our coal by our customers in electricity generation, coke plants, and steelmaking is a source of GHGs; second, combustion of fuel for mining equipment used in coal production; and third, coal mining can release methane, a GHG, directly into the atmosphere. GHG emissions from coal consumption and production are subject to pending and proposed regulation as part of initiatives to address global climate change.

The Kyoto Protocol to the 1992 United Nations Framework Convention on Climate Change (the "Kyoto Protocol") became effective in 2005 and bound those developed countries that ratified it (which the U.S. did not do) to reduce their global GHG emissions. In December 2015, the United States and almost 200 nations agreed to the Paris Agreement, which entered into force on November 4, 2016 and has the long-term goal to limit global warming to below two degrees Celsius by 2100 from temperatures in the pre-industrial era. Although this agreement does not create any binding obligations for nations to limit their GHG emissions, it does include pledges to voluntarily limit or reduce future emissions. On June 1, 2017, the Trump administration announced that the U.S. will withdraw from the Paris Agreement. This withdrawal formally took effect on November 4, 2020. However, on January 20, 2021, President Biden issued a statement formally accepting the Paris Agreement on behalf of the U.S., which triggered a 30 day process for rejoining the accord. In addition, numerous U.S. governors, mayors and businesses have pledged their commitments to the goals of the Paris Agreement. These commitments could further reduce demand and prices for our coal.

In 2009, the EPA issued a finding that emissions of carbon dioxide, methane and other GHGs present an endangerment to public health and the environment. The EPA has since adopted regulations under existing provisions of the CAA pursuant to this finding. For example, the EPA has adopted rules requiring the monitoring and reporting of GHG emissions from specified large GHG emission sources in the U.S., including coal-fired electric power plants and steel-making operations. The EPA has also promulgated the Tailoring Rule, which requires that all new or modified stationary sources of GHGs that will emit more than 75,000 tons of carbon dioxide per year and are otherwise subject to CAA regulation, and any other facilities that will emit more than 100,000 tons of carbon dioxide per year, to undergo prevention of significant deterioration ("PSD") permitting, which requires that the permitted entity adopt the best available control technology.

In June 2014, the U.S. Supreme Court addressed whether the EPA's regulation of GHG emissions from new motor vehicles properly triggered GHG permitting requirements for stationary sources under the CAA as well as the validity of the Tailoring Rule under the CAA. The decision reversed, in part, and affirmed, in part, a 2012 D.C. Circuit decision that upheld the Tailoring Rule. Specifically, the Court held that the EPA exceeded its statutory authority when it interpreted the CAA to require PSD and Title V permitting for stationary sources based on their potential GHG emissions. However, the Court also held that the EPA's determination that a source already subject to the PSD program due to its emission of conventional pollutants may be required to limit its GHG emissions by employing the "best available control technology" was permissible. As a result, the EPA is now requiring new sources already subject to the PSD program, including coal-fired power plants, to undergo control technology reviews for GHGs (predominately carbon dioxide) as a condition of permit issuance. These reviews may impose limits on GHG emissions, or otherwise be used to compel consideration of alternative fuels and generation systems, as well as increase litigation risk for-and so discourage development of-coal-fired power plants.

On August 3, 2015, the EPA released a final rule establishing New Source Performance Standards ("NSPS") for emissions of carbon dioxide for new, modified and reconstructed fossil fuel-fired electric generating units ("Power Plant NSPS"). The final rule requires that newly constructed fossil fuel-fired steam generating units achieve an emission standard for carbon dioxide of 1,400 lb CO2/MWh-gross. The standard is based on the performance of a supercritical pulverized coal boiler implementing partial carbon capture and storage ("CCS"). Modified and reconstructed fossil fuel fired steam generating units

must implement the most efficient generation achievable through a combination of best operating practices and equipment upgrades, to meet an emission standard consistent with best historical performance.

Reconstructed units must implement the most efficient generating technology based on the size of the unit (supercritical steam conditions for larger units, to meet a standard of 1,800 lb CO2/MWh-gross, and subcritical conditions for smaller units to meet a standard of 2,000 lb CO2/MWh-gross). Numerous legal challenges to the final rule are currently pending. There is a risk that CCS technology may not be commercially practical in limiting emissions as otherwise required by the rule or similar rules that may be proposed in the future. If such legislative or regulatory programs are adopted or maintained, and economic, commercially available carbon capture technology for power plants is not developed or adopted in a timely manner, it would negatively affect our customers and would further reduce the demand for coal as a fuel source, causing coal prices and sales of our coal to decline, perhaps materially.

In August 2015, the EPA issued the Clean Power Plan ("CPP"), a final rule that establishes carbon pollution standards for existing power plants, called CO2 emission performance rates. The EPA expected each state to develop implementation plans for power plants in its state to meet the individual state targets established in the CPP. The CPP was immediately subject to legal challenges and was stayed before it was implemented. On July 8, 2019, the EPA, published the ACE Rule, a replacement of the CPP. In contrast to the CPP, which called for the shifting of electricity generation away from coal-fired sources toward natural gas and renewables, the ACE Rule focuses on reducing GHG emissions from existing coal-fired plants by requiring states to mandate the implementation of a range of technologies at power plants designed to improve their heat rate (i.e., decrease the amount of fuel necessary to generate the same amount of electricity). However, on January 19, 2021, the Court of Appeals of the District of Columbia struck down the ACE rule. The EPA has since announced an intent to consider new regulations governing carbon emissions from existing power plants. More stringent standards for carbon dioxide emissions as a result of these rulemakings could further reduce demand for coal, and our business would be adversely impacted.

The United States Congress has, from time to time, considered legislation to reduce GHG emissions, such as a resolution referred to as the Green New Deal, which was introduced in the U.S. House of Representatives in February 2019 and similar legislation may be introduced in the current Congressional term. To date, Congress has not passed a bill specifically addressing GHG regulation. In addition, various states and regions have adopted initiatives to reduce, and in some cases phase out, GHG emissions and certain governmental bodies, including the states of Virginia and California, have considered or are considering the imposition of fees or taxes based on the emission of GHGs by certain facilities. A number of states have enacted legislative mandates requiring electricity suppliers to use renewable energy sources to generate a certain percentage of power. For example, on September 10, 2018, California adopted a law that requires all electricity consumed by the state to be generated from renewable sources such as solar, wind and hydropower by 2045.

In addition, certain banks and other financing sources have taken actions to limit available financing for the development of new coal-fueled power plants, which also may adversely affect the future global demand for coal. Further, there have been recent efforts by members of the general financial and investment communities, such as investment advisors, sovereign wealth funds, public pension funds, universities and other groups, to divest themselves and to promote the divestment of securities issued by companies involved in the fossil fuel extraction market, such as coal producers. Those entities also have been pressuring lenders to limit financing available to such companies. These efforts may adversely affect the market for our securities and our ability to access capital and financial markets in the future.

Furthermore, several well-funded non-governmental organizations have explicitly undertaken campaigns to minimize or eliminate the use of coal as a source of electricity generation. These efforts, as well as concerted conservation and efficiency efforts that result in reduced electricity consumption, could cause coal prices and sales of our coal to materially decline and possibly increase our operating costs.

These and other current or future global climate change laws, regulations, court orders or other legally enforceable mechanisms, or related public perceptions regarding climate change, are expected to require additional controls on coal-fired power plants and industrial boilers and may cause some users of coal to further switch from coal to alternative sources of fuel, thereby depressing demand and pricing for coal.

Clean Water Act

The CWA and corresponding state and local laws and regulations affect coal mining operations by restricting the discharge of pollutants, including dredged or fill materials, into waters of the United States. The CWA provisions and associated state and federal regulations are complex and subject to amendments, legal challenges and changes in implementation. Legislation that seeks to clarify the scope of CWA jurisdiction has also been considered by Congress. Recent court decisions, regulatory actions and proposed legislation have created uncertainty over CWA jurisdiction and permitting requirements.

CWA requirements that may directly or indirectly affect our operations include the following:

Wastewater Discharge

Prior to discharging any pollutants into waters of the United States, coal mining companies must obtain a National Pollutant Discharge Elimination System ("NPDES") permit from the appropriate state or federal permitting authority. Section 402 of the CWA creates a process for establishing effluent limitations for discharges to streams that are protective of water quality standards through the NPDES program, and corresponding programs implemented by state regulatory agencies. Regular monitoring, reporting and compliance with performance standards are preconditions for the issuance and renewal of NPDES permits that govern discharges into waters of the United States. Failure to comply with the CWA or NPDES permits can lead to the imposition of significant penalties, litigation, compliance costs and delays in coal production. Furthermore, the imposition of future restrictions on the discharge of certain pollutants into waters of the United States could increase the difficulty of obtaining and complying with NPDES permits, which could impose additional time and cost burdens on our operations. For instance, waters that states have designated as impaired (i.e., as not meeting present water quality standards) are subject to Total Maximum Daily Load regulations, which may lead to the adoption of more stringent discharge standards for our coal mines and could require more costly treatment.

In addition, when water quality in a receiving stream is of high quality, states are required to conduct an anti-degradation review before approving discharge permits. Anti-degradation policies may increase the cost, time and difficulty associated with obtaining and complying with NPDES permits and may also require more costly treatment.

On March 5, 2014, the EPA, the U.S. Department of Justice ("DOJ"), West Virginia Department of Environmental Protection, the Pennsylvania Department of Environmental Protection and the Kentucky Energy and Environment Cabinet filed a Complaint against Alpha Natural Resources, Inc. and its permit holding subsidiaries in Kentucky, Pennsylvania, Tennessee, Virginia and West Virginia alleging that Alpha Natural Resources, Inc.'s mining affiliates in those states and in Tennessee and Virginia exceeded certain water discharge permit limits during the period of 2006 to 2013 and simultaneously entered into a Consent Decree with Alpha Natural Resources, Inc. resolving their claims. The Consent Decree was entered by the Southern District of West Virginia on November 26, 2014 and amended on June 12, 2016 and again on February 28, 2018 (the "Alpha Natural Resources, Inc. Consent Decree"). As part of the Alpha Natural Resources, Inc. Consent Decree, Alpha Natural Resources, Inc. agreed to implement an integrated environmental management system and an expanded auditing/reporting protocol, install selenium and osmotic pressure treatment facilities at specific locations, and certain other measures. The Alpha Natural Resources, Inc. Consent Decree required Alpha Natural Resources, Inc. to pay $27.5 million in civil penalties, to be divided among the federal government and state agencies. All required water treatment systems have been constructed, the environmental management system has been implemented, and the other terms and conditions of the Alpha Natural Resources, Inc. Consent Decree have been substantially satisfied. On February 25, 2020, partial termination of the Consent Decree was granted by the EPA for all but 6 of the Alpha Natural Resources, Inc. Defendants. On January 29, 2021, full termination of the Consent Decree was granted for all the Defendants.

Dredge and Fill Permits

Many mining activities, including the development of settling ponds and the construction of certain sediment control structures, valley fills and surface impoundments, require permits from the U.S. Army Corps of Engineers ("COE") under Section 404 of the CWA. Generally speaking, these Section 404 permits allow the placement of dredge and fill materials into navigable waters of the United States, including wetlands, streams, and other regulated areas. The COE has issued general "nationwide" permits for specific categories of activities that are similar in nature and that are determined to have minimal adverse effects on the environment. Permits issued pursuant to Nationwide Permits 5, 21, 49 and 50 generally authorize the disposal of dredged or fill material from surface coal mining activities into waters of the United States, subject to certain restrictions. Nationwide Permits are typically reissued for a five-year period and require appropriate mitigation, and permit holders must receive explicit authorization from the COE before proceeding with proposed mining activities. On January 13, 2021, the COE published its final rule reissuing and modifying a portion of its Nationwide permits. The COE reissued and modified 12 existing Nationwide permits and issued four new permits. The 12 reissued permits replace the 2017 versions which now expire March 14, 2021. The COE finalized the proposed removal of the 300 linear foot limit for losses of stream bed from several of the Nationwide permits. Expansion of our mining operations into new areas may trigger the need for individual COE approvals, which could be more costly and take more time to obtain.

In January 2020, the EPA and the U.S. Army Corps of Engineers (the "USACE") issued a final rule that attempts to clarify the Clean Water Act's ("CWA") jurisdictional reach over waters of the United States, referred to as the Navigable Waters Protection Rule. The rule replaces a rule issued in June 2015 by the previous presidential administration, the Clean Water Rule. The Clean Water Rule was the subject of extensive legal challenges, injunctions and administrative action, and was formally

repealed in December 2019. The Navigable Waters Protection Rule is designed to fulfill a February 2017 executive order calling on the EPA and the USACE to develop a rule consistent with Justice Antonin Scalia's plurality opinion in the 2006 Supreme Court decision, *Rapanos v. United States*, that CWA jurisdiction attaches only to "navigable waters" and other waters with a relatively permanent flow, such as rivers or lakes. The Navigable Waters Protection Rule narrows the jurisdiction of the CWA relative to Clean Water Rule by, among other things, excluding from the scope of the definition of "waters of the United States" certain ephemeral streams and wetlands not adjacent to jurisdictional water bodies. The Navigable Water Protection Rule is likely to be the subject of legal challenges and its ultimate impact on our operations is uncertain.

Cooling Water Intake

In May 2014, the EPA issued a new final rule pursuant to Section 316(b) of the CWA that affects the cooling water intake structures at power plants in order to reduce fish impingement and entrainment. The rule is expected to affect over 500 power plants. These requirements could increase our customers' costs and may adversely affect the demand for coal, which may materially impact our results or operations.

Effluent Guidelines

On November 3, 2015, the EPA published the final rule for Effluent Limitations Guidelines and Standards ("ELGS"), revising the regulations for the Steam Electric Power Generating category, which became effective on January 4, 2016. It establishes the first federal limits on the levels of arsenic, mercury, selenium and nitrate-nitrites in flue gas desulfurization that can be discharged as wastewater from power plants, based on technology improvements over the last three decades. On April 25, 2017, the EPA stayed the implementation of the rule indefinitely to allow for reconsideration. On August 31, 2020, the EPA finalized the rule to revise the ELGS. The 2020 rule changes the technology basis for treatment of Flue Gas Desulfurization Wastewater and Bottom Ash Transport Water.

Endangered Species Act

The ESA and counterpart state legislation protect species threatened with possible extinction. Protection of threatened and endangered species may have the effect of prohibiting or delaying us from obtaining mining permits and mine plan modifications and approvals, and may include restrictions on timber harvesting, road building and other mining activities in areas containing the affected species or their habitats. We may also need to obtain additional permits or approvals if the incidental take of these species in the course of otherwise lawful activity may occur, which could take more time, be more costly and have adverse effects on operations. A number of species indigenous to properties we control or surrounding areas are protected under the ESA including the Guyandotte River Crayfish and the Big Sandy River Crayfish. On January 28, 2020 the U.S. Fish & Wildlife Service ("FWS") officially published the draft critical habitat designation for the Guyandotte River Crayfish and the Big Sandy River Crayfish in the Federal Register, starting the public comment period on the draft designations. On July 10, 2020, the FWS issued guidance regarding the preparation of protection and enhancement plans ("PEPs") for coal mining operations located in the Guyandotte River Crayfish habitat in southern West Virginia. The guidance contains several suggestions for requirements to be included in PEPs for proposed mining operations, such as minimizing fill placement, retaining 100 foot vegetative buffers around streams and constructing stream crossings in periods of low flow. Certain other sensitive species that are not currently protected by the ESA may also require protection and mitigation efforts consistent with federal and state requirements.

After the Stream Protection Rule and the accompanying 2016 Biological Opinion were repealed in February 2017, OSM issued a Section 7(d) determination that reinitiated consultation with the FWS to develop a new Biological Opinion. The new Biological Opinion was released on October 16, 2020. One of the most notable changes is the incidental take coverage if there is no agreement between the state regulatory authority and the FWS at the conclusion of the dispute resolution process and the regulatory authority issues the permit. The new Biological Opinion states that "any prohibited take of listed species incidental to that permit action will not be exempted through this incidental take statement." The Biological Opinion also includes discussion of OSM enforcement powers in primacy states potentially allowing the FWS to effect a permit veto via OSM enforcement actions. The new Biological Opinion could make the permitting process more difficult and expensive.

Resource Conservation and Recovery Act

RCRA affects coal mining operations by establishing requirements for the treatment, storage, and disposal of hazardous wastes. The EPA determined that coal combustion residuals ("CCR") do not warrant regulation as hazardous wastes under RCRA in May 2000. Most state hazardous waste laws do not regulate CCR as hazardous wastes. The EPA also concluded that beneficial uses of CCR, other than for mine filling, pose no significant risk and no additional national regulations of such beneficial uses are needed. However, the EPA determined that national non-hazardous waste regulations under RCRA are

warranted for certain wastes generated from coal combustion, such as coal ash, when the wastes are disposed of in surface impoundments or landfills or used as minefill. In December 2014, the EPA finalized regulations that address the management of coal ash as a non-hazardous solid waste under Subtitle D. The rules impose engineering, structural and siting standards on surface impoundments and landfills that hold coal combustion wastes and mandate regular inspections. The rules also require fugitive dust controls and impose various monitoring, cleanup, and closure requirements. In July 2018, the EPA published a final rule extending certain deadlines under the original rules, granting certain authority to states with authorized CCR programs and establishing groundwater protection standards for certain constituents. The EPA and OSM plan additional rulemaking relating to CCR.

There have also been several legislative proposals that would require the EPA to further regulate the storage of CCR. For example, in December 2016, Congress passed the Water Infrastructure Improvements for the Nation Act, which allows states to establish permit programs to regulate the disposal of CCR units in lieu of the EPA's CCR regulations. These requirements, as well as any future changes in the management of CCR, could increase our customers' operating costs and potentially reduce their ability or need to purchase coal. In addition, contamination caused by the past disposal of CCR, including coal ash, can lead to material liability for our customers under RCRA or other federal or state laws and potentially further reduce the demand for coal.

Comprehensive Environmental Response, Compensation and Liability Act

CERCLA and similar state laws affect coal mining operations by, among other things, imposing cleanup requirements for threatened or actual releases of hazardous substances into the environment. Under CERCLA and similar state laws, joint and several liability may be imposed on hazardous substance generators, site owners, transporters, lessees and others regardless of fault or the legality of the original disposal activity. Although the EPA currently excludes most wastes generated by coal mining and processing operations from the primary hazardous waste laws. The disposal, release or spilling of some products used by coal companies in operations, such as chemicals, could trigger the liability provisions of CERCLA or similar state laws. Thus, we may be subject to liability under CERCLA and similar state laws for our current or former owned, leased or operated coal mines and property or those of our predecessors. We may be liable under CERCLA or similar state laws for the cleanup of hazardous substance contamination and natural resource damages at sites where we control surface rights. These liabilities could be significant and materially and adversely affect our financial results and liquidity.

Use of Explosives. Our surface mining operations are subject to numerous regulations relating to blasting activities. Pursuant to these regulations, we incur costs to design and implement blast schedules and to conduct pre-blast surveys and blast monitoring. In addition, the storage of explosives is subject to regulatory requirements. For example, pursuant to a rule issued by the U.S. Department of Homeland Security ("DHS") in 2007, facilities in possession of chemicals of interest (including ammonium nitrate at certain threshold levels) are required to complete a screening review. In 2011, the DHS published proposed regulations of ammonium nitrate under the Ammonium Nitrate Security Rule. Many of the requirements of the proposed regulations would be duplicative of those in place under the Bureau of Alcohol, Tobacco, Firearms and Explosives, including registration and background checks, and DHS has moved its 2011 rulemaking to a non-active status because the approach proposed was unlikely to deliver appreciable security benefits. Additional requirements may include tracking and verifications for each transaction related to ammonium nitrate. The outcome of these rulemakings could materially adversely affect our cost or ability to conduct our mining operations.

Other Environmental Laws

We are required to comply with numerous other federal, state and local environmental laws and regulations in addition to those previously discussed. These additional laws include, for example, the Safe Drinking Water Act, the Toxic Substances Control Act and transportation laws adopted to ensure the appropriate transportation of our coal both nationally and internationally. Laws, regulations, and treaties of other countries may also adversely impact our export sales by reducing demand for our coal as a source of power generation in those countries.

Federal and State Nuclear Material Regulations

Many of our operations use equipment with radioactive sources primarily for coal density measurement. Use of this equipment must be approved by the U. S. Nuclear Regulatory Authority or the state agency that has been delegated this authority.

Mine Safety and Health

Stringent health and safety standards have been in effect since Congress enacted the Coal Mine Health and Safety Act of 1969. The Federal Mine Safety and Health Act of 1977 ("Mine Act") significantly expanded the enforcement of safety and health standards and imposed safety and health standards on all aspects of mining operations. All of the states in which we operate also have state programs for mine safety and health regulation and enforcement. Collectively, federal and state safety and health regulation in the coal mining industry is among the most comprehensive and pervasive systems for protection of employee health and safety affecting any segment of U.S. industry. The Mine Act is a strict liability statute that requires mandatory inspections of surface and underground coal mines and preparation plants and requires the issuance of enforcement action when it is believed that a standard has been violated. While this regulation has a significant effect on our operating costs, our U.S. competitors are subject to the same degree of regulation.

In 2006, in response to underground mine accidents, Congress enacted the Mine Improvement and New Emergency Response Act (the "MINER Act"). The MINER Act significantly amended the Mine Act, requiring, among other items, improvements in mine safety practices, increasing criminal penalties and establishing a maximum civil penalty for non-compliance, and expanding the scope of federal oversight, inspection and enforcement activities. Since passage of the MINER Act enforcement scrutiny has increased, including more inspection hours at mine sites, increased numbers of inspections and increased issuance of the number and severity of enforcement actions and related penalties. Various states also have enacted their own new laws and regulations addressing many of these same subjects. The U.S. Mine Safety and Health Administration ("MSHA") continues to interpret and implement various provisions of the MINER Act, along with introducing new proposed regulations and standards. For example, the second phase of MSHA's respirable coal mine dust rule went into effect in February 2016 and requires increased sampling frequency and the use of continuous personal dust monitors. In August 2016, the third and final phase of the rule became effective, reducing the overall respirable dust standard in coal mines from 2.0 to 1.5 milligrams per cubic meter of air. Our compliance with these or any other new mine health and safety regulations could increase our mining costs. If we were found to be in violation of these regulations we could face penalties or restrictions that may materially and adversely affect our operations, financial results and liquidity. Under the Black Lung Benefits Revenue Act of 1977 and the Black Lung Benefits Reform Act of 1977, as amended in 1981, each coal mine operator must secure payment of federal black lung benefits to claimants who are current and former employees and to a trust fund for the payment of benefits and medical expenses to claimants who last worked in the coal industry prior to July 1, 1973. Effective January 1, 2020, the trust fund was funded by an excise tax on coal sold of up to $1.10 per ton for deep-mined coal and up to $0.55 per ton for surface-mined coal, neither amount to exceed 4.4% of the gross sales price. Absent further legislation, beginning in 2022, the trust fund will be funded by an excise tax on coal sold of up to $0.50 per ton for deep-mined coal and up to $0.25 per ton for surface-mined coal, neither amount to exceed 2% of the gross sales price. The excise tax does not apply to coal shipped outside the United States. For the years ended December 31, 2021 and 2020, we recorded $5.7 million and $5.1 million excluding portions attributable to discontinued operations, respectively, of expense related to this excise tax.

The Patient Protection and Affordable Care Act ("PPACA") introduced significant changes to the federal black lung program, including an automatic survivor benefit paid upon the death of a miner with an awarded black lung claim, and established a rebuttable presumption with regard to pneumoconiosis among miners with 15 or more years of coal mine employment that are totally disabled by a respiratory condition. These changes could have a material impact on our costs expended in association with the federal black lung program. For former mining employees meeting statutory eligibility standards for federal black lung benefits, we maintain a trust fund and insurance coverage to cover the cost of present and future claims. We may also be liable under state laws for black lung claims that are covered through the trust and insurance policies. The liability associated with present and future claims for black lung benefits is difficult to estimate, and the trust and insurance policies may be insufficient to cover all such liability.

Coal Industry Retiree Health Benefit Act of 1992

Unlike many companies in the coal business, we do not have any liability under the Coal Industry Retiree Health Benefit Act of 1992 (the "Coal Act"), which requires the payment of substantial sums to provide lifetime health benefits to union-represented miners (and their dependents) who retired before 1992, because liabilities under the Coal Act that had been imposed on Alpha Natural Resources, Inc. were settled in the bankruptcy process.

GLOSSARY

Acquisition. Refers to the transaction by which the Company acquired certain of Alpha Natural Resources Inc.'s core coal operations as part of the Alpha Natural Resources, Inc. Restructuring.

Alpha. Alpha Metallurgical Resources, Inc.

Alpha Natural Resources, Inc. Restructuring. On August 3, 2015, Alpha Natural Resources, Inc. and each of its wholly owned domestic subsidiaries other than ANR Second Receivables Funding LLC (collectively, the "Debtors") filed voluntary petitions for relief under Chapter 11 of the U.S. Bankruptcy Code in the United States Bankruptcy Court for the Eastern District of Virginia (the "Bankruptcy Court"). The Bankruptcy Court approved the Debtors' Plan of Reorganization on July 7, 2016. On July 26, 2016, a consortium of former creditors of the Debtors acquired the Company's common stock in exchange for a partial release of their creditor claims pursuant to the Debtors' bankruptcy settlement. The Debtors, collectively, were a coal producer with operations in Central Appalachia, Northern Appalachia, and the Powder River Basin.

Ash. Impurities consisting of iron, alumina and other incombustible matter that are contained in coal. Since ash increases the weight of coal, it adds to the cost of handling and can affect the burning characteristics of coal.

Bituminous coal. Coal used primarily to generate electricity and to make coke for the steel industry with a heat value ranging between 10,500 and 15,500 BTU's per pound.

British Thermal Unit or BTU. A measure of the thermal energy required to raise the temperature of one pound of pure liquid water one degree Fahrenheit at the temperature at which water has its greatest density (39 degrees Fahrenheit).

Central Appalachia or CAPP. Coal producing area in eastern Kentucky, Virginia, southern West Virginia and a portion of eastern Tennessee.

Coal reserves. The economically mineable part of a measured or indicated coal resource, which includes diluting materials and allowances for losses that may occur when coal is mined or extracted.

Coal resources. Coal deposits in such form, quality, and quantity that there are reasonable prospects for economic extraction.

Coal seam. Coal deposits occur in layers. Each layer is called a "seam."

Coke. A hard, dry carbon substance produced by heating coal to a very high temperature in the absence of air. Coke is used in the manufacture of iron and steel. Its production results in a number of useful byproducts.

Coking coal. Coal used to produce coke, the primary source of carbon used in steelmaking.

Company. Alpha Metallurgical Resources, Inc. (previously named Contura Energy, Inc.)

Development stage property. A property with disclosed coal reserves but no material extraction.

ESG. Environmental, social and governance sustainability criteria.

ESM Transaction. The sale by Blackjewel L.L.C. ("Blackjewel") of the Eagle Butte and Belle Ayr mines located in Wyoming (the "Western Mines" or "Western Assets") to Eagle Specialty Materials ("ESM"), an affiliate of FM Coal, LLC on October 18, 2019. The ESM Transaction was approved by the United States Bankruptcy Court for the Southern District of West Virginia (the "Bankruptcy Court") pursuant to an order on October 4, 2019. The Company was the former owner of the Western Assets, having sold them to Blackjewel in December 2017.

Exploration stage property. A property with no disclosed coal reserves.

High-Vol A. A coking coal used in steel production with a volatile matter content between 31% and 34.5% on a dry basis.

High-Vol B. A coking coal used in steel production with a volatile matter content between 34.5% and 38% on a dry basis.

Indicated coal resource. That part of a coal resource for which quantity and quality are estimated on the basis of adequate geological evidence and sampling sufficient to establish geological and quality continuity with reasonable certainty.

Inferred coal resource. That part of a coal resource for which quantity and quality are estimated on the basis of limited geological evidence and sampling sufficient to establish that geological and quality continuity are more likely than not. Given the higher level of geological uncertainty, inferred coal resources are not considered when assessing the economic viability of a mining project or determining coal reserves.

Initial assessment. A preliminary technical and economic study of the economic potential of all or parts of mineralization to support the disclosure of mineral resources.

In situ coal resources. Coal resources stated on an in-seam dry basis (excluding surface and inherent moisture) with no consideration for dilution or losses that may occur when coal is mined or extracted.

Longwall mining. The most productive underground mining method in the United States. A rotating drum is advanced mechanically across the face of coal, and a hydraulic system supports the roof of the mine while the drum advances through the coal. Chain conveyors then move the loosened coal to a standard underground mine conveyor system for delivery to the surface.

Low-Vol. A coking coal used in steel production with a volatile matter content between 16% - 23% on a dry basis.

Marketable coal reserves. Coal reserves on a moist basis (including surface and inherent moisture) after considering dilution and losses that may occur when coal in mined or extracted.

Measured coal resource. That part of a coal resource for which quantity and quality are estimated on the basis of conclusive geological evidence and sampling sufficient to test and confirm geological and quality continuity.

Merger. Merger with ANR, Inc. and Alpha Natural Resources Holdings, Inc. completed on November 9, 2018.

Metallurgical coal. The various grades of coal suitable for carbonization to make coke for steel manufacture. Also known as “met” coal, its quality is primarily differentiated based on volatility or its percent of volatile matter. Met coal typically has a particularly high BTU but low ash and sulfur content.

Mid-Vol. A coking coal used in steel production with a volatile matter content between 23% -31% on a dry basis.

Northern Appalachia or NAPP. Coal producing area in Maryland, Ohio, Pennsylvania and northern West Virginia.

Operating Margin. Coal revenues less cost of coal sales.

Powder River Basin or PRB. Coal producing area in northeastern Wyoming and southeastern Montana.

Pre-feasibility study. A comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred method of mining or pit configuration, an effective method of mineral processing and an effective plan to sell the product has been determined.

Preparation plant. A preparation plant is a facility for crushing, sizing and washing coal to remove impurities and prepare it for use by a particular customer. The washing process has the added benefit of removing some of the coal’s sulfur content. A preparation plant is usually located on a mine site, although one plant may serve several mines.

Probable mineral reserve. The economically mineable part of an indicated and, in some cases, a measured coal resource.

Production stage property. A property with material extraction of coal reserves.

Productivity. As used in this report, refers to clean metric tons of coal produced per underground man hour worked, as published by the MSHA.

Proven mineral reserve. The economically mineable part of a measured coal resource.

Qualified person. A mineral industry professional as defined in subpart 1300 of Regulation S-K.

Reclamation. The process of restoring land and the environment to their original state following mining activities. The process commonly includes "recontouring" or reshaping the land to its approximate original appearance, restoring topsoil and planting native grass and ground covers. Reclamation operations are usually under way before the mining of a particular site is completed. Reclamation is closely regulated by both state and federal law.

Roof. The stratum of rock or other mineral above a coal seam; the overhead surface of a coal working place.

Sulfur. One of the elements present in varying quantities in coal that contributes to environmental degradation when coal is burned. Sulfur dioxide is produced as a gaseous by-product of coal combustion.

Surface mine. A mine in which the coal lies near the surface and can be extracted by removing the covering layer of soil.

Thermal coal. Coal used by power plants and industrial steam boilers to produce electricity, steam or both. It generally is lower in BTU heat content and higher in volatile matter than metallurgical coal.

Tons. A "short" or net ton is equal to 2,000 pounds. A "long" or British ton is equal to 2,240 pounds; a "metric" ton (or "*tonne*") is approximately 2,205 pounds. Tonnage amounts are stated in short tons, unless otherwise indicated.

UMWA. United Mine Workers of America.

Underground mine. Also known as a "deep" mine. Usually located several hundred feet below the earth's surface, an underground mine's coal is removed mechanically and transferred by shuttle car and conveyor to the surface.

Item 1A. ***Risk Factors***

Summary

Investment in our common stock is subject to various risks, including risks and uncertainties inherent in our business. As detailed in the following pages, these risks include, but are not limited to, the following:

- *Risks relating to our industry and the global economy*, such as those associated with declines in coal prices, our ability to obtain financing and other services, competition, decreased demand for coal, Chinese governmental policies, loss of customers, customer creditworthiness and global economic disruptions.

- *Risks relating to regulatory and legal developments*, such as those associated with regulatory requirements and costs, climate change regulations, environmental laws and treaties, unfavorable tax actions, decreased demand for energy, environmental cleanup costs, permit approvals, maintenance of internal controls and healthcare regulations and costs.

- *Risks relating to our operations*, such as those associated with mining and other conditions, many of which are beyond our control, decreased demand for coal, the complexity of mining in Central Appalachia, disruptions in transportation services, the availability of skilled workers, product specification requirements, higher than estimated employee benefit, property reclamation or mine closure costs, the availability of coal reserves, unionization, cybersecurity, our dependence upon third parties and our ability to make capital investments.

- *Risks relating to our liquidity*, such as those associated with our indebtedness, our ability to obtain or renew surety bonds, limitations imposed on us by our credit facility, access to funds when needed and debt service.

- *Risks relating to the ownership of our common stock*, such as those associated with compliance with securities laws, the availability of an orderly trading market for our common stock, dilution or other effects resulting from the issuance of additional securities, impediments to our acquisition by a third party and limited fora for stockholder litigation matters.

These risks, and others, are reviewed in greater detail below. The realization of any of these risks could cause an investment in our securities to decline and result in a loss. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition and/or operating results.

Risks Relating to Our Industry and the Global Economy

Declines in coal prices would adversely affect our revenues, operating results, cash flows, financial condition, stock price and the value of our coal reserves.

Our results of operations are substantially dependent upon the prices we receive for our coal. Those prices depend upon factors beyond our control (some of which are described in more detail in other risk factors below), including but not limited to:

- the demand for domestic and foreign coal and coke, which depends significantly on the demand for steel and electricity;
- the price and availability of natural gas, other alternative fuels and alternative steel production technologies;
- domestic and foreign economic conditions, including economic downturns and the strength of the global and U.S. economies;
- the consumption pattern of industrial customers, electricity generators and residential users;
- the legal, regulatory and tax environment for our industry and those of our customers;
- adverse weather, climactic or other natural conditions, natural disasters, epidemics, pandemics (such as the COVID-19 virus) and other public health challenges;
- the quantity, quality and pricing of coal available in the resale market;
- the effects of worldwide energy conservation or emissions measures;
- competition from other suppliers of coal and other energy sources; and
- the proximity to and availability, reliability and cost of transportation and port facilities.

A period of sustained low coal prices in the U.S. and other countries would materially adversely affect our operating results and cash flows, as well as the value of our coal reserves, and would cause a number of other risks that we face to increase in likelihood, magnitude and duration.

A period of sustained low demand for coal, particularly for metallurgical coal (or "met coal"), by U.S. and foreign customers and the potential for negative trade impacts resulting from changing tariff policies could reduce the price of our coal, which would reduce our revenues.

Alpha produces coal that is sold directly to both U.S. and foreign customers and indirectly to foreign customers through U.S.-based companies. Coal export revenues accounted for approximately 76% of our coal revenues for the year ended December 31, 2021.

Met coal accounted for approximately 92% of our coal revenues for the year ended December 31, 2021. Any deterioration in conditions in the U.S. or foreign steel industries, including the demand for steel and the continued financial viability of the industry, could reduce the demand for our met coal and could impact the collectability of our accounts receivable from U.S. or foreign steel industry customers.

The demand for foreign-produced steel both in foreign markets and in the U.S. market also depends on factors such as tariff rates on steel. For example, in 2018, the U.S. imposed tariffs on imports of steel mill products and a tariff on imports of wrought and unwrought aluminum. These tariffs led to generally higher rates of steel production in the U.S. and therefore greater domestic demand for met coal. However, Alpha's export customers include foreign steel producers who may be affected by these and similar tariffs to the extent their imports into the U.S. are curtailed as a result of tariffs. Further, retaliatory tariffs by foreign nations have already limited international trade and may adversely impact global economic conditions.

In addition, the steel industry's demand for met coal is affected by a number of factors, including the variable nature of that industry's business, technological developments in the steel-making process and the availability of substitutes for steel, such as aluminum, composites and plastics. The U.S. steel industry increasingly relies on processes to make steel that do not use coke, such as electric arc furnaces or pulverized coal processes. As this trend continues, the amount of met coal that we sell and the prices that we receive for it could decrease, thereby reducing our revenues and adversely impacting our earnings and the value of our coal reserves. Lower demand for met coal in international markets would reduce the amount of met coal that we sell and the prices that we receive for it, thereby reducing our revenues and adversely impacting our earnings and the value of our coal reserves. Foreign government policies related to coal production and consumption could also negatively impact pricing and demand for our products.

Our ability to obtain financing and other services, and the form and degree of these services available to us, may be significantly limited by the lending, investment and similar policies of financial institutions and insurance companies regarding carbon energy producers and the environmental impacts of coal combustion.

Certain financial institutions, including banks and insurance companies, have adopted policies that prevent or limit those institutions from providing financing, insurance, bonding, and other services to entities that produce, generate power from or use fossil fuels. These policies, and others that may be adopted in the future, may limit our ability to obtain financing, insurance, surety bonds, and other services and may have similar effects upon our customers, which may in turn reduce future global demand for coal. Further, some investors and investment advisors support divestiture of securities issued by companies, such as us, involved in the fossil fuel extraction market. These developments may negatively affect the market for our securities, our access to capital and financial markets and our ability to obtain insurance in the future, which may in turn have significant negative effects on our business, financial condition and results of operations.

Competition within the coal industry may adversely affect our ability to sell coal, and excess production capacity in the industry could put downward pressure on coal prices.

We compete with numerous other coal producers in various regions of the U.S. for domestic and international sales. We also compete in international markets against coal producers in other countries. International demand for U.S. coal exports also affects coal demand in the U.S. This competition affects domestic and international coal prices and our ability to retain or attract coal customers. The threat of increased production from competing mines and natural gas price declines with large basis differentials have all historically contributed, and may in the future contribute, to lower coal prices.

In the past, high demand for coal and attractive pricing brought new investors to the coal industry, leading to the development of new mines and added production capacity. Subsequent overcapacity in the industry contributed, and may in the future contribute, to lower coal prices.

Potential changes to international trade agreements, trade concessions, foreign currency fluctuations or other political and economic arrangements may benefit coal producers operating in countries other than the United States. Additionally, North

American steel producers face competition from foreign steel producers, which could adversely impact the financial condition and business of our customers. We cannot provide assurance that we will be able to compete on the basis of price or other factors with companies that in the future may benefit from favorable foreign trade policies or other arrangements. Coal is priced internationally in U.S. dollars, and, as a result, general economic conditions in foreign markets and changes in foreign currency exchange rates may provide our foreign competitors with a competitive advantage. If our competitors' currencies decline against the U.S. dollar or against our foreign customers' local currencies, those competitors may be able to offer lower prices for coal to customers. Furthermore, if the currencies of our overseas customers were to significantly decline in value in comparison to the U.S. dollar, those customers may seek decreased prices for the coal we sell to them. Consequently, currency fluctuations could adversely affect the competitiveness of our coal in international markets, which could have a material adverse effect on our business, financial condition, results of operations and cash flows. See "Item 1. Business—Competition." Similarly, currency fluctuations could adversely affect demand for U.S. steel.

Chinese governmental policies, trade disputes in Asian markets and other factors affecting the pricing of international sales may negatively affect our business, financial condition or results of operations.

The Chinese government has from time to time implemented regulations and promulgated new laws or restrictions on its domestic coal industry, sometimes with little advance notice, which may affect worldwide coal demand, supply and prices. During the past several years,for example, the Chinese government has initiated a number of anti-smog measures aimed at reducing hazardous air emissions through temporary production capacity restrictions within the steel, coal and coal-fired power sectors. Any future policy changes, regulations, laws or restrictions by the Chinese government may be detrimental to the global coal market and, thus, negatively affect our business, financial condition or results of operations. Further, similar actions by government entities in countries that produce and/or consume large quantities of coal and other energy related commodities, such as India, may have a material impact on the prices at which we sell our product.

Certain trade disputes in Asian markets, such as those between China and Australia, have resulted in changes in purchasing habits within certain regional markets and have led to more volatile price behavior in the global markets. Should these disputes endure, continued pricing volatility in certain of our export markets may have significant negative effects on our business, financial condition or results of operations.

Further, certain of our sales contracts, principally international sales contracts, contain index provisions that change the sales price based upon changes in market-based indices, economic indices or both. Therefore, volatility in these indices induced by decisions by the Chinese, other governments, disputes between nations or other factors may have significant negative effects on our business, financial condition or results of operations.

The concurrent loss of, or significant reduction in, purchases by several of our largest customers could materially and adversely affect our revenues and profitability.

Our largest customer during the year ended December 31, 2021 accounted for approximately 13% of our total revenues, and coal sales to our 10 largest customers accounted for approximately 64% of our total revenues. These customers could decide to discontinue purchasing coal from us in the volumes that they have previously purchased or decide to not purchase coal from us at all. If several of these customers were to concurrently and significantly reduce their purchases of coal, or if we were unable to sell coal to them on terms as favorable to us as previous sales, we could face a significant reduction in sales while we attempt to sell the coal to other customers in the global marketplace. If such concurrent loss of large customers or a significant reduction in our sales volume to such customers were to happen, our revenues and profitability could be materially and adversely affected.

Our ability to collect payments from our customers could be impaired if their creditworthiness and financial health deteriorate.

Our ability to receive payment for coal sold and delivered depends on the continued creditworthiness and financial health of our customers. Competition with other coal suppliers could force us to extend credit to customers and on terms that could increase the risk we bear on payment default. In recent years, downturns in the economy and disruptions in the global financial markets have, from time to time, affected the creditworthiness of our customers and limited their liquidity and credit availability. In addition, purchasers of our met coal may increasingly be required to implement costly new emissions and other technologies, thereby increasing the risk we bear for customer payment default.

For the year ended December 31, 2021 we derived 76% of our coal revenues from coal sales made to customers outside the U.S. Our customers in other countries may be subject to other pressures and uncertainties that may also affect their ability to pay, including trade barriers, exchange controls and local economic, threat of military action, and political conditions. We are

monitoring developments in Ukraine as well as the related export controls and financial and economic sanctions imposed on certain industry sectors and parties in Russia by the U.S., the U.K., the European Union and others. Although we do not presently foresee direct material adverse effects upon our business, financial condition or results of operations as a result of developments in Ukraine and the consequent controls and sanctions, these factors may affect companies in many sectors and could lead to increased market volatility and uncertainty, which could affect us in turn.

Continuing low demand for thermal coal, or further declines in demand, by North American electric power generators could reduce the price of our thermal coal, which would reduce our revenues.

Thermal coal accounted for approximately 8% of our coal revenues for the year ended December 31, 2021. The majority of our sales of thermal coal were to U.S. electric power generators. The North American demand for thermal coal is affected primarily by the overall demand for electricity, the availability, quality and price of competing fuels, such as natural gas, nuclear fuel, oil and alternative energy sources such as wind, solar, and hydroelectric power, increasingly stringent environmental and other governmental regulations and the coal inventories of utilities.

A reduction in the amount of coal consumed by North American electric power generators would reduce the amount of thermal coal that we sell and the price that we receive for it, thereby reducing our revenues and adversely impacting our earnings and the value of our coal reserves. In addition, uncertainty caused by federal and state regulations could cause thermal coal customers to be uncertain of their coal requirements in future years, which could adversely affect our ability to sell coal to such customers under multi-year sales contracts.

We may not be able to extend our existing long-term supply contracts or enter into new ones, and our existing supply contracts may contain certain provisions that may reduce protection from short-term coal price volatility, which could adversely affect the profitability of our operations.

Historically, a substantial portion of our thermal coal has been sold under long-term contracts, and these arrangements provided predictability regarding future sales to electric power generation customers. Generally, these long-term agreements have contained committed volumes and fixed prices for a certain number of periods during which thermal coal will be delivered.

In large part, as a result of increasing and frequently changing regulation and natural gas pricing, electric power generation customers are increasingly unwilling to enter into long-term coal supply contracts, instead purchasing higher percentages of coal under short-term supply contracts or requiring contracts that provide for negotiation of price and/or supply volume for upcoming contract periods, with negotiations generally considering either then current market prices and/or relevant market indices. These contracts may cause greater variability in our thermal coal revenues and may make it more difficult for us to estimate and plan for future sales. Further, when current contracts with customers expire or are otherwise renegotiated, our customers may decide to purchase fewer tons of coal than in the past or on terms, including pricing terms, that are not as favorable to us as the terms in our current agreements. Any adjustment or negotiation leading to a significantly lower contract price could result in significantly decreased future revenues.

Downturns and disruptions in the global economy and financial markets have had, and could in the future have, a material adverse effect on the demand for and price of coal, which could have a material negative effect on our sales, costs, margins and profitability and ability to obtain financing.

Downturns and disruptions in the global economy and financial markets have from time to time resulted in, among other things, extreme volatility in securities prices, severely diminished liquidity and credit availability, rating downgrades of certain investments and declining valuations of others, including real estate. Significant economic disruptions can result from numerous unpredictable factors, including but not limited to market forces, natural disasters, pandemics, trade disputes and armed conflicts. For example, during the COVID-19 pandemic, global supply chain disruptions, including COVID-19-related factory closures and port congestion have reduced our ability to obtain some materials used in our operations, have reduced the demand for steel, and therefore for met coal, and have affected railroad and other transportation systems.

Future disruptions of this sort, and in particular the tightening of credit in financial markets or any other disruption that negatively affects global economic growth, could adversely affect our customers' ability to obtain financing for operations and result in a decrease in demand, lower coal prices, the cancellation of some orders for our coal and the restructuring of agreements with some of our customers. Changes in the value of the U.S. dollar relative to other currencies, particularly where imported products are required for the mining process, could result in materially increased operating expenses. Any prolonged global, national or regional economic recession or other similar events could have a material adverse effect on the demand for and price of coal, on our sales, margins and profitability, and on our own ability to obtain financing. We are unable to predict

the timing, duration and severity of any potential future disruptions in financial markets and potential future adverse economic conditions in the U.S. and other countries and the impact these events may have on our operations and the industry in general.

Risks Relating to Regulatory and Legal Developments

The extensive regulation of the mining industry imposes significant costs on us, and future regulations or violations could increase those costs or limit our ability to produce coal.

Our operations are subject to a wide variety of federal, state and local environmental, health and safety, transportation, labor and other laws and regulations relating to matters such as:

- blasting;
- controls on emissions and discharges;
- the effects of operations on surface water and groundwater quality and availability;
- the storage, treatment and disposal of wastes;
- the remediation of contaminated soil, surface water and groundwater;
- surface subsidence from underground mining;
- the classification of plant and animal species near our mines as endangered or threatened species;
- the reclamation of mined sites; and
- employee health and safety, and benefits for current and former employees (described in more detail below).

These laws and regulations are becoming increasingly stringent. For example:

- federal and state agencies and citizen groups have increasingly focused on the amount of selenium and other constituents in mine-related water discharges;
- MSHA and the states of Virginia and West Virginia have implemented and proposed changes to mine safety and health requirements to impose more stringent health and safety controls, enhance mine inspection and enforcement practices, increase sanctions, and expand monitoring and reporting; and
- GHG emissions reductions are being considered that could increase our costs, require additional controls, or compel us to limit our current operations.

In addition, these laws and regulations require us to obtain numerous governmental permits and comply with the requirements of those permits, which are described in more detail below.

We incur substantial costs to comply with the laws, regulations and permits that apply to our mining and other operations and to address the outcome of inspections. The required compliance and actions to address inspection outcomes are often time-consuming and costly and may delay commencement or continuation of exploration or production. In addition, due in part to the extensive and comprehensive regulatory requirements, violations of laws, regulations and permits occur at our operations from time to time and may result in significant costs to us to correct the violations, as well as substantial civil or criminal penalties and limitations or shutdowns of our operations. In particular, President Biden and the current Congressional majorities have expressed support for policies that may result in stricter environmental, health and safety standards applicable to our operations and those of our customers. For example, on January 20, 2021, President Biden issued an executive order titled "Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," (the "January 20 Executive Order"), which, among other things, calls for a review of regulations and other executive actions issued during the prior Presidential administration to assess whether they are, in the view of the Biden administration, sufficiently protective of public health and the environment, including with respect to climate change. See "Item 1. Business—Environmental and Other Regulatory Matters—Clean Water Act—Wastewater Discharge."

MSHA and state regulators may also order the temporary or permanent closing of a mine in the event of certain violations of safety rules, accidents or imminent dangers. In addition, regulators may order changes to mine plans or operations due to their interpretation or application of existing or new laws or regulations. Any required changes to mine plans or operations may result in temporary idling of production or addition of costs.

These factors have had and will continue to have a significant effect on our costs of production and competitive position and, as a result, on our results of operations, cash flows and financial condition. New laws and regulations, as well as future interpretations or different enforcement of existing laws and regulations, may have a similar or more significant impact on us, including delays, interruptions or a termination of operations.

Climate change or carbon dioxide emissions reduction initiatives could significantly reduce the demand for coal and reduce the value of our coal assets.

Global climate issues continue to attract considerable public and scientific attention. Numerous reports, such as the Fourth and Fifth Assessment Report of the Intergovernmental Panel on Climate Change, have also engendered concern about the impacts of human activity, and in particular the emissions of GHG, such as carbon dioxide and methane, on global climate issues. Combustion of fossil fuels like coal results in the creation of carbon dioxide, which is emitted into the atmosphere by coal end users such as coal-fired electric power generators, coke plants and steelmaking plants, and, to a lesser extent, by the combustion of fossil fuels by the mining equipment we use. In addition, coal mining can release methane from the mine, directly into the atmosphere. Concerns associated with global climate change, and GHG emissions reduction initiatives designed to address them, have resulted, and are expected to continue to result, in materially increased operating costs for steel producers who use met coal, particularly in Europe.

Emissions from coal consumption and production are subject to pending and proposed regulations as part of regulatory initiatives to address global climate change and global warming. Various international, federal, regional, foreign and state proposals are currently in place or being considered to limit emissions of GHGs, including possible future U.S. treaty commitments, new federal or state legislation, and regulation under existing environmental laws by the EPA and other regulatory agencies and litigation by private parties. These include:

- the 2015 Paris climate summit agreement, which resulted in voluntary commitments by 197 countries to reduce their GHG emissions and could result in additional firm commitments by various nations and states with respect to future GHG emissions. On June 1, 2017, the Trump administration announced that the U.S. would withdraw from the agreement, but the Biden administration has subsequently taken steps to rejoin the agreement;
- state and regional climate change initiatives implementing renewable portfolio standards or cap-and-trade schemes;
- challenges to or denials of permits for new coal-fired power plants or retrofits to existing plants by state regulators and environmental organizations due to concerns related to GHG emissions from the new or existing plants;
- private litigation against coal companies or power plant operators based on GHG-related concerns;
- the Glasgow Climate Pact resulting from the 2021 United Nations Climate Change Conference (COP26) held from October 31 to November 13, 2021, which, though not legally binding, contains a plan to reduce use of coal by 40%.

On August 3, 2015, the EPA released a final rule establishing the Power Plant NSPS. The final rule requires that newly constructed fossil fuel-fired steam generating units achieve an emission standard for carbon dioxide of 1,400 lb CO2/MWh-gross. The standard is based on the performance of a supercritical pulverized coal boiler implementing partial CCS. Modified and reconstructed fossil fuel fired steam generating units must implement the most efficient generation achievable through a combination of best operating practices and equipment upgrades, to meet an emission standard consistent with best historical performance.

In addition, on July 8, 2019, the EPA published the ACE Rule, a replacement of the CPP. In contrast to the CPP, which called for the shifting of electricity generation away from coal-fired sources towards natural gas and renewables, the ACE Rule focuses on reducing GHG emissions from existing coal-fired plants by requiring states to mandate the implementation of a range of technologies at power plants designed to improve their heat rate (i.e., decrease the amount of fuel necessary to generate the same amount of electricity). However, on January 19, 2021, the Court of Appeals of the District of Columbia struck down the ACE rule. The EPA has since announced an intent to consider new regulations governing carbon emissions from existing power plants. The EPA's draft strategic plan issued in November 2021 emphasizes climate change and environmental justice as its top two priorities. More stringent standards for carbon dioxide pollution as a result of these rulemakings could further reduce demand for coal, and our business would be adversely impacted. In addition, certain banks and other financing sources have taken actions to limit available financing for the development of new coal-fueled power plants, which also may adversely impact the future global demand for coal.

Furthermore, several well-funded non-governmental organizations have explicitly undertaken campaigns to minimize or eliminate the use of coal as a source of electricity generation. These efforts, as well as concerted conservation and efficiency efforts that result in reduced electricity consumption and consumer and corporate preferences for non-coal fuel sources, could cause coal prices and sales of our coal to materially decline and could cause our costs to increase.

Any future laws, regulations or other policies or initiatives of the nature described above may adversely impact our business in material ways. The degree to which any particular law, regulation or policy impacts us will depend on several factors, including the substantive terms involved, the relevant time periods for enactment and any related transition periods. Considerable uncertainty is associated with these regulatory initiatives and legal developments, as the content of proposed legislation and regulation is not yet fully determined and many of the new regulatory initiatives remain subject to governmental and judicial review. In particular, President Biden and the current Congressional majorities have expressed support for the

regulation of GHG emissions. In prior Congressional sessions, legislative proposals regulating GHG emissions (such as the Green New Deal) have been introduced, and Congressional leadership may introduce similar legislation this Congressional term. We routinely attempt to evaluate the potential impact on us of any proposed laws, regulations or policies, which requires that we make several material assumptions. From time to time, we determine that the impact of one or more such laws, regulations or policies, if adopted and ultimately implemented as proposed, may result in materially adverse impacts on our operations, financial condition or cash flow; however, we often are not able to reasonably quantify such impacts.

In general, any laws, regulations or other policies aimed at reducing GHG emissions have imposed, and are likely to continue to impose, significant costs on many coal-fired power plants, steel-making plants and industrial boilers, which may make them unprofitable. Accordingly, some existing power generators have switched to other fuels that generate fewer emissions and others are likely to switch, some power plants have closed and others are likely to close, and fewer new coal-fired plants are being constructed, all of which reduce demand for coal and the amount of coal that we sell and the prices that we receive for it, thereby reducing our revenues and adversely impacting our earnings and the value of our coal reserves.

Other extensive environmental laws, including existing and potential future legislation, treaties and regulatory requirements relating to air emissions, waste management and water discharges, affect our customers and could further reduce the demand for coal as a fuel source and cause prices and sales of our coal to materially decline.

Our customers' operations are subject to extensive laws and regulations relating to environmental matters, including air emissions, wastewater discharges and the storage, treatment and disposal of wastes and operational permits. In particular, the Clean Air Act and similar state and local laws extensively regulate the amount of sulfur dioxide, particulate matter, nitrogen oxides, mercury and other compounds emitted into the air from fossil-fuel fired power plants, which are the largest end-users of our thermal coal. A series of more stringent requirements will or may become effective in coming years, including:

- implementation of the current and more stringent proposed ambient air quality standards for sulfur dioxide, nitrogen oxides, particulate matter and ozone, including the EPA's issuance of NAAQS in October 2015 of a more stringent ambient air quality standard for ozone and the EPA's determinations of attainment designations with respect to these rules;
- implementation of the EPA's CSAPR to significantly reduce nitrogen oxide and sulfur dioxide emissions from power plants in 28 states, and the CSAPR Update Rule, issued in September 2016, requiring further reductions in nitrogen oxides in 2017 in 22 states subject to CSAPR during the summertime ozone season;
- continued implementation of the EPA's MATS, which impose stringent limits on emissions of mercury and other toxic air pollutants from electric power generators, issued in December 2011 and in effect pending completion of judicial review proceedings;
- implementation of the EPA's August 2014 final rule on cooling water intake structures for power plants;
- more stringent EPA requirements governing management and disposal of coal ash pursuant to a rule finalized in December 2014 and new amendments effective as of August 2018; and
- implementation of the EPA's November 2015 final rule setting effluent discharge limits on the levels of metals that can be discharged from power plants.

These environmental laws and regulations impose significant costs on our customers, which are increasing as these requirements become more stringent. These costs make coal more expensive to use and make it a less attractive fuel source of energy for our customers. Accordingly, some existing power generators have switched to other fuels that generate fewer emissions and others are likely to switch, some power plants have closed and others are likely to close, and no coal-fired plants are currently being constructed in the U.S., all of which reduce demand for coal, the amount of coal that we sell and the prices that we receive for it, thereby reducing our revenues and adversely impacting our earnings and the value of our coal reserves.

In addition, regulations regarding sulfur dioxide emissions under the Clean Air Act, including caps on emissions and the price of emissions allowances, have a potentially significant impact on the demand for our coal based on its sulfur content. We sell both higher sulfur and low sulfur coal. More widespread installation by power generators of technology that reduces sulfur emissions may make high sulfur coal more competitive with our low sulfur coal. Decreases in the price of emissions allowances could have a similar effect. Significant increases in the price of emissions allowances could reduce the competitiveness of higher sulfur coal compared to low sulfur coal and possibly natural gas at power plants not equipped to reduce sulfur dioxide emissions. Any of these consequences could result in a decrease in revenues from some of our operations, which could adversely affect our business and results of operations.

Decreases in consumer demand for electricity and changes in general energy consumption patterns attributable to energy conservation trends could adversely affect our business, financial condition and results of operations.

Due to efforts to promote energy conservation in recent years, there is a risk that both the demand for electricity and the general energy consumption patterns of consumers worldwide will decrease. The ability of energy conservation technologies, public initiatives and government incentives to reduce electricity consumption or to support other forms of renewable energy could also lead to a reduction in the demand for and the price of coal. If prices for coal are not competitive, our business, financial condition and results of operations may be materially harmed.

Our operations may impact the environment or cause exposure to hazardous substances, and our properties may have environmental contamination, which could result in material liabilities to us.

Our operations use certain hazardous materials, and, from time to time, we generate limited quantities of hazardous wastes. We may be subject to claims under federal or state law for toxic torts, natural resource damages and other damages as well as for the investigation and clean-up of soil, surface water, sediments, groundwater and other natural resources. Such claims may arise out of current or former conditions at sites that we own or operate, or formerly owned or operated, and at contaminated sites owned or operated by third parties to which we sent wastes for treatment, storage or disposal. Our liability for such claims may be joint and several, so that we may be held responsible for more than our share of the contamination or other damages, or even for the entire share.

We operate and maintain a number of coal slurry impoundments. These impoundments are subject to extensive regulation. Some slurry impoundments maintained by other coal mining operations have failed, causing extensive damage to the environment and natural resources, as well as liability for related personal injuries and property damages. Some of our impoundments overlie mined out areas, which can pose a heightened risk of failure and of resulting damages. If one of our impoundments were to fail, we could be subject to substantial claims for the resulting environmental contamination and associated liability, as well as for fines and penalties, and potential third-party claims for personal injury, property damage or other losses. In addition, we may become subject to such claims related to surface expressions of methane gas, which can result from underground coal mining activities.

These and other environmental impacts that our operations may have, as well as exposures to hazardous substances or wastes associated with our operations, could result in costs and liabilities that could render continued operations at certain mines economically unfeasible or impractical or otherwise materially and adversely affect our financial condition and results of operations.

We may be unable to obtain and renew permits, mine plan modifications and approvals, leases or other rights necessary for our operations, which would reduce our production, cash flows and profitability.

Mining companies must obtain numerous regulatory permits that impose strict conditions on various environmental and safety matters in connection with coal mining. The permitting rules are complex and change over time, potentially in ways that may make our ability to comply with the applicable requirements more difficult or impractical or even preclude the continuation of ongoing operations or the development of future mining operations. The public, including special interest groups and individuals, have certain rights under various statutes to comment upon, submit objections to and otherwise engage in the permitting process, including bringing citizens' lawsuits or administrative actions to challenge permits or mining activities. In the states where we operate, applicable laws and regulations also provide that a mining permit or modification can, under certain circumstances, be delayed, refused or revoked if we or any entity that owns or controls or is under common ownership or control with us or is determined to be linked to us under OSM's AVS, have unabated permit violations or have been the subject of permit or reclamation bond revocation or suspension. These regulations define certain relationships, such as owning over 50% of stock in an entity or having the authority to determine the manner in which the entity conducts mining operations, as constituting ownership and control. Certain other relationships are presumed to constitute ownership or control, including being an officer or director of an entity or owning between 10% and 50% of the mining operator. This presumption, in some cases, can be rebutted where the person or entity can demonstrate that it in fact does not or did not have authority directly or indirectly to determine the manner in which the relevant coal mining operation is conducted. Thus, past or ongoing violations of federal and state mining laws by us or by coal mining operations owned or controlled by our significant stockholders, directors or officers or by entities linked to us through OSM's AVS could provide a basis to revoke existing permits and to deny the issuance of additional permits or modification or amendment of existing permits. This is known as being "permit-blocked." In recent years, the permitting required for coal mining has been the subject of increasingly stringent regulatory and administrative requirements and extensive litigation by environmental groups.

As a result, the permitting process is costly and time-consuming, required permits may not be issued or renewed in a timely fashion (or at all), and permits that are issued may be conditioned in a manner that may restrict our ability to conduct our mining activities efficiently. In some circumstances, regulators could seek to revoke permits previously issued. We are required

under certain permits to provide data on the impact on the environment of proposed exploration for or production of coal to governmental authorities.

In particular, certain of our activities require a dredge and fill permit from the COE under Section 404 of the CWA. In recent years, the Section 404 permitting process has been subject to increasingly stringent regulatory and administrative requirements and a series of court challenges, which have resulted in increased costs and delays in the permitting process.

In January 2020, the EPA and the U.S. Army Corps of Engineers (the "USACE") issued a final rule that attempts to clarify the Clean Water Act's ("CWA") jurisdictional reach over waters of the United States, referred to as the Navigable Waters Protection Rule. The rule replaces a rule issued in June 2015 by the previous presidential administration, the Clean Water Rule. The Clean Water Rule was the subject of extensive legal challenges, injunctions and administrative action, and was formally repealed in December 2019. The Navigable Waters Protection Rule is designed to fulfill a February 2017 executive order calling on the EPA and the USACE to develop a rule consistent with Justice Antonin Scalia's plurality opinion in the 2006 Supreme Court decision, Rapanos v. United States, that CWA jurisdiction attaches only to "navigable waters" and other waters with a relatively permanent flow, such as rivers or lakes. The Navigable Waters Protection Rule narrows the jurisdiction of the CWA relative to Clean Water Rule by, among other things, excluding from the scope of the definition of "waters of the United States" certain ephemeral streams and wetlands not adjacent to jurisdictional water bodies. The Navigable Water Protection Rule is likely to be the subject of legal challenges and potential reconsideration by the EPA and its ultimate impact on our operations is uncertain.

Additionally, we may rely on nationwide permits under the CWA Section 404 program for some of our operations. These nationwide permits are issued every five years, and the 2017 nationwide permit program was recently reissued in January 2017. If we are unable to use the nationwide permits and require an individual permit for certain work, that could delay operations.

Many of our permits are subject to renewal from time to time, and renewed permits may contain more restrictive conditions than our existing permits. For example, many of our permits governing surface stream and groundwater discharges and impacts will be subject to new and more stringent conditions to address various new water quality requirements upon renewal over the next several years. Although we have no estimates at this time, our costs to satisfy these conditions could be substantial.

Future changes or challenges to the permitting and mine plan modification and approval process could cause additional increases in the costs, time, and difficulty associated with obtaining and complying with the permits and could delay or prevent commencing or continuing exploration or production operations and, as a result, adversely affect our coal production, cash flows and profitability.

Federal and state regulatory agencies have the authority to order any of our facilities to be temporarily or permanently closed under certain circumstances, which could materially adversely affect our ability to meet our customers' demands.

Federal and state regulatory agencies have the authority following significant health and safety incidents, such as fatalities, to order a facility to be temporarily or permanently closed. If this were to occur, we may be required to incur capital expenditures to re-open the facility. In the event that these agencies order the closing of our facilities, our coal sales agreements and our take-or-pay contracts related to our export terminals may permit us to issue force majeure notices, which suspend our obligations to deliver coal under these contracts. However, our customers may challenge our issuances of force majeure notices. If these challenges are successful, we may have to purchase coal from third-party sources, if it is available, to fulfill these obligations, incur capital expenditures to re-open the facilities and/or negotiate settlements with the customers, which may include price reductions, the reduction of commitments or the extension of time for delivery, or terminate customers' contracts. Any of these actions could have a material adverse effect on our business and results of operations.

Our systems and procedures for internal control over financial reporting or the disclosure controls related to them may in the future have material weaknesses, which may adversely affect the value of our common stock.

We are responsible for maintaining systems and documentation necessary to evaluate the effectiveness of our internal control over financial reporting. These activities may divert management's attention from other business concerns. To maintain and improve our controls and procedures, we must commit significant resources, may be required to hire additional staff and need to continue to provide effective management oversight, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Certain U.S. federal income tax provisions currently available with respect to coal percentage depletion and exploration and development may be eliminated by future legislation.

From time to time, legislation is proposed that could result in the reduction or elimination of certain U.S. federal income tax provisions currently available to companies engaged in the exploration, development, and production of coal reserves. These proposals have included, but are not limited to: (1) the elimination of current deductions, the 60-month amortization period and the 10-year amortization period for exploration and development costs relating to coal and other hard mineral fossil fuels, (2) the repeal of the percentage depletion allowance with respect to coal properties and (3) the repeal of capital gains treatment of coal and lignite royalties. The passage of these or other similar proposals could increase our taxable income and negatively impact our cash flows and the value of an investment in our common stock.

Changes in tax laws, particularly in the areas of non-income taxes, could cause our financial position and profitability to deteriorate.

We pay non-income taxes on the coal we produce. A substantial portion of our non-income taxes are levied as a percentage of gross revenues, while others are levied on a per ton basis. If such liabilities were to arise, or if non-income tax rates were to increase significantly, our results of operations could be materially and adversely affected.

Risks Relating to Our Operations

Our coal mining production and delivery is subject to conditions and events, many of which are beyond our control, that could result in higher operating expenses and decreased production and sales. The occurrence of a significant accident or other event that is not fully insured could adversely affect our business and operating results and could result in impairments to our assets.

Our coal production at our mines is subject to operating conditions and events, many of which are beyond our control, that could disrupt operations, affect production and the cost of mining for varying lengths of time and have a significant impact on our operating results. Adverse operating conditions and events that we have experienced in the past and/or may experience in the future include:

- changes or variations in geologic, hydrologic or other conditions, such as the thickness of the coal deposits and the amount of rock, clay or other non-coal material embedded in or overlying the coal deposit;
- mining, processing and loading equipment failures and unexpected maintenance problems;
- limited availability or increased costs of mining, processing and loading equipment and parts and other materials from suppliers;
- difficulties associated with mining under or around surface obstacles;
- unfavorable conditions with respect to proximity to and availability, reliability and cost of transportation facilities;
- adverse weather and natural disasters, such as heavy snows, heavy rains and flooding, lightning strikes, hurricanes or earthquakes;
- accidental mine water discharges, coal slurry releases and failures of an impoundment or refuse area, including inadvertent environmental impacts to the local community;
- mine safety accidents, including fires and explosions from methane and other sources;
- hazards or occurrences that could result in personal injury and loss of life;
- a shortage of skilled and unskilled labor;
- security breaches or terroristic acts;
- strikes and other labor-related interruptions;
- delays or difficulties in, the unavailability of, or unexpected increases in the cost of acquiring, developing or permitting new acquisitions from the federal government and other new mining reserves and surface rights;
- competition and/or conflicts with other natural resource extraction activities and production within our operating areas;
- the termination of material contracts by state or other governmental authorities; and
- fatalities, personal injuries or property damage arising from train derailments, mined material or overburden leaving permit boundaries, underground mine blowouts, impoundment failures, subsidence or other unexpected incidents.

If any of these or other conditions or events occur in the future at any of our mines or affect deliveries of our coal to customers, they may increase our cost of mining, delay or halt production or sales to our customers, result in regulatory action or lead to customers initiating claims against us. Any of these consequences could adversely affect our operating results or result in impairments to our assets.

In addition, our mining operations are concentrated in a small number of material mines. As a result, the effects of any of these conditions or events may be exacerbated and may have a disproportionate impact on our results of operations and assets.

We maintain insurance policies that provide limited coverage for some, but not all, of these risks. Even where covered by insurance, these risks may not be fully covered, and insurers may contest their obligations to make payments. Failures by insurers to make payments could have a material adverse effect on our cash flows, results of operations or financial condition.

A decline in demand for met coal would limit our ability to sell our high quality thermal coal as higher priced met coal, which would reduce our revenues and profitability, and could affect the economic viability of some of our mines with higher operating costs.

We are able to mine, process and market some of our coal reserves as either met coal or high-quality thermal coal. In deciding our approach to these reserves, we assess the conditions in the met and thermal coal markets, including factors such as the current and anticipated future market prices of met coal and thermal coal, the generally higher price of met coal as compared to thermal coal, the lower volume of saleable tons that results when producing coal for sale in the met market rather than the thermal market, the increased costs of producing met coal, the likelihood of being able to secure a longer term sales commitment for thermal coal and our contractual commitments to deliver different types of coal to our customers. A decline in demand for met coal relative to thermal coal could cause us to shift coal from the met market to the thermal market, thereby reducing our revenues and profitability.

Mining in Central Appalachia is more complex and involves more regulatory constraints than mining in other areas of the U.S., which could affect our mining operations and cost structures in these areas.

The geological characteristics of Central Appalachian coal reserves, such as depth of overburden and coal seam thickness, make them complex and costly to mine. As mines become depleted, replacement reserves may not be available or, if available, may not be able to be mined at costs comparable to those of the depleting or depleted mines. In addition, compared to mines in other areas of the country, permitting, licensing and other environmental and regulatory requirements in Central Appalachia are more costly and time consuming to satisfy. These factors could materially adversely affect the mining operations and cost structures of, and our customers' ability to use coal produced by, our mines in Central Appalachia.

Disruptions in transportation services and increased transportation costs could impair our ability to supply coal to our customers, reduce demand and adversely affect our business.

For the year ended December 31, 2021, 82% of our coal volume was transported from our shipping points to a vessel loading point or customer location by rail. Deterioration in the reliability of the service provided by rail carriers would result in increased internal coal handling costs and decreased shipping volumes, and, if we are unable to find alternatives, our business could be adversely affected. Most of our operations are serviced by a single rail carrier. Due to the difficulty in arranging alternative transportation, these operations are particularly at risk of disruptions, capacity issues or other difficulties with that carrier's transportation services, which could adversely impact our revenues and results of operations.

We also depend upon trucks, barges and ocean vessels to deliver coal to our customers. In addition, much of our coal is transported from our mines to our loading facilities by trucks owned and operated by third parties. Disruption of any of these transportation services due to weather-related problems, mechanical difficulties, fuel and supply costs, strikes, lockouts, bottlenecks, terrorist attacks or other events could impair our ability to supply coal to our customers, resulting in decreased shipments and revenue. Disruption in shipment levels over long periods of time could cause our customers to look to other sources for their coal needs, negatively affecting our revenues and results of operations.

An increase in transportation costs could have an adverse effect on our ability to increase or to maintain production on a profit-making basis and could therefore adversely affect our revenues and earnings. Because transportation costs represent a significant portion of the total cost of coal for our customers, increases in transportation costs could also reduce overall demand for coal or make our coal production less competitive than coal produced from other sources or other regions.

We require a skilled workforce and a dedicated senior management team to run our business. If we cannot hire and retain qualified persons, including to meet replacement or expansion needs, we may not be able to achieve planned results.

Efficient coal mining using modern techniques and equipment requires skilled laborers with mining experience and proficiency as well as qualified managers, supervisors and other staff. We, along with the mining industry generally, are currently facing a significant shortage of operating staff. Moreover, we are seeing an increasing number of those who leave our employment accept new positions outside the coal industry, further reducing the number of skilled employees available to us and leading to increased labor costs. When coal producers compete for skilled miners, recruiting challenges can occur, and employee turnover rates can increase, which negatively affect operating efficiency and costs. If we are unable to train or retain the necessary number of staff, it could adversely affect our productivity, costs and ability to maintain or expand production.

In addition, we depend on the experience and industry knowledge of our officers and other key employees to design and execute our business plans. If we experience a substantial turnover in our leadership and other key employees, and those persons are not replaced by individuals with comparable skills, our performance could be materially adversely impacted. Furthermore, we may be unable to attract and retain additional qualified executives as needed in the future. We believe that our future success will depend on our continued ability to attract and retain highly skilled and qualified personnel. There is a high level of competition for experienced, successful personnel in our industry. Our inability to meet our executive staffing requirements in the future could impair our growth and harm our business.

Certain provisions in our coal supply agreements may result in economic penalties upon our failure to meet specifications.

Most of our coal supply agreements contain provisions requiring us to deliver coal meeting quality thresholds for certain characteristics such as BTU, sulfur content, ash content, grindability, moisture and ash fusion temperature. Failure to meet these specifications could result in economic penalties, including price adjustments, the rejection of deliveries or termination of the contracts. Further, some of our coal supply agreements allow our customers to terminate the contract in the event of regulatory changes that restrict the type of coal the customer may use at its facilities or the use of that coal or increase the price of coal or the cost of using coal beyond specified limits. In addition, our coal supply agreements typically contain force majeure provisions allowing temporary suspension of performance by us or the customer during specified events beyond the control of the affected party. As a result of these issues, we may not achieve the revenue or profit we expect to achieve from our coal supply agreements.

Cybersecurity attacks, natural disasters, terrorist attacks and other similar crises or disruptions may negatively affect our business, financial condition and results of operations, or those of our customers and suppliers.

Our business, or the businesses of our customers and suppliers, may be impacted by disruptions such as terrorist or cybersecurity attacks or failures, threats to physical security, and extreme weather conditions or other natural disasters. These disruptions or any significant increases in energy prices that follow could result in government-imposed price controls. Our insurance may not protect us against such occurrences. It is possible that any of these occurrences, or a combination of them, could have a material adverse effect on our business, financial condition and results of operations.

Strategic targets, such as energy-related assets, may be at greater risk of future cybersecurity attacks than other targets in the U.S. Our defensive preparedness against cybersecurity attacks includes limited technological capabilities for prevention and detection of cybersecurity disruptions; internal governance processes that assist to identify, protect, and remediate security risks routinely; non-technological measures such as threat information sharing with industry groups; internal training and awareness campaigns including testing of employee awareness and an emphasis on resiliency. If the measures we and our cloud service providers are taking to protect against cybersecurity disruptions prove to be insufficient or if our proprietary data is otherwise not protected, we as well as our customers, employees, or third parties could be adversely affected. Cybersecurity disruptions could cause physical harm to people or the environment; damage or destroy assets; compromise business systems; result in proprietary information being altered, lost, or stolen; result in employee, customer, or third-party information being compromised; or otherwise disrupt our business operations. We could incur significant costs to remedy the effects of a major cybersecurity disruption in addition to costs in connection with resulting regulatory actions, litigation or reputational harm. Further, as cybersecurity attacks continue to evolve, we may be required to expend additional resources to continue to modify or enhance our protective measures or to investigate and remediate any vulnerability to cybersecurity attacks.

Expenditures for certain employee benefits could be materially higher than we have anticipated, which could increase our costs and adversely affect our financial results.

We are responsible for certain liabilities under a variety of benefit plans and other arrangements with employees. The unfunded status of these obligations, including discontinued operations, as of December 31, 2021, included $84.3 million of workers' compensation obligations, net of expected insurance receivable amounts, $159.9 million of pension obligations and $114.5 million of black lung obligations. These obligations have been estimated based on assumptions including actuarial estimates, discount rates, and changes in health care costs. We could be required to expend greater amounts than anticipated. In addition, future regulatory and accounting changes relating to these benefits could result in increased obligations or additional costs, which could also have a material adverse effect on our financial results. Several states in which we operate consider changes in workers' compensation laws from time to time, which, if enacted, could adversely affect us. In addition, the U.S. Department of Labor has a legislative directive to periodically review operators' financial standing and federal black lung liabilities, which could result in a substantial increase in required security, negatively impacting liquidity.

If the assumptions underlying our accruals for reclamation and mine closure obligations prove to be inaccurate, we could be required to expend greater amounts than anticipated.

SMCRA establishes operational, reclamation and closure standards for all aspects of surface mining as well as deep mining. We accrue for the costs of current mine disturbance and final mine closure, including the cost of treating mine water discharge where necessary. Our estimated total reclamation and mine-closing liabilities were $164.2 million as of December 31, 2021, based upon permit requirements and the historical experience at our operations, and depend on a number of variables involving assumptions and estimation and, therefore, may be subject to change, including the estimated future asset retirement costs and the timing of such costs, estimated proven reserves, assumptions involving profit margins of third-party contractors, inflation rates and discount rates. Furthermore, these obligations are primarily unfunded. If these accruals are insufficient or our liability in a particular year is greater than currently anticipated, our future operating results and financial position could be adversely affected. In addition, significant changes from period to period could result in significant variability in our operating results, which could reduce comparability between periods and impact our liquidity. See "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations—Critical Accounting Policies and Estimates" for a description of our estimated costs of these liabilities.

Estimates of our economically recoverable coal reserves and coal resources involve uncertainties, and any inaccuracies in our estimates could result in lower than expected revenues, higher than expected costs, decreased profitability and asset impairments.

Our estimates of economically recoverable coal reserves and coal resources are based on engineering, economic and geological data and assumptions. Our estimates as to the quantity and quality of the coal in our reserves depend upon a variety of factors and assumptions, many of which involve uncertainties and factors beyond our control and may vary considerably from actual results, such as:

- geological and mining conditions that may not be fully identified by available exploration data or that may differ from experience in current operations;
- historical production from the area compared with production from other similar producing areas;
- the assumed ability to obtain future permits and effects of regulation and taxes by governmental agencies; and
- assumptions about coal prices, operating costs, mining technology improvements, development costs and reclamation costs.

For these reasons, estimates of the economically recoverable quantities and qualities attributable to any particular property, classifications of reserves and coal resources based on risk of recovery and estimates of net cash flows expected from particular reserves prepared by different engineers or by the same engineers at different times may vary substantially. In addition, actual coal tonnage recovered from identified reserve areas or properties and revenues and expenditures with respect to our reserves and resources may vary materially from estimates. Accordingly, our estimates may not accurately reflect our actual reserves and resources. Any inaccuracy in our reserve estimates could result in lower than expected revenues, higher than expected costs, decreased profitability and asset impairments.

Decreased availability or increased costs of key equipment and materials, including certain items mandated by regulations, or of coal that we purchase from third parties, could impact our cost of production and decrease our profitability.

We depend on reliable supplies of mining equipment, replacement parts and materials such as explosives, diesel fuel, tires, steel, magnetite and other raw materials and consumables which, in some cases, do not have ready substitutes. Some equipment and materials are needed to comply with regulations, such as proximity detection devices on continuous mining machines and steel. The supplier base providing mining materials and equipment has been relatively consistent in recent years, although there continues to be consolidation, which has resulted in a limited number of suppliers for certain types of equipment and supplies. Any significant reduction in availability or increase in cost of any mining equipment or key supplies could adversely affect our operations and increase our costs, which could adversely affect our operating results and cash flows.

In addition, the prices we pay for these materials are strongly influenced by the global commodities markets. Coal mines consume large quantities of commodities such as steel, copper, rubber products, explosives and diesel and other liquid fuels. If the value of the U.S. dollar declines relative to foreign currencies with respect to certain imported supplies or other products, our operating expenses will increase, which could materially adversely impact our profitability. Likewise, a sustained period of inflation could also lead to an overall increase in input costs, which could also materially adversely impact our profitability. Furthermore, operating expenses at our mining locations are sensitive to changes in certain variable costs, including diesel fuel prices, which is one of our largest variable costs. Our results depend on our ability to adequately control our costs. Any increase in the price we pay for diesel fuel will have a negative impact on our results of operations. A rapid or significant increase in the cost of these commodities could increase our mining costs because we have limited ability to negotiate lower prices due to a small number of suppliers for many of our mining supplies.

We purchase coal from third parties, for use in coal blending and for other purposes, for which ready substitutes may not be immediately available. A significant reduction in availability or increase in cost of these supplies, or the failure of third party coal producers to provide them in a timely fashion, could adversely affect our operations and increase our costs, which could adversely affect our operating results and cash flows.

Our business will be adversely affected if we are unable to timely develop or acquire additional coal reserves that are economically recoverable.

Our profitability depends substantially on our ability to mine in a cost-effective manner coal reserves of the quality our customers need. Although we have coal reserves that we believe could support current production levels for multiple decades, we have not yet developed the mines for all our reserves. We may not be able to mine all of our reserves as profitably as we do at our current operations. Under adverse market conditions, some reserves could not be mined profitably at all. In addition, in order to develop our reserves, we must receive various governmental permits. As discussed above, some of these permits are becoming increasingly more difficult and expensive to obtain, and the review process continues to lengthen. We may be unable to obtain the necessary permits on terms that would allow us to operate profitably or at all.

Because our reserves are depleted as we mine our coal, our future success and growth depend in part on our ability to timely acquire additional coal reserves that are economically recoverable. Our planned development projects and acquisition activities may not result in significant additional reserves, and we may not succeed in developing new mines or expanding existing mines beyond our existing reserves. Replacement reserves may not be available when required or, if available, may not be able to be mined at costs comparable to those of the depleting mines. We may not be able to accurately assess the geological characteristics of any reserves that we now own or subsequently acquire, which may adversely affect our profitability and financial condition. Exhaustion of reserves at particular mines also may have an adverse effect on our operating results due to lost production capacity from diminished or discontinued operations at those mines, as well as lay-offs, write-off charges and other costs, potentially causing an adverse effect that is disproportionate to the percentage of overall production represented by those mines. Our ability to acquire other reserves in the future could be limited by restrictions under our existing or future debt agreements, competition from other coal companies for attractive properties or the lack of suitable acquisition candidates available on commercially reasonable terms, among other factors. If we are unable to replace or increase our coal reserves on acceptable terms, our production and revenues will decline as our reserves are depleted.

If we are unable to acquire surface rights to access our coal reserves, we may be unable to obtain a permit to mine coal we own and may be required to employ expensive techniques to mine around those sections of land we cannot access in order to access other sections of coal reserves, which could materially and adversely affect our business and our results of operations.

After we acquire coal reserves, we are required to obtain a permit to mine the reserves through the applicable state agencies prior to mining the acquired coal. In part, permitting requirements provide that, under certain circumstances, we must obtain surface owner consent if the surface estate has been severed from the mineral estate, which is commonly known as a "severed estate." At certain of our mines where we have obtained the underlying coal and the surface is held by one or more third party owners, we are engaged in negotiations for surface rights with multiple parties. If we are unable to successfully negotiate surface rights with any or all of these surface owners, or to do so on commercially reasonable terms, we may be denied a permit to mine some or all of our coal or may find that we cannot mine the coal at a profit. If we are denied a permit, that would create significant delays in our mining operations and materially and adversely impact our business and results of operations. Furthermore, if we decide to alter our plans to mine around the affected areas, we could incur significant additional costs to do so, which could increase our operating expenses considerably and could materially and adversely affect our results of operations.

Conflicts with competing holders of mineral rights and rights to use adjacent, overlying or underlying lands could materially and adversely affect our ability to mine coal or do so on a cost-effective basis.

Our operations at times face potential conflicts with holders of other mineral interests such as coalbed methane, natural gas and oil reserves. Some of these minerals are located on, or are adjacent to, some of our coal reserves and active operations, potentially creating conflicting interests between us and the holders of those interests. From time to time we acquire these minerals ourselves to prevent conflicting interests from arising. If, however, conflicting interests arise and we do not acquire the competing mineral rights, we may be required to negotiate our ability to mine with the holder of the competing mineral rights. Furthermore, the rights of third parties for competing uses of adjacent, overlying or underlying lands, such as oil and gas activity, coalbed methane, pipelines, roads, easements and public facilities, may affect our ability to operate as planned if our title is not superior or arrangements cannot be negotiated. If we are unable to reach an agreement with the holders of such

rights, or to do so on a cost-effective basis, we may incur increased costs, and our ability to mine could be impaired, which could materially and adversely affect our business and results of operations.

We contract with third parties to operate or reclaim certain of our mines, and our results of operations could be adversely affected if those third party operators are ineffective.

We contract with third parties to operate certain of our mines. Under those arrangements, we retain certain contractual rights of oversight over these mines, which are operated under our permits or leases, but we do not control, and our employees do not participate in, the day-to-day operations of these mines. Operational difficulties at these mines, increased competition for contract miners from other coal producers and other factors beyond our control could affect the availability, cost and quality of coal produced for us by contractors. Disruption in our supply of contractor-produced coal could impair our ability to fill our customers' orders or require us to pay higher prices to obtain the required coal from other sources. Any increase in the per-ton compensation for services we pay for the production of contractor-produced coal could increase our costs and, therefore, lower our earnings and adversely affect our results of operations. We also contract with third parties to perform reclamation services for properties that are no longer in operation. If these third parties fail to meet their obligations under those contracts or are otherwise ineffective, it could increase our costs and, therefore, lower our earnings and adversely affect our results of operations.

Provisions in our lease agreements, defects in title in our mine properties or loss of leasehold rights could limit our ability to recover coal from our properties or result in significant unanticipated costs.

We conduct a significant part of our mining operations on properties that we lease. Title to most of our leased properties and mineral rights is not thoroughly verified until a permit to mine the property is obtained, and, in some cases, title is not verified at all. Accordingly, actual or alleged defects in title or boundaries may exist, which may result in the loss of our right to mine on the property or in unanticipated costs to obtain leases or mining contracts to allow us to conduct our mining operations on the property, which could adversely affect our business and profitability. Furthermore, some leases require us to produce a minimum quantity of coal and/or pay minimum production royalties. If those requirements are not met, the leasehold interest may terminate.

Strategic transactions, including acquisitions, involve a number of risks, any of which could result in a material adverse effect on our business, financial condition or results of operations.

In the future, we may undertake strategic transactions such as the acquisition or disposition of coal mining and related infrastructure assets, interests in coal mining companies, joint ventures or other strategic transactions involving companies with coal mining or other energy assets. Our ability to complete these transactions is subject to the availability of attractive opportunities, including potential acquisition targets that can be successfully integrated into our existing business and provide us with complementary capabilities, products or services on terms acceptable to us, as well as general market conditions, among other things.

Risks inherent in these strategic transactions include, but are not limited to:

- accurately assessing the geological conditions of acquired properties;
- the ability to obtain and maintain surety bonds, at acceptable rates, related to acquired properties;
- uncertainties in assessing the value, strengths, and potential profitability, and identifying the extent of all weaknesses, risks, contingent liabilities and other liabilities of acquisition candidates and strategic partners;
- the potential loss of key customers, management and employees of an acquired business;
- the ability to achieve identified operating and financial synergies from an acquisition or other strategic transactions in the amounts and on the time frame due to inaccurate assumptions underlying estimates of expected cost savings, the deterioration of general industry and business conditions, unanticipated legal, insurance and financial compliance costs, or other factors;
- the ability of management to manage successfully our exposure to pending and potential litigation and regulatory obligations;
- the ability of a purchaser to complete the transfer of operating permits related to our divested operations;
- unanticipated increases in competition that limit our ability to expand our business or capitalize on expected business opportunities, including retaining current customers; and
- unanticipated changes in business, industry, market, or general economic conditions that differ from the assumptions underlying our rationale for pursuing the acquisition or other strategic transactions.

The ultimate success of any strategic transaction we may undertake will depend in part on our ability to continue to realize the anticipated synergies, business opportunities and growth prospects from those transactions. We may not be able to successfully integrate the companies, businesses or properties that we acquire, invest in or partner with. Problems that could arise from the integration of an acquired business may involve:

- coordinating management and personnel and managing different corporate cultures;
- applying our safety and environmental programs at acquired mines and facilities;
- establishing, testing and maintaining effective internal control processes and systems of financial reporting for the acquired business;
- the diversion of our management's and our finance and accounting staff's resources and time commitments, and the disruption of either our or the acquired company's ongoing businesses;
- tax costs or inefficiencies; and
- inconsistencies in standards, information technology systems, procedures or policies.

Any one or more of these factors could cause us not to realize the benefits anticipated from a strategic transaction, adversely affect our ability to maintain relationships with clients, employees or other third parties or reduce our earnings.

Moreover, any strategic transaction we pursue could materially affect our liquidity and capital resources and may require us to incur indebtedness, seek equity capital or both. Future transactions could also result in our assuming more long-term liabilities relative to the value of the acquired assets. Further, acquisition accounting rules require changes in certain assumptions made subsequent to the measurement period, as defined in current accounting standards, to be recorded in current period earnings, which could affect our results of operations.

We may be unable to generate sufficient taxable income from future operations, or other circumstances could arise, which may limit our ability to utilize our tax net operating loss carryforwards or maintain our deferred tax assets.

We acquired the core coal assets of Alpha Natural Resources, Inc. as part of Alpha Natural Resources, Inc.'s bankruptcy restructuring in transactions intended to be treated as a tax-free reorganization for U.S. federal income tax purposes. As a result of these transactions, we inherited the tax basis of the core assets and the net operating loss and other carryforwards of Alpha Natural Resources, Inc. These carryforwards and tax basis were subject to reduction on December 31, 2016 due to the cancellation of indebtedness resulting from Alpha Natural Resources, Inc.'s bankruptcy restructuring. Due to the change in ownership, the net operating loss and other carryforwards will be subjected to limitations on their use in future years and additional changes in ownership in future years may further reduce the annual amount of the net operating loss and other carryforwards available to be utilized. In addition, we do not have a long history of operating results, and, if we are unable to generate profits in the future, we may be unable to utilize these carryforwards. As of December 31, 2021, a valuation allowance of $172.9 million has been provided on federal and state net operating loss carryforwards and other deferred tax assets not expected to provide future tax benefits.

Negative or unexpected consequences of the Tax Cuts and Jobs Act could affect our business.

On December 22, 2017, legislation commonly referred to as the Tax Cuts and Jobs Act (the "TCJA") significantly revised U.S. federal corporate tax law by, among other things, reducing the U.S. federal corporate income tax rate to 21%, eliminating the corporate alternative minimum tax, providing a mechanism for corporations to monetize alternative minimum tax credits ("AMT Credits"), limiting the tax deduction for interest expense to 30% of adjusted earnings, allowing immediate expensing for certain new investments, and, effective for net operating losses arising in taxable years beginning after December 31, 2017, eliminating net operating loss carrybacks, permitting indefinite net operating loss carryforwards, and limiting the use of net operating loss carryforwards to 80% of current year taxable income.

There are a number of uncertainties and ambiguities as to the interpretation and application of many of the provisions in the TCJA. In the absence of guidance concerning those matters, we will use what we believe are reasonable interpretations and assumptions in interpreting and applying the TCJA for purposes of determining our cash tax liabilities and results of operations, which may change as we receive additional clarification and implementation guidance and as the interpretation of the TCJA evolves over time. It is possible that the IRS could issue subsequent guidance or take positions on audit that differ from the interpretations and assumptions that we previously made, which could have a material adverse effect on our cash tax liabilities, results of operations and financial condition.

Our business requires substantial capital investment and maintenance expenditures, which we may be unable to provide.

Our business plan and strategy require substantial capital expenditures. We require capital for, among other purposes, acquisition of surface rights, equipment and the development of our mining operations, capital renovations, maintenance and expansions of plants and equipment and compliance with safety, health and environmental laws and regulations. Future debt or equity financing may not be available on satisfactory terms or at all or, if available, may result in dilution. If we are unable to obtain additional capital, we may not be able to maintain or increase our existing production rates, and we could be forced to reduce or delay capital expenditures or change our business strategy, sell assets or restructure or refinance our indebtedness, all of which could have a material adverse effect on our business or financial condition.

Our workforce could become increasingly unionized in the future and our unionized or union-free workforce could strike, which could adversely affect the stability of our production and reduce our profitability.

Approximately 97% of our total workforce and approximately 95% of our hourly workforce was union-free as of December 31, 2021. However, under the National Labor Relations Act, employees have the right at any time to form or affiliate with a union. Any further unionization of our employees or the employees of third-party contractors who mine coal for us could adversely affect the stability of our production and reduce our profitability.

Our union-represented employees could strike, which would disrupt our production, increase our costs and disrupt shipments of coal to our customers, and could result in the closure of affected mines, all of which could reduce our profitability.

Changes in the fair value of liabilities that are marked to market could cause volatility in our earnings.

Pursuant to the Second Amended Joint Plan of Reorganization of Debtors and Debtors in Possession, dated May 27, 2016, as modified and confirmed by the Order Confirming Second Amended Joint Plan of Reorganization of Debtors and Debtors in Possession, as Modified (Docket No. 3038), entered by the Bankruptcy Court on July 12, 2016, we have contingent revenue payment obligations to certain of Alpha Natural Resources Inc.'s creditors, which are recorded at fair market value and marked to market in each reporting period, with changes in value reflected in earnings. Any change in fair value can have a significant impact on our earnings from period to period, including in the future.

Risks Relating to Our Liquidity

Our indebtedness exposes us to various risks.

At December 31, 2021, we had $454.7 million of indebtedness outstanding before discounts and issuance costs applied for financial reporting, of which $454.6 million is scheduled to mature in the next three years.

Our indebtedness could have important consequences to our business. For example, it could:

- make it more difficult for us to pay or refinance our debts as they become due during adverse economic and industry conditions because any related decrease in revenues could cause us to not have sufficient cash flows from operations to make our scheduled debt payments;
- force us to seek additional capital, restructure or refinance our debts, or sell assets;
- cause us to be less able to take advantage of significant business opportunities such as acquisition opportunities and to react to changes in market or industry conditions;
- cause us to use a portion of our cash flow from operations for debt service, reducing the availability of working capital and delaying or preventing investments, capital expenditures, research and development and other business activities;
- cause us to be more vulnerable to general adverse economic and industry conditions;
- expose us to the risk of increased interest rates because certain of our borrowings are at variable rates of interest;
- expose us to the risk of foreclosure on substantially all of our assets and those of most of our subsidiaries, which secure certain of our indebtedness if we default on payment or are unable to comply with covenants or restrictions in any of the agreements;
- limit our ability to borrow additional monies in the future to fund working capital, capital expenditures and other general corporate purposes; and
- result in a downgrade in the credit ratings of our indebtedness, which could harm our ability to incur additional indebtedness and result in more restrictive borrowing terms, including increased borrowing costs and more restrictive covenants, all of which could affect our internal cost of capital estimates and therefore impact operational and investment decisions.

Our ability to meet our debt service obligations will depend on our future cash flow from operations and our ability to restructure or refinance our debt, which will depend on the condition of the capital markets and our financial condition at that

time. We may incur additional secured or unsecured indebtedness in the future, subject to compliance with covenants in our existing debt agreements. 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. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations, and the terms of existing or future debt instruments may restrict us from adopting some of these alternatives.

Failure to obtain or renew surety bonds on acceptable terms could affect our ability to secure reclamation and coal lease obligations, which could adversely affect our ability to mine or lease coal.

Federal and state laws require us to obtain surety bonds to secure payment of certain long-term obligations such as mine closure or reclamation costs, federal and state workers' compensation costs (including related to black lung), coal leases and other obligations. These bonds are typically renewable annually. Under applicable regulations, self-bonding may not be available to us as a means to comply with our reclamation bonding obligations for the foreseeable future. Surety bond issuers and holders may not continue to renew the bonds, may demand less favorable terms upon renewal or may impose new or increased collateral requirements. As of December 31, 2021, we had outstanding surety bonds with third parties of approximately $176.1 million, including $30 thousand attributable to discontinued operations. Surety bond issuers and holders may demand additional collateral, unfavorable terms or higher fees. Our failure to retain, or inability to acquire, surety bonds or to provide a suitable alternative could adversely affect our ability to mine or lease coal, which would materially adversely affect our business and results of operations. That failure could result from a variety of factors, including lack of availability, higher expense or unfavorable market terms, the exercise by third-party surety bond issuers of their right to refuse to renew the surety bonds, restrictions on availability of collateral for current and future third-party surety bond issuers under the terms of any credit arrangements then in place, or our inability to comply with our reclamation bonding obligations through self-bonding. In addition, as a result of increasing credit pressures on the coal industry, it is possible that surety bond providers could demand cash collateral as a condition to providing or maintaining surety bonds. Any such demands, depending on the amount of any cash collateral required, could have a material adverse impact on our liquidity and financial position. If we are unable to meet cash collateral requirements and cannot otherwise obtain or retain required surety bonds, we may be unable to satisfy legal requirements necessary to conduct our mining operations.

Difficulty in acquiring surety bonds, or additional collateral requirements, would increase our costs and likely require greater use of alternative sources of funding for this purpose, which would reduce our liquidity. If we are unable to provide the financial assurance that is required by state and federal law to secure our reclamation and coal lease obligations, our ability to mine or lease coal and, as a result, our results of operations could be materially and adversely affected.

The terms of our credit facility impose operating and financial restrictions on us, which may limit our ability to respond to changing business and economic conditions.

In connection with the Credit Agreement entered into on June 14, 2019, we incurred indebtedness of approximately $561.8 million under a term loan credit facility to refinance existing indebtedness and to pay related fees and expenses. The term loan credit facility matures on June 14, 2024. The term loan credit facility permits us, subject to approval of the administrative agent and the lenders providing the financing, to request incremental term loans up to an aggregate amount of $50.0 million subject to certain conditions in the Credit Agreement, in increments not less than $25.0 million or the remaining availability.

On December 6, 2021, we entered into the Second Amended and Restated Asset-Based Revolving Credit Agreement ("New ABL Agreement"). The New ABL Agreement amended and restated the Amended and Restated Asset-Based Revolving Credit Agreement dated November 9, 2018, in its entirety, and includes a senior secured asset-based revolving credit facility ("the New ABL Facility"). Under the New ABL Facility, we may borrow cash from the Lenders (as defined therein) or cause the L/C Issuers (as defined therein) to issue letters of credit, on a revolving basis, in an aggregate amount of up to $155.0 million, of which no more than $150.0 million may represent outstanding letters of credit ($125.0 million on a committed basis and another $25.0 million on an uncommitted cash collateralized basis) with a maturity date of December 6, 2024. The New ABL Agreement extended the maturity date of the facility from the previous maturity of April 3, 2022. The terms of our credit facilities impose operating and financial restrictions on us, which may limit our ability to respond to changing business and economic conditions. The revolving loan facility permits us, subject to approval of the administrative agent and the lenders providing the financing, to request incremental revolving commitment increases up to an aggregate amount of $50.0 million, in increments not less than $10.0 million or the remaining availability and subject to specified conditions.

We are subject to various operating and financial covenants under the term loan and revolving credit facilities that restrict our ability to, among other things, incur additional indebtedness, make particular types of investments, incur certain types of liens, engage in fundamental corporate changes, enter into transactions with affiliates, make substantial asset sales, make certain restricted payments, enter into amendments or waivers to certain agreements, conduct certain sale leasebacks or enter into

certain burdensome agreements. Any failure to comply with those covenants may constitute a breach under the term loan and revolving credit facilities that could result in the acceleration of all or a substantial portion of any outstanding indebtedness and termination of revolving credit commitments under the term loan and revolving credit facilities. As of December 31, 2021, we are in compliance with the operating and financial covenants under the term loan and revolving credit facilities. Our inability in the future to maintain our term loan and revolving credit facilities could materially adversely affect our liquidity and our business.

Pressure on our business, cash flow and liquidity could materially and adversely affect our ability to fund our business operations or react to and withstand changing market and industry conditions. Additional sources of funds may not be available.

A significant source of liquidity is our cash balance. Access to additional funds from liquidity-generating transactions or other sources of external financing may not be available to us and, if available, would be subject to market conditions and certain limitations, including our credit rating and covenant restrictions in our credit facility.

The terms of our borrowing arrangements limit our and our subsidiaries' ability to take certain actions, which may limit our operating and financial flexibility and adversely affect our business.

Our borrowing arrangements contain, and any future borrowing arrangements are also likely to contain, a number of significant restrictions and covenants that limit our ability and our subsidiaries' ability to, among other things, incur additional indebtedness, enter into sale and leaseback transactions, pay dividends, make redemptions and repurchases of certain capital stock, make loans and investments, create liens, sell certain assets, engage in transactions with affiliates, and merge or consolidate with other companies or sell substantially all of our assets. These covenants could adversely affect our ability to finance our future operations or capital needs or to execute preferred business strategies. In addition, complying with these covenants may make it more difficult for us to successfully execute our business strategy and compete against companies who are not subject to such restrictions. We regularly evaluate opportunities to enhance our capital structure and financial flexibility through a variety of methods, including repayment or repurchase of outstanding debt, amendment of our credit facility and other facilities, and other methods. As a result of any of these actions, the restrictions and covenants that apply to us may become more restrictive or otherwise change.

Operating results below current levels, or other adverse factors, including a significant increase in interest rates, could result in our being unable to comply with our covenants and payment obligations contained in our borrowing arrangements. If we violate these covenants or obligations under any of these agreements and are unable to obtain waivers from our lenders, our debt under all of these agreements would be in default and could be accelerated by our lenders. If our indebtedness is accelerated, we may not be able to repay our debt or borrow sufficient funds to refinance it. Even if we were able to obtain new financing, it may not be on commercially reasonable terms or on terms that are acceptable to us. If our debt is in default for any reason, our business, financial condition, results of operations and cash flows could be materially and adversely affected.

The need to maintain capacity for required letters of credit could limit our ability to provide financial assurance for self-insured obligations and negatively impact our ability to fund future working capital, capital expenditure or other general corporate requirements.

On December 6, 2021, we entered into the Second Amended and Restated Asset-Based Revolving Credit Agreement which amended and restated the Amended and Restated Asset-Based Revolving Credit Agreement dated November 9, 2018, in its entirety. Additionally, on December 6, 2021, we entered into the Second Amended and Restated Letter of Credit Agreement and a Credit and Security Agreement which amended and restated the Amended and Restated Letter of Credit Agreement and a Credit and Security Agreement dated November 9, 2018, in its entirety. Each of these agreements includes, among other things, provisions that provide for the issuance of letters of credit. Obligations secured by letters of credit may increase in the future. If we do not maintain sufficient borrowing capacity under our letter of credit facilities, we may be unable to provide financial assurance for self-insured obligations and could negatively impact our ability to fund future working capital, capital expenditure or other general corporate requirements.

Risks Relating to the Ownership of Our Common Stock

The requirements of being a public company, including compliance with the reporting requirements of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the requirements of the Sarbanes-Oxley Act, require application of significant resources and management attention, and we may be unable to comply with these requirements in a timely or cost-effective manner.

As a public company, we must comply with laws, regulations and requirements, certain corporate governance provisions of the Sarbanes-Oxley Act of 2002, related regulations of the SEC and the requirements of the New York Stock Exchange. Complying with these statutes, regulations and requirements occupies a significant amount of time for our board of directors and management and requires us to incur significant costs. We are required to:

- maintain a comprehensive compliance function;
- comply with rules promulgated by the New York Stock Exchange;
- prepare and distribute periodic public reports in compliance with our obligations under the federal securities laws;
- maintain internal policies; and
- engage outside counsel and accountants in the above activities.

We are responsible for assessing the operating effectiveness of internal controls over financial reporting and we may conclude that our internal controls over financial reporting are ineffective. Additionally, our independent registered public accounting firm may issue an adverse report indicating that our internal controls are not effective due to deficiencies in how our controls are documented, designed, operated or reviewed. Efforts to remediate any such deficiencies and otherwise comply with these requirements may strain our resources, and we may be unable to do so in a timely or cost-effective manner.

An active, liquid and orderly trading market for our common stock may not be maintained, and our stock price may be volatile.

Alpha's common stock trades on the New York Stock Exchange under the ticker symbol "AMR." Active, liquid and orderly trading markets usually result in less price volatility and more efficiency in carrying out investors' purchase and sale orders. An active, liquid and orderly trading market for our common stock may not be maintained, however. The market price of our common stock could vary significantly as a result of a number of factors, some of which are beyond our control. In the event of a drop in the market price of our common stock, shareholders could lose a substantial part or all of their investment in our common stock.

The following factors, among others, could affect our stock price:

- our operating and financial performance, including reserve estimates;
- an unexpected mine or environmental incident;
- quarterly variations in the rate of growth of our financial indicators, such as net income per share, net income and revenues;
- the public reaction to our press releases, our other public announcements and our filings with the SEC;
- strategic actions by our competitors;
- changes in revenue or earnings estimates, or changes in recommendations or withdrawal of research coverage, by equity research analysts;
- speculation in the press or investment community;
- research analysts' coverage of our common stock, or their failure to cover our common stock;
- sales of our common stock by us, our directors or officers or the selling stockholders or the perception that such sales may occur;
- our payment of dividends;
- changes in accounting principles, policies, guidance, interpretations or standards;
- additions or departures of key management personnel;
- actions by our stockholders;
- general market conditions, including fluctuations in commodity prices;
- public sentiment regarding climate change and fossil fuels;
- domestic and international economic, legal and regulatory factors unrelated to our performance; and
- the realization of any of the other risks described under this "Risk Factors" section or described elsewhere in this document.

The stock markets in general have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. These broad market fluctuations may adversely affect the trading price of our common stock. Securities class action litigation has often been instituted against companies following periods of volatility in the overall market and in the market price of a company's securities. Such litigation, if instituted against us, could result in very substantial costs, divert our management's attention and resources and harm our business, operating results and financial condition.

Future sales of our common stock in the public market, or the perception that such sales may occur, could reduce our stock price, and any additional capital raised by us through the sale of equity or convertible securities may dilute your ownership.

We may issue additional shares of common stock or convertible securities in subsequent public offerings. We cannot predict the size of future issuances of our common stock or securities convertible into common stock or the effect, if any, that future issuances and sales of shares of our common stock will have on the market price of our common stock or the dividend amount payable per share on our common stock. Sales of substantial amounts of our common stock (including shares issued in connection with an acquisition), or the perception that such sales could occur, may adversely affect prevailing market prices of our common stock or the dividend amount payable per share on our common stock. In addition, the issuance of shares of common stock upon the exercise of outstanding options and warrants would result in dilution to the interests of other stockholders.

Our share repurchase program could affect the price of our common stock and increase volatility and may be suspended or terminated at any time, which may result in a decrease in the trading price of our common stock.

On March 4, 2022, our board of directors authorized a new share repurchase program for up to $150.0 million of our common stock with no expiration date. This share repurchase program does not obligate us to repurchase any dollar amount or number of shares of our common stock and may be suspended or discontinued at any time, which could cause the market price of our common stock to decline. Repurchases pursuant to our share repurchase program could affect the price of our common stock and increase its volatility. Important factors that could cause us to limit, suspend or delay our share repurchases, without prior notice, and that could in any event impact our management's exercise of our discretion as to the amount and timing of such repurchases, include market conditions, the trading price of the stock, applicable legal requirements, compliance with the provisions of our debt agreements, and other factors. The existence of our share repurchase program could cause the price of our common stock to be higher than it would be in the absence of such a program and could potentially reduce the market liquidity for our common stock. Additionally, repurchases under our share repurchase program would diminish our cash reserves, which could adversely affect our operating results. There can be no assurance that any share repurchases would enhance stockholder value because the market price of our common stock may decline below the levels at which we repurchased such shares. Any failure to repurchase shares could negatively impact our reputation, investor confidence in us and our stock price.

We may issue preferred stock with terms that could adversely affect the voting power or value of our common stock.

Our second amended and restated certificate of incorporation authorizes us to issue, without the approval of our stockholders, one or more classes or series of preferred stock having such designations, preferences, limitations and relative rights, including preferences over our common stock respecting dividends and distributions, as our board of directors may determine. The terms of one or more classes or series of preferred stock could adversely impact the voting power or value of our common stock. For example, we might grant holders of preferred stock the right to elect some number of our directors in all events or on the happening of specified events or the right to veto specified transactions. Similarly, the repurchase or redemption rights or liquidation preferences we might assign to holders of preferred stock could affect the residual value of the common stock.

Provisions in our organizational documents and the instruments governing our debt may discourage a takeover attempt, even if doing so might be beneficial to our stockholders.

Provisions contained in our certificate of incorporation and bylaws, as amended, could impose impediments to the ability of a third-party to acquire us even if a change of control would be beneficial to our stockholders. Provisions of our certificate of incorporation and bylaws impose various procedural and other requirements, which could make it more difficult for stockholders to effect certain corporate actions. For example, our certificate of incorporation authorizes our board of directors to determine the rights, preferences, privileges and restrictions of unissued series of preferred stock, without any vote or action by our stockholders. Thus, our board of directors can authorize the issuance of shares of preferred stock with voting or conversion rights that could adversely affect the voting or other rights of holders of our common stock. These provisions may have the effect of delaying or deterring a change of control of our company and could limit the price that certain investors might be willing to pay in the future for shares of our common stock.

A change of control (as defined under the instruments governing our debt) is an event of default, permitting our lenders to accelerate the maturity of certain borrowings. Further, our borrowing arrangements impose other restrictions on us, including with respect to mergers or consolidations with other companies and the sale of substantially all of our assets. These provisions could prevent or deter a third-party from acquiring us even where the acquisition could be beneficial to our stockholders.

Our bylaws provide, subject to certain exceptions, that the Court of Chancery of the State of Delaware and the federal district courts of the United States are the exclusive forums for certain stockholder litigation matters, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or stockholders.

Our bylaws provide, subject to limited exceptions, that the Court of Chancery of the State of Delaware is, to the fullest extent permitted by law, the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf; (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders; (iii) any action asserting a claim against us, any director or our officers or employees arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation (including any certificate of designations relating to any class or series of preferred stock) or our bylaws; or (iv) any action asserting a claim against us, any director or our officers or employees that is governed by the internal affairs doctrine. This provision does not apply to suits brought to enforce a duty or liability under the Exchange Act or any other claim for which the U.S. federal courts have exclusive jurisdiction. In addition, our bylaws provide that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our bylaws described above. This choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or any of our directors, officers, other employees or stockholders which may discourage lawsuits with respect to such claims. Alternatively, if a court were to find the choice of forum provision that is contained in our bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could materially adversely affect our business, financial condition and results of operations.

Item 1B. ***Unresolved Staff Comments***

None.

Item 2. ***Properties***

Our Properties

Refer to "Item 1. Business" for information on our active mining properties.

Our corporate headquarters consists of approximately 50,000 square feet of leased office space at 340 Martin Luther King Jr. Boulevard in Bristol, Tennessee.

Coal Reserves and Resources

As of December 31, 2021, we estimate that we owned or controlled approximately 351.1 million tons of marketable proven and probable bituminous coal reserves and approximately 381.7 million tons of in situ bituminous coal resources. Our coal reserve and resource estimates were prepared by Marshall Miller & Associates, Inc. ("Marshall Miller"), an independent professional mine engineering and geological consulting firm. Technical Summary Reports prepared by Marshall Miller, as a Qualified Person, for each of our material mining properties are filed as exhibits to this Annual Report on Form 10-K and incorporated herein by reference.

Coal reserve and resource estimates are based on data obtained from drilling activities and other available geologic data. Estimating reserves and resources requires the use of a geologic, engineering, and economic assumptions. Our engineering, land and operational support personnel work closely with Marshall Miller to ensure the integrity and accuracy of the data used to calculate the estimates as well as to ensure the assumptions used are reasonable based on our historical results as well as current and future anticipated mine plans. We provide Marshall Miller with historical property information including property maps, deed, lease, and permit information, drilling and lab results, mine plans, production quantities, development, capital, and operating costs as well as market information. For each of our active and development mining properties, Marshall Miller performs an initial assessment and based on the level of geological evidence estimates our coal resources and classifies such resources as either inferred, indicated or measured. For each of our active and material mining properties, Marshall Miller further conducts a pre-feasibility study to estimate our coal reserves and classify such reserves as either proven or probable. The estimates and reports prepared by Marshall Miller are reviewed by our personnel to ensure such reports have been prepared in accordance with applicable rules and regulations and that estimates are based on reasonable assumptions and reflect known facts and circumstances updated through year-end.

Economic analysis is a required part of the process to estimate coal reserves and resources. For a coal reserve or resource to be considered economic, generally revenue generated from its sale must exceed its total cost of production (including consideration of development, capital, and operating costs).

In determining coal reserves as of December 31, 2021, the following estimated market pricing was utilized:

Coal quality	Market Pricing Per Ton [1][2]
High-Vol. A	$138
High- Vol. B	$117
Mid-Vol.	$144
Low-Vol.	$144
Thermal	$76

[1] Market pricing shown on U.S. East Coast basis.
[2] Met and thermal pricing based on 10-year and 3-year average, respectively of forecasted pricing from pricing services.

The following is a summary of our estimated marketable proven and probable coal reserves as of December 31, 2021 as determined by Marshall Miller:

Coal Reserves (Tons in thousands)

		Marketable Coal Reserves [1]			Reserve Control		Stage / Permit Status Production Stage	
Mining Complex	Location	Total	Proven	Probable	Owned	Leased	Permitted	Not Permitted
Met								
Aracoma	WV	44,181	26,237	17,944	5,250	38,931	15,134	29,047
Kepler	WV	48,611	26,831	21,780	259	48,352	20,097	28,514
Kingston	WV	32,489	19,477	13,012	607	31,882	15,082	17,407
Marfork	WV	145,741	72,826	72,915	2,084	143,657	74,477	71,264
McClure/Toms Creek	VA	80,077	55,041	25,036	—	80,077	48,658	31,419
Total		351,099	200,412	150,687	8,200	342,899	173,448	177,651

[1] Minimum seam height 30 inches for underground mines.

Coal Reserves (Tons in thousands)

		Coal Type/Quality							
		Met Coal by Volatility				Thermal	Sulfur		
Mining Complex	Location	High-Vol A	High-Vol B	Mid-Vol	Low-Vol	Thermal [1]	< 1%	> 1%	Recovery Percentage [2]
Met									
Aracoma	WV	—	44,181	—	—	—	41,950	2,231	27 %
Kepler	WV	—	—	5,942	42,669	—	47,694	917	43 %
Kingston	WV	15,676	—	1,418	9,091	6,304	13,002	19,487	43 %
Marfork	WV	103,069	6,819	2,300	26,195	7,358	122,526	23,215	29 %
McClure/Toms Creek	VA	485	1,926	75,998	—	1,668	80,077	—	31 %
Total		119,230	52,926	85,658	77,955	15,330	305,249	45,850	

[1] Kingston thermal reserves primarily proven and >1% sulfur; Marfork thermal reserves primarily probable and >1% sulfur; McClure/Toms Creek thermal reserves primarily probable and <1% sulfur.
[2] Recovery percentage defined as estimated coal reserves divided by related estimated in situ measured and indicated coal resources.

In determining an initial assessment for purposes of determining coal resources as of December 31, 2021, the following estimated market pricing was utilized:

Complex	Market Pricing Per Ton [1][2]
Aracoma	$153
Kepler	$162
Kingston	$141
Marfork	$171
McClure/Toms Creek	$164

[1] Market pricing shown on U.S. East Coast basis.
[2] Pricing shown for primary product judgmentally selected by qualified person based on review of historical average pricing for each complexes coal products over the past 5 years.

The following is a summary of the Company's estimated in situ inferred, indicated, and measured coal resources (exclusive of coal reserves) as of December 31, 2021 as determined by Marshall Miller:

Coal Resources [1] (Tons in thousands)

		In Situ Coal Resources [2]			Reserve Control		Stage / Permit Status Exploration Stage	
Mining Complex	Location	Total	Indicated	Measured	Owned	Leased	Permitted	Not Permitted
Met								
Aracoma	WV	140,657	53,692	86,965	49,236	91,421	17,206	123,451
Kepler	WV	58,734	29,916	28,818	596	58,138	9,555	49,179
Kingston	WV	21,254	21,254	—	13,651	7,603	—	21,254
Marfork	WV	128,786	46,605	82,181	61,168	67,618	19,976	108,810
McClure/Toms Creek	VA	32,281	10,382	21,899	—	32,281	11,558	20,723
Total		381,712	161,849	219,863	124,651	257,061	58,295	323,417

[1] Amounts shown exclusive of coal reserves.
[2] Inferred Resources were not considered material and have not been presented.

Coal Resources [1] (Tons in thousands)

		Coal Type/Quality							
		Met Coal by Volatility				Thermal	Sulfur		
Mining Complex	Location	High-Vol A	High-Vol B	Mid-Vol	Low-Vol	Thermal	< 1%	> 1%	Expected Recovery Percentage [2]
Met									
Aracoma	WV	—	140,657	—	—	—	45,154	95,503	18 %
Kepler	WV	—	—	7,334	51,400	—	45,264	13,470	41 %
Kingston	WV	—	—	—	21,254	—	21,254	—	28 %
Marfork	WV	62,890	18,117	1,854	43,800	2,125	35,020	93,766	31 %
McClure/Toms Creek	VA	—	585	31,696	—	—	12,376	19,905	22 %
Total		62,890	159,359	40,884	116,454	2,125	159,068	222,644	

[1] Amounts shown exclusive of coal reserves.
[2] Expected recovery percentage defined as potential estimated recoverable tons included in the initial assessment divided by estimated in situ measured and indicated coal resources.

Our coal reserves and resources are owned or are controlled through leases with third parties which have varied expiration dates and either have options to renew or are expected to be renewed until all mineable and merchantable coal is exhausted. Leases require the payment of production royalties to lessors based on a stated percentage of sales revenue less freight cost and may contain annual minimum payment requirements. We permit coal reserves and resources in advance of mining. Currently, there are no known permitting issues that would impact the reporting of our coal reserves or resources. However, also refer to

"Item 1. Business—Environmental and Other Regulatory Matters" and "Item 1A. Risks Factors—Risks relating to regulatory and legal developments."

Our coal reserve and resource estimates are updated periodically to reflect coal production, acquisitions and dispositions of mineral interests, new drilling, mine or geological data, and changes in regulations, market conditions or other economic factors. As coal seams in the United States have been mined for many years and are well established, we do not conduct material exploration activity. However, we periodically conduct drilling of additional core holes to provide additional geological evidence as part of our routine mine permitting and planning processes. The following is a summary of the changes in our coal reserves and resources for the year-ended December 31, 2021:

Changes in Coal Reserves (Tons in thousands)

Mining Complex	12/31/2020 Coal Reserves	Acquired/Leased	Disposed	Production	Initial Assessment [1]	Change in Mine Plan	Other [2]	12/31/2021 Coal Reserves
Met								
Aracoma	83,351	479	(2,259)	(2,317)	(20,232)	(14,841)	—	44,181
Kepler	58,461	—	—	(1,471)	(10,605)	2,226	—	48,611
Kingston	36,864	9,091	—	(2,005)	(10,914)	(547)	—	32,489
Marfork	264,824	—	(4,945)	(4,017)	(26,792)	(24,913)	(58,416)	145,741
McClure/Toms Creek	87,060	—	—	(3,783)	—	(3,200)	—	80,077
Other	88,541	—	—	(842)	—	—	(87,699)	—
All Other								
Other	4,444	—	—	(1,178)	—	—	(3,266)	—
Total	623,545	9,570	(7,204)	(15,613)	(68,543)	(41,275)	(149,381)	351,099

[1] Mineral areas subjected to initial assessment only and reported as coal resources.
[2] In adopting the SEC's new subpart 1300 of Regulation S-K, the Company focused efforts on material and active mining properties and concluded that, for certain inactive and/or immaterial mining properties, preparing reserve/resource reports was not cost beneficial. Additional reserve/resource reports may be prepared in the future if such properties become active and/or material.

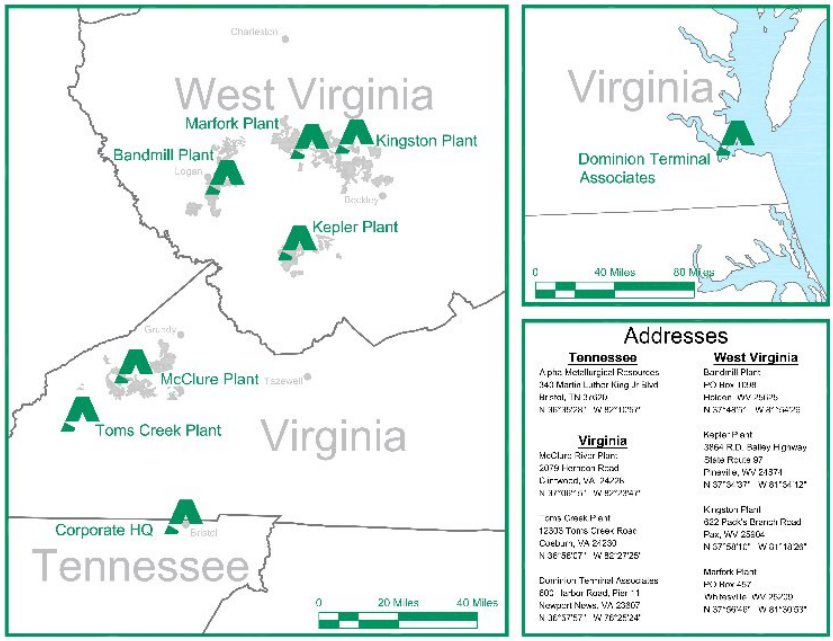
Changes in Coal Resources (Tons in thousands)

Mining Complex	12/31/2020 Coal Resources	S-K Rule Adoption [1]	12/31/2021 Coal Resources
Met			
Aracoma	—	140,657	140,657
Kepler	—	58,734	58,734
Kingston	—	21,254	21,254
Marfork	—	128,786	128,786
McClure/Toms Creek	—	32,281	32,281
Total	—	381,712	381,712

[1] Adoption of new SEC subpart 1300 of Regulation S-K required the Company to disclose coal resources beginning with the year ending December 31, 2021.

As coal reserve and resource amounts represent estimates, also refer to "Estimates of our economically recoverable coal reserves and coal resources involve uncertainties, and inaccuracies in our estimates could result in lower than expected revenues, higher than anticipated costs, decreased profitability and asset impairments" contained in "Item 1A. Risk Factors."

The following map shows the locations of our material mining properties and corporate headquarters:



Item 3. ***Legal Proceedings***

For a description of the Company's legal proceedings, refer to Note 22, part (d), to the Consolidated Financial Statements, which is incorporated herein by reference.

Item 4. ***Mine Safety Disclosures***

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 Annual Report on Form 10-K.

Part II

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

Upon the consummation of the transactions contemplated by the Merger Agreement, we began trading on the New York Stock Exchange under the ticker "CTRA" on November 9, 2018. Following the effectiveness of our name change on February 1, 2021, our ticker symbol on the New York Stock Exchange changed from "CTRA" to "AMR" effective on February 4, 2021.

As of December 31, 2021, there were 115 registered holders of record of our common stock. The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. Our common stock is registered by book-entry only.

Dividend Policy

The payment of dividends is subject to certain limitations, as set forth in the terms of our borrowing arrangements. During the years ended 2021 and 2020, we did not pay dividends on our common stock. Our board of directors periodically evaluates the initiation of dividends. There is no assurance as to the amount or payment of dividends in the future because they will be subject to ongoing board of directors review and authorization will be based on a number of factors, including terms of our borrowing arrangements, business and market conditions, our future financial performance, and other capital priorities.

Repurchase of Common Stock

Refer to Note 25 for subsequent event disclosures related to our share repurchase program.

Item 6. ***[Reserved]***

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

The following discussion and analysis provides a narrative of our results of operations and financial condition for the years ended December 31, 2021 and 2020. The following discussion and analysis should be read in conjunction with our Consolidated Financial Statements and related notes and the risk factors included elsewhere in this Annual Report on Form 10-K.

COVID-19 Pandemic

The COVID-19 pandemic has had negative impacts on our business, results of operations, financial condition and cash flows. Refer to "Item 1. Business—Human Capital Resources—Employee Health and Welfare" for further COVID-19 related impacts. The full extent of the impact of the COVID-19 pandemic on our operational and financial performance will depend on certain developments, including the continued duration and spread of the outbreak, its impact on our customers and suppliers and the range of governmental and community reactions to the pandemic, which are still uncertain and still cannot be fully predicted. Our current view of the impacts of COVID-19 to our customers and suppliers is discussed below in the Market Overview section. We have not experienced significant supply chain disruptions due to the COVID-19 pandemic. We continue to monitor developments closely.

All of our coal mining operations have been classified as essential in the states in which we operate enabling them to continue operations throughout the COVID-19 pandemic. Health and safety are core values of our company and are the foundation for how we manage every aspect of our business and we have therefore implemented policies, procedures and prevention measures to protect our employees during the COVID-19 pandemic. These include, but are not limited to, employee communications on COVID-19 monitoring and precautionary measures, enhanced cleaning and sterilization practices, and remote work arrangements. We will continue to evaluate these policies, procedures, and precautionary measures in light of further developments as necessary or appropriate.

Market Overview

Metallurgical coal markets exhibited volatility and strength in the final months of 2021, with the U.S. East Coast indices rising to new calendar-year highs in the fourth quarter. Each of the U.S. East Coast indices finished the year more than double where it started at the beginning of January 2021, and the Australian Premium Low Volatile index more than tripled over the same twelve-month period.

Looking specifically at movement within the fourth quarter, the U.S. East Coast High Volatile A index was at $377 per metric ton on October 1, 2021 and ended the quarter at $340 per metric ton on December 31, 2021. The U.S. East Coast Low

Volatile index began at $412 per metric ton at the start of the quarter and moved to $320 per metric ton at quarter close. The Australian Premium Low Volatile index also ended lower, going from $390 per metric ton on October 1, 2021 down to $357 per metric ton on December 31, 2021. Supply conditions remain tight in the metallurgical coal markets, with demand in Alpha's key markets continuing to be strong.

Across the globe, economic indicators reflect an inconsistent growth landscape as the uneven recovery continues from COVID-19 pandemic-related labor and supply-chain challenges. While still representing positive, yet slowing, economic growth, the world manufacturing Purchasing Managers' Index ("PMI") of 53.2 in January 2022 represented a 15-month low for the metric. In December and January, the United States PMI indices of 57.7 and 55.5, respectively, continued to come off their mid-year highs. Brazil and India, two of Alpha's important foreign markets, also posted lower January PMI levels as compared to their December indices. India's PMI slipped from 55.5 in December to 54.0 in January, and Brazil dipped further into economic contraction from 49.8 in December to 47.8 in January. China's PMI also slid from 50.9 to 49.1. Alpha's key market of Europe was the exception to the general pattern of slowing growth for the time period, with its PMI indices improving modestly from 58.0 in December to 58.7 in January.

The World Steel Association's ("WSA") global crude steel production was 158.7 million metric tons in December 2021, a 3.0% decrease as compared to the year-ago period of December 2020. Steel production in the European Union held roughly flat year over year, with December 2021 levels just 1.4% lower than in December 2020. North American crude steel production of 9.7 million metric tons for the month represented a 7.5% increase over the year-ago period. China's production level of 86.2 million metric tons was down 6.8% as compared to December of 2020.

The capacity utilization rate for U.S. steel mills, which is measured by the American Iron and Steel Institute, was 79.8% for the week ending February 12, 2022. While this level is lower than the recent high in the mid-80s, it still represents sustained steel demand in North America.

In the thermal coal market, strong demand and tight supply conditions remain, alongside volatility in the indices. Alpha's last remaining thermal operation, the Slabcamp mine, is on schedule to mine out and cease operation in summer of 2022. Alpha continues to ship coal in accordance with existing contracts.

We are monitoring developments in Ukraine as well as the related export controls and financial and economic sanctions imposed on certain industry sectors and parties in Russia by the U.S., the U.K., the European Union and others. Although we do not presently foresee direct material adverse effects upon our business, financial condition or results of operations as a result of developments in Ukraine and the consequent controls and sanctions, these factors may affect companies in many sectors and could lead to increased market volatility and uncertainty, which could affect us in turn.

Business Overview

We are a Tennessee-based mining company with operations across Virginia and West Virginia. With customers across the globe, high-quality reserves and significant port capacity, we reliably supply metallurgical coal products to the steel industry. We operate high-quality, cost-competitive coal mines across the CAPP coal basin. As of December 31, 2021, our operations consisted of twenty active mines and eight coal preparation and load-out facilities, with approximately 3,500 employees. We produce, process, and sell met coal and thermal coal. We also sell coal produced by others, some of which is processed and/or blended with coal produced from our mines prior to resale, with the remainder purchased for resale. As of December 31, 2021, we had 351.1 million tons of reserves, 335.8 million tons of proven and probable metallurgical reserves, and 15.3 million tons of proven and probable thermal reserves. Additionally, we had approximately 381.7 million tons of in situ bituminous coal resources.

We began operations on July 26, 2016, with mining operations in NAPP, CAPP, and the PRB. Through the Acquisition, we acquired a significant reserve base. We also acquired Alpha Natural Resources Inc.'s 40.6% interest in the DTA coal export terminal in Newport News, Virginia, and on March 31, 2017, we acquired a portion of another partner's ownership stake and increased our interest to 65.0%. We merged with Alpha Natural Resources Holdings, Inc. and ANR, Inc. on November 9, 2018.

On December 8, 2017, we closed a transaction with Blackjewel L.L.C. ("Blackjewel") to sell our Eagle Butte and Belle Ayr mines (the "Western Mines") located in the PRB, Wyoming, along with related coal reserves, equipment, infrastructure and other real properties (our former PRB operations). On October 4, 2019, we closed on the ESM Transaction in connection with Blackjewel's subsequent bankruptcy filing. On May 29, 2020, certain of our subsidiaries (Contura Coal West, LLC and Contura Wyoming Land, LLC), one of which held the mining permits for the Western Mines, were merged with certain subsidiaries of

ESM to become wholly-owned subsidiaries of ESM and to complete the permit transfer process in connection with the ESM Transaction.

On December 10, 2020, we closed on a transaction with Iron Senergy Holdings, LLC, to sell our thermal coal mining operations located in Pennsylvania consisting primarily of our Cumberland mining complex and related property (our former NAPP operations). The disposition of our former NAPP operations accelerated our strategic exit from thermal coal production to shift our focus toward met coal production. The former NAPP operations' results of operations and financial position are reported as discontinued operations in the Consolidated Financial Statements. Refer to Note 3 for further information on discontinued operations. At our thermal coal operations, we have significantly reduced inventories at all locations and are matching our sales and production to make for an orderly transition to lower thermal coal production.

For the years ended December 31, 2021 and 2020, sales of met coal were 13.9 million tons and 12.3 million tons, respectively, and accounted for approximately 83% and 80%, respectively, of our coal sales volume. Sales of thermal coal were 2.9 million tons and 3.2 million tons, respectively, and accounted for approximately 17% and 20%, respectively, of our coal sales volume.

Our sales of met coal were made primarily to steel companies in the northeastern and midwestern regions of the United States and in several countries in Asia, Europe, and the Americas. Our sales of thermal coal were made primarily to large utilities and industrial customers throughout the United States. For the years ended December 31, 2021 and 2020 approximately 76% and 64%, respectively, of our coal revenues were derived from coal sales made to customers outside the United States.

In addition, we generate other revenues from equipment sales, rentals, terminal and processing fees, coal and environmental analysis fees, royalties and the sale of natural gas. We also record freight and handling fulfillment revenue within coal revenues for freight and handling services provided in delivering coal to certain customers, which are a component of the contractual selling price.

As of December 31, 2021, we have one reportable segment: Met. To conform to the current period reportable segment presentation, the prior periods have been restated to reflect the change in reportable segments. Our Met segment operations consist of high-quality met coal mines, including Deep Mine 41, Road Fork 52, Black Eagle, and Lynn Branch. The coal produced by our Met segment operations is predominantly met coal with some amounts of thermal coal being produced as a byproduct of mining. In addition to the one reportable segment, our All Other category includes general corporate overhead and corporate assets and liabilities, our former CAPP - Thermal operations consisting of one active mine and one preparation plant in West Virginia, and the elimination of certain intercompany activity, as well as expenses associated with certain idled/closed mines. Refer to Notes 23 and 24 for additional disclosures on our reportable segment, geographic areas, and export coal revenue information.

Other Business Developments

We announced on March 7, 2022 that our board of directors authorized a share repurchase program allowing for the expenditure of up to $150.0 million for the repurchase of our common stock. Repurchases will be made from time to time in accordance with applicable securities laws in the open market, and may include repurchases pursuant to Rule 10b5-1 trading plans. The share repurchase program is effective immediately and has no expiration date, and repurchases may begin as soon as March 9, 2022.

The repurchase program does not obligate us to acquire any particular amount of common stock or to acquire shares on any particular timetable, and the program may be suspended at any time at our discretion. The timing and amount of share repurchases will be determined by our management based on our evaluation of market conditions, the trading price of the stock, applicable legal requirements, compliance with the provisions of our debt agreements, and other factors.

Effective February 1, 2021, we changed our corporate name from Contura Energy, Inc. to Alpha Metallurgical Resources, Inc. for rebranding to more accurately reflect our strategic focus on the production of met coal. Following the effectiveness of our name change, our ticker symbol on the New York Stock Exchange changed from "CTRA" to "AMR" effective on February 4, 2021.

During the third quarter of 2020, we joined three other regional coal producers to restructure and expand the Virginia Coal & Energy Alliance to now be named the Metallurgical Coal Producers Association ("MCPA") focusing on issues specific to the U.S.'s metallurgical coal industry. Additionally, the MCPA will focus on our regional presence by combining forces to advance collective interests.

Factors Affecting Our Results of Operations

Sales Agreements

We manage our commodity price risk for coal sales through the use of coal supply agreements. As of February 25, 2022, we had sales commitments for 2022 as follows:

	Tons	% Priced	Average Realized Price per Ton
Met - Domestic			$189.31
Met - Export			$236.99
Met Total	14.5 million	39 %	$204.75
Thermal	1.0 million	100 %	$52.46
Met Segment	15.5 million	44 %	$180.36
All Other	0.7 million	82 %	$57.24

Due to the significant uncertainty in the worldwide coal markets due to COVID-19, there is risk of reduction in future shipments due to deferrals and utilization of force majeure clauses in customer contracts.

Realized Pricing. Our realized price per ton of coal is influenced by many factors that vary by region, including (i) coal quality, which includes energy (heat content), sulfur, ash, volatile matter and moisture content; (ii) differences in market conventions concerning transportation costs and volume measurement; and (iii) regional supply and demand.

- Coal Quality. The energy content or heat value of thermal coal is a significant factor influencing coal prices as higher energy coal is more desirable to consumers and typically commands a higher price in the market. The heat value of coal is commonly measured in British thermal units or the amount of heat needed to raise the temperature of one pound of water by one-degree Fahrenheit. Coal from the Eastern and Midwest regions of the United States tends to have a higher heat value than coal found in the western United States. Coal volatility is a significant factor influencing met coal pricing as coal with a lower volatility has historically been more highly valued and typically commands a higher price in the market. The volatility refers to the loss in mass, less moisture, when coal is heated in the absence of air. The volatility of met coal determines the percentage of feed coal that becomes coke, known as coke yield, with lower volatility producing a higher coke yield.

- Market Conventions. Coal sales contracts are priced according to conventions specific to the market into which such coal is to be sold. Our domestic sales contracts are typically priced free on board ("FOB") at our mines and on a short ton basis. Our international sales contracts are typically priced FOB at the shipping port from which such coal is delivered and on a metric ton basis. Accordingly, for international sales contracts, we typically bear the cost of transportation from our mines to the applicable outbound shipping port, and our coal sales realization per ton calculation reflects the conversion of such tonnage from metric tons into short tons, as well as the elimination of the freight and handling fulfillment component of coal sales revenue. In addition, for domestic sales contracts, as customers typically bear the cost of transportation from our mines, our operations located further away from the end user of the coal may command lower prices.

- Regional Supply and Demand. Our realized price per ton is influenced by market forces of the regional market into which such coal is to be sold. Market pricing may vary according to region and lead to different discounts or premiums to the most directly comparable benchmark price for such coal product.

Costs. Our results of operations are dependent upon our ability to maximize productivity and control costs. Our primary expenses are for operating supply costs, repair and maintenance expenditures, cost of purchased coal, royalties, wages and benefits, freight and handling costs and taxes incurred in selling our coal. Principal goods and services we use in our operations include maintenance and repair parts and services, electricity, fuel, roof control and support items, explosives, tires, conveyance structure, ventilation supplies and lubricants. Our management strives to aggressively control costs and improve operating performance to mitigate external cost pressures. We experience volatility in operating costs related to fuel, explosives, steel, tires, contract services and healthcare, among others, and take measures to mitigate the increases in these costs at all operations. We have a centralized sourcing group for major supplier contract negotiation and administration, for the negotiation and purchase of major capital goods, and to support the business units. We promote competition between suppliers and seek to develop relationships with suppliers that focus on lowering our costs. We seek suppliers who identify and concentrate on implementing continuous improvement opportunities within their area of expertise. To the extent upward pressure on costs

exceeds our ability to realize sales increases, or if we experience unanticipated operating or transportation difficulties, our operating margins would be negatively impacted. We may also experience difficult geologic conditions, delays in obtaining permits, labor shortages, unforeseen equipment problems, and unexpected shortages of critical materials such as tires, fuel and explosives that may result in adverse cost increases and limit our ability to produce at forecasted levels.

Results of Operations

Our results of operations for the years ended December 31, 2021 and 2020 are discussed in these "Results of Operations" presented below.

Year Ended December 31, 2021 Compared to the Year Ended December 31, 2020

Revenues

The following table summarizes information about our revenues during the years ended December 31, 2021 and 2020:

	Year Ended December 31,		Increase (Decrease)	
(In thousands, except for per ton data)	2021	2020	$ or Tons	%
Coal revenues	$ 2,252,597	$ 1,413,124	$ 839,473	59.4 %
Other revenues	5,989	3,063	2,926	95.5 %
Total revenues	$ 2,258,586	$ 1,416,187	$ 842,399	59.5 %
Tons sold	16,839	15,513	1,326	8.5 %

Coal revenues. Coal revenues increased $839.5 million, or 59.4%, for the year ended December 31, 2021 compared to the prior year period. The increase was primarily due to an increase in tons sold and higher coal sales realization within our Met segment operations as a result of an improved pricing environment during the second half of 2021. Increasing coal demand, resulting from improved economic activity, coupled with a limited supply response contributed to a rise in coal prices. Refer to the "Non-GAAP Coal revenues" section below for further detail on coal revenues for the year ended December 31, 2021 compared to the prior year period.

Cost and Expenses

The following table summarizes information about our costs and expenses during the years ended December 31, 2021 and 2020:

	Year Ended December 31,		Increase (Decrease)	
(In thousands)	2021	2020	$	%
Cost of coal sales (exclusive of items shown separately below)	$ 1,679,742	$ 1,281,011	$ 398,731	31.1 %
Depreciation, depletion and amortization	110,047	139,885	(29,838)	(21.3)%
Accretion on asset retirement obligations	26,520	26,504	16	0.1 %
Amortization of acquired intangibles, net	13,244	9,214	4,030	43.7 %
Asset impairment and restructuring	(561)	83,878	(84,439)	(100.7)%
Selling, general and administrative expenses (exclusive of depreciation, depletion and amortization shown separately above)	63,901	57,356	6,545	11.4 %
Total other operating (income) loss:				
Mark-to-market adjustment for acquisition-related obligations	19,525	(8,750)	28,275	323.1 %
Other income	(10,972)	(2,223)	(8,749)	(393.6)%
Total costs and expenses	$ 1,901,446	$ 1,586,875	$ 314,571	19.8 %

Cost of coal sales. Cost of coal sales increased $398.7 million, or 31.1%, for the year ended December 31, 2021 compared to the prior year period. The increase was primarily driven by an increase in tons sold in the current period relative to the prior

year period and increased supplies and maintenance expense, royalties and taxes, and salaries and wages expense, partially offset by inventory change during the current period.

Depreciation, depletion and amortization. Depreciation, depletion and amortization decreased $29.8 million, or 21.3%, for the year ended December 31, 2021 compared to the prior year period. The decrease in depreciation, depletion and amortization was primarily a result of asset disposals and asset impairments throughout the prior year.

Amortization of acquired intangibles, net. Amortization of acquired intangibles, net increased $4.0 million, or 43.7%, for the year ended December 31, 2021 compared to the prior year period. The increase was primarily driven by the lower current period amortization related to below-market acquired coal supply agreements.

Asset impairment and restructuring. Asset impairment and restructuring decreased $84.4 million, or 100.7%, for the year ended December 31, 2021 compared to the prior year period. For the year ended December 31, 2021, asset impairment and restructuring included long-lived asset impairment of $60 thousand and restructuring expense of ($621) thousand. For the year ended December 31, 2020, asset impairment and restructuring included long-lived asset impairment of $81.0 million and restructuring expense of $2.9 million. Refer to Note 8 for further information.

Selling, general and administrative. Selling, general and administrative expenses increased $6.5 million, or 11.4%, for the year ended December 31, 2021 compared to the prior year period. This increase in expense was primarily related to increases of $4.3 million in incentive pay, $2.1 million in stock compensation expense, and $1.2 million in wages and benefits expense, partially offset by decreases of $1.6 million in professional fees and $0.7 million in severance expense.

Mark-to-market adjustment for acquisition-related obligations. The mark-to-market adjustment for acquisition-related obligations resulted in an increase in expense of $28.3 million for the year ended December 31, 2021 compared to the prior year period. This decrease was related to the $19.5 million Contingent Revenue Obligation mark-to-market adjustment recorded during the year ended December 31, 2021 due to changes in underlying fair value assumptions during the current period. Refer to Note 17 for Contingent Revenue Obligation fair value input assumptions.

Other income. Other income increased $8.7 million, or 393.6%, for the year ended December 31, 2021 compared to the prior year period, primarily due to a gain on sale of assets, net, of $9.9 million and a gain on settlement of acquisition-related obligations of $1.1 million in the current period.

Other (Expense) Income

The following table summarizes information about our other (expense) income during the year ended December 31, 2021 and 2020:

	Year Ended December 31,		Increase (Decrease)	
(In thousands)	**2021**	**2020**	**$**	**%**
Other (expense) income:				
Interest expense	$ (69,654)	$ (74,528)	$ 4,874	6.5 %
Interest income	334	7,027	(6,693)	(95.2)%
Equity loss in affiliates	(4,149)	(3,473)	(676)	(19.5)%
Miscellaneous income (loss), net	6,867	(1,972)	8,839	448.2 %
Total other expense, net	$ (66,602)	$ (72,946)	$ 6,344	8.7 %

Interest expense. Interest expense decreased $4.9 million, or 6.5%, for the year ended December 31, 2021 compared to the prior year period, primarily due to a decrease in debt outstanding. Refer to Note 14 for additional information.

Interest income. Interest income decreased $6.7 million, or 95.2%, for the year ended December 31, 2021 compared to the prior year period. The decrease was primarily due to the interest income recorded during the three months ended June 30, 2020 associated with the federal income tax interest receivable related to the net operating loss carryback claim.

Miscellaneous income (loss), net. Miscellaneous income (loss), net increased $8.8 million, or 448.2%, for the year ended December 31, 2021 compared to the prior year period. The increase was primarily due to the increase in the net periodic benefit credit for pension obligations. Refer to Note 19 for additional information.

Income Tax (Expense) Benefit

The following table summarizes information about our income tax (expense) benefit during the years ended December 31, 2021 and 2020:

	Year Ended December 31,		Increase (Decrease)	
(In thousands)	2021	2020	$	%
Income tax (expense) benefit	$ (3,609)	$ 2,164	$ (5,773)	(266.8)%

Income taxes. Income tax expense of $3.6 million was recorded for the year ended December 31, 2021 on income from continuing operations before income taxes of $290.5 million. The effective tax rate differs from the federal statutory rate of 21% primarily due to the decrease in the valuation allowance.

Income tax benefit of $2.2 million was recorded for the year ended December 31, 2020 on a loss from continuing operations before income taxes of $243.6 million. The effective tax rate differs from the federal statutory rate of 21% primarily due to the increase in the valuation allowance, partially offset by the permanent impact of percentage depletion deductions, the impact of state income taxes, net of federal tax impact, and a refund of previously sequestered AMT Credits. Refer to Note 18 for additional information.

Non-GAAP Financial Measures

The discussion below contains "non-GAAP financial measures." These are financial measures which either exclude or include amounts that are not excluded or included in the most directly comparable measures calculated and presented in accordance with generally accepted accounting principles in the United States ("U.S. GAAP" or "GAAP"). Specifically, we make use of the non-GAAP financial measures "Adjusted EBITDA," "non-GAAP coal revenues," "non-GAAP cost of coal sales," "non-GAAP coal margin," and "Adjusted cost of produced coal sold." We use Adjusted EBITDA to measure the operating performance of our segments and allocate resources to the segments. Adjusted EBITDA does not purport to be an alternative to net income (loss) as a measure of operating performance or any other measure of operating results or liquidity presented in accordance with GAAP. We use non-GAAP coal revenues to present coal revenues generated, excluding freight and handling fulfillment revenues. Non-GAAP coal sales realization per ton for our operations is calculated as non-GAAP coal revenues divided by tons sold. We use non-GAAP cost of coal sales to adjust cost of coal sales to remove freight and handling costs, depreciation, depletion and amortization - production (excluding the depreciation, depletion and amortization related to selling, general and administrative functions), accretion on asset retirement obligations, amortization of acquired intangibles, net, and idled and closed mine costs. Non-GAAP cost of coal sales per ton for our operations is calculated as non-GAAP cost of coal sales divided by tons sold. Non-GAAP coal margin per ton for our coal operations is calculated as non-GAAP coal sales realization per ton for our coal operations less non-GAAP cost of coal sales per ton for our coal operations. We also use Adjusted cost of produced coal sold to distinguish the cost of captive produced coal from the effects of purchased coal. The presentation of these measures should not be considered in isolation, or as a substitute for analysis of our results as reported under GAAP.

Management uses non-GAAP financial measures to supplement GAAP results to provide a more complete understanding of the factors and trends affecting the business than GAAP results alone. The definition of these non-GAAP measures may be changed periodically by management to adjust for significant items important to an understanding of operating trends and to adjust for items that may not reflect the trend of future results by excluding transactions that are not indicative of our core operating performance. Furthermore, analogous measures are used by industry analysts to evaluate the Company's operating performance. Because not all companies use identical calculations, the presentations of these measures may not be comparable to other similarly titled measures of other companies and can differ significantly from company to company depending on long-term strategic decisions regarding capital structure, the tax jurisdictions in which companies operate, and capital investments.

Included below are reconciliations of non-GAAP financial measures to GAAP financial measures.

The following tables summarize certain financial information relating to our coal operations for the years ended December 31, 2021 and 2020:

(In thousands, except for per ton data)	Year Ended December 31, 2021		
	Met	All Other	Consolidated
Coal revenues	$ 2,173,647	$ 78,950	$ 2,252,597
Less: Freight and handling fulfillment revenues	(380,457)	(520)	(380,977)
Non-GAAP Coal revenues	$ 1,793,190	$ 78,430	$ 1,871,620
Tons sold	15,569	1,270	16,839
Non-GAAP Coal sales realization per ton	$ 115.18	$ 61.76	$ 111.15
Cost of coal sales (exclusive of items shown separately below)	$ 1,607,157	$ 72,585	$ 1,679,742
Depreciation, depletion and amortization - production [(1)]	99,963	9,362	109,325
Accretion on asset retirement obligations	13,571	12,949	26,520
Amortization of acquired intangibles, net	13,671	(427)	13,244
Total Cost of coal sales	$ 1,734,362	$ 94,469	$ 1,828,831
Less: Freight and handling costs	(380,457)	(520)	(380,977)
Less: Depreciation, depletion and amortization - production [(1)]	(99,963)	(9,362)	(109,325)
Less: Accretion on asset retirement obligations	(13,571)	(12,949)	(26,520)
Less: Amortization of acquired intangibles, net	(13,671)	427	(13,244)
Less: Idled and closed mine costs	(16,858)	(11,680)	(28,538)
Non-GAAP Cost of coal sales	$ 1,209,842	$ 60,385	$ 1,270,227
Tons sold	15,569	1,270	16,839
Non-GAAP Cost of coal sales per ton	$ 77.71	$ 47.55	$ 75.43

[(1)] Depreciation, depletion and amortization - production excludes the depreciation, depletion and amortization related to selling, general and administrative functions.

(In thousands, except for per ton data)	Year Ended December 31, 2021		
	Met	All Other	Consolidated
Coal revenues	$ 2,173,647	$ 78,950	$ 2,252,597
Less: Total Cost of coal sales (per table above)	(1,734,362)	(94,469)	(1,828,831)
GAAP Coal margin	$ 439,285	$ (15,519)	$ 423,766
Tons sold	15,569	1,270	16,839
GAAP Coal margin per ton	$ 28.22	$ (12.22)	$ 25.17
GAAP Coal margin	$ 439,285	$ (15,519)	$ 423,766
Add: Depreciation, depletion and amortization - production [(1)]	99,963	9,362	109,325
Add: Accretion on asset retirement obligations	13,571	12,949	26,520
Add: Amortization of acquired intangibles, net	13,671	(427)	13,244
Add: Idled and closed mine costs	16,858	11,680	28,538
Non-GAAP Coal margin	$ 583,348	$ 18,045	$ 601,393
Tons sold	15,569	1,270	16,839
Non-GAAP Coal margin per ton	$ 37.47	$ 14.21	$ 35.71

[(1)] Depreciation, depletion and amortization - production excludes the depreciation, depletion and amortization related to selling, general and administrative functions.

(In thousands, except for per ton data)	Year Ended December 31, 2020		
	Met	All Other	Consolidated
Coal revenues	$ 1,263,855	$ 149,269	$ 1,413,124
Less: Freight and handling fulfillment revenues	(206,509)	(12,940)	(219,449)
Non-GAAP Coal revenues	$ 1,057,346	$ 136,329	$ 1,193,675
Tons sold	13,070	2,443	15,513
Non-GAAP Coal sales realization per ton	$ 80.90	$ 55.80	$ 76.95
Cost of coal sales (exclusive of items shown separately below)	$ 1,140,556	$ 140,455	$ 1,281,011
Depreciation, depletion and amortization - production [1]	124,060	14,568	138,628
Accretion on asset retirement obligations	14,214	12,290	26,504
Amortization of acquired intangibles, net	12,889	(3,675)	9,214
Total Cost of coal sales	$ 1,291,719	$ 163,638	$ 1,455,357
Less: Freight and handling costs	(206,509)	(12,940)	(219,449)
Less: Depreciation, depletion and amortization - production [1]	(124,060)	(14,568)	(138,628)
Less: Accretion on asset retirement obligations	(14,214)	(12,290)	(26,504)
Less: Amortization of acquired intangibles, net	(12,889)	3,675	(9,214)
Less: Idled and closed mine costs	(16,640)	(12,240)	(28,880)
Non-GAAP Cost of coal sales	$ 917,407	$ 115,275	$ 1,032,682
Tons sold	13,070	2,443	15,513
Non-GAAP Cost of coal sales per ton	$ 70.19	$ 47.19	$ 66.57

[1] Depreciation, depletion and amortization - production excludes the depreciation, depletion and amortization related to selling, general and administrative functions.

(In thousands, except for per ton data)	Year Ended December 31, 2020		
	Met	All Other	Consolidated
Coal revenues	$ 1,263,855	$ 149,269	$ 1,413,124
Less: Total Cost of coal sales (per table above)	(1,291,719)	(163,638)	(1,455,357)
GAAP Coal margin	$ (27,864)	$ (14,369)	$ (42,233)
Tons sold	13,070	2,443	15,513
GAAP Coal margin per ton	$ (2.13)	$ (5.88)	$ (2.72)
GAAP Coal margin	$ (27,864)	$ (14,369)	$ (42,233)
Add: Depreciation, depletion and amortization - production [1]	124,060	14,568	138,628
Add: Accretion on asset retirement obligations	14,214	12,290	26,504
Add: Amortization of acquired intangibles, net	12,889	(3,675)	9,214
Add: Idled and closed mine costs	16,640	12,240	28,880
Non-GAAP Coal margin	$ 139,939	$ 21,054	$ 160,993
Tons sold	13,070	2,443	15,513
Non-GAAP Coal margin per ton	$ 10.71	$ 8.62	$ 10.38

[1] Depreciation, depletion and amortization - production excludes the depreciation, depletion and amortization related to selling, general and administrative functions.

(In thousands, except for per ton data)	Year Ended December 31, 2021	Year Ended December 31, 2020	Increase (Decrease) $ or Tons	Increase (Decrease) %
Met segment operations:				
Tons sold	15,569	13,070	2,499	19.1 %
Non-GAAP Coal revenues	$ 1,793,190	$ 1,057,346	$ 735,844	69.6 %
Non-GAAP Coal sales realization per ton	$ 115.18	$ 80.90	$ 34.28	42.4 %
All Other category:				
Tons sold	1,270	2,443	(1,173)	(48.0)%
Non-GAAP Coal revenues	$ 78,430	$ 136,329	$ (57,899)	(42.5)%
Non-GAAP Coal sales realization per ton	$ 61.76	$ 55.80	$ 5.96	10.7 %

Non-GAAP Coal revenues. Met segment operations non-GAAP coal revenues increased $735.8 million, or 69.6%, for the year ended December 31, 2021 compared to the prior year period. The increase was primarily due to an increase in tons sold and higher average non-GAAP coal sales realization of 42.4% per ton resulting from an improved pricing environment compared to the prior year period.

All Other category non-GAAP coal revenues decreased $57.9 million, or 42.5%, for the year ended December 31, 2021 compared to the prior year period primarily due to a decrease in thermal tons sold as we continued our strategic shift to focus on met coal production.

(In thousands, except for per ton data)	Year Ended December 31, 2021	Year Ended December 31, 2020	Increase (Decrease) $	Increase (Decrease) %
Met segment operations:				
Non-GAAP Cost of coal sales	$ 1,209,842	$ 917,407	$ 292,435	31.9 %
Non-GAAP Cost of coal sales per ton	$ 77.71	$ 70.19	$ 7.52	10.7 %
Non-GAAP Coal margin per ton	$ 37.47	$ 10.71	$ 26.76	249.9 %
All Other category:				
Non-GAAP Cost of coal sales	$ 60,385	$ 115,275	$ (54,890)	(47.6)%
Non-GAAP Cost of coal sales per ton	$ 47.55	$ 47.19	$ 0.36	0.8 %
Non-GAAP Coal margin per ton	$ 14.21	$ 8.62	$ 5.59	64.8 %

Non-GAAP cost of coal sales. Met segment operations non-GAAP cost of coal sales increased $292.4 million, or 31.9%, for the year ended December 31, 2021 compared to the prior year period. The increase was primarily driven by an increase in tons sold in the current period relative to the prior year period and increased supplies and maintenance expense, royalties and taxes, and salaries and wages expense, partially offset by inventory change during the current period.

All Other category non-GAAP cost of coal sales decreased $54.9 million, or 47.6%, for the year ended December 31, 2021 compared to the prior year period. The decrease was primarily driven by a decrease in thermal tons sold and decreased supplies and maintenance expense and royalties and taxes, partially offset by increased salaries and wages expense and inventory change during the current period.

Our non-GAAP cost of coal sales includes purchased coal costs. In the following tables, we calculate Adjusted cost of produced coal sold as non-GAAP cost of coal sales less purchased coal costs.

	Year Ended December 31, 2021		
(In thousands, except for per ton data)	Met	All Other	Consolidated
Non-GAAP Cost of coal sales	$ 1,209,842	$ 60,385	$ 1,270,227
Less: cost of purchased coal sold	(97,872)	(660)	(98,532)
Adjusted cost of produced coal sold	$ 1,111,970	$ 59,725	$ 1,171,695
Produced tons sold	14,638	1,265	15,903
Adjusted cost of produced coal sold per ton [(1)]	$ 75.96	$ 47.21	$ 73.68

[(1)] Cost of produced coal sold per ton for our operations is calculated as non-GAAP cost of produced coal sold divided by produced tons sold.

	Year Ended December 31, 2020		
(In thousands, except for per ton data)	Met	All Other	Consolidated
Non-GAAP Cost of coal sales	$ 917,407	$ 115,275	$ 1,032,682
Less: cost of purchased coal sold	(85,769)	(925)	(86,694)
Adjusted cost of produced coal sold	$ 831,638	$ 114,350	$ 945,988
Produced tons sold	11,941	2,429	14,370
Adjusted cost of produced coal sold per ton [(1)]	$ 69.65	$ 47.08	$ 65.83

[(1)] Cost of produced coal sold per ton for our operations is calculated as non-GAAP cost of produced coal sold divided by produced tons sold.

Adjusted EBITDA

Adjusted EBITDA is a non-GAAP financial measure that is presented as a supplemental measure and is not intended to replace financial performance or liquidity measures determined in accordance with GAAP. Moreover, this measure is not calculated identically by all companies and therefore may not be comparable to similarly titled measures used by other companies. Adjusted EBITDA is presented because management believes it is a useful indicator of the financial performance of our coal operations. The following tables present a reconciliation of net income (loss) to Adjusted EBITDA for the years ended December 31, 2021 and 2020:

	Year Ended December 31, 2021		
(In thousands)	Met	All Other	Consolidated
Net income (loss) from continuing operations	$ 439,859	$ (152,930)	$ 286,929
Interest expense	184	69,470	69,654
Interest income	(6)	(328)	(334)
Income tax expense	—	3,609	3,609
Depreciation, depletion and amortization	99,963	10,084	110,047
Non-cash stock compensation expense	28	5,287	5,315
Mark-to-market adjustment - acquisition-related obligations	—	19,525	19,525
Gain on settlement of acquisition-related obligations	—	(1,125)	(1,125)
Accretion on asset retirement obligations	13,571	12,949	26,520
Asset impairment and restructuring	—	(561)	(561)
Amortization of acquired intangibles, net	13,671	(427)	13,244
Adjusted EBITDA	$ 567,270	$ (34,447)	$ 532,823

(In thousands)	Year Ended December 31, 2020		
	Met	All Other	Consolidated
Net loss from continuing operations	$ (77,519)	$ (163,951)	$ (241,470)
Interest expense	(2,014)	76,542	74,528
Interest income	(63)	(6,964)	(7,027)
Income tax benefit	—	(2,164)	(2,164)
Depreciation, depletion and amortization	124,060	15,825	139,885
Non-cash stock compensation expense	289	4,607	4,896
Mark-to-market adjustment - acquisition-related obligations	—	(8,750)	(8,750)
Accretion on asset retirement obligations	14,214	12,290	26,504
Asset impairment and restructuring	46,317	37,561	83,878
Management restructuring costs [1]	501	440	941
Loss on partial settlement of benefit obligations	1,607	1,359	2,966
Amortization of acquired intangibles, net	12,889	(3,675)	9,214
Adjusted EBITDA	$ 120,281	$ (36,880)	$ 83,401

[1] Management restructuring costs are related to severance expense associated with senior management changes during the three months ended March 31, 2020.

The following table summarizes Adjusted EBITDA for our Met segment operations and All Other category:

(In thousands)	Year Ended December 31,		Increase (Decrease)	
	2021	2020	$	%
Adjusted EBITDA				
Met operations	$ 567,270	$ 120,281	$ 446,989	371.6 %
All Other	(34,447)	(36,880)	2,433	6.6 %
Total	$ 532,823	$ 83,401	$ 449,422	538.9 %

Met segment operations. Adjusted EBITDA increased $447.0 million, or 371.6%, for the year ended December 31, 2021 compared to the prior year period. The increase in Adjusted EBITDA was primarily driven by increased coal margin and coal sales volumes.

All Other category. Adjusted EBITDA increased $2.4 million, or 6.6%, for the year ended December 31, 2021 compared to the prior year period. The increase in Adjusted EBITDA was primarily driven by decreases in cost of coal sales and increases in sales realization per ton, partially offset by a decrease in thermal tons sold.

Discontinued Operations

The former NAPP operations' results of operations and financial position are reported as discontinued operations in the Consolidated Financial Statements. Refer to Note 3 for further information on discontinued operations. The following tables summarize certain financial information relating to the discontinued operating results which are reported within the All Other category that have been derived from our Consolidated Financial Statements for the year ended December 31, 2020.

(In thousands, except for per ton data)	Year Ended December 31, 2020 [2]
Coal revenues	$ 233,083
Less: Freight and handling fulfillment revenues	(11,135)
Non-GAAP Coal revenues	$ 221,948
Tons sold	5,420
Non-GAAP Coal sales realization per ton	$ 40.95
Cost of coal sales (exclusive of items shown separately below)	$ 215,390
Depreciation, depletion and amortization - production [1]	11,570
Accretion on asset retirement obligations	4,154
Amortization of acquired intangibles, net	861
Total Cost of coal sales	$ 231,975
Less: Freight and handling costs	(11,135)
Less: Depreciation, depletion and amortization - production [1]	(11,570)
Less: Accretion on asset retirement obligations	(4,154)
Less: Amortization of acquired intangibles, net	(861)
Less: Idled and closed mine costs	(3,102)
Non-GAAP Cost of coal sales	$ 201,153
Tons sold	5,420
Non-GAAP Cost of coal sales per ton	$ 37.11

[1] Depreciation, depletion and amortization - production excludes the depreciation, depletion and amortization related to selling, general and administrative functions.
[2] Includes minor residual activity related to our former PRB operations.

(In thousands, except for per ton data)	Year Ended December 31, 2020 [2]
Coal revenues	$ 233,083
Less: Total Cost of coal sales (per table above)	(231,975)
GAAP Coal margin	$ 1,108
Tons sold	5,420
GAAP Coal margin per ton	$ 0.20
GAAP Coal margin	$ 1,108
Add: Depreciation, depletion and amortization - production [1]	11,570
Add: Accretion on asset retirement obligations	4,154
Add: Amortization of acquired intangibles, net	861
Add: Idled and closed mine costs	3,102
Non-GAAP Coal margin	$ 20,795
Tons sold	5,420
Non-GAAP Coal margin per ton	$ 3.84

[1] Depreciation, depletion and amortization - production excludes the depreciation, depletion and amortization related to selling, general and administrative functions.
[2] Includes minor residual activity related to our former PRB operations.

Refer to Note 3 for disclosures on the Cumberland Back-to-Back Coal Supply Agreements.

Liquidity and Capital Resources

Overview

Our primary liquidity and capital resource requirements stem from the cost of our coal production and purchases, our capital expenditures, our debt service, our reclamation obligations, our regulatory costs and settlements and associated costs. Our primary sources of liquidity are derived from sales of coal, our debt financing, and miscellaneous revenues.

We believe that cash on hand and cash generated from our operations will be sufficient to meet our working capital requirements, anticipated capital expenditures, debt service requirements, acquisition-related obligations, and reclamation obligations for the next 12 months and the reasonably foreseeable future. We rely on a number of assumptions in budgeting for our future activities. These include the costs for mine development to sustain capacity of our operating mines, our cash flows from operations, effects of regulation and taxes by governmental agencies, mining technology improvements and reclamation costs. These assumptions are inherently subject to significant business, political, economic, regulatory, environmental and competitive uncertainties, pending and existing climate-related initiatives, contingencies and risks, all of which are difficult to predict and many of which are beyond our control. Increased scrutiny of ESG matters specific to the coal sector could negatively influence our ability to raise capital in the future and result in a reduced number of surety and insurance providers. We may need to raise additional funds if market conditions deteriorate, and we may not be able to do so in a timely fashion, on terms acceptable to us, or at all; or one or more of our assumptions prove to be incorrect or if we choose to expand our acquisition, exploration, appraisal, or development efforts or any other activity more rapidly than we presently anticipate. Additionally, we may elect to raise additional funds before we need them if the conditions for raising capital are favorable. We may seek to sell equity or debt securities or obtain additional bank credit facilities. The sale of equity securities could result in dilution to our stockholders. The incurrence of additional indebtedness could result in increased fixed obligations and additional covenants that could restrict our operations.

Liquidity

The following table summarizes our total liquidity as of December 31, 2021:

(in thousands)	December 31, 2021
Cash and cash equivalents	$ 81,211
Credit facility availability [(1)]	33,963
Total liquidity	$ 115,174

[(1)] Comprised of our unused commitments available under the Second Amended and Restated Asset-Based Revolving Credit Agreement, subject to limitations described therein.

Cash Collateral

We are required to provide cash collateral to secure our obligations under certain worker's compensation, black lung, reclamation-related obligations, financial payments and other performance obligations, and other operating agreements. Additionally, we have short-term restricted cash held in escrow related to our Contingent Revenue Obligation (refer to Note 15). Future regulatory changes relating to these obligations could result in increased obligations, additional costs, or additional collateral requirements which could require greater use of alternative sources of funding for this purpose, which would reduce our liquidity. Refer to the DCMWC Reauthorization Process section below for information related to the new authorization process for self-insured coal mine operators being implemented by the U.S. Department of Labor (Division of Coal Mine Workers' Compensation). As of December 31, 2021, we had the following cash collateral on our Consolidated Balance Sheets:

(in thousands)	December 31, 2021
Short-term and long-term restricted cash	$ 101,403
Long-term restricted investments	28,443
Short-term and long-term deposits	1,394
Total cash collateral	$ 131,240

Off-Balance Sheet Arrangements

We are required to provide financial assurance in order to perform the post-mining reclamation required by our mining permits, pay workers' compensation claims under workers' compensation laws in various states, pay federal black lung benefits, and perform certain other obligations. In order to provide the required financial assurance, we generally use surety bonds for post-mining reclamation and workers' compensation obligations. We also use bank letters of credit to collateralize certain obligations. As of December 31, 2021, we had the following outstanding surety bonds and letters of credit:

(in thousands)	December 31, 2021
Surety bonds [1]	$ 176,119
Letters of credit [2]	$ 121,650

[1] Total face amount includes $30 thousand attributable to discontinued operations.
[2] The letters of credit outstanding are under the Second Amended and Restated Asset-Based Revolving Credit Agreement dated December 6, 2021 and the Credit and Security Agreement dated June 30, 2017, and related amendments, between ANR, Inc. and First Tennessee Bank National Association.

Refer to Note 22, part (c) for further disclosures on off-balance sheet arrangements.

Debt Financing and Related Transactions

At December 31, 2021, we had $454.7 million of indebtedness outstanding before debt discount and issuance costs. Our indebtedness is primarily comprised of our Credit Agreement entered into on June 14, 2019 that provides for a senior secured term loan facility in the aggregate principal amount of $561.8 million with a maturity date of June 14, 2024 (the "Term Loan Credit Facility"). The Term Loan Credit Facility permits us, subject to approval of the administrative agent and the lenders providing the financing, to request incremental term loans up to an aggregate amount of $50.0 million subject to certain conditions in the Credit Agreement, in increments not less than $25.0 million or the remaining availability.

In a continued strategic effort to reduce our outstanding debt and strengthen our balance sheet, we repurchased at a discount certain outstanding principal borrowings of $18.7 million and made voluntary prepayments of $81.0 million of outstanding principal borrowings under the Term Loan Credit Facility during the third and fourth quarters of 2021. During the first quarter of 2022, we made additional voluntary prepayments of $150.0 million of outstanding principal borrowings under the Term Loan Credit Facility. Subject to continued coal market strength and available liquidity, we are planning to continue our efforts to substantially deleverage the balance sheet in coming quarters.

On December 6, 2021, we entered into the Second Amended and Restated Asset-Based Revolving Credit Agreement ("New ABL Agreement"). The New ABL Agreement amended and restated the Amended and Restated Asset-Based Revolving Credit Agreement dated November 9, 2018, in its entirety, and includes a senior secured asset-based revolving credit facility ("the New ABL Facility"). Under the New ABL Facility, we may borrow cash from the Lenders (as defined therein) or cause the L/C Issuers (as defined therein) to issue letters of credit, on a revolving basis, in an aggregate amount of up to $155.0 million, of which no more than $150.0 million may represent outstanding letters of credit ($125.0 million on a committed basis and another $25.0 million on an uncommitted cash collateralized basis) with a maturity date of December 6, 2024. The New ABL Agreement extended the maturity date of the facility from the previous maturity of April 3, 2022. Availability under the New ABL Facility is calculated on a monthly basis and fluctuates based on qualifying amounts of coal inventory and trade accounts receivable (the "Borrowing Base") and the facility's covenant limitations related to our Fixed Charge Coverage Ratio (refer to "Analysis of Material Debt Covenants" below). In accordance with terms of the New ABL Facility, we may be required to cash collateralize the New ABL Facility to the extent outstanding borrowings and letters of credit under the New ABL Facility exceed the Borrowing Base after considering covenant limitations.

On July 26, 2021, we repaid in full the West Virginia allocation of the Lexington Coal Company ("LCC") note payable ("LCC Note Payable") in the amount of $21.2 million. The final $7.7 million payment was originally due in July of 2022, but we negotiated the return of $14.0 million of surety collateral in exchange for early repayment, which allowed us to eliminate that portion of the debt a year early and at a lower net cash outflow than was previously expected in 2021. In October 2021, we elected to repay in full the remaining LCC Note Payable in the amount of $2.3 million and the remaining obligation to contribute into the LCC's water treatment restricted accounts (the "LCC Water Treatment Stipulation") in the amount of $5.0 million.

Refer to Note 14 for additional disclosures on long-term debt.

Acquisition-Related Obligations

At December 31, 2021, we had $41.6 million of acquisition-related obligations outstanding before discount. Our acquisition-related obligations are primarily comprised of the Contingent Revenue Obligation which has an offsetting $17.6 million of short-term restricted cash held in escrow as of the first quarter of 2022 (refer to Note 15).

Capital Requirements

We expect to spend between $160.0 million and $190.0 million on capital expenditures during 2022. Our expected capital expenditures include an increase from our estimates in the prior year due to inflationary pressure on labor and supplies and plans for several important projects that will help modernize and strategically improve our operations and preparation plant infrastructure.

Contractual Obligations

The following is a summary of our significant contractual obligations as of December 31, 2021:

(in thousands)	2022	2023	2024	2025	2026	After 2026	Total
Term Loan Credit Facility [1]	$ 44,944	$ 44,944	$ 470,158	$ —	$ —	$ —	$ 560,046
Contingent Revenue Obligation	17,524	22,988	—	—	—	—	40,512
Minimum royalties	14,665	14,418	13,620	12,525	12,396	56,771	124,395
Coal purchase commitments	37,335	—	—	—	—	—	37,335
Unconditional purchase obligations [2]	46,514	105,750	87,825	—	—	—	240,089
Total	$ 160,982	$ 188,100	$ 571,603	$ 12,525	$ 12,396	$ 56,771	$ 1,002,377

[1] Includes cash interest payable on this obligation, with an interest rate of 10.00% as of December 31, 2021.
[2] Includes transportation commitments, minimum equipment purchase commitments, and diesel fuel purchase commitments. Refer to Note 22 for further information.

Additionally, we have long-term liabilities relating to asset retirement obligations, pension benefits, black lung benefits, postretirement life insurance benefits, and workers' compensation benefits. The table below reflects the estimated undiscounted cash flows for these obligations:

(in thousands)	2022	2023	2024	2025	2026	After 2026	Total
Asset retirement obligation	$ 32,802	$ 35,495	$ 35,663	$ 24,079	$ 35,865	$ 256,029	$ 419,933
Pension benefit obligation [1]	30,949	30,944	31,161	31,497	31,657	940,537	1,096,745
Black lung benefit obligation	7,295	7,208	7,254	7,329	7,497	158,467	195,050
Postretirement life insurance benefit obligation	602	568	569	571	570	14,237	17,117
Workers' compensation benefit obligation	10,612	7,757	6,277	5,497	5,076	72,759	107,978
Total	$ 82,260	$ 81,972	$ 80,924	$ 68,973	$ 80,665	$ 1,442,029	$ 1,836,823

[1] The estimated undiscounted cash flows will be paid from the defined benefit pension plan assets held within the defined benefit pension plan trust. Refer to Note 19 for further disclosures related to this obligation.

Business Updates

On December 14, 2021, S&P Global Ratings upgraded its issuer credit rating on the Company to B- from CCC+ and its issuer-level rating on our senior secured debt to B- from CCC+ amid favorable market indicators. The rating outlook was noted as stable. On September 14, 2021, Moody's Investors Service ("Moody's") upgraded our Corporate Family Rating to B3 from Caa1, Probability of Default Rating to B3-PD from Caa1-PD, Senior Secured First Lien Bank Credit Facility Rating to B3 (LGD4) from Caa2 (LGD4), and Speculative Grade Liquidity Rating to SGL-2 from SGL-3 which were upgraded from Moody's previous ratings which were released on April 16, 2021. The rating outlook was noted as stable. Should we receive any negative outlook ratings in the future, such negative outlook ratings would result in potential liquidity risks for us, including the risks of declines in our stock value, declines in our cash and cash equivalents, less availability and higher costs of additional credit, and requests for additional collateral by surety providers.

The COVID-19 pandemic has had negative impacts on our business, results of operations, financial condition, and cash flows. The full extent of the impact of the COVID-19 pandemic on our operational and financial performance will depend on

various developments, including the duration and spread of the outbreak, its impact on our customers and suppliers and the range of governmental and community reactions to the pandemic, which are still uncertain and still cannot be fully predicted.

We continually strive to enhance our capital structure and financial flexibility and reduce cash outflows from operations. As future opportunities arise, we will consider the possibility of refinancing, repayment or repurchase of outstanding debt and amendment of our credit facilities, and may consider the sale of other assets or businesses, and such other measures as we believe circumstances warrant. We may decide to pursue or not pursue these opportunities at any time. Access to additional funds from liquidity-generating transactions or other sources of external financing is subject to market conditions and certain limitations, including our credit rating and covenant restrictions in our credit facilities.

As a regular part of our business, we review opportunities for, and engage in discussions and negotiations concerning, the acquisition or disposition of coal mining and related infrastructure assets and interests in coal mining companies, and acquisitions or dispositions of, or combinations or other strategic transactions involving companies with coal mining or other energy assets. When we believe that these opportunities are consistent with our strategic plans and our acquisition or disposition criteria, we will make bids or proposals and/or enter into letters of intent and other similar agreements. These bids or proposals, which may be binding or non-binding, are customarily subject to a variety of conditions and usually permit us to terminate the discussions and any related agreement if, among other things, we are not satisfied with the results of due diligence. Any acquisition opportunities we pursue could materially affect our liquidity and capital resources and may require us to incur indebtedness, seek equity capital or both. There can be no assurance that additional financing will be available on terms acceptable to us, or at all.

Income Taxes

In August 2021, we received an expected $64.2 million federal income tax refund and a $5.4 million associated interest payment related to a net operating loss ("NOL") carryback claim. Refer to Note 18 for further income tax disclosures.

Pension Plans

We sponsor three qualified non-contributory pension plans ("Pension Plans") which cover certain salaried and non-union hourly employees. Participants accrued benefits either based on certain formulas, the participant's compensation prior to retirement or plan specified amounts for each year of service. Benefits are frozen under these Pension Plans. Annual funding contributions to the Pension Plans are made as recommended by consulting actuaries based upon the Employee Retirement Income Security Act of 1974, as amended ("ERISA") funding standards. Funding decisions also consider certain funded status thresholds defined by the Pension Protection Act of 2006. As a result of the recent funding relief granted under the American Rescue Plan Act, contributions requirements to the pension plans were reduced relative to our previous estimates, and we contributed $6.6 million to the Pension Plans in 2021. We expect our minimum required contributions to be $4.4 million to the pension plans in 2022. Refer to Note 19 for further disclosures related to this obligation.

Discontinued Operations

Refer to Note 3 for disclosure on discontinued operations.

DCMWC Reauthorization Process

In July 2019, the U.S. Department of Labor (Division of Coal Mine Workers' Compensation or "DCMWC") began implementing a new authorization process for all self-insured coal mine operators. As requested by DCMWC, we filed an application and supporting documentation for reauthorization to self-insure certain of our black lung obligations in October 2019. As a result of this application, the DCMWC notified us in a letter dated February 21, 2020 that we were reauthorized to self-insure certain of our black lung obligations for a period of one-year from February 21, 2020. The DCMWC reauthorization is contingent, however, upon us providing collateral of $65.7 million to secure certain of our black lung obligations. This collateral requirement, which the DCMWC advises represents 70% of our estimated future liability according to the DCMWC's estimation methodology, is an increase of approximately 2,400% from the approximately $2.6 million in collateral which we (previously by Alpha Natural Resources Inc. prior to the Merger) have provided since 2016 to secure these self-insured black lung obligations. Future liability has not previously been estimated by the DCMWC in connection with the reauthorization process but is now being considered as part of its new collateral-setting methodology.

The reauthorization process provided us with the right to appeal the security determination in writing within 30 days of the date of the notification, which appeal period the DCMWC agreed to extend to May 22, 2020, and we exercised this right of appeal. We strongly disagree with the DCMWC's substantially higher collateral determination and the methodology through

which the calculation was derived. In February 2021, the U.S. Department of Labor ("DOL") withdrew its Federal Register notice seeking comments on its bulletin describing its new method of calculating collateral requirements. The Department removed the bulletin from its website in May 2021. On February 10, 2022, a telephone conference was held with DCMWC and DOL decision makers wherein we presented facts and arguments in support of our appeal. No ruling has been made on the appeal, but during the call we indicated that we would be willing to allocate an additional $10.0 million in collateral. If our appeal is unsuccessful, we may be required to provide additional letters of credit in order to receive self-insurance reauthorization from the DCMWC or insure these black lung obligations through a third party provider, which would likely also require us to provide additional collateral. Either of these outcomes would significantly reduce our liquidity.

Share Repurchase Program

On March 4, 2022, our board of directors adopted a share repurchase program that permits us to repurchase up to an aggregate amount of $150.0 million of our common stock. Share repurchases may be made from time to time through open market transactions, block trades, tender offers, or otherwise. Repurchases under the program are subject to market and business conditions, levels of available liquidity, our cash needs, restrictions under agreements or obligations, legal or regulatory requirements or restrictions and other relevant factors.

Cash Flows

Cash, cash equivalents, and restricted cash decreased by $62.0 million and $103.1 million over the years ended December 31, 2021 and 2020, respectively. The net change in cash, cash equivalents, and restricted cash was attributable to the following:

	Year Ended December 31,	
	2021	2020
Cash flows (in thousands):		
Net cash provided by operating activities	$ 174,943	$ 129,236
Net cash used in investing activities	(89,855)	(209,969)
Net cash used in financing activities	(147,045)	(22,376)
Net decrease in cash and cash equivalents and restricted cash	$ (61,957)	$ (103,109)

Operating Activities. The increase in net cash provided by operating activities for the year ended December 31, 2021 compared to the prior year period was primarily attributable to the improvement in our results from operations as discussed above in "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations—Results of Operations," partially offset by changes in operating assets and liabilities, primarily attributable to an increase in our working capital. Our working capital increase was primarily driven by an increase in our trade accounts receivable, net, partially offset by the receipt of the federal tax refund in the current year as discussed above.

Investing Activities. The decrease in net cash used in investing activities for the year ended December 31, 2021 compared to the prior year period was primarily driven by the decrease in our capital expenditures which were near the maintenance capital level in the current year period and the cash paid on the sale of our former NAPP operations in the prior year period (refer to Note 3 for further information).

Financing Activities. The increase in net cash used in financing activities for the year ended December 31, 2021 compared to the prior year period was primarily driven by the repurchase and voluntary prepayments of our outstanding principal borrowings under the Term Loan Credit Facility during the second half of the current year period (refer to Note 14 for further information).

Analysis of Material Debt Covenants

We are in compliance with all covenants under the Credit Agreement's Term Loan Credit Facility and the New ABL Agreement, as of December 31, 2021. A breach of the covenants in the Credit Agreement's Term Loan Credit Facility or the Amended and Restated Asset-Based Revolving Credit Agreement could result in a default under the terms of such agreement, and the respective lenders could then elect to declare all amounts borrowed due and payable.

Pursuant to the New ABL Agreement, during any Liquidity Period (capitalized terms as defined in the New ABL Agreement), our Fixed Charge Coverage Ratio cannot be less than 1.0 as of the last day of any Test Period, commencing with the Test Period ended immediately preceding the commencement of such Liquidity Period. The Fixed Charge Coverage Ratio is

calculated as (a) Consolidated EBITDA of the Company and its Restricted Subsidiaries for such period, minus non-financed Capital Expenditures (including Capital Expenditures financed with the proceeds of any Loans) paid or payable currently in cash by the Company or any of its Subsidiaries for such period to (b) the Fixed Charges of the Company and its Restricted Subsidiaries during such period. As of December 31, 2021, we were not in a Liquidity Period.

Critical Accounting Policies and Estimates

The preparation of financial statements in accordance with GAAP requires management to make estimates and assumptions that affect reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. We base our estimates on historical experience and on various other factors and assumptions, including the current economic environment, that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. We evaluate our estimates and assumptions on an ongoing basis and adjust such estimates and assumptions as facts and circumstances require. Foreign currency and energy markets, and fluctuations in demand for steel products have combined to increase the uncertainty inherent in such estimates and assumptions. As future events and their effects cannot be determined with precision, actual results may differ significantly from these estimates. Changes in these estimates resulting from continuing changes in the economic environment will be reflected in the financial statements in future periods.

Reclamation. Our asset retirement obligations arise from the federal Surface Mining Control and Reclamation Act of 1977 and similar state statutes, which require that mine property be restored in accordance with specified standards and an approved reclamation plan. Significant reclamation activities include reclaiming refuse and slurry ponds, reclaiming the pit and support acreage at surface mines, sealing portals at deep mines, and the treatment of water. We determine the future cash flows necessary to satisfy our reclamation obligations on a permit-by-permit basis based upon current permit requirements and various estimates and assumptions, including estimates of disturbed acreage, cost estimates, and assumptions regarding productivity. We are also faced with increasingly stringent environmental regulation, much of which is beyond our control, which could increase our costs and materially increase our asset retirement obligations. Estimates of disturbed acreage are determined based on approved mining plans and related engineering data. Cost estimates are based upon third-party costs. Productivity assumptions are based on historical experience with the equipment that is expected to be utilized in the reclamation activities. Our asset retirement obligations are initially recorded at fair value. In order to determine fair value, we use assumptions including a discount rate and third-party margin. Each is discussed further below:

- *Discount Rate.* Asset retirement obligations are initially recorded at fair value. We utilize discounted cash flow techniques to estimate the fair value of our obligations. We base our discount rate on the rates of treasury bonds with maturities similar to expected mine lives and adjust for our credit standing as necessary after considering funding and assurance provisions. Changes in our credit standing could have a material impact on our asset retirement obligations.

- *Third-Party Margin.* The measurement of an obligation at fair value is based upon the amount a third party would demand to perform the obligation. Because we plan to perform a significant amount of the reclamation activities with internal resources, a third-party margin was added to the estimated costs of these activities. This margin was estimated based upon our historical experience with contractors performing similar types of reclamation activities. The inclusion of this margin will result in a recorded obligation that is greater than our estimates of our cost to perform the reclamation activities. If our cost estimates are accurate, the excess of the recorded obligation over the cost incurred to perform the work will be recorded as a reduction to depreciation, depletion and amortization within our Consolidated Statements of Operations at the time that reclamation work is completed.

On at least an annual basis, we review our reclamation liabilities and make necessary adjustments for permit changes as granted by state authorities, additional costs resulting from accelerated mine closures, and revisions to cost estimates and productivity assumptions to reflect current experience and updated plans. At December 31, 2021, we had recorded asset retirement obligation liabilities of $164.2 million, including amounts reported as current. While the precise amount of these future costs cannot be determined with certainty, as of December 31, 2021, we estimate that the aggregate undiscounted cost of final mine closures is approximately $419.9 million. Refer to Note 16 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for reclamation disclosures including a table summarizing the changes in asset retirement obligations for the years ended December 31, 2021 and 2020.

Retirement Plans. We have three non-contributory defined benefit retirement plans (the “Pension Plans”) covering certain of our salaried and non-union hourly employees, all of which are frozen. Benefits are based on either the employee’s compensation prior to retirement or stated amounts for each year of service with us. Funding of the Pension Plans is in accordance with requirements of ERISA, and our contributions can be deducted for federal income tax purposes. We contributed $6.6 million to our Pension Plans for the year ended December 31, 2021. For the year ended December 31, 2021,

we recorded a net periodic benefit credit of $11.5 million, which included a settlement of $0.4 million, for our Pension Plans and have recorded net obligations of $159.9 million. Refer to Note 19 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for disclosures summarizing the changes in these projected benefit obligations for the years ended December 31, 2021 and 2020.

The calculation of the net periodic benefit expense (credit) and projected benefit obligation associated with our Pension Plans requires the use of a number of assumptions, which are used by our independent actuaries to make the underlying calculations. Refer to Note 19 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for a summary of these assumptions and additional disclosures related to our Pension Plans. Changes in these assumptions can result in different net periodic benefit expense and liability amounts, and actual experience can differ from the assumptions.

- The expected long-term rate of return on plan assets is an assumption of the rate of return on plan assets reflecting the average rate of earnings expected on the funds invested or to be invested to provide for the benefits included in the projected benefit obligation. We establish the expected long-term rate of return on plan assets at the beginning of each fiscal year based upon historical returns and projected returns on the underlying mix of invested assets. The Pension Plans investment targets are 60% equity securities and 40% fixed income funds, based on the assumption the Pension Plans have a funded status level less than 90% (refer to Note 19 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for additional disclosures on this assumption). Investments are rebalanced on a periodic basis to stay within these targeted guidelines. The expected long-term rate of return on plan assets assumption used to determine net periodic benefit expense was 5.80% for the year ended December 31, 2021. The expected long-term rate of return on plan assets assumption to be used in 2022 is expected to be 5.80%. Any difference between the actual experience and the assumed experience is deferred as an unrecognized actuarial gain or loss and amortized into expense in future periods.

- The discount rate represents our estimate of the interest rate at which pension benefits could be effectively settled. Assumed discount rates are used in the measurement of the projected and accumulated benefit obligations and the interest cost component of the net periodic benefit expense. In estimating that rate, we use rates of return on high quality, fixed income investments. The weighted average discount rate used to determine the pension benefit obligations was 2.92% for the year ended December 31, 2021. The differences resulting from actual versus assumed discount rates are amortized into pension net periodic benefit expense (credit) over the remaining average life of the active plan participants. A one percentage-point increase in the discount rate would increase the net periodic pension cost for the year ended December 31, 2021 by approximately $3.3 million and decrease the projected benefit obligation as of December 31, 2021 by approximately $83.5 million. The corresponding effects of a one percentage-point decrease in discount rate would decrease the net periodic pension cost for the year ended December 31, 2021 by approximately $4.5 million and increase the projected benefit obligation as of December 31, 2021 by approximately $104.8 million.

Coal Workers' Pneumoconiosis. We are required by federal and state statues to provide benefits to employees for awards related to coal workers' pneumoconiosis disease (black lung). Certain of our subsidiaries are insured for black lung benefit obligations by a third-party insurance provider and certain subsidiaries are self-insured for state black lung benefit obligations and may fund benefit payments through a Section 501(c)(21) tax-exempt trust fund. Provisions are made for estimated benefits based on annual evaluations prepared by independent actuaries. Charges are made to operations for self-insured black lung claims, as determined by an independent actuary at the present value of the actuarially computed liability for such benefits over the employee's applicable term of service. These actuarially determined liabilities use various actuarial assumptions, including the discount rate, future cost trends, demographic assumptions, and return on plan assets to estimate the costs and obligations for these items.

- The discount rate represents our estimate of the interest rate at which black lung benefit obligations could be effectively settled. Assumed discount rates are used in the measurement of the black lung benefit obligations and the interest cost and service cost components of the net periodic benefit expense. In estimating that rate, we use rates of return on high quality, fixed income investments. The weighted average discount rate used to determine black lung benefit obligations was 2.96% for the year ended December 31, 2021. The differences resulting from actual versus assumed discount rates are amortized into black lung net periodic benefit cost over the remaining average life of the active plan participants. A one percentage-point increase in the discount rate would increase the net periodic black lung benefit cost for the year ended December 31, 2021 by approximately $0.6 million and decrease the projected benefit obligation as of December 31, 2021 by approximately $14.4 million. The corresponding effects of a one percentage-point decrease in discount rate would decrease the net periodic black lung benefit cost for the year ended December 31, 2021 by approximately $0.8 million and increase the projected benefit obligation as of December 31, 2021 by approximately $18.4 million.

If our assumptions do not materialize as expected, actual cash expenditures and costs that we incur could differ materially from our current estimates. Moreover, regulatory changes could affect our obligation to satisfy these or additional obligations. As of December 31, 2021, we had estimated black lung benefit obligations of approximately $114.5 million, including amounts reported as current and within discontinued operations, which are net of assets of $2.7 million that are held in a tax-exempt trust fund. Refer to Note 19 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for disclosures summarizing these underlying assumptions and the changes in these projected benefit obligations for the years ended December 31, 2021 and 2020.

Income Taxes. We recognize deferred tax assets and liabilities using enacted tax rates for the effect of temporary differences between the book and tax bases of recorded assets and liabilities. Deferred tax assets are reduced by a valuation allowance if it is more likely than not that some portion or all of the deferred tax assets will not be realized. In evaluating our ability to recover our deferred tax assets within the jurisdiction in which they arise, we consider all available positive and negative evidence, including the expected reversals of deferred tax liabilities, projected future taxable income, taxable income available via carryback to prior years, tax planning strategies, and results of recent operations. We assess the realizability of our deferred tax assets, including scheduling the reversal of our deferred tax assets and liabilities, to determine the amount of valuation allowance needed. Scheduling the reversal of deferred tax asset and liability balances requires judgment and estimation. We believe the deferred tax liabilities relied upon as future taxable income in our assessment will reverse in the same period and jurisdiction and are of the same character as the temporary differences giving rise to the deferred tax assets that will be realized. At December 31, 2021, a valuation allowance of $172.9 million has been provided on federal and state net operating losses and other deferred tax assets not currently expected to provide future tax benefits. Refer to Note 18 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for additional disclosures on income taxes.

Asset Impairment. U.S. GAAP requires that a long-lived asset group that is held and used should be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the long-lived asset group might not be recoverable. Once indicators of potential impairment are identified, testing of a long-lived asset group for impairment is a two-step process. Step one evaluates the recoverability of an asset group by comparing its projected future net undiscounted cash flows to its carrying value. If the carrying value of an asset group exceeds its projected future net undiscounted cash flows, step two is performed whereby the fair value of the asset group is estimated and compared to its carrying amount. The amount of any potential impairment is equal to the excess of an asset group's carrying value over its estimated fair value. The amount of any potential impairment is allocated to the individual long-lived assets within the asset group on a pro-rata basis, except that the carrying value of individual long-lived assets are not reduced below their individual estimated fair values. Long-lived assets located in a close geographic area are grouped together for purposes of impairment testing when, after considering revenue and cost interdependencies, circumstances indicate the assets are used together to produce future cash flows. Our asset groups generally consist of the assets and applicable liabilities of one or more mines and preparation plants and associated coal reserves for which cash flows are largely independent of cash flows of other mines, preparation plants and associated reserves.

During the year ended December 31, 2021, long-lived asset impairment of $60 was recorded in the All Other category to reduce the carrying value of property, plant, and equipment, net, due to capital spending during the period at previously impaired locations requiring the impairment of certain additional assets not considered recoverable. We performed long-lived asset impairment tests as of November 30, 2020, August 31, 2020, May 31, 2020, and February 29, 2020. In total, we determined that indicators of impairment with respect to five long-lived asset groups within our Met reporting segment, three long-lived asset groups within our All Other category, and one long-lived asset group within discontinued operations existed during the year ended December 31, 2020. At December 31, 2020, we determined that the carrying amounts of the asset groups exceeded both their undiscounted cash flows and their estimated fair values. As a result, the Company recorded a long-lived asset impairment of $228.6 million, including $147.6 million recorded within discontinued operations.

We estimate the fair value of an asset group generally using discounted cash flow analysis based on estimates of future sales volumes, coal prices, production costs, and a risk-adjusted cost of capital. Changes in any of these assumptions could materially impact the estimated undiscounted cash flows of our asset groups. Refer to Note 2 and Note 8 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K.

Contingent Revenue Obligation. Our Contingent Revenue Obligation was assumed in connection with the Merger. Determining the fair value of this obligation requires management's judgment and the utilization of independent valuation experts, and involves the use of significant estimates and assumptions with respect to forecasts of future revenues and discount rates. The Company forecasts future revenues for the duration of the obligation for the properties subject to the obligation. Discount rates are determined based on the risk associated with the projected cash flows. If our assumptions do not materialize as expected, actual payments made under the obligation could differ materially from our current estimates. For a further

discussion of the factors that could result in a change in our assumptions, see “Item 1A. Risk Factors” in this Annual Report on Form 10-K and our other filings with the Securities and Exchange Commission.

New Accounting Pronouncements. Refer to Note 2 to the Consolidated Financial Statements included elsewhere in this Annual Report on Form 10-K for disclosures related to new accounting policies adopted.

Item 8. ***Financial Statements and Supplementary Data***

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Alpha Metallurgical Resources, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting
We have audited the accompanying consolidated balance sheets of Alpha Metallurgical Resources, Inc. and subsidiaries (the Company) as of December 31, 2021 and 2020, and the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the two years in the period ended December 31, 2021, and the related notes (collectively, the financial statements). We also have audited the Company's internal control over financial reporting as of December 31, 2021, criteria established in *Internal Control - Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the years in the two year period ended December 31, 2021 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control - Integrated Framework (2013) issued by COSO.

Basis for Opinions
The Company's management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting. Our responsibility is to express an opinion on the Company's financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("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 audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the 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 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 financial statements. Our audit of internal control over financial reporting 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 audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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.

Critical Audit Matter
The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Asset Retirement Obligations
As described in Notes 2 and 16 to the consolidated financial statements, the Company's consolidated asset retirement obligation liability was $164.2 million at December 31, 2021. The Company records the asset retirement obligation liability at fair value in the period in which the legal obligation associated with the retirement of the long-lived asset is incurred. Changes to the liability at operations that are not currently being reclaimed are offset by increasing or decreasing the carrying amount of the related long-lived asset. Changes to the liability at operations that are currently being reclaimed are recorded to depreciation, depletion, and amortization. The Company annually reviews its estimated future cash flows for its asset retirement obligations.

We identified the valuation of the asset retirement obligation as a critical audit matter because the estimate involves a high degree of subjectivity and auditing the significant assumptions utilized by management in estimating the amount of the liability requires judgment. In particular, the obligation is determined using a discounted cash flow technique and is based upon mining permit requirements and various assumptions including discount rates, inflation rate, estimates of disturbed acreage, timing of reclamation activities, and third-party reclamation costs.

Our audit procedures related to the Company's asset retirement obligation liability included the following, among others:

- We obtained an understanding of the relevant controls related to the Company's accounting for the asset retirement obligation liability, and tested such controls for design and operating effectiveness, including controls over management's review of the significant assumptions and data inputs described above.
- We compared significant valuation assumptions including the discount rates and inflation rate to market data and utilized a valuation specialist to assist in testing the Company's discounted cash flow model.
- We compared the estimates of disturbed acreage, timing of reclamation activities, and third-party reclamation costs to the prior year estimate, assessing consistency between timing of reclamation activities and projected mine life, evaluated the appropriateness of the estimated costs based on mine type, and compared anticipated costs to recent operating data.
- We utilized an external specialist to perform observations of mine site operations, conducted interviews of engineering personnel, assessed the completeness of the mine reclamation estimate with respect to meeting mine closure and post closure plan regulatory requirements, and evaluated the reasonableness of the engineering estimates and assumptions.

/s/ *RSM US LLP*

We have served as the Company's auditor since 2020.

Atlanta, Georgia
March 7, 2022

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS
(Amounts in thousands, except share and per share data)

	Year Ended December 31,	
	2021	2020
Revenues:		
Coal revenues	$ 2,252,597	$ 1,413,124
Other revenues	5,989	3,063
Total revenues	2,258,586	1,416,187
Costs and expenses:		
Cost of coal sales (exclusive of items shown separately below)	1,679,742	1,281,011
Depreciation, depletion and amortization	110,047	139,885
Accretion on asset retirement obligations	26,520	26,504
Amortization of acquired intangibles, net	13,244	9,214
Asset impairment and restructuring	(561)	83,878
Selling, general and administrative expenses (exclusive of depreciation, depletion and amortization shown separately above)	63,901	57,356
Total other operating loss (income):		
Mark-to-market adjustment for acquisition-related obligations	19,525	(8,750)
Other income	(10,972)	(2,223)
Total costs and expenses	1,901,446	1,586,875
Income (loss) from operations	357,140	(170,688)
Other (expense) income:		
Interest expense	(69,654)	(74,528)
Interest income	334	7,027
Equity loss in affiliates	(4,149)	(3,473)
Miscellaneous income (loss), net	6,867	(1,972)
Total other expense, net	(66,602)	(72,946)
Income (loss) from continuing operations before income taxes	290,538	(243,634)
Income tax (expense) benefit	(3,609)	2,164
Net income (loss) from continuing operations	286,929	(241,470)
Discontinued operations:		
Income (loss) from discontinued operations before income taxes	1,660	(205,429)
Income tax benefit from discontinued operations	201	—
Income (loss) from discontinued operations	1,861	(205,429)
Net income (loss)	$ 288,790	$ (446,899)
Basic income (loss) per common share:		
Income (loss) from continuing operations	$ 15.56	$ (13.20)
Income (loss) from discontinued operations	0.10	(11.22)
Net income (loss)	$ 15.66	$ (24.42)
Diluted income (loss) per common share:		
Income (loss) from continuing operations	$ 15.20	$ (13.20)
Income (loss) from discontinued operations	0.10	(11.22)
Net income (loss)	$ 15.30	$ (24.42)
Weighted average shares - basic	18,441,175	18,298,362

Weighted average shares - diluted	18,871,682	18,298,362

Refer to accompanying Notes to Consolidated Financial Statements.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(Amounts in thousands)

	Year Ended December 31,	
	2021	**2020**
Net income (loss)	$ 288,790	$ (446,899)
Other comprehensive income (loss), net of tax:		
Employee benefit plans:		
Current period actuarial gain (loss)	$ 47,461	$ (60,647)
Income tax	—	—
	$ 47,461	$ (60,647)
Less: reclassification adjustments for amounts reclassified to earnings due to amortization of net actuarial loss and settlements	6,021	7,278
Income tax	—	—
	$ 6,021	$ 7,278
Total other comprehensive income (loss), net of tax	$ 53,482	$ (53,369)
Total comprehensive income (loss)	$ 342,272	$ (500,268)

Refer to accompanying Notes to Consolidated Financial Statements.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Amounts in thousands, except share and per share data)

	December 31, 2021	December 31, 2020
Assets		
Current assets:		
Cash and cash equivalents	$ 81,211	$ 139,227
Trade accounts receivable, net of allowance for doubtful accounts of $393 and $293 as of December 31, 2021 and 2020, respectively	489,241	145,670
Inventories, net	129,382	108,051
Prepaid expenses and other current assets	47,690	106,252
Current assets - discontinued operations	462	10,935
Total current assets	747,986	510,135
Property, plant, and equipment, net of accumulated depreciation and amortization of $443,856 and $382,423 as of December 31, 2021 and 2020, respectively	362,218	363,620
Owned and leased mineral rights, net of accumulated depletion and amortization of $52,444 and $35,143 as of December 31, 2021 and 2020, respectively	444,302	463,250
Other acquired intangibles, net of accumulated amortization of $34,221 and $25,700 as of December 31, 2021 and 2020, respectively	74,197	88,196
Long-term restricted cash	89,426	96,033
Other non-current assets	131,057	149,382
Non-current assets - discontinued operations	8,526	9,473
Total assets	$ 1,857,712	$ 1,680,089
Liabilities and Stockholders' Equity		
Current liabilities:		
Current portion of long-term debt	$ 2,989	$ 28,830
Trade accounts payable	90,090	58,413
Acquisition-related obligations - current	22,405	19,099
Accrued expenses and other current liabilities	174,607	140,406
Current liabilities - discontinued operations	5,838	12,306
Total current liabilities	295,929	259,054
Long-term debt	445,562	553,697
Acquisition-related obligations - long-term	19,000	20,768
Workers' compensation and black lung obligations	208,193	230,081
Pension obligations	159,930	218,671
Asset retirement obligations	132,013	140,074
Deferred income taxes	317	480
Other non-current liabilities	26,176	28,072
Non-current liabilities - discontinued operations	23,683	29,090
Total liabilities	1,310,803	1,479,987
Commitments and Contingencies (Note 22)		
Stockholders' Equity		
Preferred stock - par value $0.01, 5.0 million shares authorized, none issued	—	—
Common stock - par value $0.01, 50.0 million shares authorized, 20.8 million issued and 18.4 million outstanding at December 31, 2021 and 20.6 million issued and 18.3 million outstanding at December 31, 2020	208	206
Additional paid-in capital	784,743	779,424
Accumulated other comprehensive loss	(58,503)	(111,985)
Treasury stock, at cost: 2.4 million shares at December 31, 2021 and 2.3 million shares at December 31, 2020	(107,800)	(107,014)

Accumulated deficit	(71,739)	(360,529)
Total stockholders' equity	546,909	200,102
Total liabilities and stockholders' equity	$ 1,857,712	$ 1,680,089

Refer to accompanying Notes to Consolidated Financial Statements.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Amounts in thousands)

	Year Ended December 31,	
	2021	2020
Operating activities:		
Net income (loss)	$ 288,790	$ (446,899)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:		
Depreciation, depletion and amortization	110,047	151,455
Amortization of acquired intangibles, net	13,244	10,075
Accretion of acquisition-related obligations discount	1,258	3,342
Amortization of debt issuance costs and accretion of debt discount	12,338	14,772
Mark-to-market adjustment for acquisition-related obligations	19,525	(8,750)
Loss on sale of business	—	36,113
Gain on disposal of assets, net	(9,911)	(2,401)
Accretion on asset retirement obligations	26,520	30,658
Employee benefit plans, net	(1,751)	14,439
Deferred income taxes	(163)	33,123
Asset impairment and restructuring	(561)	256,518
Stock-based compensation	5,315	4,896
Equity loss in affiliates	4,149	3,473
Other, net	(6,570)	(5,972)
Changes in operating assets and liabilities		
Trade accounts receivable, net	(336,240)	91,190
Inventories, net	(21,331)	48,689
Prepaid expenses and other current assets	61,581	28,152
Deposits	26,853	(17,926)
Other non-current assets	(250)	(6,753)
Trade accounts payable	25,154	(28,620)
Accrued expenses and other current liabilities	15,961	15,428
Acquisition-related obligations	(18,121)	(32,560)
Asset retirement obligations	(16,306)	(19,375)
Other non-current liabilities	(24,588)	(43,831)
Net cash provided by operating activities	174,943	129,236
Investing activities:		
Capital expenditures	(83,300)	(153,990)
Proceeds on disposal of assets	8,224	4,023
Cash paid on sale of business	—	(52,192)
Capital contributions to equity affiliates	(6,677)	(3,443)
Purchases of investment securities	(17,985)	(21,129)
Maturity of investment securities	13,265	16,685
Other, net	(3,382)	77
Net cash used in investing activities	(89,855)	(209,969)
Financing activities:		
Proceeds from borrowings on long-term debt	—	57,500
Repurchases of long-term debt	(18,415)	—
Principal repayments of long-term debt	(119,097)	(76,491)
Principal repayments of financing lease obligations	(2,064)	(3,176)

Debt issuance costs	(6,683)	—
Common stock repurchases and related expenses	(786)	(209)
Net cash used in financing activities	(147,045)	(22,376)
Net decrease in cash and cash equivalents and restricted cash	(61,957)	(103,109)
Cash and cash equivalents and restricted cash at beginning of period	244,571	347,680
Cash and cash equivalents and restricted cash at end of period	$ 182,614	$ 244,571
Supplemental cash flow information:		
Cash paid for interest	$ 63,061	$ 49,294
Cash paid for income taxes	$ 176	$ 5
Cash received for income tax refunds	$ 64,498	$ 68,801
Supplemental disclosure of noncash investing and financing activities:		
Financing leases and capital financing - equipment	$ 787	$ 4,411
Accrued capital expenditures	$ 9,964	$ 7,493

The following table provides a reconciliation of cash and cash equivalents and restricted cash reported within the Consolidated Balance Sheets that sum to the total of the same such amounts shown in the Consolidated Statements of Cash Flows.

	As of December 31,	
	2021	2020
Cash and cash equivalents	$ 81,211	$ 139,227
Short-term restricted cash (included in Prepaid expenses and other current assets)	11,977	9,311
Long-term restricted cash	89,426	96,033
Total cash and cash equivalents and restricted cash shown in the Consolidated Statements of Cash Flows	$ 182,614	$ 244,571

Refer to accompanying Notes to Consolidated Financial Statements.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Amounts in thousands)

	Common Stock	Additional Paid-in Capital	Accumulated Other Comprehensive (Loss) Income	Treasury Stock at Cost	Retained Earnings (Accumulated Deficit)	Total Stockholders' Equity
Balances, December 31, 2019	$ 205	$ 775,707	$ (58,616)	$ (107,984)	$ 86,810	$ 696,122
Net loss	—	—	—	—	(446,899)	(446,899)
Credit losses cumulative-effect adjustment	—	—	—	—	(440)	(440)
Other comprehensive loss, net	—	—	(53,369)	—	—	(53,369)
Stock-based compensation and net issuance of common stock for share vesting	1	3,717	—	—	—	3,718
Common stock reissuances, repurchases and related expenses	—	—	—	970	—	970
Balances, December 31, 2020	$ 206	$ 779,424	$ (111,985)	$ (107,014)	$ (360,529)	$ 200,102
Net income	—	—	—	—	288,790	288,790
Other comprehensive income, net	—	—	53,482		—	53,482
Stock-based compensation and net issuance of common stock for share vesting	2	5,313	—	—	—	5,315
Common stock repurchases and related expenses	—	—	—	(786)	—	(786)
Warrant exercises	—	6	—	—	—	6
Balances, December 31, 2021	$ 208	$ 784,743	$ (58,503)	$ (107,800)	$ (71,739)	$ 546,909

Refer to accompanying Notes to Consolidated Financial Statements.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

(1) Business and Basis of Presentation

Business

Alpha Metallurgical Resources, Inc. (“Alpha” or the “Company”), previously named Contura Energy, Inc., is a Tennessee-based mining company with operations across Virginia and West Virginia. With customers across the globe, high-quality reserves and significant port capacity, Alpha is a leading U.S. supplier of metallurgical coal products for the steel industry.

The Company was formed to acquire and operate certain of Alpha Natural Resources, Inc.’s core coal operations, as part of the Alpha Natural Resources, Inc. bankruptcy reorganization. The Company began operations on July 26, 2016 and currently operates mines in the Central Appalachia region.

A merger with ANR, Inc. and Alpha Natural Resources Holdings, Inc. (together, the "Merger Companies") was completed on November 9, 2018 (the “Merger”) pursuant to terms of the definitive merger agreement (the “Merger Agreement”). Upon the consummation of the transactions contemplated by the Merger Agreement, the Company began trading on the New York Stock Exchange under the ticker “CTRA.”

Effective February 1, 2021, the Company changed its corporate name from Contura Energy, Inc. to Alpha Metallurgical Resources, Inc. to more accurately reflect its strategic focus on the production of metallurgical coal. Following the effectiveness of its name change, the Company’s ticker symbol on the New York Stock Exchange changed from “CTRA” to “AMR” effective on February 4, 2021.

Basis of Presentation

Together, the consolidated balance sheets and consolidated statements of operations, comprehensive income (loss), cash flows and stockholders’ equity for the Company are referred to as the “Financial Statements.” The Financial Statements are also referred to as “Consolidated” and references across periods are generally labeled “Balance Sheets,” “Statements of Operations,” and “Statements of Cash Flows.” The Company’s former Northern Appalachia (“NAPP”) operations results of operations and financial position are reported as discontinued operations in the Consolidated Financial Statements. Refer to Note 3 for further information on discontinued operations.

The Consolidated Financial Statements include all wholly owned subsidiaries’ results of operations for the years ended December 31, 2021 and 2020. All significant intercompany transactions have been eliminated in consolidation.

The accompanying Consolidated Financial Statements have been prepared in accordance with accounting principles generally accepted in the United States (“U.S. GAAP”).

Reclassifications

Certain amounts in the prior year Consolidated Statements of Cash Flows have been reclassified to conform to the current year presentation.

Liquidity Risks and Uncertainties

The Company believes it will have sufficient liquidity to meet its working capital requirements, anticipated capital expenditures, debt service requirements, acquisition-related obligations, and reclamation obligations for the 12 months subsequent to the issuance of these financial statements. However, the Company may need to raise additional funds if market conditions deteriorate and may not be able to do so in a timely fashion, or at all. The Company relies on a number of assumptions in budgeting for future activities. These include the costs for mine development to sustain capacity of its operating mines, cash flows from operations, effects of regulation and taxes by governmental agencies, mining technology improvements and reclamation costs. These assumptions are inherently subject to significant business, political, economic, regulatory, environmental and competitive uncertainties, pending and existing climate-related initiatives, contingencies and risks, all of which are difficult to predict and many of which are beyond the Company’s control. Therefore, the Company’s cash on hand and from future operations will be subject to any significant changes in these assumptions.

COVID-19 Pandemic

In the first quarter of 2020, the COVID-19 virus was declared a pandemic by the World Health Organization. The COVID-19 pandemic has had negative impacts on the Company's business, results of operations, financial condition and cash flows. The full extent of the impact of the COVID-19 pandemic on the Company's operational and financial performance will depend on certain developments, including the duration and spread of the outbreak, its impact on its customers and suppliers and the range of governmental and community reactions to the pandemic, which are still uncertain and still cannot be fully predicted.

(2) Summary of Significant Accounting Policies

Use of Estimates

The preparation of the Company's Consolidated Financial Statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the Consolidated Financial Statements and the reported amounts of revenues and expenses during the reporting period. Significant items subject to such estimates and assumptions include inventories; mineral reserves and resources; long-lived asset impairments; reclamation obligations; post-employment and other employee benefit obligations; useful lives, depletion and amortization; reserves for workers' compensation and black lung claims; deferred income taxes; income taxes refundable and receivable; reserves for contingencies and litigation; fair value of financial instruments; and fair value adjustments for acquisition accounting. Estimates are based on facts and circumstances believed to be reasonable at the time; however, actual results could differ from those estimates.

Cash and Cash Equivalents

Cash and cash equivalents consist of cash held with reputable depository institutions and highly liquid, short-term investments, such as highly-rated money market funds, with original maturities of three months or less. Cash and cash equivalents are stated at cost, which approximates fair value.

Restricted Cash

Amounts included in restricted cash represent cash deposits primarily invested in interest-bearing accounts that are restricted as to withdrawal as required by certain agreements entered into by the Company and provide collateral to secure the certain obligations which have been written on the Company's behalf. Refer to Note 22 for further information.

Restricted Investments

Restricted investments consist of Federal Deposit Insurance Company ("FDIC") insured certificates of deposit, mutual funds, and U.S. treasury bills classified as either trading securities or held-to-maturity securities that are restricted as to withdrawal as required by certain agreements entered into by the Company and provide collateral to secure certain obligations which have been written on the Company's behalf.

Trading securities are recorded initially at cost and are adjusted to fair value at each reporting period with unrealized gains and recorded in current period earnings or loss. Held-to-maturity securities are recorded at amortized cost with interest income recorded in current period earnings. Given the nature of the underlying investments, the Company does not expect any credit losses and has not recorded any credit losses with respect to its held-to-maturity portfolio. Refer to Note 22 for further information.

Deposits

Deposits represent cash deposits held at third parties as required by certain agreements entered into by the Company to provide cash collateral to secure the following obligations which have been written on the Company's behalf. Refer to Note 22 for further information.

Trade Accounts Receivable and Allowance for Doubtful Accounts

Trade accounts receivable are recorded at their invoiced amounts and do not bear interest. The Company markets its coal primarily to domestic and international steel producers and electric utilities in the United States. Credit is extended based on an evaluation of a customer's financial condition, including a review of third-party credit score information. Collateral is generally not required. Accounts receivable balances are monitored against approved credit limits. Credit limits are monitored and adjusted as considered necessary based on changes to a customer's credit profile. If a customer's credit deteriorates, the Company may reduce credit risk exposure by reducing credit limits, obtaining letters of credit, obtaining credit insurance, or requiring pre-payment for shipments. Credit losses have historically not been material. Account balances are written-off against the allowance after all means of collection have been exhausted and the potential for recovery is considered remote. Refer to Note 23 for further information.

Inventories

Coal is reported as inventory at the point in time the coal is extracted from the mine. Raw coal represents coal stockpiles that may be sold in current condition or may be further processed prior to shipment to a customer. Saleable coal represents coal stockpiles that require no further processing prior to shipment to a customer.

Coal inventories are valued at the lower of average cost or net realizable value. The cost of coal inventories is determined based on the average cost of production, which includes labor, supplies, equipment costs, operating overhead, depreciation, and other related costs. Net realizable value considers the projected future sales price of the product, less estimated preparation and selling costs. Material and supplies inventories are valued at average cost, less an allowance for obsolete and surplus items. Refer to Note 7 for further information.

Discontinued Operations

In accordance with Accounting Standards Codification ("ASC") 205-20-45, the Company treats a disposal transaction as a discontinued operation when the disposal of a component or group of components represents a strategic shift that will have a major effect on the Company's operations and financial results. In the period in which the discontinued operations criteria are met, the assets and liabilities of the discontinued operations are separately presented on the Company's Consolidated Balance Sheets and the results of operations, including any gain or loss recognized, is reclassified to discontinued operations on the Company's Consolidated Statement of Operations. Refer to Note 3 for further information.

Deferred Longwall Move Expenses

The Company deferred the direct costs, including labor and supplies, associated with moving longwall equipment, the related equipment refurbishment costs, costs to drill vent holes and plug existing gas wells in advance of the longwall panel associated with its former NAPP operations included in discontinued operations during the year ending December 31, 2020. Refer to Note 3 for further information. These deferred costs were amortized on a units-of-production basis into cost of coal sales over the life of the related panel of coal mined by the longwall equipment.

Advanced Mining Royalties

Lease rights to coal reserves are often acquired in exchange for royalty payments. Advance mining royalties are advance payments made to lessors under terms of mineral lease agreements that are recoupable against future production royalties. These advance payments are deferred and charged to operations as the coal reserves are mined. The Company regularly reviews recoverability of advance mining royalties and establishes or adjusts the allowance for advance mining royalties as necessary using the specific identification method. Advance royalty balances are generally charged off against the allowance when they are no longer recoupable. Refer to Note 11 for further information.

Property, Plant, and Equipment, Net

Costs for mine development incurred to expand capacity of operating mines or to develop new mines are capitalized and charged to operations on the units-of-production method over the estimated proven and probable reserve tons directly benefiting from the capital expenditures. Mine development costs include costs incurred for site preparation and development of the mines during the development stage less any incidental revenue generated during the development stage. Mining equipment, buildings, and other fixed assets are stated at cost and depreciated on a straight-line basis over estimated useful lives ranging from one to 25 years. Leasehold improvements are amortized using the straight-line method, over the shorter of the estimated

useful lives or term of the lease. Major repairs and betterments that significantly extend original useful lives or improve productivity are capitalized and depreciated over the period benefited. Maintenance and repairs are expensed as incurred. When equipment is retired or disposed, the related cost and accumulated depreciation are removed from the respective accounts and any profit or loss on disposal is recognized in other (income) expense in the Company's Consolidated Statements of Operations. Refer to Note 10 for further information.

Owned and Leased Mineral Rights

Owned and leased mineral rights, net of accumulated depletion and amortization, for the years ended December 31, 2021 and 2020 were $444,302 and $463,250, respectively, and are reported in assets in the Company's Consolidated Balance Sheets. These amounts include $10,354 and $10,491 of asset retirement obligation assets, net of accumulated amortization, associated with active mining operations for the years ended December 31, 2021 and 2020, respectively. During the year ended December 31, 2020, the Company recorded a long-lived asset impairment which reduced the carrying value of owned and leased mineral rights, net, by $41,579. Refer to Note 8 for further information on long-lived asset impairment.

Costs to obtain owned and leased mineral rights are capitalized and amortized to operations as depletion expense using the units-of-production method. Only proven and probable reserves are included in the depletion base. Depletion expense is included in depreciation, depletion and amortization in the accompanying Consolidated Statements of Operations and was $23,541 and ($13,746) for the years ended December 31, 2021 and 2020, respectively.

Depletion expense for the years ended December 31, 2021 and 2020 includes an expense of $5,782 and a credit of ($34,377), respectively, related to revisions to asset retirement obligations. Refer to Note 16 for further disclosures related to asset retirement obligations.

Leases

In accordance with ASC 842, the Company recognizes right of use assets and lease liabilities on the Consolidated Balance Sheets for all leases with a term longer than 12 months. Some of these leases include both lease and non-lease components which are accounted for as a single lease component as the Company has elected the practical expedient to combine these components for all leases. The discount rates used to determine the present value of the lease assets and liabilities are based on the Company's incremental borrowing rate at the lease commencement date and commensurate with the remaining lease term. As the rates implicit in most of the Company's leases are not readily determinable, the Company uses a collateralized incremental borrowing rate based on the information available at the lease commencement date in determining the present value of future payments. The Company uses the portfolio approach and groups leases by short-term and long-term categories, applying the corresponding incremental borrowing rates to these categories of leases. For leases with a term of 12 months or less, no right of use assets or liabilities are recognized on the Consolidated Balance Sheets and the Company recognizes the lease expense on a straight-line basis over the lease term. Additionally, the Company recognizes variable lease payments as an expense in the period incurred. The Company has elected to show net instead of gross amounts for right-of-use assets and liabilities within its Consolidated Statements of Cash Flows. Refer to Note 12 for further information.

Acquired Intangibles

The Company has recognized assets for acquired above market-priced coal supply agreements and acquired mine permits and liabilities for acquired below market-priced coal supply agreements. The coal supply agreements were valued based on the present value of the difference between the expected net contractual cash flows based on the stated contract terms and the estimated net contractual cash flows derived from applying forward market prices at the Merger or acquisition date for new contracts of similar terms and conditions. The acquired mine permits were valued based on the replacement cost and lost profits method as of the Merger date. The balances and respective Consolidated Balance Sheets classifications of such assets and liabilities as of December 31, 2021 and 2020, net of accumulated amortization, are set forth in the following tables:

	December 31, 2021		
	Assets [1]	Liabilities [2]	Net Total
Coal supply agreements, net	$ —	$ —	$ —
Acquired mine permits, net	74,197	—	74,197
Total	$ 74,197	$ —	$ 74,197

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

	December 31, 2020		
	Assets [1]	Liabilities [2]	Net Total
Coal supply agreements, net	$ —	$ (327)	$ (327)
Acquired mine permits, net	88,196	—	88,196
Total	$ 88,196	$ (327)	$ 87,869

[1] Included within Other acquired intangibles, net of accumulated amortization, on the Company's Consolidated Balance Sheets.
[2] Included within Other non-current liabilities on the Company's Consolidated Balance Sheets.

During the year ended December 31, 2020, the Company recorded long-lived asset impairments which reduced the carrying value of acquired mine permits, net, by $21,144. Refer to Note 8 for further information.

The acquired mine permits are amortized over the estimated life of the associated mine. The coal supply agreement assets and liabilities were amortized over the actual number of tons shipped over the life of each contract. The following table details the amortization of mine permits acquired as a result of the Merger and the amortization of above-market and below-market coal supply agreements.

	December 31,	
	2021	2020
Amortization of mine permits [1]	$ 13,571	$ 14,887
Amortization of above-market coal supply agreements	$ —	$ 18
Amortization of below-market coal supply agreements	(327)	(5,691)
Net income [1]	$ (327)	$ (5,673)

[1] Included within amortization of acquired intangibles, net in the Consolidated Statements of Operations.

Future net amortization expense related to acquired intangibles is expected to be as follows:

2022	$ 11,749
2023	8,079
2024	6,728
2025	6,723
2026	6,196
Thereafter	34,722
Total net future amortization expense	$ 74,197

Asset Impairment

Long-lived assets, such as property, plant, and equipment, mineral rights, and acquired intangibles subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset or asset groups may not be recoverable. Recoverability of assets or asset groups to be held and used is measured by a comparison of the carrying amount of an asset or asset group to the estimated undiscounted future cash flows expected to be generated by the asset or asset group. Long-lived assets located in a close geographic area are grouped together for purposes of impairment testing when, after considering revenue and cost interdependencies, circumstances indicate the assets are used together to produce future cash flows. The Company's asset groups generally consist of the assets and applicable liabilities of one or more mines and preparation plants and associated coal reserves for which cash flows are largely independent of cash flows of other mines, preparation plants, and associated coal reserves. If the carrying amount of an asset or asset group exceeds its estimated future cash flows, the potential impairment is equal to the amount by which the carrying amount of the asset or asset group exceeds the fair value of the asset or asset group. The Company estimates the fair value of an asset group generally using discounted cash flow analysis based on estimates of future sales volumes, coal prices, production costs, and a risk-adjusted cost of capital.

These estimates generally constitute unobservable Level 3 inputs under the fair value hierarchy. The amount of impairment, if any, is allocated to the long-lived assets on a pro-rata basis, except that the carrying value of the individual long-lived assets are not reduced below their estimated fair value. Refer to Note 8 for further information.

Asset Retirement Obligations

Minimum standards for mine reclamation have been established by various regulatory agencies and dictate the reclamation requirements at the Company's operations. The Company's asset retirement obligations consist principally of costs to reclaim acreage disturbed at surface operations and estimated costs to reclaim support acreage, treat mine water discharge, and perform other related functions at underground mines. The Company records these reclamation obligations at fair value in the period in which the legal obligation associated with the retirement of the long-lived asset is incurred. Changes to the liability at operations that are not currently being reclaimed are offset by increasing or decreasing the carrying amount of the related long-lived asset. Changes to the liability at operations that are currently being reclaimed are recorded to depreciation, depletion, and amortization. Over time, the liability is accreted and any capitalized cost is depreciated or depleted over the useful life of the related asset. To settle the liability, the obligation is paid, and any difference between the liability and the amount of cash paid is recorded within depreciation, depletion and amortization within the Consolidated Statements of Operations at the time the reclamation work is completed. The Company annually reviews its estimated future cash flows for its asset retirement obligations. Refer to Note 16 for further information.

Income Taxes

The Company recognizes deferred tax assets and liabilities using enacted tax rates for the effect of temporary differences between the book and tax bases of recorded assets and liabilities. Deferred tax assets are reduced by a valuation allowance if it is more likely than not that some portion or all of the deferred tax assets will not be realized. In evaluating its ability to recover deferred tax assets within the jurisdiction in which they arise, the Company considers all available positive and negative evidence, including the expected reversals of deferred tax liabilities, projected future taxable income, taxable income available via carryback to prior years, tax planning strategies, and results of recent operations. The Company assesses the realizability of its deferred tax assets, including scheduling the reversal of its deferred tax assets and liabilities, to determine the amount of valuation allowance needed. Scheduling the reversal of deferred tax asset and liability balances requires judgment and estimation. The Company believes the deferred tax liabilities relied upon as future taxable income in its assessment will reverse in the same period and jurisdiction and are of the same character as the temporary differences giving rise to the deferred tax assets that will be realized. Refer to Note 18 for further information.

Deferred Financing Costs

The costs to obtain new debt financing or amend existing financing agreements are generally deferred and amortized to interest expense over the life of the related indebtedness or credit facility using the effective interest method. Unamortized deferred financing costs are presented in the Consolidated Balance Sheets as a direct deduction from the carrying amount of the debt liability, consistent with debt discounts or premiums. Unamortized deferred financing costs associated with undrawn credit facilities are included in the Consolidated Balance Sheets within other non-current assets.

Revenue Recognition

In accordance with ASC 606 Revenue from Contracts with Customers ("ASC 606"), the Company measures revenue based on the consideration specified in a contract with a customer and recognizes revenue as a result of satisfying its promise to transfer goods or services in a contract with a customer using the following general revenue recognition five-step model: (1) identify the contract; (2) identify performance obligations; (3) determine transaction price; (4) allocate transaction price; and (5) recognize revenue. Freight and handling costs paid to third-party carriers and invoiced to coal customers are recorded as freight and handling costs and freight and handling fulfillment revenues within cost of coal sales and coal revenues, respectively. Refer to Note 4 for further information.

Workers' Compensation and Pneumoconiosis (Black Lung) Benefits

Workers' Compensation

As of December 31, 2021, the Company's subsidiaries generally utilize high-deductible insurance programs for workers' compensation claims at its operations with the exception of certain subsidiaries in which the Company is a qualified self-insurer

for workers' compensation obligations. The liabilities for workers' compensation claims are estimates of the ultimate losses incurred based on the Company's experience and include a provision for incurred but not reported losses. Adjustments to the probable ultimate liabilities are made annually based on an actuarial study and adjustments to the liability are recorded based on the results of this study. These short-term and long-term obligations are included in the Consolidated Balance Sheets within accrued expenses and other current liabilities and workers' compensation and black lung obligations, respectively, with the related expected insurance receivables within prepaid expenses and other current assets and other non-current assets. As of December 31, 2021 and 2020, the workers' compensation liability was net of a discount of $23,442 and $24,061, respectively, related to fair value adjustments associated with acquisition accounting. Refer to Note 19 for further information.

Black Lung Benefits

The Company is required by federal and state statutes to provide benefits to employees for awards related to black lung. As of December 31, 2021, certain of the Company's subsidiaries are insured for black lung obligations by a third-party insurance provider and certain subsidiaries are self-insured for state black lung obligations. Certain other subsidiaries are self-insured for federal black lung benefits and may fund benefit payments through a Section 501(c)(21) tax-exempt trust fund. Charges are made to operations for black lung claims, as determined by an independent actuary at the present value of the actuarially computed liability for such benefits over the employee's applicable term of service. The Company recognizes in its Consolidated Balance sheets the amount of the Company's unfunded Accumulated Benefit Obligation ("ABO") at the end of the year. The actuarial gains and losses recognized in accumulated other comprehensive income (loss) are amortized into components of net periodic benefit cost over the expected lifetime of active participants (the Company does not use a corridor method). These short-term and long-term obligations are included in the Consolidated Balance Sheets within accrued expenses and other current liabilities and workers' compensation and black lung obligations, respectively. Refer to Note 19 for further information.

Pension

The Company is required to recognize the overfunded or underfunded status of a defined benefit pension plan as an asset or liability in its Consolidated Balance Sheets and to recognize changes in that funded status in the year in which the changes occur through other comprehensive (loss) income. The actuarial gains and losses recognized in accumulated other comprehensive income (loss) are amortized into components of net periodic benefit cost over the average future lifetime of participants expected to have benefits (the Company does not use a corridor method). The Company is required to measure plan assets and benefit obligations as of the date of the Company's fiscal year-end Consolidated Balance Sheet and provide the required disclosures as of the end of each fiscal year. Refer to Note 19 for information.

Postretirement Life Insurance Benefits

As part of the Alpha Natural Resources, Inc. bankruptcy reorganization plan and the Retiree Committee Settlement Agreement, the Company assumed the liability for life insurance benefits for certain disabled and non-union retired employees. Provisions are made for estimated benefits based on annual evaluations prepared by independent actuaries. Adjustments to the probable ultimate liabilities are made annually based on an actuarial study and adjustments to the liability are recorded based on the results of this study. These obligations are included in the Consolidated Balance Sheets as Accrued expenses and other current liabilities and Other non-current liabilities. Refer to Note 19 for further information.

Net Income (Loss) per Share

Basic net income (loss) per share is computed by dividing net income (loss) by the weighted-average number of outstanding common shares for the period. Diluted (loss) earnings per share reflects the potential dilution that could occur if instruments that may require the issuance of common shares in the future were settled and the underlying common shares were issued. Diluted (loss) earnings per share is computed by increasing the weighted-average number of outstanding common shares computed in basic earnings (loss) per share to include the additional common shares that would be outstanding after issuance and adjusting net income (loss) for changes that would result from the issuance. Only those securities that are dilutive are included in the calculation. In periods of loss, the number of shares used to calculate diluted earnings is the same as basic earnings per share. Refer to Note 6 for further information.

Stock-Based Compensation

The Company recognizes expense for stock-based compensation awards based on their grant-date fair value. The expense is recorded over the respective service period of the underlying award. Liability classified stock-based compensation awards are remeasured each reporting period at fair value until the award is settled. The Company recognizes forfeitures of stock-based compensation awards as they occur. Refer to Note 20 for further information.

Warrants

On July 26, 2016 (the "Initial Issue Date"), the Company issued 810,811 warrants, which are classified as equity instruments, each with an initial exercise price, as defined in the Series A Warrants Agreement (the "Warrants Agreement"), of $55.93 per share of common stock and exercisable for one share of the Alpha's common stock, par value $0.01 per share. Pursuant to the Warrants Agreement, the warrants are exercisable for cash or on a cashless basis at any time from the Initial Issue Date until July 26, 2023, and no fractional shares shall be issued upon warrant exercises. The exercise price and the warrant share number will be adjusted in respect of certain dilutive events with respect to the common stock (namely, dividends or distributions on the common stock, share splits and combinations, above-market tender offers for common stock by the Company or a subsidiary thereof, and discounted issuances of common stock or rights or options to purchase common stock or securities convertible or exchangeable into common stock). Refer to Note 25 for subsequent event disclosures related to the Company's share repurchase program. Additionally, in the case of any reorganization (i.e., a consolidation, merger, or sale of all or substantially all of the consolidated assets of Alpha) pursuant to which the common stock is converted into cash, securities or other property, the warrants would become exercisable for such property. As of December 31, 2021 and 2020, the exercise price was $46.911 per share and the warrant share number was equal to 1.15, as adjusted in respect to certain dilutive events with respect to the common stock during 2017 and 2018.

As of December 31, 2021, of the 810,811 warrants that were originally issued, 801,246 remained outstanding, with a total of 921,433 shares underlying the un-exercised warrants. For the year ended December 31, 2021, the Company issued 143 shares of common stock resulting from exercises of its Series A Warrants and, pursuant to the terms of the Warrants Agreement, withheld 17 of the issued shares in satisfaction of the warrant exercise price, which were subsequently reclassified as treasury stock. As of December 31, 2020, of the 810,811 warrants that were originally issued, 801,370 remained outstanding, with a total of 921,576 shares underlying the un-exercised warrants. For the year ended December 31, 2020, there were no warrant exercises.

Equity Method Investments

Investments in unconsolidated affiliates that the Company has the ability to exercise significant influence over, but not control, are accounted for under the equity method of accounting. Under the equity method of accounting, the Company records its proportionate share of the entity's net income or loss at each reporting period in the Consolidated Statements of Operations in other (expense) income, with a corresponding entry to increase or decrease the carrying value of the investment. The carrying value of the Company's equity method investments was $20,460 and $18,383 as of December 31, 2021 and 2020, respectively.

Recently Adopted Accounting Guidance

Business Combinations: In October 2021, the Financial Accounting Standards Board (the "FASB") issued Accounting Standards Update ("ASU") 2021-08, *Business Combinations (Topic 805), Accounting for Contract Assets and Contract Liabilities from Contracts with Customers* ("ASU 2021-08"). This update requires an acquirer in a business combination to recognize and measure contract assets and contract liabilities from acquired contracts with customers using the revenue recognition guidance in ASC 606. This creates an exception to the general recognition and measurement principle in ASC 805, Business Combinations. The amendments in this update are intended to improve the accounting for acquired revenue contracts with customers in a business combination by addressing diversity in practice and certain inconsistencies. The update is effective for fiscal years beginning after December 15, 2022 and interim periods within those fiscal years for public business entities, with early adoption permitted. The Company adopted ASU 2021-08 during the fourth quarter of 2021. The adoption of this ASU did not have a material impact on the Company's Consolidated Financial Statements and related disclosures.

Presentation of Financial Statements: In August 2021, the FASB issued ASU 2021-06, *Presentation of Financial Statements (Topic 205), Financial Services—Depository and Lending (Topic 942), and Financial Services—Investment Companies (Topic 946)* ("ASU 2021-06"). This update amends certain SEC paragraphs from the Codification in response to the issuance of SEC Final Rule Nos. 33-10786, Amendments to Financial Disclosures About Acquired and Disposed Businesses, and 33-10835, Update of Statistical Disclosures for Bank and Savings and Loan Registrants. For all entities, the update is effective immediately. The Company adopted ASU 2021-06 during the third quarter of 2021. The adoption of this ASU did not

have a material impact on the Company's Consolidated Financial Statements and related disclosures.

Leases: In July 2021, the FASB issued ASU 2021-05, *Leases (Topic 842) Lessors—Certain Leases with Variable Lease Payments* ("ASU 2021-05"). The amendments in this update affect lessors with lease contracts that (1) have variable lease payments that do not depend on a reference index or a rate ("variable payments") and (2) would have resulted in the recognition of a selling loss at lease commencement if classified as sales-type or direct financing. The amendments in this update address stakeholders' concerns by amending the lease classification requirements for lessors to align them with practice under Topic 840 by requiring a lessor to classify a lease with variable payments as an operating lease on the commencement date of the lease if specified criteria are met. The amendments are effective for fiscal years beginning after December 15, 2021, for all entities, and interim periods within those fiscal years for public business entities with early application permitted. The Company adopted ASU 2021-05 during the third quarter of 2021. The adoption of this ASU did not have a material impact on the Company's Consolidated Financial Statements and related disclosures.

Certain Modifications or Exchanges of Freestanding Equity-Classified Written Call Options: In May 2021, the FASB issued ASU 2021-04, *Earnings Per Share (Topic 260), Debt—Modifications and Extinguishments (Subtopic 470-50), Compensation—Stock Compensation (Topic 718), and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40)* ("ASU 2021-04"). The amendments in this update provide final guidance that requires issuers to account for modifications or exchanges of freestanding equity-classified written call options, such as the Company's outstanding Series A warrants, that remain equity classified after the modification or exchange based on the economic substance of the modification or exchange. This ASU addresses the diversity in practice in issuers' accounting by providing a principles-based framework to determine whether an issuer should recognize the modification or exchange as 1) an adjustment to equity and, if so, the related earnings per share effects, if any, or 2) an expense and, if so, the manner and pattern of recognition. For all entities, the standard is effective for fiscal years beginning after December 15, 2021, with early adoption permitted. The Company adopted ASU 2021-04 during the second quarter of 2021. The adoption of this ASU did not have a material impact on the Company's Consolidated Financial Statements and related disclosures.

Reference Rate Reform: In January 2021, the FASB issued ASU 2021-01, *Reference Rate Reform (Topic 848)* ("ASU 2021-01"). The amendments in this update clarify that certain optional expedients and exceptions in Topic 848 for contract modifications and hedge accounting apply to derivatives that are affected by the discounting transition. For all entities, the standard is effective immediately. The Company adopted ASU 2021-01 during the first quarter of 2021. The adoption of this ASU did not have a material impact on the Company's Consolidated Financial Statements and related disclosures.

Convertible Debt and Contracts in Entity's Own Equity: In August 2020, the FASB issued ASU 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)* ("ASU 2020-06"). The amendments in this update simplify the accounting for certain financial instruments with characteristics of liabilities and equity, including convertible instruments and contracts in an entity's own equity, such as the Company's outstanding Series A warrants. For public business entities, the standard is effective for fiscal years beginning after December 15, 2021, with early adoption permitted. The Company adopted ASU 2020-06 during the first quarter of 2021. The adoption of this ASU did not have a material impact on the Company's Consolidated Financial Statements and related disclosures.

Credit Losses: In June 2016, the FASB issued ASU 2016-13, *Credit Losses* ("ASU 2016-13"). ASU 2016-13, along with related amendments and improvements issued in 2018 and 2019, replaces the previous incurred loss impairment methodology in U.S. GAAP with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable supportable information to inform credit loss estimates for financial instruments that are in the scope of this update, including trade accounts receivable. The Company adopted ASU 2016-13 during the first quarter of 2020. The adoption of this ASU did not have a material impact on the Company's Consolidated Financial Statements and related disclosures and resulted in a cumulative-effect adjustment to retained earnings of $440 in the Consolidated Balance Sheet as of January 1, 2020.

Recent Accounting Guidance Issued Not Yet Effective

Government Assistance: In November 2021, the FASB issued ASU 2021-10*, Disclosures by Business Entities about Government Assistance* ("ASU 2021-10"). This update requires business entities to make annual disclosures about transactions with a government accounted for by analogizing to a grant or contribution accounting model. The required annual disclosures include the nature of the transaction, the related accounting policy, the financial statement line items affected and the amounts reflected in the current period financial statements, and any significant terms and conditions. The amendments are effective for fiscal years beginning after December 15, 2021, for all entities, with early application permitted. The adoption of this ASU is not expected to have a material impact on the Company's Consolidated Financial Statements and related disclosures.

(3) Discontinued Operations

Discontinued operations consisted of activity related to the Company's former NAPP operations.

Former NAPP Operations

On November 11, 2020, the Company entered into a unit purchase agreement (the "UPA") to sell its thermal coal mining operations located in Pennsylvania consisting primarily of its Cumberland mining complex and related property ("Cumberland Transaction") to a third party purchaser Iron Senergy Holdings, LLC ("Iron Senergy"). The Cumberland Transaction closed on December 10, 2020. In accordance with terms of the UPA, the Company transferred its equity interests in certain subsidiaries (Cumberland Contura, LLC, Contura Coal Resources, LLC, Contura Pennsylvania Land, LLC, Emerald Contura, LLC, and Contura Pennsylvania Terminal, LLC) along with total consideration of $49,987 to Iron Senergy. Pursuant to the terms of the UPA, the Company also retained certain assets and liabilities associated with its former NAPP operations. The mining permits associated with the Cumberland mining operations were obtained by Iron Senergy at closing. During the second quarter of 2021, nearly all of the Company's remaining surety bonds were released and Iron Senergy's replacement bonds were accepted through the administrative process with only $30 remaining as of December 31, 2021, which are expected to be released in the short-term.

The following table presents the details of the Cumberland Transaction:

	Year Ended December 31, 2020
Cash	$ 19,987
Surety bonding collateral	30,000
Total consideration	49,987
Transaction costs	2,205
Carrying value of assets and liabilities [1]	$ (16,079)
Loss on sale	$ 36,113

[1] Assets and liabilities were primarily comprised of property, plant and equipment, net of $32,872, deferred longwall move expenses of $15,173, and coal and supplies inventory of $5,112 and asset retirement obligations of $39,573, severance of $17,143, black lung obligations of $8,290, and subsidence liability of $3,559.

In connection with the UPA, the Company entered into certain agreements with Iron Senergy under which Iron Senergy will sell to the Company all of the coal that the Company is obligated to sell to customers under Cumberland coal supply agreements ("Cumberland CSAs") which existed as of the transaction closing date but did not transfer to Iron Senergy at closing (each, a "Cumberland Back-to-Back Coal Supply Agreement"). Each Cumberland Back-to-Back Coal Supply Agreement has economic terms identical to, but offsetting, the related Cumberland CSA. If a Cumberland customer subsequently consents to assign a Cumberland CSA to Iron Senergy after closing, the related Cumberland CSA will immediately and automatically transfer to Iron Senergy and the related Cumberland Back-to-Back Coal Supply Agreements executed by the parties shall thereupon terminate as set forth therein. As the Company does not control the purchased coal prior to customer delivery, the Company will record coal purchases and sales under the related agreements on a net basis. Per terms of the Cumberland Back-to-Back Coal Supply Agreements, the Company is required to purchase and sell 2,014 tons of coal in 2022 totaling $77,844. For the years ended December 31, 2021 and 2020, the Company purchased and sold 2,591 and 104 tons, respectively, totaling $100,338 and $3,997, respectively, under the Cumberland Back-to-Back Coal Supply Agreements. The Cumberland Back-to-Back Coal Supply Agreements are scheduled to be fully performed by December 31, 2022.

Major Financial Statement Components of Discontinued Operations

The income from discontinued operations before income taxes for the year ended December 31, 2021 was $1,660. The major components of net loss from discontinued operations before income taxes in the Consolidated Statements of Operations for the year ended December 31, 2020 are as follows:

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

	Year Ended December 31, 2020 [1]
Revenues:	
Total revenues	$ 235,509
Costs and expenses:	
Cost of coal sales (exclusive of items shown separately below)	215,390
Depreciation, depletion and amortization	11,570
Accretion on asset retirement obligations	4,154
Asset impairment and restructuring [2]	172,640
Selling, general and administrative expenses [3]	1,623
Other income	(926)
Other non-major expense items, net	374
Loss on sale	36,113
Loss from discontinued operations before income taxes	$ (205,429)

[1] Includes minor residual activity related to the Company's former PRB operations.
[2] Refer to Note 8.
[3] Represents professional and legal fees.

Refer to the Consolidated Statements of Operations and Note 6 for net income (loss) per share information related to discontinued operations.

The major components of assets and liabilities that are classified as discontinued operations in the Consolidated Balance Sheets are as follows:

	December 31,	
	2021	2020
Assets:		
Trade accounts receivable, net of allowance for doubtful accounts	$ —	$ 7,504
Prepaid expenses and other current assets	$ 462	$ 3,431
Other non-current assets [1]	$ 8,526	$ 9,473
Liabilities:		
Trade accounts payable, accrued expenses and other current liabilities	$ 5,838	$ 12,306
Workers' compensation and black lung obligations, non-current	$ 23,683	$ 27,799
Other non-current liabilities	$ —	$ 1,291

[1] Primarily comprised of workers' compensation insurance receivable and long-term restricted investments collateralizing workers' compensation obligations.

The major components of cash flows related to discontinued operations were as follows:

	Year Ended December 31,
	2020
Depreciation, depletion and amortization	$ 11,570
Capital expenditures	$ 34,411
Other significant operating non-cash items related to discontinued operations:	
Accretion on asset retirement obligations	$ 4,154
Asset impairment and restructuring	$ 172,640

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

(4) Revenue

Disaggregation of Revenue from Contracts with Customers

ASC 606 requires that entities disclose disaggregated revenue information in categories (such as type of good or service, geography, market, type of contract, etc.) that depict how the nature, amount, timing, and uncertainty of revenue and cash flow are affected by economic factors. ASC 606 explains that the extent to which an entity's revenue is disaggregated depends on the facts and circumstances that pertain to the entity's contracts with customers and that some entities may need to use more than one type of category to meet the objective for disaggregating revenue.

The Company earns revenues primarily through the sale of coal produced at Company operations and coal purchased from third parties. The Company extracts, processes and markets met and thermal coal from deep and surface mines for sale to steel and coke producers, industrial customers, and electric utilities. The Company conducts mining operations only in the United States with mines in Central Appalachia. The Company has one reportable segment: Met. In addition to the one reportable segment, the All Other category includes general corporate overhead and corporate assets and liabilities, the former CAPP - Thermal operations, and the elimination of certain intercompany activity, as well as expenses associated with certain idled/closed mines. Refer to Note 24 for further segment information.

The Company has disaggregated revenue between met coal and thermal coal and export and domestic revenues which depicts the pricing and contract differences between the two. Export revenue generally is derived by spot or short term contracts with pricing determined at the time of shipment or based on a market index; whereas domestic revenue is characterized by contracts that typically have a term of one year or longer and typically the pricing is fixed. The following tables disaggregate the Company's coal revenues by product category and by market to depict how the nature, amount, timing, and uncertainty of the Company's coal revenues and cash flows are affected by economic factors:

	Year Ended December 31, 2021		
	Met Coal	Thermal Coal	Total
Export coal revenues	$ 1,675,147	$ 30,879	$ 1,706,026
Domestic coal revenues	396,160	150,411	546,571
Total coal revenues	$ 2,071,307	$ 181,290	$ 2,252,597

	Year Ended December 31, 2020		
	Met Coal	Thermal Coal	Total
Export coal revenues	$ 870,121	$ 27,904	$ 898,025
Domestic coal revenues	362,654	152,445	515,099
Total coal revenues	$ 1,232,775	$ 180,349	$ 1,413,124

Performance Obligations

The Company considers each individual transfer of coal on a per shipment basis to the customer a performance obligation. The pricing terms of the Company's contracts with customers include fixed pricing, variable pricing, or a combination of both fixed and variable pricing. All the Company's revenue derived from contracts with customers is recognized at a point in time. The following table includes estimated revenue expected to be recognized in the future related to performance obligations that are unsatisfied as of December 31, 2021.

	2022	2023	2024	2025	2026	Total
Estimated coal revenues [1]	$ 65,768	$ 14,199	$ —	$ —	$ —	$ 79,967

[1] Amounts only include estimated coal revenues associated with contracts with customers with fixed pricing with original expected duration of more than one year. The Company has elected not to disclose the aggregate amount of the transaction price allocated to the performance obligations that are unsatisfied (or partially unsatisfied) as of the end of the reporting period for performance obligations with either of the following conditions: 1) the remaining performance obligation is part of a contract that has an original expected duration of one year or less; or 2) the remaining performance obligation has variable consideration that is allocated entirely to a wholly unsatisfied performance obligation.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

(5) Accumulated Other Comprehensive Loss

The following tables summarize the changes to accumulated other comprehensive loss during the years ended December 31, 2021 and 2020:

	Balance January 1, 2021	Other comprehensive income before reclassifications	Amounts reclassified from accumulated other comprehensive loss	Balance December 31, 2021
Employee benefit costs	$ (111,985)	$ 47,461	$ 6,021	$ (58,503)

	Balance January 1, 2020	Other comprehensive loss before reclassifications	Amounts reclassified from accumulated other comprehensive loss	Balance December 31, 2020
Employee benefit costs	$ (58,616)	$ (60,647)	$ 7,278	$ (111,985)

The following table summarizes the amounts reclassified from accumulated other comprehensive loss and the Consolidated Statements of Operations line items affected by the reclassification during the years ended December 31, 2021 and 2020:

	Amounts reclassified from accumulated other comprehensive loss Year Ended December 31,		
Details about accumulated other comprehensive loss components	**2021**	**2020**	**Affected line item in the Consolidated Statements of Operations**
Employee benefit costs:			
Amortization of actuarial loss [1]	$ 5,653	$ 3,929	Miscellaneous income (loss), net
Settlement [1]	368	3,349	Miscellaneous income (loss), net
Total before income tax	$ 6,021	$ 7,278	
Income tax	—	—	Income tax (expense) benefit
Total, net of income tax	$ 6,021	$ 7,278	

[1] These accumulated other comprehensive loss components are included in the computation of net periodic benefit costs for certain employee benefit plans. Refer to Note 19.

(6) Net Income (Loss) per Share

The number of shares used to calculate basic net income (loss) per common share is based on the weighted average number of the Company's outstanding common shares during the respective period. The number of shares used to calculate diluted net income (loss) per common share is based on the number of common shares used to calculate basic net income (loss) per common share plus the dilutive effect of stock options and other stock-based instruments held by the Company's employees and directors during the period, and the Company's outstanding Series A warrants. The dilutive effect of outstanding stock-based instruments is determined by application of the treasury stock method. The warrants become dilutive for diluted net income (loss) per common share calculations when the market price of the Company's common stock exceeds the exercise price. As discussed below, dilutive securities are not included in the computation of diluted net loss per common share for the year ended December 31, 2020 as the impact would be anti-dilutive.

For the years ended December 31, 2021 and 2020, 717,992 and 1,317,351 warrants, stock options, and other stock-based instruments, respectively, were excluded from the computation of dilutive net income (loss) per common share because they would have been anti-dilutive. When applying the treasury stock method, anti-dilution generally occurs when the exercise prices or unrecognized compensation cost per share are higher than the Company's average stock price during an applicable period.

Anti-dilution also occurs in periods of a net loss, and the dilutive impact of all share-based compensation awards are excluded. For the year ended December 31, 2020, the weighted average share impact of stock options and other stock-based instruments that were excluded from the calculation of diluted shares due to the Company incurring a net loss for the period was 142,250.

The following table presents the net income (loss) per common share for the years ended December 31, 2021 and 2020:

	Year Ended December 31,	
	2021	2020
Net income (loss)		
Income (loss) from continuing operations	$ 286,929	$ (241,470)
Income (loss) from discontinued operations	1,861	(205,429)
Net income (loss)	$ 288,790	$ (446,899)
Basic		
Weighted average common shares outstanding - basic	18,441,175	18,298,362
Basic income (loss) per common share:		
Income (loss) from continuing operations	$ 15.56	$ (13.20)
Income (loss) from discontinued operations	0.10	(11.22)
Net income (loss)	$ 15.66	$ (24.42)
Diluted		
Weighted average common shares outstanding - basic	18,441,175	18,298,362
Diluted effect of warrants	35,574	—
Diluted effect of stock options	1,753	—
Diluted effect of other stock-based instruments	393,180	—
Weighted average common shares outstanding - diluted	18,871,682	18,298,362
Diluted income (loss) per common share:		
Income (loss) from continuing operations	$ 15.20	$ (13.20)
Income (loss) from discontinued operations	0.10	(11.22)
Net income (loss)	$ 15.30	$ (24.42)

(7) Inventories, net

Inventories, net consisted of the following:

	December 31,	
	2021	2020
Raw coal	$ 20,347	$ 15,084
Saleable coal	81,240	69,262
Materials, supplies and other, net [(1)]	27,795	23,705
Total inventories, net	$ 129,382	$ 108,051

[(1)] Includes an increase in allowance for obsolete material and supplies inventory of $807 recorded as restructuring expense during the year ended December 31, 2020 (refer to Note 8).

(8) Asset Impairment and Restructuring

Long-lived Asset Impairment for the Year Ended December 31, 2021

During the year ended December 31, 2021, long-lived asset impairment of $60 was recorded in the All Other category to reduce the carrying value of property, plant, and equipment, net, due to capital spending during the period at previously impaired locations requiring the impairment of certain additional assets not considered recoverable.

Long-lived Asset Impairment for the Year Ended December 31, 2020

During the year ended December 31, 2020, weakening coal market conditions due in part to the impact of the global COVID-19 Pandemic, as well as the following events resulted in quarterly impairment testing:

- During the second quarter of 2020, the Company announced that it would take certain strategic actions with respect to two of its thermal coal mining complexes in an effort to strengthen its financial performance and improve forecasted liquidity. The Company announced that an underground mine and preparation plant located in West Virginia would be idled during the third quarter of 2020. In addition, the Company decided not to move forward with the construction of a new refuse impoundment at its Cumberland mine in Pennsylvania and would therefore no longer spend the significant capital required in connection with the project. As a result, the Cumberland mine was expected to cease production by the end of 2022. On December 10, 2020, the Company sold its Cumberland mining operations. Refer to Note 3 for further details.

- During the fourth quarter of 2020, changes in mine plans and the determination that certain mineral reserves previously forecasted to be mined were no longer considered economic due to poor geologic conditions reduced forecasted cash flows for one Met and one All Other asset group to amounts below those required for full recoverability.

The Company performed long-lived asset impairment tests as of November 30, 2020, August 31, 2020, May 31, 2020, and February 29, 2020. In total, the Company determined that indicators of impairment with respect to five long-lived asset groups within its Met reporting segment, three long-lived asset groups within its All Other category, and one long-lived asset group within discontinued operations existed during the year ended December 31, 2020.

The following tables present the details of the long-lived asset impairments during the year ended December 31, 2020:

	Year Ended December 31, 2020				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year Ended
Continuing operations:					
Met	$ 32,951	$ —	$ —	$ 13,366	$ 46,317
All Other	758	17,390	219	16,270	34,637
Total from continuing operations	$ 33,709	$ 17,390	$ 219	$ 29,636	$ 80,954
Discontinued operations:	$ —	$ 144,348	$ 3,297	$ —	$ 147,645
Total long-lived asset impairment:	$ 33,709	$ 161,738	$ 3,516	$ 29,636	$ 228,599

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

	Year Ended December 31, 2020				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year Ended
Continuing operations:					
Mineral rights, net	$ 21,825	$ 2,241	$ —	$ 17,513	$ 41,579
Property, plant, and equipment, net	6,066	6,496	219	5,450	18,231
Acquired mine permits, net	5,818	8,653	—	6,673	21,144
Total from continuing operations	$ 33,709	$ 17,390	$ 219	$ 29,636	$ 80,954
Discontinued operations:					
Mineral rights, net	$ —	$ 16,364	$ —	$ —	$ 16,364
Property, plant, and equipment, net	—	127,984	3,297	—	131,281
Total from discontinued operations	$ —	$ 144,348	$ 3,297	$ —	$ 147,645
Total long-lived asset impairment:					
Mineral rights, net	$ 21,825	$ 18,605	$ —	$ 17,513	$ 57,943
Property, plant, and equipment, net	6,066	134,480	3,516	5,450	149,512
Acquired mine permits, net	5,818	8,653	—	6,673	21,144
Total long-lived asset impairment	$ 33,709	$ 161,738	$ 3,516	$ 29,636	$ 228,599

Restructuring

As a result of the strategic actions announced in the second quarter of 2020 and subsequent changes to severance and employee-related benefits, the Company recorded restructuring expense of ($621) in the All Other category during the year ended December 31, 2021.

As a result of the strategic actions discussed above, the Company recorded restructuring expense during the year ended December 31, 2020 as follows:

	Year Ended December 31, 2020		
	Total Restructuring	Continuing Operations [3]	Discontinued Operations
Severance and employee-related benefits [1]	$ 26,037	$ 2,117	$ 23,920
Other costs [2]	1,882	807	1,075
Total restructuring expense	$ 27,919	$ 2,924	$ 24,995

[1] Severance and employee-related benefits were considered probable and estimable based on provisions of contractual agreements and existing employee benefit plans.
[2] Includes accelerated amortization of deferred longwall move expenses of $668, allowance for advanced mining royalties of $407, and allowance for obsolete materials and supplies inventory of $807.
[3] Total restructuring expense from continuing operations of $2,924 was recorded within the All Other category and affected Accrued expenses and other current liabilities, Other non-current liabilities, Inventories, net, and Other non-current assets.

(9) Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consisted of the following:

	December 31,	
	2021	2020
Prepaid freight	$ 19,671	$ 8,515
Notes and other receivables	4,161	13,245
Short-term restricted cash	11,977	9,311
Prepaid insurance	8,525	6,510
Refundable income taxes	—	64,565
Prepaid bond premium	1,649	2,576
Other prepaid expenses	1,707	1,530
Total prepaid expenses and other current assets	$ 47,690	$ 106,252

(10) Property, Plant, and Equipment, net

Property, plant, and equipment, net, consisted of the following:

	December 31,	
	2021	2020
Plant and mining equipment	$ 642,874	$ 603,463
Mine development	115,357	96,008
Land	26,389	26,606
Office equipment, software and other	1,462	1,379
Construction in progress	19,992	18,587
Total property, equipment and mine development costs	$ 806,074	$ 746,043
Less accumulated depreciation, depletion and amortization	(443,856)	(382,423)
Total property, plant, and equipment, net	$ 362,218	$ 363,620

Included in plant and mining equipment are assets under financing leases totaling $8,611 and $7,907 with accumulated depreciation of $5,624 and $3,645 as of December 31, 2021 and December 31, 2020, respectively.

Depreciation and amortization expense associated with property, plant, equipment, and non-mineral asset retirement obligation assets, net, was $86,506 and $153,631 for the years ended December 31, 2021 and 2020, respectively.

Depreciation expense for the years ended December 31, 2021 and 2020 includes a credit of ($307) and ($3,689), respectively, related to revisions to asset retirement obligations. Refer to Note 16 for further disclosures related to asset retirement obligations.

During the years ended December 31, 2021 and 2020, the Company recorded long-lived asset impairments which reduced the carrying value of property, plant, and equipment, net, by $60 and $18,231, respectively. Refer to Note 8 for further information.

As of December 31, 2021, the Company had commitments to purchase approximately $18,497 of new equipment, expected to be acquired at various dates in 2022.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

(11) Other Non-Current Assets

Other non-current assets consisted of the following:

	December 31,	
	2021	2020
Advanced mining royalties	$ 10,788	$ 13,132
Long-term deposits	1,371	28,200
Long-term restricted investments	28,443	23,768
Equity method investments	20,460	18,383
Workers' compensation receivables	45,335	48,320
Other	24,660	17,579
Total other non-current assets	$ 131,057	$ 149,382

(12) Leases

The Company's lease population consists primarily of vehicle and heavy equipment leases and leases for office equipment. The Company's building and land leases relate to corporate office space and certain site offices. The Company determines whether a contract contains a lease based on whether the Company obtains the right to control the use of specifically identifiable property, plant, and equipment for a period of time in exchange for consideration. For the years ended December 31, 2021 and 2020, the Company identified no instances requiring significant judgment in determining whether any contracts entered into during the period were or were not leases. Additionally, the Company had no material sublease agreements within the scope of ASC 842 or lease agreements for which the Company was the lessor for the years ended December 31, 2021 and 2020.

Renewal options in the Company's lease population primarily relate to month-to-month extensions on vehicle leases and are immaterial both individually and in the aggregate. The Company includes renewal options that are reasonably certain to be exercised in the measurement of lease liabilities. As of December 31, 2021, the Company does not intend to exercise any termination options on existing leases.

As of December 31, 2021 and 2020, the Company had the following right-of-use assets and lease liabilities within the Company's Consolidated Balance Sheets:

		December 31, 2021	December 31, 2020
Assets	**Balance Sheet Classification**		
Financing lease assets	Property, plant, and equipment, net	$ 2,987	$ 4,262
Operating lease right-of-use assets	Other non-current assets	5,003	5,671
Total lease assets		$ 7,990	$ 9,933
Liabilities	**Balance Sheet Classification**		
Financing lease liabilities - current	Current portion of long-term debt	$ 1,878	$ 2,014
Operating lease liabilities - current	Accrued expenses and other current liabilities	547	595
Financing lease liabilities - long-term	Long-term debt	791	1,996
Operating lease liabilities - long-term	Other non-current liabilities	4,456	5,076
Total lease liabilities		$ 7,672	$ 9,681

Total lease costs and other lease information for the years ended December 31, 2021 and 2020 included the following:

	Year Ended December 31, 2021	Year Ended December 31, 2020
Lease cost [1]		
Financing lease cost:		
Amortization of leased assets	$ 2,061	$ 3,238
Interest on lease liabilities	245	358
Operating lease cost	1,383	2,105
Short-term lease cost	786	1,518
Total lease cost	$ 4,475	$ 7,219

[1] The Company had no variable lease costs or sublease income for the years ended December 31, 2021 and 2020.

	Year Ended December 31,	
	2021	2020
Other information		
Cash paid for amounts included in the measurement of lease liabilities	$ 4,478	$ 7,157
Operating cash flows from financing leases	$ 245	$ 358
Operating cash flows from operating leases	$ 2,169	$ 3,623
Financing cash flows from financing leases	$ 2,064	$ 3,176
Right-of-use assets obtained in exchange for new financing lease liabilities	$ 703	$ 221
Right-of-use assets obtained in exchange for new operating lease liabilities	$ 275	$ (12)
Lease Term and Discount Rate		
Weighted-average remaining lease term in years - financing leases	1.75	1.94
Weighted-average remaining lease term in years - operating leases	7.88	8.45
Weighted-average discount rate - financing leases	9.6 %	6.1 %
Weighted-average discount rate - operating leases	11.3 %	11.5 %

The Company has elected to show net instead of gross amounts for right-of-use assets and liabilities within its Consolidated Statements of Cash Flows.

The following table summarizes the maturity of the Company's lease liabilities on an undiscounted cash flow basis and a reconciliation to the lease liabilities recognized in the Company's Consolidated Balance Sheets as of December 31, 2021:

	Financing Leases	Operating Leases
Lease cost		
2022	$ 2,072	$ 1,100
2023	522	1,066
2024	259	955
2025	150	897
2026	3	884
Thereafter	—	2,775
Total future minimum lease payments	$ 3,006	$ 7,677
Imputed interest	(337)	(2,674)
Present value of future minimum lease payments	$ 2,669	$ 5,003

As of December 31, 2021, the Company had no leases with future commencement dates that will create significant rights or obligations for the Company.

(13) Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following:

	December 31,	
	2021	2020
Wages and benefits	$ 52,310	$ 40,330
Workers' compensation	10,582	10,355
Black lung	7,235	6,784
Taxes other than income taxes	30,734	21,540
Current portion of asset retirement obligations	32,159	24,990
Accrued interest and fees	14,489	15,902
Deferred revenue	—	13,197
Freight accrual	15,085	2,610
Other	12,013	4,698
Total accrued expenses and other current liabilities	$ 174,607	$ 140,406

(14) Long-Term Debt

Long-term debt consisted of the following:

	December 31,	
	2021	2020
Term Loan Credit Facility - due June 2024	$ 449,435	$ 553,373
ABL Facility - due December 2024	—	3,350
LCC Note Payable	—	27,500
LCC Water Treatment Obligation	—	6,875
Other [1]	5,311	8,475
Debt discount and issuance costs	(6,195)	(17,046)
Total long-term debt	$ 448,551	$ 582,527
Less current portion	(2,989)	(28,830)
Long-term debt, net of current portion	$ 445,562	$ 553,697

[1] Includes financing leases, refer to Note 12 for additional information.

Term Loan Credit Facility - due June 2024

On June 14, 2019, the Company entered into a Credit Agreement with Cantor Fitzgerald Securities, as administrative agent and collateral agent, and the other lenders party thereto (as defined therein) that provides for a senior secured term loan facility in the aggregate principal amount of $561,800 with a maturity date of June 14, 2024 (the "Term Loan Credit Facility"). Principal repayments equal to approximately $1,405 were due each March, June, September and December (commencing with September 30, 2019) with the final principal repayment installment to be paid on the maturity date and in an amount equal to the aggregate principal amount outstanding on such date. The Term Loan Credit Facility bears an interest rate per annum based on the character of the loan (defined as either "Base Rate Loan" or "Eurocurrency Rate Loan"). Each loan type bears interest at a rate per annum comprised of a base rate (as defined) plus an applicable percentage (6.00% for Base Rate Loans and 7.00% for Eurocurrency Rate Loans on or prior to the second anniversary of the Closing Date and 7.00% or 8.00% thereafter (the "Applicable Rate")). The Eurocurrency base rate is subject to a 2.00% floor. Interest accrued on each Base Rate Loan is payable in arrears on the last business day of each March, June, September and December and the maturity date. Interest accrued on each Eurocurrency Rate Loan is payable in arrears on the last day of each interest period as defined therein. As of December 31, 2021, the borrowings made under the Term Loan Credit Facility were comprised of Eurocurrency Rate Loans with an interest rate of 10.00%, calculated as the Eurocurrency rate during the period plus an applicable rate of 8.00%. As of December 31, 2021, the carrying value of the Term Loan Credit Facility was $443,241, all of which was classified as long-term within the

Consolidated Balance Sheets. As of December 31, 2020, the carrying value of the Term Loan Credit Facility was $540,643, with $5,618 classified as current, within the Consolidated Balance Sheets.

During the three months ending September 30, 2021, the Company repurchased and permanently retired, through privately negotiated transactions, $18,724 of outstanding principal borrowings under the Term Loan Credit Facility. These borrowings were repurchased at a discount resulting in an aggregate purchase price of $18,415. As the participating lenders were existing shareholders (related parties) of the Company as of the repurchase date, the Company analyzed various factors regarding each of the transactions and concluded such repurchases were at a reasonable market rate and reflected the terms of an arm's length transaction per the requirements of the Term Loan Credit Facility. Additionally, on December 31, 2021 and September 30, 2021, the Company made voluntary prepayments of $50,000 and $31,000, respectively, of outstanding principal borrowings under the Term Loan Credit Facility. As a result of the prepayments, no further amortization payments under the Term Loan Credit Facility are required prior to maturity.

All obligations under the Term Loan Credit Facility are guaranteed by substantially all of Alpha's direct and indirect subsidiaries. Certain obligations under the Term Loan Facility are secured by a senior lien, subject to certain exceptions (including the ABL Priority Collateral described below), by substantially all of Alpha's assets and the assets of Alpha's subsidiary guarantors ("Term Loan Priority Collateral"), in each case subject to exceptions. The obligations under the Term Loan Credit Facility are also secured by a junior lien, again subject to certain exceptions, against the ABL Priority Collateral. The Term Loan Facility contains negative and affirmative covenants including certain financial covenants that are more flexible than the covenants on the Second Amended and Restated Credit Agreement dated December 6, 2021. The Company was in compliance with all covenants under this agreement as of December 31, 2021.

Second Amended and Restated Asset-Based Revolving Credit Agreement

On December 6, 2021, the Company entered into the Second Amended and Restated Asset-Based Revolving Credit Agreement with Citibank N.A as administrative agent, collateral agent, swingline lender, and L/C issuer and the other lenders party thereto (the "Lenders"), and BMO Harris Bank N.A and Eclipse Business Capital LLC as co-collateral agents. The Second Amended and Restated Asset-Based Revolving Credit Agreement ("New ABL Agreement") amended and restated the Amended and Restated Asset-Based Revolving Credit Agreement dated November 9, 2018, in its entirety, and includes a senior secured asset-based revolving credit facility ("the New ABL Facility"). Under the New ABL Facility, the Company may borrow cash from the Lenders (as defined therein) or cause the L/C Issuers (as defined therein) to issue letters of credit, on a revolving basis, in an aggregate amount of up to $155,000, of which no more than $150,000 may represent outstanding letters of credit ($125,000 on a committed basis and another $25,000 on an uncommitted cash collateralized basis) with a maturity date of December 6, 2024. The New ABL Agreement extended the maturity date of the facility from the previous maturity of April 3, 2022. Under the terms of the New ABL Agreement, letters of credit fees will be calculated at 5.25%, while any future borrowings will bear interest based on the character of the loan (defined as either secured overnight financing rate "SOFR" Loan ("SOFR Loan") or "Base Rate Loan") plus an applicable rate of 4.50% for SOFR Loans and 3.50% for Base Rate Loans. Pursuant to terms of the New ABL Agreement at each notice period, the Company elects the character of the loan, the interest period, and may provide notice of continuation or conversion of the borrowed principal amount with the ability to repay the borrowed principal amount in advance of the maturity date without penalty. As of the date of the refinance and as of December 31, 2021, no borrowings were outstanding under the New ABL Facility.

The New ABL Agreement provides that a specified percentage of billed and unbilled receivables and raw and clean inventory meeting certain criteria are eligible to be counted for purposes of collateralizing the amount of financing available, subject to certain terms and conditions. Availability under the New ABL Facility is calculated on a monthly basis and fluctuates based on qualifying amounts of coal inventory and trade accounts receivable (the "Borrowing Base") and the facility's covenant limitations related to the Fixed Charge Coverage Ratio (as defined in therein). In accordance with terms of the New ABL Facility, the Company may be required to collateralize the New ABL Facility to the extent outstanding borrowings and letters of credit under the New ABL Facility exceed the Borrowing Base after considering covenant limitations.

Any letter of credit issued under the New ABL Facility will bear a commitment fee rate of 0.50%, and a fronting fee of 0.25% of the face amount under each letter of credit. As of December 31, 2021, the Company had $121,037 letters of credit outstanding under the New ABL Facility.

The New ABL Facility is guaranteed by substantially all of Alpha's direct and indirect subsidiaries (together with Alpha, the "Loan Parties") and secured by all or substantially all assets of the Loan Parties, including equity in Alpha's direct domestic subsidiaries, as collateral for the obligations under the New ABL Facility. The New ABL Facility has a first lien on ABL priority collateral and a second lien on Term Loan Priority Collateral. The New ABL Agreement, as amended, and related documents contain negative and affirmative covenants including certain financial covenants. The Company is in compliance with all covenants under these agreements as of December 31, 2021.

Amended and Restated Asset-Based Revolving Credit Agreement

On November 9, 2018, the Company entered into the Amended and Restated Asset-Based Revolving Credit Agreement with Citibank N.A. as administrative agent, collateral agent, and swingline lender and the other lenders party thereto (the "Lenders"), and Citibank N.A., Barclays Bank PLC, BMO Harris Bank N.A. and Credit Suisse AG as letter of credit issuers ("LC Lenders"). The Amended and Restated Asset-Based Revolving Credit Agreement amended and restated the Asset-Based Revolving Credit Agreement dated April 3, 2017, in its entirety, and included a senior secured asset-based revolving credit facility (the "ABL Facility"). Under the ABL Facility, the Company could borrow cash from the Lenders (as defined therein) or cause the L/C Issuers (as defined therein) to issue letters of credit, on a revolving basis, in an aggregate amount of up to $225,000, of which no more than $200,000 could be drawn through letters of credit. Any borrowings under the ABL Facility had a maturity date of April 3, 2022 and incurred interest based on the character of the loan (defined as either "Base Rate Loan" or "Eurocurrency Rate Loan") plus an applicable rate ranging from 1.00% to 1.50% for Base Rate Loans and 2.00% to 2.50% for Eurocurrency Rate Loans, depending on the amount of credit available. Pursuant to terms of the Amended and Restated Asset-Based Revolving Credit Agreement at each notice period, the Company elected the character of the loan, the interest period, and could provide notice of continuation or conversion of the borrowed principal amount with the ability to repay the borrowed principal amount in advance of the maturity date without penalty. On March 20, 2020, the Company borrowed $57,500 principal amount under the ABL Facility. The funds were borrowed to augment the Company's short-term operational flexibility in the face of uncertainty created by the spread of the COVID-19 virus and its potential effects. As of December 6, 2021, the date the Company entered into the New ABL Agreement, there were no outstanding borrowings under the ABL Facility. As of December 31, 2020, the carrying value of the ABL Facility was $3,350, all of which was classified as long-term within the Consolidated Balance Sheets, with the outstanding borrowings comprised of Eurocurrency Rate Loans with an interest rate of 2.73%, calculated as the Eurocurrency rate during the period plus an applicable rate of 2.50%.

The Amended and Restated Asset-Based Revolving Credit Agreement provided that a specified percentage of billed, unbilled and approved foreign receivables and raw and clean inventory meeting certain criteria were eligible to be counted for purposes of collateralizing the amount of financing available, subject to certain terms and conditions. Availability under the ABL Facility was calculated on a monthly basis and fluctuated based on qualifying amounts of coal inventory and trade accounts receivable (the "Borrowing Base") and the facility's covenant limitations related to the Fixed Charge Coverage Ratio (as defined in therein). In accordance with terms of the ABL Facility, the Company was required to collateralize the ABL Facility to the extent outstanding borrowings and letters of credit under the ABL Facility exceeded the Borrowing Base after considering covenant limitations. Due to fluctuations of the Borrowing Base, the Company was required to post $25,000 of collateral in January 2021 to remain in compliance with the terms of the ABL Facility as of December 31, 2020. During the first quarter of 2021, a portion of the posted cash collateral was used to repay the remaining $3,350 in borrowings under the ABL Facility, and the remaining posted cash collateral was returned to unrestricted cash.

Any letters of credit issued under the ABL Facility incurred a commitment fee rate ranging from 0.25% to 0.375% depending on the amount of availability per terms of the agreement, and a fronting fee of 0.25% of the face amount under each letter of credit, payable to the ABL Facility's administrative agent. As of December 31, 2020, the Company had $123,108 letters of credit outstanding under the ABL Facility.

LCC Note Payable

As a result of the Merger, the Company assumed a note payable to Lexington Coal Company ("LCC") in the aggregate amount of $62,500 (the "LCC Note Payable") and with a maturity date of July 26, 2022. The LCC Note Payable had no stated interest rate and an imputed interest rate of 12.45%. Principal repayments of $17,500 were due each July during 2019, 2020 and 2021, with the final principal payment of $10,000 due on the maturity date. On July 26, 2021, the Company prepaid $7,700 of the final principal payment. As a result of the prepayment, $13,982 of surety collateral was returned. In October 2021, the Company elected to repay in full the remaining $2,300 of the final principal payment.

There was no remaining carrying value of the LCC Note Payable as of December 31, 2021. As of December 31, 2020, the carrying value of the LCC Note Payable was $24,423, with $17,500 reported within the current portion of long-term debt.

LCC Water Treatment Stipulation

As a result of the Merger, the Company assumed an obligation to contribute $12,500 into LCC's water treatment restricted cash accounts (the "LCC Water Treatment Stipulation"). Contributions equal to $625 were due each January, April, July and October from 2019 through 2023. The LCC Water Treatment Stipulation had no stated interest rate and an imputed interest rate of 13.12%. In October 2021, the Company elected to repay in full the remaining $5,000 obligation.

There was no remaining carrying value of the LCC Water Treatment Stipulation as of December 31, 2021. As of December 21, 2020, the carrying value of the LCC Water Treatment Stipulation was $5,636, with $1,875 reported within the current portion of long-term debt.

Future Maturities

Future maturities of long-term debt as of December 31, 2021 are as follows:

2022	$ 2,989
2023	1,367
2024	450,245
2025	142
2026	3
Total long-term debt	$ 454,746

(15) Acquisition-Related Obligations

Acquisition-related obligations consisted of the following:

	December 31,	
	2021	2020
Contingent Revenue Obligation	$ 35,005	$ 28,967
Environmental Settlement Obligations	6,633	10,391
UMWA Funds Settlement Liability	—	2,000
Discount	(233)	(1,491)
Total acquisition-related obligations	$ 41,405	$ 39,867
Less current portion	(22,405)	(19,099)
Acquisition-related obligations, net of current portion	$ 19,000	$ 20,768

The Company entered into various settlement agreements with Alpha Natural Resources, Inc. and/or the Alpha Natural Resources, Inc. bankruptcy successor ANR, Inc. and third parties as part of the Alpha Natural Resources, Inc. bankruptcy reorganization process. The Company assumed acquisition-related obligations through those settlement agreements which became effective on July 26, 2016, the effective date of Alpha Natural Resources, Inc.'s plan of reorganization. Additionally, as a result of the Merger, the Company assumed certain acquisition-related obligations pursuant to the terms stipulated within the bankruptcy settlement previously entered into by the Merger Companies.

Contingent Revenue Obligation

As a result of the Merger, the Company assumed a contingent revenue payment obligation (the "Contingent Revenue Obligation") to certain of the Merger Companies' creditors pursuant to the terms stipulated within the bankruptcy settlement previously entered into by the Merger Companies. Pursuant to terms of the obligation, the annual obligation will be limited to revenues derived from legacy operations for the Merger Companies and will not include revenues related to legacy Alpha Metallurgical Resources, Inc. operations. The Contingent Revenue Obligation consists of a contingent revenue payment of

1.5% of annual gross revenues of the legacy operations for the Merger Companies up to $500,000 and 1.0% of annual gross revenue of the legacy operations for the Merger Companies in excess of $500,000 through the period ended December 31, 2022. As of December 31, 2021 and 2020, the carrying value of the Contingent Revenue Obligation was $35,005 and $28,967, with $16,005 and $11,393 classified as current, respectively, and classified as an acquisition-related obligation in the Consolidated Balance Sheets. Refer to Note 17 for further disclosures related to the fair value assignment and methods used.

Refer to Note 21 for disclosures related to a Contingent Revenue Obligation repurchase transaction with a related party during the fourth quarter of 2021. Additionally, during the second quarter of 2021, the Company paid $11,396 pursuant to terms of the Contingent Revenue Obligation. During the second quarter of 2020, the Company paid $15,084, including $374 of unclaimed unsecured claims distributions, pursuant to terms of the Contingent Revenue Obligation.

Environmental Settlement Obligations

As a result of the Merger, the Company assumed certain environmental settlement obligations (the "Environmental Settlement Obligations") pursuant to the terms stipulated within the bankruptcy settlement previously entered into by the Merger Companies. These obligations include payments to a third-party environmental agency and the funding of certain reclamation related projects through 2022. As of December 31, 2021 and 2020, the carrying value of the Environmental Settlement Obligations was $6,400 and $9,237, net of discounts of $233 and $1,154, with $6,400 and $6,044 classified as current, respectively, all of which was classified as an acquisition-related obligation in the Consolidated Balance Sheets.

(16) Asset Retirement Obligations

The following table summarizes the changes in asset retirement obligations for the years ended December 31, 2021 and 2020:

Total asset retirement obligations at December 31, 2019	$	203,137
Accretion for the period		26,504
Sites added during the period		621
Revisions in estimated cash flows [1]		(43,765)
Expenditures for the period		(21,433)
Total asset retirement obligations at December 31, 2020	$	165,064
Accretion for the period		26,520
Sites added during the period		2,125
Revisions in estimated cash flows [1]		(12,744)
Expenditures for the period		(16,793)
Total asset retirement obligations at December 31, 2021	$	164,172
Less current portion [2]		(32,159)
Long-term portion	$	132,013

[1] The revisions in estimated cash flows resulted primarily from discount rate adjustments and changes in mine plans.
[2] Included within Accrued expenses and other current liabilities on the Company's Consolidated Balance Sheets. Refer to Note 13.

(17) Fair Value of Financial Instruments and Fair Value Measurements

The estimated fair values of financial instruments are determined based on relevant market information. These estimates involve uncertainty and cannot be determined with precision.

The carrying amounts for cash and cash equivalents, trade accounts receivable, net, prepaid expenses and other current assets, short-term and long-term restricted cash, short-term and long-term deposits, trade accounts payable, and accrued expenses and other current liabilities approximate fair value as of December 31, 2021 and 2020 due to the short maturity of these instruments.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

The following tables set forth by level, within the fair value hierarchy, the Company's long-term debt at fair value as of December 31, 2021 and 2020:

	December 31, 2021				
	Carrying Amount [1]	Total Fair Value	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Term Loan Credit Facility - due June 2024	$ 443,241	$ 447,561	$ —	$ 447,561	$ —
Total long-term debt	$ 443,241	$ 447,561	$ —	$ 447,561	$ —

	December 31, 2020				
	Carrying Amount [1]	Total Fair Value	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Term Loan Credit Facility - due June 2024	$ 540,643	$ 379,614	$ —	$ 379,614	$ —
ABL Facility - due April 2022 [2]	3,350	3,057	—	—	3,057
LCC Note Payable	24,423	20,328	—	—	20,328
LCC Water Treatment Obligation	5,636	4,281	—	—	4,281
Total long-term debt	$ 574,052	$ 407,280	$ —	$ 379,614	$ 27,666

[1] Net of debt discounts and debt issuance costs.
[2] On December 6, 2021, the Company entered into a New ABL Agreement. Refer to Note 14 for additional information.

The following tables set forth by level, within the fair value hierarchy, the Company's acquisition-related obligations at fair value as of December 31, 2021 and 2020:

	December 31, 2021				
	Carrying Amount [1]	Total Fair Value	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Environmental Settlement Obligations	$ 6,400	$ 6,270	$ —	$ —	$ 6,270
Total acquisition-related obligations	$ 6,400	$ 6,270	$ —	$ —	$ 6,270

	December 31, 2020				
	Carrying Amount [1]	Total Fair Value	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
UMWA Funds Settlement Liability	$ 1,662	$ 1,426	$ —	$ —	$ 1,426
Environmental Settlement Obligations	9,237	7,760	—	—	7,760
Total acquisition-related obligations	$ 10,899	$ 9,186	$ —	$ —	$ 9,186

[1] Net of discounts.

The following table sets forth by level, within the fair value hierarchy, the Company's financial and non-financial assets and liabilities that were accounted for at fair value on a recurring basis as of December 31, 2021 and 2020. Financial and non-financial assets and liabilities are classified in their entirety based on the lowest level of input that is significant to the fair value measurement. The Company's assessment of the significance of a particular input to the fair value measurement requires judgment, and may affect the determination of fair value for assets and liabilities and their placement within the fair value hierarchy levels.

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

	December 31, 2021			
	Total Fair Value	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Contingent Revenue Obligation	$ 35,005	$ —	$ —	$ 35,005
Trading securities	$ 28,443	$ 27,075	$ 1,368	$ —

	December 31, 2020			
	Total Fair Value	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Contingent Revenue Obligation	$ 28,967	$ —	$ —	$ 28,967
Trading securities	$ 22,498	$ 20,092	$ 2,406	$ —

The following table is a reconciliation of the financial and non-financial assets and liabilities that were accounted for at fair value on a recurring basis and that were categorized within Level 3 of the fair value hierarchy:

	December 31, 2020	Payments	Loss Recognized in Earnings	Transfer In (Out) of Level 3 Fair Value Hierarchy	December 31, 2021
Contingent Revenue Obligation	$ 28,967	$ (13,487)	$ 19,525	$ —	$ 35,005

(1) The loss recognized in earnings resulted primarily from an increase in forecasted future revenue as of December 31, 2021.

	December 31, 2019	Payments	Gain Recognized in Earnings	Transfer In (Out) of Level 3 Fair Value Hierarchy	December 31, 2020
Contingent Revenue Obligation	$ 52,427	$ (14,710)	$ (8,750)	$ —	$ 28,967

(1) The gain recognized in earnings resulted primarily from a change in the forecasted future revenue associated with this obligation and an increase in annualized volatility as of December 31, 2020.

The following methods and assumptions were used to estimate the fair values of the assets and liabilities in the tables above:

Level 1 Fair Value Measurements

Trading Securities - Includes money market funds and other cash equivalents. The fair value is based on observable market data.

Level 2 Fair Value Measurements

Term Loan Credit Facility - due June 2024 - The fair value is based on the average between bid and ask prices provided by a third-party. As the fair value is based on observable market inputs and due to limited trading volume in the Term Loan Credit Facility, the Company has classified the fair value within Level 2 of the fair value hierarchy.

Trading Securities - Includes certificates of deposit, mutual funds, corporate debt securities and U.S. treasury and agency securities. The fair values of the Company's trading securities are obtained from a third-party pricing service provider. The fair values provided by the pricing service provider are based on observable market inputs including credit spreads and broker-dealer quotes, among other inputs. The Company classifies the prices obtained from the pricing services within Level 2 of the fair value hierarchy because the underlying inputs are directly observable from active markets. However, the pricing models used entail a certain amount of subjectivity and therefore differing judgments in how the underlying inputs are modeled could result in different estimates of fair value.

Level 3 Fair Value Measurements

ABL Facility - due April 2022 - Observable transactions are not available to aid in determining the fair value of this item. Therefore, the fair value was derived by using the expected present value approach in which estimated cash flows are discounted using a risk-free interest rate adjusted for credit risk (discount rate of approximately 9% as of December 31, 2020). On December 6, 2021, the Company entered into a New ABL Agreement. Refer to Note 14 for additional information.

LCC Note Payable, LCC Water Treatment Obligation, UMWA Funds Settlement Liability and Environmental Settlement Obligations - Observable transactions are not available to aid in determining the fair value of these items. Therefore, the fair value was derived by using the expected present value approach in which estimated cash flows are discounted using a risk-free interest rate adjusted for credit risk (discount rates of approximately 13% and 34% as of December 31, 2021 and 2020, respectively).

Contingent Revenue Obligation - The fair value of the Contingent Revenue Obligation was estimated using a Black-Scholes pricing model and is marked to market at each reporting period with changes in value reflected in earnings. The inputs included in the Black-Scholes pricing model are the Company's forecasted future revenue, the stated royalty rate, the remaining periods in the obligation, annual risk-free interest rate based on the U.S. Constant Maturity Treasury Curve and annualized volatility. The annualized volatility was calculated by observing volatilities for comparable companies with adjustments for the Company's size and leverage. The range of significant unobservable inputs used to value the Contingent Revenue Obligation as of December 31, 2021 and 2020 are set forth in the following table:

	December 31, 2021	December 31, 2020
Forecasted future revenue	$1.5 - $2.0 billion	$0.9 - $1.1 billion
Stated royalty rate	1.0% - 1.5%	1.0% - 1.5%
Annualized volatility	18.4% - 39.3% (29.9%)	19.4% - 52.1% (28.0%)

(18) Income Taxes

Total income tax expense (benefit) provided on income (loss) before income taxes was allocated as follows:

	Year Ended December 31,	
	2021	2020
Continuing operations	$ 3,609	$ (2,164)
Discontinued operations	(201)	—
Total	$ 3,408	$ (2,164)

Significant components of income tax expense (benefit) from continuing operations were as follows:

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

	Year Ended December 31,	
	2021	2020
Current tax expense (benefit):		
Federal	$ 2,586	$ (35,187)
State	1,186	(99)
Total current	$ 3,772	$ (35,286)
Deferred tax (benefit) expense:		
Federal	$ (3)	$ 33,348
State	(160)	(226)
Total deferred	$ (163)	$ 33,122
Total income tax expense (benefit):		
Federal	$ 2,583	$ (1,839)
State	1,026	(325)
Total	$ 3,609	$ (2,164)

A reconciliation of statutory federal income tax expense (benefit) on income (loss) from continuing operations to the actual income tax expense (benefit) is as follows:

	Year Ended December 31,	
	2021	2020
Federal statutory income tax expense (benefit)	$ 61,013	$ (51,163)
Increase (reductions) in taxes due to:		
Percentage depletion allowance	(11,864)	(2,039)
AMT sequestration refund	—	(2,123)
State taxes, net of federal tax impact	12,998	(9,640)
State apportioned tax rate change, net of federal tax impact	8,751	(1,235)
Change in valuation allowances	(78,056)	59,929
Capital loss expiration	10,552	—
Stock-based compensation	405	1,739
Other, net	(190)	2,368
Income tax expense (benefit)	$ 3,609	$ (2,164)

Deferred income taxes result from temporary differences between the reporting of amounts for financial statement purposes and income tax purposes. The net deferred tax assets and liabilities included in the Consolidated Balance Sheets include the following amounts:

	Year Ended December 31,	
	2021	2020
Deferred tax assets:		
Asset retirement obligations	$ 36,252	$ 41,268
Reserves and accruals not currently deductible	9,610	12,131
Workers' compensation benefit obligations	47,105	59,478
Pension obligations	34,956	52,598
Equity method investments	1,846	2,050
Loss carryforwards, net of Section 382 limitation	187,341	255,772
Acquisition-related obligations	9,156	10,002
Other	7,100	10,976
Gross deferred tax assets	333,366	444,275
Less valuation allowance	(172,883)	(263,387)
Deferred tax assets	$ 160,483	$ 180,888
Deferred tax liabilities:		
Property, plant and mineral reserves	$ (134,075)	$ (141,549)
Acquired intangibles, net	(16,408)	(22,037)
Prepaid expenses	(4,955)	(6,211)
Restricted cash	(5,362)	(11,516)
Other	—	(55)
Total deferred tax liabilities	(160,800)	(181,368)
Net deferred tax liabilities	$ (317)	$ (480)

Changes in the valuation allowance were as follows:

	Year Ended December 31,	
	2021	2020
Valuation allowance beginning of period	$ 263,387	$ 133,020
(Decrease) increase in valuation allowance recorded to income tax expense (benefit)	(78,043)	117,829
(Decrease) increase in valuation allowance not affecting income tax expense (benefit)	(12,461)	12,538
Valuation allowance end of period	$ 172,883	$ 263,387

On December 22, 2017, President Trump signed into law legislation commonly referred to as the "Tax Cuts and Jobs Act" ("TCJA"). Among other provisions, the TCJA repealed the corporate alternative minimum tax ("AMT") and provided a mechanism for corporations to monetize their alternative minimum tax credits ("AMT Credits") as a refundable credit during the 2018 through 2021 tax years. On March 27, 2020, President Trump signed into law legislation referred to as the CARES Act. The CARES Act modified the AMT Credits provision such that a corporate taxpayer's remaining AMT Credits would be refunded in the 2019 tax year rather than the 2019 through 2021 tax years. As of December 31, 2019, the Company recorded a current federal income tax receivable of $33,065 and a deferred tax asset of $33,065 in relation to its refundable AMT Credits. During the first quarter of 2020 and following enactment of the CARES Act, the Company reclassified the $33,065 deferred tax asset to a current federal income tax receivable. The Company received the $66,130 AMT Credit refund in the fourth quarter of 2020. In addition, the Company received $2,123 related to AMT Credits claimed in prior tax years under a different Internal Revenue Code section, which were previously and erroneously subjected to the budgetary sequestration provisions. The Company does not expect to receive any further benefits related to AMT Credits.

The Company acquired the core assets of Alpha Natural Resources, Inc. as part of the Alpha Natural Resources, Inc. bankruptcy reorganization in transactions intended to be treated as a tax-free reorganization for U.S. federal income tax purposes. As a result of these transactions, the Company inherited the tax basis of the core assets and the net operating loss and

other carryforwards of Alpha Natural Resources, Inc. On December 31, 2016, the net operating loss carryforwards and other carryforwards were reduced under Internal Revenue Code Section 108 due to the cancellation of indebtedness resulting from the Alpha Natural Resources, Inc. bankruptcy reorganization. Due to the change in ownership, the net operating loss and other carryforwards inherited in the Alpha Natural Resources, Inc. bankruptcy reorganization are subjected to significant limitations on their use in future years.

Due to the Company's formation through acquisition of certain core coal assets as part of the Alpha Natural Resources, Inc. bankruptcy reorganization, the Company does not have a long history of operating results. Additionally, significant ownership change limitations limit the ability of the Company to utilize its net operating loss and other carryforwards in future years. The Company currently is relying primarily on the reversal of taxable temporary differences, along with consideration of taxable income via carryback to prior years and tax planning strategies, to support the realization of deferred tax assets. The Company assesses the realizability of its deferred tax assets, including scheduling the reversal of its deferred tax liabilities, to determine the amount of valuation allowance needed. Scheduling the reversal of deferred tax asset and liability balances requires judgment and estimation. The Company believes the deferred tax liabilities relied upon as future taxable income in its assessment will reverse in the same period and jurisdiction and are of the same character as temporary differences giving rise to the deferred tax assets that will be realized. The valuation allowance recorded represents the portion of deferred tax assets for which the Company is unable to support realization through the methods described above. The Company has concluded that it is more likely than not that the remaining deferred tax assets, net of valuation allowances, are realizable.

At December 31, 2021, the Company has regular tax net operating loss carryforwards for federal income tax purposes of approximately $1,543,000. This includes $1,008,000 that are available to offset regular federal taxable income subject to an annual Internal Revenue Code Section 382 limitation of approximately $1,000 and $270,000 that are subject to an annual Section 382 limitation of approximately $17,500. These federal net operating loss carryforwards were generated before 2018 and will expire between years 2030 and 2037. The Company also has $265,000 of federal net operating loss carryforwards with an indefinite carryforward period that can be used to offset up to 80% of taxable income. The Company has capital loss carryforwards of approximately $223,000. The capital loss carryforwards will expire between years 2022 and 2025. A full valuation allowance is recorded against the capital loss carryforwards.

During the third quarter of the year ended December 31, 2020, the Company recorded a decrease in unrecognized tax benefits of approximately $20,788 as a result of the issuance of final regulatory guidance from the Internal Revenue Service ("IRS"). The decrease in unrecognized tax benefits did not impact the Company's effective tax rate for the year ended December 31, 2020.

The Company's policy is to classify interest and penalties related to uncertain tax positions as part of income tax expense. As of December 31, 2021 and 2020, the Company had no accrued interest and penalties.

The following reconciliation illustrates the Company's liability for uncertain tax positions:

	Year Ended December 31,	
	2021	2020
Unrecognized tax benefits - beginning of period	$ —	$ 20,788
Reductions for tax positions of prior years	—	(20,788)
Unrecognized tax benefits - end of period	$ —	$ —

As of December 31, 2021, tax years 2018 – 2021 remain open to federal and state examination. During the third quarter of 2021, the IRS concluded its audit of the Company's 2016 federal income tax return and associated net operating loss ("NOL") carryback claim. The audit conclusion did not result in any material impact to the financial statements or related disclosures. Following the conclusion of the audit, the Company received the $64,160 carryback claim tax refund and $5,425 of accrued interest.

(19) Employee Benefit Plans

The Company provides several types of benefits for its employees, including defined benefit and defined contribution pension plans, workers' compensation and black lung benefits, and postretirement life insurance. The Company does not participate in any multi-employer plans. The components of net periodic benefit (credit) cost other than the service cost

component for black lung and postretirement life insurance benefits are included in the line item miscellaneous income (loss), net, in the Consolidated Statements of Operations.

Company Administered Defined Benefit Pension Plans

In connection with the Merger, the Company assumed three qualified non-contributory defined benefit pension plans, which cover certain salaried and non-union hourly employees. The qualified non-contributory defined benefit pension plans are collectively referred to as the "Pension Plans." Benefits are frozen under these plans. Participants accrued benefits either based on certain formulas, the participant's compensation prior to retirement, or plan specified amounts for each year of service with the Company. One of the Company's frozen qualified non-contributory defined benefit pension plans utilizes a cash balance formula for certain of its participants. The cash balance formula provides guaranteed rates of interest on accumulated balances of 6% for balances accumulated prior to 2004 and 4% on balances accumulated thereafter.

Annual funding contributions to the Pension Plans are made as recommended by consulting actuaries based upon the ERISA funding standards. Plan assets consist of equity securities, fixed income funds, commingled short-term funds, private equity funds, and a guaranteed insurance contract.

Effective in 2019, two of the qualified non-contributory defined benefit pension plans were amended to offer certain eligible participants the option to elect to receive lump sum benefits, which resulted in a partial plan settlement and the accelerated recognition of a portion of the accumulated other comprehensive loss during the years ended December 31, 2021 and December 31, 2020. Refer to the disclosures below for further information on the partial plan settlements.

The following tables set forth the Pension Plans' accumulated benefit obligations, fair value of plan assets and funded status for the years ended December 31, 2021 and 2020.

	Year Ended December 31,	
	2021	2020
Change in benefit obligations:		
Accumulated benefit obligation at beginning of period:	$ 723,448	$ 674,439
Interest cost	13,566	18,730
Actuarial (gain) loss [1]	(34,922)	72,822
Benefits paid	(30,222)	(30,916)
Settlement	(3,815)	(11,627)
Accumulated benefit obligation at end of period	$ 668,055	$ 723,448
Change in fair value of plan assets:		
Fair value of plan assets at beginning of period	$ 504,777	$ 470,353
Actual return on plan assets	30,814	54,222
Employer contributions	6,571	22,745
Benefits paid	(30,222)	(30,916)
Settlement	(3,815)	(11,627)
Fair value of plan assets at end of period	$ 508,125	$ 504,777
Funded status	$ (159,930)	$ (218,671)
Accrued benefit cost at end of period [2]	$ (159,930)	$ (218,671)

[1] For the years ended December 31, 2021 and 2020, the actuarial (gain) loss was primarily attributable to the change in the weighted-average discount rate actuarial assumption used in determining the benefit obligations.
[2] Amounts are classified as long-term on the Consolidated Balance Sheets as there are sufficient plan assets to make expected benefit payments to plan participants in the succeeding twelve months.

Gross amounts related to benefit obligations recognized in accumulated other comprehensive loss consisted of the following as of December 31, 2021 and 2020:

	December 31,	
	2021	2020
Net actuarial loss	$ 47,950	$ 88,583

The following table details the components of net periodic benefit credit:

	Year Ended December 31,	
	2021	2020
Interest cost	$ 13,566	$ 18,730
Expected return on plan assets	(28,732)	(27,064)
Amortization of net actuarial loss	3,217	2,012
Settlement	412	1,636
Net periodic benefit credit	$ (11,537)	$ (4,686)

Other changes in plan assets and benefit obligations recognized in other comprehensive income (loss) are as follows:

	Year Ended December 31,	
	2021	2020
Actuarial (gain) loss	$ (37,004)	$ 45,663
Amortization of net actuarial loss	(3,217)	(2,012)
Settlement	(412)	(1,636)
Total recognized in other comprehensive income (loss)	$ (40,633)	$ 42,015

The following table presents information applicable to plans with accumulated benefit obligations in excess of plan assets:

	Year Ended December 31,	
	2021	2020
Projected benefit obligation	$ 668,055	$ 723,448
Accumulated benefit obligation	$ 668,055	$ 723,448
Fair value of plan assets	$ 508,125	$ 504,777

The weighted-average actuarial assumption used in determining the benefit obligations as of December 31, 2021 and 2020 was as follows:

	December 31,	
	2021	2020
Discount rate	2.92 %	2.62 %

The weighted-average actuarial assumptions used to determine net periodic benefit credit for the years ended December 31, 2021 and 2020 were as follows:

	Year Ended December 31,	
	2021	2020
Discount rate for benefit obligation	2.62 %	3.35 %
Discount rate for interest cost	1.96 %	2.92 %
Expected long-term rate of return on plan assets	5.80 %	5.90 %

The discount rate assumptions were determined from a high-quality corporate bond yield-curve timing of the Company’s projected cash out flows.

The expected long-term rate of return on assets of the Pension Plans is established each year by the Company's Benefits Committee in consultation with the plans' actuaries and outside investment advisors. This rate is determined by taking into consideration the Pension Plans' target asset allocation, expected long-term rates of return on each major asset class by reference to long-term historic ranges, inflation assumptions, and the expected additional value from active management of the Pension Plans' assets. For the determination of net periodic benefit cost in 2022, the Company will utilize an expected long-term rate of return on plan assets of 5.80%.

Assets of the Pension Plans are held in trusts and are invested in accordance with investment guidelines that have been established by the Company's Benefits Committee in consultation with outside investment advisors. The target allocation for 2022 and the actual asset allocation as reported at December 31, 2021 are as follows:

	Target Allocation Percentages 2022 [1]	Percentage of Plan Assets 2021
Equity securities	60.0 %	56.0 %
Fixed income funds	40.0 %	41.0 %
Other	— %	3.0 %
Total	100.0 %	100.0 %

[1] Assumes the Pension Plans have a funded status level less than 90.0%.

The asset allocation targets have been set with the expectation that the Pension Plans' assets will fund the expected liabilities within an appropriate level of risk. In determining the appropriate target asset allocations, the Benefits Committee considers the demographics of the Pension Plans' participants, the funded status of each plan, the Company's contribution philosophy, the Company's business and financial profile, and other associated risk factors. The Pension Plans' assets are periodically rebalanced among the major asset categories to maintain the asset allocation within a specified range of the target allocation percentage. The target allocation between equity securities and fixed income funds is determined by reference to the funded status percentage for each of the Pension Plans. The plan administrator uses a de-risking glide path whereby the fixed income funds allocation increases as the funded status improves. At a 90.0% funded status level, the glide path calls for a 50/50 equity securities and fixed income funds mix. During the year ended December 31, 2021, one of the Pension Plans funded status levels reached 90.0% and the related plan assets were adjusted accordingly to the new allocation. In September 2020, the target allocation was adjusted by the Company's Benefits Committee to transition to 60.0% equity securities and 40.0% fixed income funds in approximate 2.0% increments over a 10-month period.

As a result of the recent funding relief granted under the American Rescue Plan Act, estimated contributions requirements to the pension plans were reduced relative to the Company's previous estimates. The Company contributed $6,571 to the pension plans during the year ended December 31, 2021. The Company's minimum required contributions are estimated to be $4,404 to the Pension Plans in 2022.

The following represents expected future pension benefit payments for the next ten years:

2022	$ 30,949
2023	30,944
2024	31,161
2025	31,497
2026	31,657
2027-2031	158,207
	$ 314,415

The fair values of the Company's Pension Plans' assets as of December 31, 2021, by asset category are as follows:

Asset Category	Total	Quoted Market Prices in Active Market for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Equity securities:				
Multi-asset fund [1]	$ 284,568	$ —	$ 284,568	$ —
Fixed income funds:				
Bond fund [2]	208,466	—	208,466	—
Commingled short-term fund [3]	1,384	—	1,384	—
Other types of investments:				
Guaranteed insurance contract	11,652	—	—	11,652
Total	$ 506,070	$ —	$ 494,418	$ 11,652
Receivable [4]	876			
Total assets at fair value	506,946			
Private equity funds measured at net asset value practical expedient [5]	1,179			
Total plan assets	$ 508,125			

[1] This fund contains equities (domestic and international), real estate and bonds.
[2] This fund contains bonds representing a diversity of sectors and maturities. This fund also includes mortgage-backed securities and U.S. Treasuries.
[3] This fund contains cash and highly liquid short-term investments in a collective investment fund.
[4] Receivable for investments sold at December 31, 2021, which approximates fair value.
[5] In accordance with Accounting Standards Update 2015-07, investments that are measured at fair value using the net asset value per share practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the total value of assets of the plans.

Changes in Level 3 plan assets for the period ended December 31, 2021 were as follows:

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)
	Guaranteed Insurance Contract
Beginning balance, December 31, 2020	$ 11,454
Actual return on plan assets:	
Relating to assets still held at the reporting date	528
Purchases, sales and settlements	(330)
Ending balance, December 31, 2021	$ 11,652

The fair values of the Company's Pension Plans' assets as of December 31, 2020, by asset category are as follows:

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

Asset Category	Total	Quoted Market Prices in Active Market for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Equity securities:				
Multi-asset fund [1]	$ 236,405	$ —	$ 236,405	$ —
Fixed income funds:				
Bond fund [2]	253,218	—	253,218	—
Commingled short-term fund [3]	1,405	—	1,405	—
Other types of investments:				
Guaranteed insurance contract	11,454	—	—	11,454
Total	$ 502,482	$ —	$ 491,028	$ 11,454
Receivable [4]	888			
Total assets at fair value	503,370			
Private equity funds measured at net asset value practical expedient [5]	1,407			
Total plan assets	$ 504,777			

[1] This fund contains equities (domestic and international), real estate and bonds.
[2] This fund contains bonds representing a diversity of sectors and maturities. This fund also includes mortgage-backed securities and U.S. Treasuries.
[3] This fund contains cash and highly liquid short-term investments in a collective investment fund.
[4] Receivable for investments sold at December 31, 2020, which approximates fair value.
[5] In accordance with Accounting Standards Update 2015-07, investments that are measured at fair value using the net asset value per share practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the total value of assets of the plans.

Changes in Level 3 plan assets for the period ended December 31, 2020 were as follows:

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)
	Guaranteed Insurance Contract
Beginning balance, December 31, 2019	$ 11,155
Actual return on plan assets:	
Relating to assets still held at the reporting date	659
Purchases, sales and settlements	(360)
Ending balance, December 31, 2020	$ 11,454

The following is a description of the valuation methodologies used for assets measured at fair value:

Level 1 Plan Assets: Assets consist of individual security positions that are easily traded on recognized market exchanges. These securities are priced and traded daily, and therefore the fund is valued daily.

Level 2 Plan Assets: Funds consist of individual security positions that are mostly securities easily traded on recognized market exchanges. These securities are priced and traded daily, and therefore the fund is valued daily.

Level 3 Plan Assets: Assets are valued monthly or quarterly based on the Market Value provided by managers of the underlying fund investments. The Market Value provided typically reflects the fair value of each underlying fund investment, including unrealized gains and losses.

Workers' Compensation and Pneumoconiosis (Black Lung)

The Company is required by federal and state statutes to provide benefits to employees for awards related to workers' compensation and black lung.

The Company's subsidiaries utilize high-deductible third-party insurance for worker's compensation and black lung obligations with the exception of certain subsidiaries in which the Company is a qualified self-insurer for workers' compensation and/or black lung obligations. The Company's subsidiaries that are self-insured for black lung benefits may fund benefit payments through a Section 501(c) (21) tax-exempt trust fund.

Pursuant to the Merger Agreement, the Company assumed a reinsurance contract with a third party. In 2017, the Merger Companies made a lump sum payment in exchange for a reinsurance company's agreement to administer and pay certain future workers' compensation and state black lung obligations in the state of Kentucky. Pursuant to the Merger Agreement, the Company assumed the estimated liability for these future claims. As the liabilities are paid by the insurance company, the prepaid insurance amounts will be reduced by a corresponding amount.

The Company accrues for workers' compensation liability by recognizing costs when it is probable that a covered liability has been incurred and the cost can be reasonably estimated. The Company's estimates of these costs are adjusted based upon actuarial studies and include a provision for incurred but not reported losses. Actual losses may differ from these estimates, which could increase or decrease the Company's costs. Additionally, the liability for black lung benefits is estimated by an independent actuary by prorating the accrual of actuarially projected benefits over the employee's applicable term of service. Adjustments to the probable ultimate liability for workers' compensation and black lung are made annually based on actuarial valuations.

For the Company's subsidiaries that are insured with a high-deductible insurance plan for workers' compensation and black lung claims, the insurance premium expense for the years ended December 31, 2021 and 2020 was $8,602 and $7,000, respectively.

Workers' Compensation

The table below presents workers' compensation amounts recognized in the Consolidated Balance Sheets:

	December 31,	
	2021	2020
Current liabilities	$ 10,582	$ 10,355
Current liabilities - discontinued operations [1]	2,730	4,847
Long-term liabilities	103,574	113,904
Long-term liabilities - discontinued operations [1]	21,119	26,000
Total liabilities	$ 138,005	$ 155,106
Less expected insurance receivable [2]	(47,644)	(50,688)
Less long-term expected insurance receivable - discontinued operations [1]	(6,020)	(6,970)
Workers' compensation obligations, net of expected insurance receivables	$ 84,341	$ 97,448

[1] The discontinued operations consisted of activity related to the Company's former NAPP operations. Refer to Note 3.
[2] Included within Prepaid expenses and other current assets and Other non-current assets in the Consolidated Balance Sheets.

Workers' compensation expense for high-deductible insurance plans for the years ended December 31, 2021 and 2020 was $3,750 and $1,275, respectively.

Black Lung

The divestiture of the Company's former NAPP operations during the fourth quarter of 2020 (refer to Note 3) resulted in a partial plan settlement of $8,290 and the accelerated recognition of a portion of the accumulated other comprehensive loss of $1,563 during the three months ended December 31, 2020. Refer to the disclosures below for further information on the partial plan settlement.

As a result of the strategic actions impacting certain mines during the three months ended June 30, 2020 (refer to Note 8), black lung obligations were revalued for curtailment and remeasured with an updated discount rate as of May 31, 2020, which resulted in an increase in the liability for black lung obligations of approximately $7,400 with the offset to accumulated other comprehensive loss and a slight increase in net periodic expense to be recognized subsequent to the remeasurement date. Refer to the disclosures below for further information.

The following tables set forth the accumulated black lung benefit obligations, fair value of plan assets and funded status for the years ended December 31, 2021 and 2020:

	Year Ended December 31,	
	2021	2020
Change in benefit obligation:		
Accumulated benefit obligation at beginning of period	$ 127,506	$ 122,788
Service cost	2,972	2,361
Interest cost	2,463	3,240
Actuarial (gain) loss [1]	(9,759)	14,736
Benefits paid	(6,040)	(7,166)
Curtailment gain	—	(163)
Settlement	—	(8,290)
Accumulated benefit obligation at end of period	$ 117,142	$ 127,506
Change in fair value of plan assets:		
Fair value of plan assets at beginning of period	$ 2,720	$ 2,660
Actual return on plan assets	(56)	60
Benefits paid	(6,040)	(7,166)
Employer contributions	6,040	7,166
Fair value of plan assets at end of period [2]	2,664	2,720
Funded status	$ (114,478)	$ (124,786)
Accrued benefit cost at end of period	$ (114,478)	$ (124,786)
Summary of accrued benefit cost at end of period:		
Continuing operations	(111,854)	(122,961)
Discontinued operations [3]	(2,624)	(1,825)
Total accrued benefit cost at end of period	$ (114,478)	$ (124,786)

[1] For the years ended December 31, 2021 and 2020, the actuarial (gain) loss was primarily attributable to the change in the weighted-average discount rate actuarial assumption used in determining the benefit obligations.
[2] Assets of the plan are held in a Section 501(c)(21) tax-exempt trust fund and consist primarily of government debt securities. All assets are classified as Level 1 and valued based on quoted market prices.
[3] The discontinued operations consisted of activity related to the Company's former NAPP operations. Refer to Note 3.

The table below presents amounts recognized in the Consolidated Balance Sheets:

	December 31,	
	2021	2020
Current liabilities	$ 7,235	$ 6,784
Current liabilities - discontinued operations	60	26
Long-term liabilities	104,619	116,177
Long-term liabilities - discontinued operations	2,564	1,799
Total liabilities	$ 114,478	$ 124,786

Gross amounts related to the black lung benefit obligations recognized in accumulated other comprehensive loss consisted of the following as of December 31, 2021 and 2020:

	December 31,	
	2021	2020
Net actuarial loss	$ 11,940	$ 24,042

The following table details the components of the net periodic benefit cost for the black lung benefit obligations:

	Year Ended December 31,	
	2021	2020
Service cost	$ 2,972	$ 2,361
Interest cost	2,463	3,240
Expected return on plan assets	(54)	(54)
Amortization of net actuarial loss	2,453	1,942
Settlement	—	1,563
Net periodic benefit cost	$ 7,834	$ 9,052
Summary net periodic benefit cost:		
Continuing operations	$ 7,418	$ 7,670
Discontinued operations [1]	416	1,382
Total net periodic benefit cost	$ 7,834	$ 9,052

[1] The discontinued operations consisted of activity related to the Company's former NAPP operations. Refer to Note 3.

Other changes in the black lung plan assets and benefit obligations recognized in other comprehensive income (loss) are as follows:

	Year Ended December 31,	
	2021	2020
Actuarial (gain) loss	$ (9,649)	$ 14,567
Amortization of net actuarial loss	(2,453)	(1,942)
Settlement	—	(1,563)
Total recognized in other comprehensive income (loss)	$ (12,102)	$ 11,062

The weighted-average assumptions related to black lung obligations used to determine the benefit obligation as of December 31, 2021 and 2020 were as follows:

	December 31,	
	2021	2020
Discount rate	2.96 %	2.75 %
Federal black lung income benefit trend rate	2.00 %	2.00 %
Federal black lung medical benefit trend rate	5.00 %	5.00 %
Black lung benefit expense inflation rate [1]	— %	2.00 %

[1] Effective in 2021, the annual claim administration expenses are incorporated into the annual service cost component of the net periodic benefit cost for the black lung benefit obligations.

The weighted-average assumptions related to black lung benefit obligations used to determine net periodic benefit cost were as follows:

	Year Ended December 31,	
	2021	2020
Discount rate for benefit obligation	2.75 %	3.47 %
Discount rate for service cost	3.15 %	3.56 %
Discount rate for interest cost	1.96 %	2.61 %
Federal black lung income benefit trend rate	2.00 %	2.50 %
Federal black lung medical benefit trend rate	5.00 %	5.00 %
Black lung benefit expense inflation rate [1]	— %	2.00 %
Expected return on plan assets	2.00 %	2.00 %

[1] Effective in 2021, the annual claim administration expenses are incorporated into the annual service cost component of the net periodic benefit cost for the black lung benefit obligations.

Estimated future cash payments related to black lung benefit obligations for the next 10 years ending after December 31, 2021 are as follows:

Year ending December 31:	
2022	$ 7,295
2023	7,208
2024	7,254
2025	7,329
2026	7,497
2027-2031	19,889
	$ 56,472

Postretirement Life Insurance Benefits

As part of the Alpha Natural Resources, Inc. bankruptcy reorganization process and the Retiree Committee Settlement Agreement, the Company assumed the unfunded liability for life insurance benefits for certain disabled and non-union retired employees. Provisions are made for estimated benefits and adjustments to the probable ultimate liabilities are made annually based on an actuarial study prepared by independent actuaries. As of December 31, 2021 and 2020, the postretirement life insurance benefit obligation was $11,610, including a current portion $602, and $12,635, including a current portion $628, respectively, which are included in the Consolidated Balance Sheets as Other non-current liabilities and Accrued expenses and other current liabilities.

Defined Contribution and Profit-Sharing Plans

The Company sponsors defined contribution plans to assist its eligible employees in providing for retirement. Generally, under the terms of these plans, employees make voluntary contributions through payroll deductions and the Company makes

matching and/or discretionary contributions, as defined by each plan. The Company's total contributions to these plans for the years ended December 31, 2021 and 2020 were $10,276 and $3,613, respectively.

During the second quarter of 2020, the Company's matching contributions under the Alpha Metallurgical Resources (formerly Contura Energy) 401(k) Retirement Savings Plan (the "Plan") were suspended due to weak market conditions at that time. Effective in June 2021, the Company's matching contributions under the Plan were reinstated.

Self-insured Medical Plan

The Company is self-insured for health benefit coverage for all of its active employees. Estimated liabilities for health and medical claims are recorded based on the Company's historical experience and include a component for incurred but not paid claims. During the years ended December 31, 2021 and 2020, the Company incurred total expenses of $63,127 and $52,517, respectively, which primarily include claims processed and an estimate for claims incurred but not paid.

(20) Stock-Based Compensation Awards

The MIP is currently authorized for the issuance of awards of up to 1,201,202 shares of common stock, and as of December 31, 2021, there were 37,805 shares of common stock available for grant under the MIP. The Long-Term Incentive Plan (the "LTIP") is currently authorized for the issuance of awards of up to 1,500,000 shares of common stock, and as of December 31, 2021, there were 870,503 shares of common stock available for grant under the LTIP. Pursuant to the Merger Agreement, the Company assumed the ANR Inc. 2017 Equity Incentive Plan (the "ANR EIP"), which had underlying ANR shares that were converted to 89,766 Contura Energy, Inc. shares. The ANR EIP is not authorized for additional issuance of awards of shares of common stock, and as of December 31, 2021, there were no shares of common stock available for grant under the ANR EIP.

As of December 31, 2021, the Company had four types of stock-based awards outstanding: time-based restricted stock units, performance-based restricted stock units, stock options, and performance-based cash awards. Stock-based compensation expense totaled $7,468 and $5,540 for the years ended December 31, 2021 and 2020, respectively. For the years ended December 31, 2021 and 2020, approximately 89% and 83%, respectively, of stock-based compensation expense was reported as selling, general and administrative expenses, and the remainder was recorded as cost of coal sales.

The Company is authorized to repurchase common shares from employees (upon the election by the employee) to satisfy the employees' statutory tax withholdings upon the vesting of stock grants. Shares that are repurchased to satisfy the employees' statutory tax withholdings are recorded in treasury stock at cost. During the year ended December 31, 2021, the Company repurchased 50,363 shares of its common stock issued pursuant to awards under the MIP and LTIP for a total purchase amount of $785, or $15.60 average price paid per share. During the year ended December 31, 2020, the Company repurchased 43,559 shares of its common stock issued pursuant to awards under the MIP, LTIP and ANR EIP for a total purchase amount of $209, or $4.79 average price paid per share.

2021 Awards Granted

During the year ended December 31, 2021, the Company granted certain key employees and non-employee directors 223,496 time-based restricted stock units under the MIP and LTIP with a weighted average grant date fair value of $12.03 based on the Company's closing stock price at the trading day before the date of the grant. The awards granted to key employees will vest ratably over a three-year period from date of grant in accordance with the vesting schedule, subject to the participant's continuous service with the Company through each applicable vesting date. The restricted stock units granted to non-employee directors on February 10, 2021 will vest on the first to occur of (i) April 30, 2021, (ii) the director's separation from service due to the director's death or physical or mental incapacity to perform his or her usual duties, such condition likely to remain continuously and permanently, as determined by the Company, and (iii) a change in control. The restricted stock units granted to non-employee directors on May 1, 2021 will vest on the first to occur of (i) April 30, 2022, (ii) the director's service as a member of the board of directors is terminated, for any reason other than removal for cause, as of a date that is more than six months after the date of grant, and (iii) a change in control. Upon vesting and settlement of time-based restricted stock units, the Company issues authorized and unissued shares of the Company's common stock to the recipient.

Additionally, during the year ended December 31, 2021, the Company granted certain key employees 167,587 performance-based restricted stock units granted under the LTIP which represent the number of shares of common stock that may be issued based on the achievement of targeted performance levels related to pre-established relative total shareholder

return goals and annually determined operational goals over a three year period. These awards are scheduled to cliff vest on the third anniversary of the date of the grant, subject to the participant's continuous service with the Company through the applicable vesting date and the satisfaction of the performance criteria. These performance-based restricted stock units have the potential to be earned from 0% to 200% of target depending on actual results. Upon vesting and settlement of these awards, the Company will issue authorized and previously unissued shares of the Company's common stock to the recipient. The 100,552 operational performance-based restricted stock units were valued based on the Company's closing stock price at the trading day before the date of the grant and had a weighted average grant date fair value of $12.00. For the awards with operational performance conditions, the Company reassesses at each reporting date whether achievement of each of the performance conditions was probable and adjusts the accrual of stock-based compensation expense as needed. The 67,035 relative total shareholder return performance-based restricted stock units were valued relative to the stock price performance of a comparator group and had a weighted average grant date fair value of $16.18 based on a Monte Carlo simulation. The Monte Carlo simulation incorporated the assumptions as presented in the following table:

Relative performance-based restricted stock units		
Start price [1]	$	11.81
Valuation date stock price [2]	$	11.34
Expected volatility [3]		98.54 %
Risk-free interest rate [4]		0.18 %
Expected dividend yield [5]		— %

[1] The start price for the Company represented the average closing stock price over the twenty trading days ending on December 31, 2020, assuming dividends distributed during this period were reinvested in additional shares of the Company's stock on the ex-dividend date.
[2] The valuation date stock price represented the closing price on the grant date.
[3] The expected volatility assumption was based on the historical volatility of the price of the Company's stock.
[4] The annual risk-free interest rate equaled the yield on the semi-annual zero coupon U.S. Treasury rates converted to continuously compounded rates that had a term equal to the length of the remaining performance measurement period as of the valuation date.
[5] The expected dividend yield represented the investments return to a share of the Company's stock that is not available to the holder of the performance-based restricted stock unit.

Additionally, the Company granted certain key employees performance-based cash incentive awards granted under the LTIP with a target award amount of $927. The cash to be awarded is based on the achievement of pre-established relative total shareholder return goals over a three-year period. These awards are scheduled to cliff vest on the third anniversary of the date of the grant, subject to the participant's continuous service with the Company through the applicable vesting date and the satisfaction of the performance criteria. These awards have the potential to be distributed from 0% to 200% of target depending on actual performance. Upon vesting of these awards, the Company issues cash to the recipient. These awards are classified as a liability, and the Company reassesses at each reporting date the fair value of the award and adjusts the accruals of stock-based compensation expense as appropriate based on a Monte Carlo simulation. As of December 31, 2021, the liability for these awards totaled $255. The performance-based cash incentive awards were valued relative to the stock price performance of a comparator group and had a weighted average grant date fair value as a percent of target dollar value of 51.73% based on a Monte Carlo simulation. The Monte Carlo simulation incorporates the assumptions as presented in the following table:

Performance-based cash incentive awards		
Start price [1]	$	11.81
Valuation date stock price [2]	$	11.34
Expected volatility [3]		98.54 %
Risk-free interest rate [4]		0.18 %
Expected dividend yield [5]		— %

[1] The start price for the Company represents the average closing stock price over the twenty trading days ending on December 31, 2020, assuming dividends distributed during this period were reinvested in additional shares of the Company's stock on the ex-dividend date.
[2] The valuation date stock price represents the closing price at each reporting date.
[3] The expected volatility assumption is based on the historical volatility of the price of the Company's stock.

(4) The annual risk-free interest rate equals the yield on the semi-annual zero coupon U.S. Treasury rates converted to continuously compounded rates that have a term equal to the length of the remaining performance measurement period as of the valuation date.
(5) The expected dividend yield represents the investments return to a share of the Company's stock that is not available to the holder of the performance-based restricted stock unit.

2020 Awards Granted

During the year ended December 31, 2020, the Company granted certain key employees and non-employee directors 402,620 time-based restricted stock units under the MIP and LTIP with a weighted average grant date fair value of $6.17 based on the Company's closing stock price at the trading day before the date of the grant. The awards granted to key employees will vest ratably over a three-year period from date of grant in accordance with the vesting schedule, subject to the participant's continuous service with the Company through each applicable vesting date. The awards granted to non-employee directors will vest on the first to occur of (i) April 30, 2021, (ii) the director's separation from service due to the director's death or physical or mental incapacity to perform his or her usual duties, such condition likely to remain continuously and permanently, as determined by the Company, (iii) a change in control, and (iv) the director's service as a member of the board of directors is terminated as of a date that is after October 31, 2021 but prior to May 1, 2022 for any reason other than removal for cause. Upon vesting and settlement of time-based restricted stock units, the Company issues authorized and unissued shares of the Company's common stock to the recipient.

Additionally, during the year ended December 31, 2020, the Company granted the Chief Executive Officer ("CEO") 302,795 performance-based restricted stock units granted under the LTIP which represent the number of shares of common stock that may be issued based on the achievement of targeted performance levels related to pre-established relative total shareholder return goals and annually determined operational goals over a three year period. This award was scheduled to cliff vest on the third anniversary of the date of the grant, subject to the participant's continuous service with the Company through the applicable vesting date and the satisfaction of the performance criteria. These performance-based restricted stock units had the potential to be earned from 0% to 200% of target depending on actual results. Upon vesting of this award, the Company would issue authorized and previously unissued shares of the Company's common stock to the recipient. The 151,398 operational performance-based restricted stock units were valued based on the Company's closing stock price at the trading day before the date of the grant and had a weighted average grant date fair value of $6.36. For the awards with operational performance conditions, the Company reassessed at each reporting date whether achievement of each of the performance conditions was probable and adjusted the accrual of stock-based compensation expense as needed. The 151,397 relative total shareholder return performance-based restricted stock units were valued relative to the stock price performance of a comparator group and had a weighted average grant date fair value of $8.53 based on a Monte Carlo simulation. The Monte Carlo simulation incorporated the assumptions as presented in the following table:

Relative performance-based restricted stock units		
Start price [1]	$	7.59
Valuation date stock price [2]	$	6.33
Expected volatility [3]		55.27 %
Risk-free interest rate [4]		1.37 %
Expected dividend yield [5]		— %

(1) The start price for the Company represented the average closing stock price over the twenty trading days ending on December 31, 2019, assuming dividends distributed during this period were reinvested in additional shares of the Company's stock on the ex-dividend date.
(2) The valuation date stock price represented the closing price on the grant date.
(3) The expected volatility assumption was based on the historical volatility of the price of the Company's stock.
(4) The annual risk-free interest rate equaled the yield on the semi-annual zero coupon U.S. Treasury rates converted to continuously compounded rates that had a term equal to the length of the remaining performance measurement period as of the valuation date.
(5) The expected dividend yield represented the investments return to a share of the Company's stock that is not available to the holder of the performance-based restricted stock unit.

During the first quarter of 2021, the 302,795 performance-based restricted stock units granted under the LTIP were voluntarily forfeited by the CEO in conjunction with an amendment to his employment agreement and the shares were cancelled and allocated back to the LTIP for future issuance. The amendment also included an amendment to the participant's time-based restricted stock granted under the MIP, such that the ratable vesting initially scheduled to occur on the second and third anniversaries of the award shall instead both occur on the second anniversary of the award.

Additionally, the Company granted certain key employees performance-based cash incentive awards granted under the LTIP with a target award amount of $2,755. The cash to be awarded is based on the achievement of pre-established relative total shareholder return goals over a three-year period. These awards are scheduled to cliff vest on the third anniversary of the date of the grant, subject to the participant's continuous service with the Company through the applicable vesting date and the satisfaction of the performance criteria. These awards have the potential to be distributed from 0% to 200% of target depending on actual performance. Upon vesting of these awards, the Company issues cash to the recipient. These awards are classified as a liability, and the Company reassesses at each reporting date the fair value of the award and adjusts the accruals of stock-based compensation expense as appropriate based on a Monte Carlo simulation. As of December 31, 2021 and 2020, the liability for these awards totaled $2,542 and $643, respectively. The performance-based cash incentive awards were valued relative to the stock price performance of a comparator group and had a weighted average grant date fair value as a percent of target dollar value of 82.45% based on a Monte Carlo simulation. The Monte Carlo simulation incorporates the assumptions as presented in the following table:

Performance-based cash incentive awards		
Start price [1]	$	7.59
Valuation date stock price [2]	$	6.33
Expected volatility [3]		55.27 %
Risk-free interest rate [4]		1.37 %
Expected dividend yield [5]		— %

[1] The start price for the Company represents the average closing stock price over the twenty trading days ending on December 31, 2019, assuming dividends distributed during this period were reinvested in additional shares of the Company's stock on the ex-dividend date.
[2] The valuation date stock price represents the closing price at each reporting date.
[3] The expected volatility assumption is based on the historical volatility of the price of the Company's stock.
[4] The annual risk-free interest rate equals the yield on the semi-annual zero coupon U.S. Treasury rates converted to continuously compounded rates that have a term equal to the length of the remaining performance measurement period as of the valuation date.
[5] The expected dividend yield represents the investments return to a share of the Company's stock that is not available to the holder of the performance-based restricted stock unit.

Restricted Stock Units

Time-Based Restricted Stock Units

Time-based restricted stock unit activity for the year ended December 31, 2021 is summarized in the following table:

Time-based restricted stock unit activity:	Number of Shares	Weighted-Average Grant Date Fair Value
Non-vested shares outstanding at December 31, 2020	367,553	$ 13.72
Granted	223,496	$ 12.03
Vested [1]	(193,854)	$ 16.05
Forfeited	(4,920)	$ 19.22
Non-vested shares outstanding at December 31, 2021	392,275	$ 11.54

[1] Includes 61,646 shares with deferred settlement pursuant to the award agreements.

As of December 31, 2021, there was $1,167 of unrecognized compensation cost related to non-vested time-based restricted stock units which is expected to be recognized as expense over a weighted-average period of 1.33 years.

Performance-Based Restricted Stock Units

Relative performance-based restricted stock unit activity for the year ended December 31, 2021 based on target achievement of the performance criteria is summarized in the following table:

Relative performance-based restricted stock unit activity:	Number of Shares	Weighted-Average Grant Date Fair Value
Non-vested shares outstanding at December 31, 2020	174,203	$ 16.01
Granted	67,035	$ 16.18
Vested	—	$ —
Forfeited or Cancelled	(153,016)	$ 9.13
Non-vested shares outstanding at December 31, 2021 [1]	88,222	$ 28.07

[1] During the first quarter of 2022, 46,551 shares were cancelled and allocated back to the LTIP for future issuance as the 2019 award's performance metric was not achieved.

As of December 31, 2021, there was $803 of unrecognized compensation cost related to non-vested relative performance-based restricted stock units which is expected to be recognized as expense over a weighted-average period of 1.95 years.

Absolute performance-based restricted stock unit activity for the year ended December 31, 2021 based on target achievement of the performance criteria is summarized in the following table:

Absolute performance-based restricted stock unit activity:	Number of Shares	Weighted-Average Grant Date Fair Value
Non-vested shares outstanding at December 31, 2020	7,614	$ 50.60
Granted	—	$ —
Vested	—	$ —
Forfeited	(541)	$ 50.60
Non-vested shares outstanding at December 31, 2021 [1]	7,073	$ 50.60

[1] During the first quarter of 2022, 15,532 shares were cancelled and allocated back to the LTIP for future issuance as the 2019 award's performance metric was not achieved.

As of December 31, 2021, there was $13 of unrecognized compensation cost related to non-vested absolute performance-based restricted stock units which is expected to be recognized as expense over a weighted-average period of 0.11 years.

Operational performance-based restricted stock unit activity for the year ended December 31, 2021 based on target achievement of the performance criteria is summarized in the following table:

Operational performance-based restricted stock unit activity:	Number of Shares	Weighted-Average Fair Value
Non-vested shares outstanding at December 31, 2020	151,398	$ 6.36
Granted	100,552	$ 12.00
Vested	—	$ —
Cancelled	(151,398)	$ 6.36
Non-vested shares outstanding at December 31, 2021	100,552	$ 12.00

As of December 31, 2021, there was $386 of unrecognized compensation cost related to non-vested operational performance-based restricted stock units, based on the probability of achievement as of December 31, 2021, which is expected to be recognized as expense over a weighted-average period of 2.08 years.

Stock Options

30-Day Volume-Weighted Average Price ("VWAP") Stock Options

30-day VWAP stock option activity for the year ended December 31, 2021 is summarized in the following table:

	Number of Shares	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value [1]
Outstanding at December 31, 2020	23,225	$ 60.20	6.12	$ (1,134)
Exercisable at December 31, 2020	23,225	$ 60.20	6.12	$ (1,134)
Granted	—	$ —		
Exercised	—	$ —		$ —
Forfeited or Expired	—	$ —		
Outstanding at December 31, 2021	23,225	$ 60.20	5.12	$ 20
Exercisable at December 31, 2021	23,225	$ 60.20	5.12	$ 20

[1] The aggregate intrinsic value of outstanding and exercisable options is calculated as the difference between the exercise price and the Company's stock price at each reporting period end. The aggregate intrinsic value of exercised options is calculated as the difference between the exercise price and the Company's stock price on the exercise date.

As of December 31, 2021, there was $0 of unrecognized compensation cost related to the 30-day VWAP stock options.

Performance-Based Cash Incentive Awards

Performance-based cash incentive award activity for the year ended December 31, 2021 based on target achievement of the performance criteria is summarized in the following table:

Performance-based cash incentive award activity:	Target Dollar Value	Weighted-Average Fair Value as a % of Target Dollar Value
Non-vested awards outstanding at December 31, 2020	$ 2,206	94.21 %
Granted	927	51.73 %
Vested	—	— %
Forfeited	(142)	78.45 %
Non-vested awards outstanding at December 31, 2021	$ 2,991	162.03 %

As of December 31, 2021, there was $2,092 of unrecognized compensation cost related to non-vested performance-based cash incentive awards, based on the probability of achievement as of December 31, 2021, which is expected to be recognized as expense over a weighted-average period of 1.39 years.

(21) Related Party Transactions

There were no material related party transactions for the years ended December 31, 2021 and 2020. However, during the year ended December 31, 2021,

- the Company, through a privately negotiated transaction with an underlying Contingent Revenue Obligation creditor, repurchased 7.75% of the outstanding rights of the Contingent Revenue Obligation at an aggregate purchase price of $2,091. The underlying Contingent Revenue Obligation creditor was an existing shareholder (related party) as of the repurchase date. Refer to Note 15 for additional disclosures on this acquisition-related obligation; and
- the Company repurchased at a discount certain outstanding principal borrowings made under the Term Loan Credit Facility from existing shareholders through privately negotiated transactions. Refer to Note 14 for additional disclosures on long-term debt.

(22) Commitments and Contingencies

(a) General

Estimated losses from loss contingencies are accrued by a charge to income when information available indicates that it is probable that an asset has been impaired or a liability has been incurred and the amount of the loss can be reasonably estimated.

If a loss contingency is not probable or reasonably estimable, disclosure of the loss contingency is made in the Consolidated Financial Statements when it is at least reasonably possible that a loss may be incurred and that the loss could be material.

(b) Commitments and Contingencies

Commitments

The Company leases coal mining and other equipment under long-term financing and operating leases with varying terms. Refer to Note 12 for further information on leases. In addition, the Company leases mineral interests and surface rights from landowners under various terms and royalty rates.

Coal royalty expense was $113,685 and $67,992 for the years ended December 31, 2021 and 2020, respectively.

Minimum royalty obligations under coal leases total $14,665, $14,418, $13,620, $12,525, $12,396, and $56,771 for 2022, 2023, 2024, 2025, 2026, and after 2026, respectively.

Other Commitments

As of December 31, 2021, the Company has obligations under certain coal purchase agreements that contain minimum quantities to be purchased in 2022 totaling an estimated $37,335. The Company also has obligations under certain coal transportation agreements that contain minimum quantities to be shipped during contract periods in 2022 and 2023 with estimated cash settlements in 2022, 2023, and 2024 which are based on estimated remaining tons to be shipped, totaling $2,527, $105,750, and $87,825, respectively. The Company also has obligations under certain equipment purchase agreements that contain minimum quantities to be purchased in 2022 totaling $18,497. Additionally, the Company has diesel fuel purchase commitments totaling $25,490 in 2022.

Contingencies

Extensive regulation of the impacts of mining on the environment and of maintaining workplace safety has had, and is expected to continue to have, a significant effect on the Company's costs of production and results of operations. Further regulations, legislation or litigation in these areas may also cause the Company's sales or profitability to decline by increasing costs or by hindering the Company's ability to continue mining at existing operations or to permit new operations.

During the normal course of business, contract-related matters arise between the Company and its customers. When a loss related to such matters is considered probable and can reasonably be estimated, the Company records a liability.

Refer to Note 3 for disclosures on the Cumberland Back-to-Back Coal Supply Agreements.

(c) Guarantees and Financial Instruments with Off-Balance Sheet Risk

In the normal course of business, the Company is a party to certain guarantees and financial instruments with off-balance sheet risk, such as bank letters of credit, performance or surety bonds, and other guarantees and indemnities related to the obligations of affiliated entities which are not reflected in the Company's Consolidated Balance Sheets. However, the underlying liabilities that they secure, such as asset retirement obligations, workers' compensation liabilities, and royalty obligations, are reflected in the Company's Consolidated Balance Sheets.

The Company is required to provide financial assurance in order to perform the post-mining reclamation required by its mining permits, pay workers' compensation claims under workers' compensation laws in various states, pay federal black lung benefits, and perform certain other obligations. In order to provide the required financial assurance, the Company generally uses surety bonds for post-mining reclamation and workers' compensation obligations. The Company can also use bank letters of credit to collateralize certain obligations.

As of December 31, 2021, the Company had $121,037 in letters of credit outstanding under the Second Amended and Restated Asset-Based Revolving Credit Agreement. Additionally, as of December 31, 2021, the Company had $613 in letters of credit outstanding under the Credit and Security Agreement dated June 30, 2017, and related amendments, between ANR, Inc. and First Tennessee Bank National Association. On March 31, 2021, the Amended and Restated Letter of Credit Agreement dated November 9, 2018 between ANR, Inc. and Citibank, N.A. was terminated.

As of December 31, 2021, the Company had outstanding surety bonds with a total face amount of $176,119 to secure various obligations and commitments, including $30 attributable to discontinued operations. To secure the Company's reclamation-related obligations, the Company currently has $36,792 of collateral in the form of restricted cash, restricted investments, and deposits and $15,548 of letters of credit outstanding supporting these obligations as of December 31, 2021.

The Company meets frequently with its surety providers and has discussions with certain providers regarding the extent of and the terms of their participation in the program. These discussions may cause the Company to shift surety bonds between providers or to alter the terms of their participation in our program. To the extent that surety bonds become unavailable or the Company's surety bond providers require additional collateral, the Company would seek to secure its obligations with letters of credit, cash deposits or other suitable forms of collateral. The Company's failure to maintain, or inability to acquire, surety bonds or to provide a suitable alternative would have a material adverse effect on its liquidity. These failures could result from a variety of factors including lack of availability, higher cost or unfavorable market terms of new surety bonds, and the exercise by third-party surety bond issuers of their right to refuse to renew the surety.

Amounts included in restricted cash represent cash deposits primarily invested in interest-bearing accounts that are restricted as to withdrawal as required by certain agreements entered into by the Company and provide collateral to secure the following obligations which have been written on the Company's behalf:

	December 31, 2021	December 31, 2020
Workers' compensation and black lung obligations	$ 70,637	$ 69,725
Reclamation-related obligations	10,449	8,445
Financial payments and other performance obligations	8,340	17,863
Contingent Revenue Obligation escrow	11,977	9,311
Total restricted cash	101,403	105,344
Less current portion [1]	(11,977)	(9,311)
Restricted cash, net of current portion	$ 89,426	$ 96,033

[1] Included within Prepaid expenses and other current assets on the Company's Consolidated Balance Sheets.

Restricted investments consist of FDIC insured certificates of deposit, mutual funds, and U.S. treasury bills that are restricted as to withdrawal as required by certain agreements entered into by the Company and provide collateral to secure the following obligations which have been written on the Company's behalf:

	December 31, 2021	December 31, 2020
Workers' compensation obligations	$ 210	$ 51
Reclamation-related obligations	26,225	22,233
Financial payments and other performance obligations	2,008	1,484
Total restricted investments [1], [2]	$ 28,443	$ 23,768

[1] Included within Other non-current assets on the Company's Consolidated Balance Sheets.
[2] As of December 31, 2021 and 2020, respectively, $28,443 and $22,498 are classified as trading securities and $0 and $1,270 are classified as held-to-maturity securities.

Deposits represent cash deposits held at third parties as required by certain agreements entered into by the Company to provide cash collateral to secure the following obligations which have been written on the Company's behalf:

	December 31, 2021	December 31, 2020
Reclamation-related obligations	$ 118	$ 25,633
Financial payments and other performance obligations	403	1,596
Other operating agreements	873	1,018
Total deposits [1]	$ 1,394	$ 28,247

[1] Included within Prepaid expenses and other current assets and other non-current assets on the Company's Consolidated Balance Sheets.

DCMWC Reauthorization Process

In July 2019, the U.S. Department of Labor (Division of Coal Mine Workers' Compensation or "DCMWC") began implementing a new authorization process for all self-insured coal mine operators. As requested by the DCMWC, the Company filed an application and supporting documentation for reauthorization to self-insure certain of its black lung obligations in October 2019. As a result of this application, the DCMWC notified the Company in a letter dated February 21, 2020 that the Company was reauthorized to self-insure certain of its black lung obligations for a period of one-year from February 21, 2020. The DCMWC reauthorization is contingent, however, upon the Company's providing collateral of $65,700 to secure certain of its black lung obligations. This proposed collateral requirement is an increase from the approximate $2,600 in collateral that the Company currently provides to secure these self-insured black lung obligations. The reauthorization process provided the Company with the right to appeal the security determination in writing within 30 days of the date of the notification, which appeal period the DCMWC agreed to extend to May 22, 2020. The Company exercised this right of appeal in connection with the substantial increase in the amount of required collateral. In February 2021, the U.S. Department of Labor ("DOL") withdrew its Federal Register notice seeking comments on its bulletin describing its new method of calculating collateral requirements. The Department removed the bulletin from its website in May 2021. On February 10, 2022, a telephone conference was held with DCMWC and DOL decision makers wherein the Company presented facts and arguments in support of its appeal. No ruling has been made on the appeal, but during the call the Company indicated that it would be willing to allocate an additional $10,000 in collateral. If the Company's appeal is unsuccessful, the Company may be required to provide additional letters of credit to receive the self-insurance reauthorization from the DCMWC or alternatively insure these black lung obligations through a third party provider that would likely also require the Company to provide additional collateral. Either of these outcomes could potentially reduce the Company's liquidity.

(d) Legal Proceedings

The Company is party to legal proceedings from time to time. These proceedings, as well as governmental examinations, could involve various business units and a variety of claims including, but not limited to, contract disputes, personal injury claims, property damage claims (including those resulting from blasting, trucking and flooding), environmental and safety issues, securities-related matters and employment matters. While some legal matters may specify the damages claimed by the plaintiffs, many seek an unquantified amount of damages. Even when the amount of damages claimed against the Company or its subsidiaries is stated, (i) the claimed amount may be exaggerated or unsupported; (ii) the claim may be based on a novel legal theory or involve a large number of parties; (iii) there may be uncertainty as to the likelihood of a class being certified or the ultimate size of the class; (iv) there may be uncertainty as to the outcome of pending appeals or motions; and/or (v) there may be significant factual issues to be resolved. As a result, if such legal matters arise in the future, the Company may be unable to estimate a range of possible loss for matters that have not yet progressed sufficiently through discovery and development of important factual information and legal issues. The Company records accruals based on an estimate of the ultimate outcome of these matters, but these estimates can be difficult to determine and involve significant judgment.

(23) Concentration of Credit Risk and Major Customers

The Company markets produced, processed, and purchased coal to customers in the United States and in international markets, primarily India, China, and Brazil. The following table presents additional information on our total revenues and top customers:

	Year Ended December 31,	
	2021	2020
Total revenue	$ 2,258,586	$ 1,416,187
Top customer as % of total revenue	13 %	16 %
Top 10 customers as % of total revenue	64 %	63 %
Number of customers exceeding 10% of total revenue	2	2
Number of customers exceeding 10% of total trade accounts receivable, net	3	3
Domestic revenue as % of coal revenue	24 %	36 %
Export revenue as % of coal revenue	76 %	64 %
Countries with export revenue exceeding 10% of total revenue	India, China, Brazil	India, Brazil
Met coal as % of coal sales volume	83 %	80 %
Thermal coal as % of coal sales volume	17 %	20 %

(24) Segment Information

The Company extracts, processes and markets met and thermal coal from deep and surface mines for sale to steel and coke producers, industrial customers, and electric utilities. The Company conducts mining operations only in the United States with mines in Central Appalachia. The Company has one reportable segment: Met, which consists of five active mines and two preparation plants in Virginia, fourteen active mines and five preparation plants in West Virginia, as well as expenses associated with certain idled/closed mines. As of December 31, 2020, the Company had two reportable segments: CAPP - Met and CAPP - Thermal. As a result of the Company's continued strategic focus on the production of metallurgical coal and the reduction of thermal mining operations, the Company re-evaluated its previous conclusions with respect to its segment reporting during the first quarter of 2021. To conform to the current period reportable segments presentation, the prior periods have been restated to reflect the change in reportable segments.

In addition to the one reportable segment, the All Other category includes general corporate overhead and corporate assets and liabilities, the former CAPP - Thermal operations consisting of one active mine and one preparation plant in West Virginia, and the elimination of certain intercompany activity, as well as expenses associated with certain idled/closed mines.

Reportable segment operating results are regularly reviewed by the Chief Operating Decision Maker ("CODM"), who is the Chief Executive Officer of the Company.

Segment operating results and capital expenditures from continuing operations for the year ended December 31, 2021 were as follows:

	Year Ended December 31, 2021		
	Met	All Other	Consolidated
Total revenues	$ 2,176,080	$ 82,506	$ 2,258,586
Depreciation, depletion, and amortization	$ 99,963	$ 10,084	$ 110,047
Amortization of acquired intangibles, net	$ 13,671	$ (427)	$ 13,244
Adjusted EBITDA	$ 567,270	$ (34,447)	$ 532,823
Capital expenditures	$ 79,185	$ 4,115	$ 83,300

ALPHA METALLURGICAL RESOURCES, INC. AND SUBSIDIARIES
Notes to Consolidated Financial Statements
(Amounts in thousands except share and per share data)

Segment operating results and capital expenditures from continuing operations for the year ended December 31, 2020 were as follows:

	Year Ended December 31, 2020		
	Met	All Other	Consolidated
Total revenues	$ 1,264,496	$ 151,691	$ 1,416,187
Depreciation, depletion, and amortization	$ 124,060	$ 15,825	$ 139,885
Amortization of acquired intangibles, net	$ 12,889	$ (3,675)	$ 9,214
Adjusted EBITDA	$ 120,281	$ (36,880)	$ 83,401
Capital expenditures	$ 111,745	$ 7,834	$ 119,579

The following table presents a reconciliation of net income (loss) from continuing operations to Adjusted EBITDA for the year ended December 31, 2021:

	Year Ended December 31, 2021		
	Met	All Other	Consolidated
Net income (loss) from continuing operations	$ 439,859	$ (152,930)	$ 286,929
Interest expense	184	69,470	69,654
Interest income	(6)	(328)	(334)
Income tax expense	—	3,609	3,609
Depreciation, depletion and amortization	99,963	10,084	110,047
Non-cash stock compensation expense	28	5,287	5,315
Mark-to-market adjustment - acquisition-related obligations	—	19,525	19,525
Gain on settlement of acquisition-related obligations	—	(1,125)	(1,125)
Accretion on asset retirement obligations	13,571	12,949	26,520
Asset impairment and restructuring	—	(561)	(561)
Amortization of acquired intangibles, net	13,671	(427)	13,244
Adjusted EBITDA	$ 567,270	$ (34,447)	$ 532,823

The following table presents a reconciliation of net loss from continuing operations to Adjusted EBITDA for the year ended December 31, 2020:

	Year Ended December 31, 2020		
	Met	All Other	Consolidated
Net loss from continuing operations	$ (77,519)	$ (163,951)	$ (241,470)
Interest expense	(2,014)	76,542	74,528
Interest income	(63)	(6,964)	(7,027)
Income tax benefit	—	(2,164)	(2,164)
Depreciation, depletion and amortization	124,060	15,825	139,885
Non-cash stock compensation expense	289	4,607	4,896
Mark-to-market adjustment - acquisition-related obligations	—	(8,750)	(8,750)
Accretion on asset retirement obligations	14,214	12,290	26,504
Asset impairment and restructuring	46,317	37,561	83,878
Management restructuring costs [1]	501	440	941
Loss on partial settlement of benefit obligations	1,607	1,359	2,966
Amortization of acquired intangibles, net	12,889	(3,675)	9,214
Adjusted EBITDA	$ 120,281	$ (36,880)	$ 83,401

[1] Management restructuring costs are related to severance expense associated with senior management changes during the three months ended March 31, 2020.

No asset information has been disclosed as the CODM does not regularly review asset information by reportable segment.

(25) Subsequent Events

On March 4, 2022, the Company’s board of directors adopted a share repurchase program that permits the Company to repurchase up to an aggregate amount of $150,000 of the Company's common stock. Share repurchases may be made from time to time through open market transactions, block trades, tender offers, or otherwise. Repurchases under the program are subject to market and business conditions, levels of available liquidity, the Company’s cash needs, restrictions under agreements or obligations, legal or regulatory requirements or restrictions and other relevant factors.

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

None.

Item 9A. ***Controls and Procedures***

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures as that term is defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act") that are designed to ensure that information required to be disclosed by the Company in reports that it files or submits under the Exchange Act, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer ("CEO") and our Chief Financial Officer ("CFO"), as appropriate, to allow timely decisions regarding required disclosures. In accordance with Rule 13a-15(b) of the Exchange Act, we have evaluated, under the supervision of our CEO and our CFO, the effectiveness of disclosure controls and procedures as of December 31, 2021. Based on this evaluation, our CEO and our CFO concluded that our disclosure controls and procedures were effective as of December 31, 2021.

Management's Report on Internal Control Over Financial Reporting

Management is responsible for maintaining and establishing adequate internal control over financial reporting. An evaluation of the effectiveness of the design and operation of our internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act, as of the end of the period covered by this report was performed under the supervision and with the participation of management, including our CEO and CFO under the oversight of the audit committee of the board of directors. This evaluation is performed to determine if our internal controls over financial reporting 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.

Management conducted an assessment of the effectiveness of our internal control over financial reporting using the criteria set by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control - Integrated Framework (2013). Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2021.

Our CEO, CFO, and other members of management do not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. 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.

Our independent registered public accounting firm, RSM US LLP, has audited the effectiveness of our internal control over financial reporting, as stated in their attestation report included in this annual report on Form 10-K.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) that occurred during the period covered by this Annual Report on Form 10-K that have materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

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***

The sections of our Proxy Statement entitled "Proposal 1 - Election of Directors," "About our Board of Directors - Board and Its Committees," "About our Board of Directors - Board Committees - Audit Committee," "About our Management Team," "Delinquent Section 16(a) Reports," "About our Board of Directors - Code of Business Ethics" and "Stockholder Proposals for the 2023 Annual Meeting" are incorporated herein by reference.

The Company has a written Code of Business Ethics that applies to the Company's Chief Executive Officer (Principal Executive Officer), Chief Financial Officer (Principal Financial and Accounting Officer) and others. The Code of Business Ethics is available on the Company's website at www.alphametresources.com. Any amendments to, or waivers from, a provision of our Code of Business Ethics that applies to our Principal Executive Officer, Principal Financial and Accounting Officer or persons performing similar functions and that relates to any element of the code of ethics enumerated in paragraph (b) of Item 406 of Regulation S-K shall be disclosed by posting on our website. Information on or accessible through our website is not incorporated by reference into this Annual Report on Form 10-K.

Item 11. ***Executive Compensation***

The sections of our Proxy Statement entitled "About our Board of Directors - Director Compensation - 2021 Director Compensation," "Executive Compensation - Compensation Discussion and Analysis," "Board Committee Reports - Compensation Committee Report," "Executive Compensation - Compensation Discussion and Analysis - Risk Assessment of Compensation Programs," "Executive Compensation - 2021 Summary Compensation Table," "Executive Compensation - 2021 Grants of Plan-Based Awards," "Executive Compensation - Outstanding Equity Awards at 2021 Fiscal Year End," "Executive Compensation - Option Exercises and Stock Vested in 2021," "Executive Compensation - Nonqualified Deferred Compensation," "Executive Compensation - Potential Payments on Termination or Change in Control," and "Pay Ratio" are incorporated herein by reference.

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

The section of our Proxy Statement entitled "Security Ownership of Certain Beneficial Owners and Management" is incorporated herein by reference.

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

The sections of our Proxy Statement entitled "About our Board of Directors - Independent and Non-Management Directors" and "Other Information - Review and Approval of Transactions With Related Persons" are incorporated herein by reference.

Item 14. ***Principal Accounting Fees and Services***

The sections of our Proxy Statement entitled "Proposal 2 - Ratification of Appointment of Independent Registered Public Accounting Firm - Independent Registered Public Accounting Firm and Fees" and "Proposal 2 - Ratification of Appointment of Independent Registered Public Accounting Firm - Policy for Approval of Audit and Permitted Non-Audit Services" are incorporated herein by reference.

Additional Information

We file annual, quarterly and current reports, proxy statements and other information with the Securities and Exchange Commission ("SEC"). You may access and read our SEC filings through our website, at www.alphametresources.com, or the SEC's website, at www.sec.gov. You may also request copies of our filings, at no cost, by telephone at (423) 573-0300 or by mail at: Alpha Metallurgical Resources, Inc., P.O. Box 848, Bristol, TN 37621, attention: Investor Relations. Our Audit Committee Charter, Compensation Committee Charter, Nominating and Corporate Governance Committee Charter, Corporate Governance Practices and Policies, and Code of Business Ethics are also available on our website and available in print to any stockholder who requests them. Information on or accessible through our website is not incorporated by reference into this Annual Report on Form 10-K.

Part IV

Item 15. ***Exhibits, Financial Statement Schedules***

Pursuant to the rules and regulations of the Securities and Exchange Commission, the Company has filed certain agreements as exhibits to this Annual Report on Form 10-K. These agreements may contain representations and warranties by the parties. These warranties have been made solely for the benefit of the other party or parties to such agreements and (i) may have been qualified by disclosure made to such other party or parties, (ii) were made only as of the date of such agreements or such other date(s) as may be specified in such agreements and are subject to more recent developments, which may not be fully reflected in such Company's public disclosure, (iii) may reflect the allocation of risk among the parties to such agreements and (iv) may apply materiality standards different from what may be viewed as material to investors. Accordingly, these representations and warranties may not describe the Company's actual state of affairs at the date hereof and should not be relied upon.

(a) Documents filed as part of this Annual Report on Form 10-K:

(1) *The following financial statements are filed as part of this Annual Report on Form 10-K under Item 8-Financial Statements and Supplementary Data:*

- Report of Independent Registered Public Accounting Firm
- Consolidated Statements of Operations, Years ended December 31, 2021 and 2020
- Consolidated Statements of Comprehensive Income (Loss), Years ended December 31, 2021 and 2020
- Consolidated Balance Sheets, December 31, 2021 and 2020
- Consolidated Statements of Cash Flows, Years ended December 31, 2021 and 2020
- Consolidated Statements of Stockholders' Equity, Years ended December 31, 2021 and 2020
- Notes to Consolidated Financial Statements

(2) *Financial Statement Schedules*. All schedules are omitted because they are not required or because the information is immaterial or provided elsewhere in the Consolidated Financial Statements and Notes thereto.

(3) *Listing of Exhibits.* See the Exhibit Index following the signature page to this Annual Report on Form 10-K.

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.

ALPHA METALLURGICAL RESOURCES, INC.

Date: March 7, 2022

By: */s/ Charles Andrew Eidson*

Name: Charles Andrew Eidson

Title: President and Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Charles Andrew Eidson, and each of them, his or her true and lawful attorneys-in-fact, each with full power of substitution, for him or her in any and all capacities, to sign any amendments to this Annual Report on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact or their substitute or substitutes may do or cause to be done by virtue hereof. 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.

Signature	Date	Title
/s/ David J. Stetson David J. Stetson	March 7, 2022	Chief Executive Officer (Principal Executive Officer)
/s/ Charles Andrew Eidson Charles Andrew Eidson	March 7, 2022	President and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)
/s/ Michael J. Quillen Michael J. Quillen	March 7, 2022	Director
/s/ Kenneth S. Courtis Kenneth S. Courtis	March 7, 2022	Director
/s/ Albert E. Ferrara, Jr. Albert E. Ferrara, Jr.	March 7, 2022	Director
/s/ Elizabeth A. Fessenden Elizabeth A. Fessenden	March 7, 2022	Director
/s/ Daniel D. Smith Daniel D. Smith	March 7, 2022	Director
/s/ Scott D. Vogel Scott D. Vogel	March 7, 2022	Director

Exhibit Index

Exhibit No.	Description of Exhibit
3.1*	Second Amended and Restated Certificate of Incorporation of Alpha Metallurgical Resources, Inc., as amended through January 22, 2021 (Incorporated by reference to Exhibit 3.1 on Form 10-Q of Alpha Metallurgical Resources, Inc. filed on November 5, 2021)
3.2	Third Amended and Restated Bylaws of Alpha Metallurgical Resources, Inc., as amended through November 4, 2021
4.1*	Specimen Certificate for shares of Common Stock (Incorporated by reference to Exhibit 4.1 on Form 10-K of Alpha Metallurgical Resources, Inc. filed on March 15, 2021)
4.2	Description of Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934
10.1*	Form of Indemnification Agreement by and between Contura Energy, Inc. and each of its current and future directors and officers. (Incorporated by reference to Exhibit 10.28 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.2*	Warrant Agreement, dated July 26, 2016, between Contura Energy, Inc., Computershare, Inc. and Computershare Trust Company, N.A. (including Form of Warrant Certificate). (Incorporated by reference to Exhibit 10.29 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.3*†	Contura Energy, Inc. Management Incentive Plan, effective as of July 26, 2016. (Incorporated by reference to Exhibit 10.36 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.4*†	Amendment 1 to Contura Energy, Inc. Management Incentive Plan, dated as of January 18, 2017. (Incorporated by reference to Exhibit 10.37 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.5*†	Form of Contura Energy, Inc. Option Agreement. (Incorporated by reference to Exhibit 10.38 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.6*†	Form of Contura Energy, Inc. Restricted Share Agreement. (Incorporated by reference to Exhibit 10.39 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.7*†	Form of Contura Energy, Inc. Emergence Award Agreement. (Incorporated by reference to Exhibit 10.40 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.8*†	Contura Energy, Inc. Deferred Compensation Plan. (Incorporated by reference to Exhibit 10.41 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.9*†	Contura Energy, Inc. Annual Incentive Bonus Program. (Incorporated by reference to Exhibit 10.42 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on August 21, 2018)
10.10*	Form of Voting and Support Agreement. (Incorporated by reference to Exhibit 10.46 to the Registration Statement on Form S-4/A of Contura Energy, Inc. (File No. 333-226953) filed on October 5, 2018)
10.11*†	Form of Indemnification Agreement. (Incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K of Contura Energy, Inc. filed on November 13, 2018)
10.12*†	Contura Energy, Inc. Amended and Restated Non-Employee Director Compensation Policy, dated November 17, 2020 (Incorporated by reference to Exhibit 10.43 on Form 10-K of Alpha Metallurgical Resources, Inc. filed on March 15, 2021)
10.13*†	Contura Energy, Inc. Form of Non-Employee Director Restricted Stock Unit Award Agreement (Incorporated by reference to Exhibit 10.8 to the Current Report on Form 8-K of Contura Energy, Inc. filed on November 13, 2018)
10.14*†	Contura Energy, Inc. Form of Restricted Stock Unit Award Agreement (For Employees) (Incorporated by reference to Exhibit 10.9 to the Current Report on Form 8-K of Contura Energy, Inc. filed on November 13, 2018)
10.15*	Credit Agreement, dated as of June 14, 2019, by and among Contura Energy, Inc., as the Borrower, Cantor Fitzgerald Securities, as Administrative Agent and certain lenders party thereto (Incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Contura Energy, Inc. filed on June 18, 2019)
10.16*†	Employment Agreement, dated as of July 29, 2019, by and between Contura Energy, Inc. and David J. Stetson (Incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Contura Energy, Inc. filed on July 29, 2019)
10.17*†	Form of Incentive Award Agreement (Incorporated by reference to Exhibit 10.1 on Form 10-Q of Contura Energy, Inc. filed on May 11, 2020)
10.18*†	Form of Performance Share Unit Award Agreement (Incorporated by reference to Exhibit 10.2 on Form 10-Q of Contura Energy, Inc. filed on May 11, 2020)
10.19*†	Form of Management Incentive Plan Restricted Unit Award Agreement (Incorporated by reference to Exhibit 10.3 on Form 10-Q of Contura Energy, Inc. filed on May 11, 2020)

10.20*†	Plan Document and Summary Plan Description of the Amended and Restated Contura Energy, Inc. Key Employee Separation Plan (Incorporated by reference to Exhibit 10.1 on Form 10-Q of Contura Energy, Inc. filed on November 9, 2020)
10.21*†	Amended and Restated Employment Agreement, dated as of January 26, 2021, by and between Contura Energy, Inc. and David J. Stetson (Incorporated by reference to Exhibit 10.1 on Form 8-K of Contura Energy, Inc. filed on January 29, 2021)
10.22*	Amendment, dated as of May 27, 2020, to the Credit Agreement, dated as of June 14, 2019, by and among Contura Energy, Inc., as the Borrower, Cantor Fitzgerald Securities, as Administrative Agent and certain lenders party thereto. (Incorporated by reference to Exhibit 99.1 to the Current Report on Form 8-K of Alpha Metallurgical Resources, Inc. filed on May 29, 2020)
10.23 *†	Executive Officer Incentive Compensation Recoupment (Clawback) Policy (Incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Alpha Metallurgical Resources, Inc. filed on May 4, 2021)
10.24* †	Form of 2018 Long-Term Incentive Plan, as restated to give effect to Amendment No.1. (Incorporated by reference to Exhibit 99.1 to the Registration Statement on Form S-8 of Alpha Metallurgical Resources, Inc. (File No. 333-257563) filed on June 30, 2021)
10.25* †	Amendment, effective June 30, 2021, by and between Alpha Metallurgical Resources, Inc. and David J. Stetson, to the Amended and Restated Employment Agreement, dated as of January 26, 2021, between Contura Energy, Inc. (now known as Alpha Metallurgical Resources, Inc.) and David J. Stetson (Incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Alpha Metallurgical Resources, Inc. filed on July 7, 2021)
10.26*	Second Amended and Restated Asset-Based Revolving Credit Agreement, dated as of December 6, 2021, by and among Alpha Metallurgical Resources, Inc. and certain of its Subsidiaries, as borrowers, the Guarantors party thereto, Citibank, N.A. and BMO Capital Markets Corp., as joint lead arrangers and joint bookrunners, BMO Harris Bank, N.A. and Eclipse Business Capital LLC, as co-collateral agents, the other Lenders from time to time party thereto, and Citibank, N.A., as administrative agent, collateral agent, swingline lender and L/C issuer. (Incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Alpha Metallurgical Resources, Inc. filed on December 10, 2021)
10.27*	Second Amended and Restated Pledge and Security Agreement, dated as of December 6, 2021, by and among Alpha Metallurgical Resources, Inc., the subsidiaries of Alpha Metallurgical Resources, Inc. that are grantors thereunder and Citibank, N.A., as collateral agent. (Incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K of Alpha Metallurgical Resources, Inc. filed on December 10, 2021)
21.1	List of Subsidiaries of Alpha Metallurgical Resources, Inc.
23.1	Consent of RSM US LLP
23.2	Consent of Marshall Miller & Associates, Inc. dated March 7, 2022
31	Certifications Pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to §302 of the Sarbanes-Oxley Act of 2002
32	Certifications Pursuant to 18 U.S.C. §1350, As Adopted Pursuant to §906 of the Sarbanes-Oxley Act of 2002
95	Mine Safety Disclosure
96.1	Technical Report Summary - Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Aracoma Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022
96.2	Technical Report Summary - Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Kepler Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022
96.3	Technical Report Summary - Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Mid-West Virginia Surface Business Unit in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022
96.4	Technical Report Summary - Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Mid-West Virginia Underground Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022
96.5	Technical Report Summary - Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Virginia Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, Virginia, USA, February 2022

101	The following financial information from Alpha Metallurgical Resources, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2021 formatted in Inline XBRL (Extensible Business Reporting Language) includes: (i) Consolidated Statements of Operations, (ii) Consolidated Statements of Comprehensive Income (Loss), (iii) Consolidated Balance Sheets, (iv) Consolidated Statements of Cash Flows, (v) Consolidated Statements of Stockholders' Equity, and (vi) Notes to the Consolidated Financial Statements.
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

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* Previously filed.

† Management contract, compensatory plan or arrangement.

THIRD AMENDED AND RESTATED BYLAWS

OF

ALPHA METALLURGICAL RESOURCES, INC.

(Amended as of: November 4, 2021)

* * * * *

ARTICLE 1
OFFICES

Section 1.01. *Registered Office.* The registered office of the Corporation shall be in the City of Wilmington, County of New Castle, State of Delaware.

Section 1.02. *Other Offices.* The Corporation may also have offices at such other places both within and without the State of Delaware as the Board of Directors may from time to time determine or the business of the Corporation may require.

Section 1.03. *Books.* The books of the Corporation may be kept within or without the State of Delaware as the Board of Directors may from time to time determine or the business of the Corporation may require.

Section 1.04. *Name of the Corporation*: The name of the Corporation shall be Alpha Metallurgical Resources, Inc., effective as of February 1, 2021.

ARTICLE 2
MEETINGS OF STOCKHOLDERS

Section 2.01. *Time and Place of Meetings.* All meetings of stockholders shall be held at such place, either within or without the State of Delaware, on such date and at such time as may be determined from time to time by the Board of Directors (or the Chairman in the absence of a designation by the Board of Directors).

Section 2.02. *Annual Meetings.* An annual meeting of stockholders shall be held for the election of directors and to transact such other business as may properly be brought before the meeting at such place, on such date, and at such time as the Board of Directors shall determine.

Section 2.03. *Special Meetings.* Special meetings of the stockholders may be called only by the Board of Directors acting pursuant to a resolution adopted by a majority of the Board of

Directors. Notwithstanding the foregoing, whenever holders of one or more classes or series of Preferred Stock shall have the right, voting separately as a class or series, to elect directors, such holders may call, pursuant to the terms of such class or series of Preferred Stock adopted by resolution or resolutions of the Board of Directors as provided in the Amended and Restated Certificate of Incorporation, special meetings of holders of such Preferred Stock.

Section 2.04. *Notice of Meetings and Adjourned Meetings; Waivers of Notice.* (a) Whenever stockholders are required or permitted to take any action at a meeting, a written notice of the meeting shall be given which shall state the place, if any, date and hour of the meeting, the means of remote communications, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at such meeting, and, in the case of a special meeting, the purpose or purposes for which the meeting is called. Unless otherwise provided by the General Corporation Law of the State of Delaware as the same exists or may hereafter be amended ("**Delaware Law**"), such notice shall be given not less than 10 nor more than 60 days before the date of the meeting to each stockholder of record entitled to vote at such meeting. The Board of Directors or the chairman of the meeting may adjourn the meeting to another time or place (whether or not a quorum is present), and notice need not be given of the adjourned meeting if the time, place, if any, and the means of remote communications, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at such meeting, are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the Corporation may transact any business which might have been transacted at the original meeting. If the adjournment is for more than 30 days, or after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

(b) A written waiver of any such notice signed by the person entitled thereto, or a waiver by electronic transmission by the person entitled to notice, whether before or after the time stated therein, shall be deemed equivalent to notice. Attendance of a person at a meeting shall constitute a waiver of notice of such meeting, except when the person attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Business transacted at any special meeting of stockholders shall be limited to the purposes stated in the notice.

Section 2.05. *Quorum.* Unless otherwise provided under the Amended and Restated Certificate of Incorporation or these Second Amended and Restated Bylaws ("**Bylaws**") and subject to Delaware Law, the presence, in person or by proxy, of the holders of a majority of the total voting power of all outstanding securities of the Corporation generally entitled to vote at a meeting of stockholders shall constitute a quorum for the transaction of business. If, however, such quorum shall not be present or represented at any meeting of the stockholders, the chairman of the meeting or a majority in voting interest of the stockholders present in person or represented by proxy may adjourn the meeting, without notice other than announcement at the meeting, until a quorum shall be present or represented. At such adjourned meeting at which a

quorum shall be present or represented any business may be transacted that might have been transacted at the meeting as originally notified.

Section 2.06. *Voting.* (a) Unless otherwise provided in the Amended and Restated Certificate of Incorporation and subject to Delaware Law, each stockholder shall be entitled to one vote for each outstanding share of capital stock of the Corporation held by such stockholder. Any share of capital stock of the Corporation held by the Corporation shall have no voting rights. Except as otherwise provided by law, the Amended and Restated Certificate of Incorporation or these Bylaws, in all matters other than the election of directors, the affirmative vote of the holders of a majority of the votes cast at the meeting on the subject matter shall be the act of the stockholders. Abstentions and broker non-votes shall not be counted as votes cast. Subject to the rights of the holders of any class or series of preferred stock to elect additional directors under specific circumstances, as may be set forth in the certificate of designations for such class or series of preferred stock, directors shall be elected by a plurality of the votes of the shares of capital stock of the Corporation present in person or represented by proxy at the meeting and entitled to vote on the election of directors.

(b) Each stockholder entitled to vote at a meeting of stockholders or to express consent or dissent to a corporate action in writing without a meeting may authorize another person or persons to act for such stockholder by proxy, appointed by an instrument in writing, subscribed by such stockholder or by his attorney thereunto authorized, or by proxy sent by cable, telegram or by any means of electronic communication permitted by law, which results in a writing from such stockholder or by his attorney, and delivered to the secretary of the meeting. No proxy shall be voted after three (3) years from its date, unless said proxy provides for a longer period.

Section 2.07. *Action by Consent*. Subject to the rights of the holders of any class or series of preferred stock then outstanding, as may be set forth in the certificate of designations for such class or series of preferred stock, any action required or permitted to be taken at any annual or special meeting of stockholders may be taken only upon the vote of stockholders at an annual or special meeting duly noticed and called in accordance with Delaware Law and may not be taken by written consent of stockholders without a meeting.

Section 2.08. *Organization.* At each meeting of stockholders, the Chairman of the Board of Directors, if one shall have been elected, or in the Chairman's absence or if one shall not have been elected, the director designated by the vote of the majority of the directors present at such meeting, shall act as chairman of the meeting. The Secretary (or in the Secretary's absence or inability to act, the person whom the chairman of the meeting shall appoint secretary of the meeting) shall act as secretary of the meeting and keep the minutes thereof.

Section 2.09. *Order of Business.* The order of business at all meetings of stockholders shall be as determined by the chairman of the meeting.

Section 2.10. *Nomination of Directors and Proposal of Other Business.*

(a) *Annual Meetings of Stockholders*. (i) Nominations of persons for election to the Board of Directors or the proposal of other business to be transacted by the stockholders at an annual

meeting of stockholders may be made only (A) pursuant to the Corporation's notice of meeting (or any supplement thereto), (B) by or at the direction of the Board of Directors or any committee thereof, (C) as may be provided in the certificate of designations for any class or series of preferred stock or (D) by any stockholder of the Corporation who is a stockholder of record at the time of giving of notice provided for in paragraph (ii) of this Section 2.10(a) and at the time of the annual meeting, who shall be entitled to vote at the meeting and who complies with the procedures set forth in this Section 2.10(a), and, except as otherwise required by law, any failure to comply with these procedures shall result in the nullification of such nomination or proposal.

(ii) For nominations or other business to be properly brought before an annual meeting of stockholders by a stockholder pursuant to clause (D) of paragraph (i) of this Section 2.10(a), the stockholder must have given timely notice thereof in writing to the Secretary of the Corporation and any such proposed business (other than the nominations of persons for election to the Board of Directors) must constitute a proper matter for stockholder action. To be timely, a stockholder's notice shall be delivered to, or mailed and received by, the Secretary of the Corporation at the principal executive offices of the Corporation not less than 120 days nor more than 150 days prior to the first anniversary of the preceding year's annual meeting of stockholders; *provided, however*, that in the event that the date of the annual meeting is advanced more than 30 days prior to such anniversary date or delayed more than 70 days after such anniversary date then to be timely such notice must be received by the Corporation no earlier than 120 days prior to such annual meeting and no later than the later of 70 days prior to the date of the meeting or the 10th day following the day on which public announcement of the date of the meeting was first made by the Corporation; *provided, further*, that, solely for the purposes of the notice requirements under this Section 2.10(a), with respect to the annual meeting of stockholders of the Company for 2019, the anniversary of the preceding year's annual meeting of stockholders shall be deemed to be May 15, 2018. In no event shall the adjournment or postponement of any meeting, or any announcement thereof, commence a new time period (or extend any time period) for the giving of a stockholder's notice as described above.

(iii) A stockholder's notice to the Secretary shall set forth (A) as to each person whom the stockholder proposes to nominate for election or reelection as a director: (1) all information relating to such person that is required to be disclosed in solicitations of proxies for election of directors, or is otherwise required, in each case pursuant to Regulation 14A under the Securities Exchange Act of 1934 (as amended (together with the rules and regulations promulgated thereunder), the "**Exchange Act**") including such person's written consent to being named in the proxy statement as a nominee and to serving as a director if elected; and (2) a reasonably detailed description of any compensatory, payment or other financial agreement, arrangement or understanding that

such person has with any other person or entity other than the Corporation including the amount of any payment or payments received or receivable thereunder, in each case in connection with candidacy or service as a director of the Corporation (a "**Third-Party Compensation Arrangement**"), (B) as to any other business that the stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the text of the proposal or business (including the text of any resolutions proposed for consideration and in the event that such business includes a proposal to amend these Bylaws, the text of the proposed amendment), the reasons for conducting such business and any material interest in such business of such stockholder and the beneficial owner, if any, on whose behalf the proposal is made and (C) as to the stockholder giving the notice and the beneficial owner, if any, on whose behalf the proposal is made:

(1) the name and address of such stockholder (as they appear on the Corporation's books) and any such beneficial owner;

(2) for each class or series, the number of shares of capital stock of the Corporation that are held of record or are beneficially owned by such stockholder and by any such beneficial owner;

(3) a description of any agreement, arrangement, understanding between or among such stockholder and any such beneficial owner, any of their respective affiliates or associates, and any other person or persons (including their names) in connection with the proposal of such nomination or other business;

(4) a description of any agreement, arrangement or understanding (including, regardless of the form of settlement, any derivative, long or short positions, profit interests, forwards, futures, swaps, options, warrants, convertible securities, stock appreciation or similar rights, hedging transactions and borrowed or loaned shares) that has been entered into by or on behalf of, or any other agreement, arrangement or understanding that has been made, the effect or intent of which is to create or mitigate loss to, manage risk or benefit of share price changes for, or increase or decrease the voting power of, such stockholder or any such beneficial owner or any such nominee with respect to the Corporation's securities;

(5) a representation that the stockholder is a holder of record of stock of the Corporation entitled to vote at such meeting and intends to appear in person or by proxy at the meeting to bring such nomination or other business before the meeting;

(6) a representation as to whether such stockholder or any such beneficial owner intends or is part of a group that intends to (i) deliver a proxy statement and/or form of proxy to holders of at least the percentage of the voting power of the Corporation's outstanding capital stock required to approve or adopt the

proposal or to elect each such nominee and/or (ii) otherwise to solicit proxies from stockholders in support of such proposal or nomination;

(7) any other information relating to such stockholder, beneficial owner, if any, or director nominee or proposed business that would be required to be disclosed in a proxy statement or other filing required to be made in connection with the solicitation of proxies in support of such nominee or proposal pursuant to Section 14 of the Exchange Act; and

(8) such other information relating to any proposed item of business as the Corporation may reasonably require to determine whether such proposed item of business is a proper matter for stockholder action.

If requested by the Corporation, the information required under clauses 2.10(a)(iii)(C)(2), (3) and (4) of the preceding sentence of this Section 2.10 shall be supplemented by such stockholder and any such beneficial owner not later than 10 days after the record date for the meeting to disclose such information as of the record date.

(b) *Special Meetings of Stockholders*. If the election of directors is included as business to be brought before a special meeting in the Corporation's notice of meeting, then nominations of persons for election to the Board of Directors at a special meeting of stockholders may be made by any stockholder who is a stockholder of record at the time of giving of notice provided for in this Section 2.10(b) and at the time of the special meeting, who shall be entitled to vote at the meeting and who complies with the procedures set forth in this Section 2.10(b). For nominations to be properly brought by a stockholder before a special meeting of stockholders pursuant to this Section 2.10(b), the stockholder must have given timely notice thereof in writing to the Secretary of the Corporation. To be timely, a stockholder's notice shall be delivered to or mailed and received at the principal executive offices of the Corporation (A) not earlier than 150 days prior to the date of the special meeting nor (B) later than the later of 120 days prior to the date of the special meeting or the 10th day following the day on which public announcement of the date of the special meeting was first made. A stockholder's notice to the Secretary shall comply with the notice requirements of Section 2.10(a)(iii).

(c) *General*. (i) To be eligible to be a nominee for election as a director, the proposed nominee must provide to the Secretary of the Corporation in accordance with the applicable time periods prescribed for delivery of notice under Section 2.10(a)(ii) or Section 2.10(b): (1) a completed D&O questionnaire (in the form provided by the secretary of the Corporation at the request of the nominating stockholder) containing information regarding the nominee's background and qualifications and such other information as may reasonably be required by the Corporation to determine the eligibility of such proposed nominee to serve as a director of the Corporation or to serve as an independent director of the Corporation, (2) a written representation that, unless previously disclosed to the Corporation, the nominee is not and will not become a party to any voting agreement, arrangement or understanding with any person or

entity as to how such nominee, if elected as a director, will vote on any issue or that could interfere with such person's ability to comply, if elected as a director, with his/her fiduciary duties under applicable law, (3) a written representation and agreement that the nominee is not and will not become a party to any Third-Party Compensation Arrangement pursuant to Section 2.10(a)(iii)(A)(2), unless disclosed to the Corporation prior to entering into any such Arrangement and (4) a written representation that, if elected as a director, such nominee would be in compliance and will continue to comply with the Corporation's corporate governance guidelines as disclosed on the Corporation's website, as amended from time to time. At the request of the Board of Directors, any person nominated by the Board of Directors for election as a director shall furnish to the Secretary of the Corporation the information that is required to be set forth in a stockholder's notice of nomination that pertains to the nominee.

(ii) No person shall be eligible to be nominated by a stockholder to serve as a director of the Corporation unless nominated in accordance with the procedures set forth in this Section 2.10. No business proposed by a stockholder shall be conducted at a stockholder meeting except in accordance with this Section 2.10.

(iii) The chairman of the meeting shall, if the facts warrant, determine and declare to the meeting that a nomination was not made in accordance with the procedures prescribed by these Bylaws or that business was not properly brought before the meeting, and if he/she should so determine, he/she shall so declare to the meeting and the defective nomination shall be disregarded or such business shall not be transacted, as the case may be. Notwithstanding the foregoing provisions of this Section 2.10, unless otherwise required by law, if the stockholder (or a qualified representative of the stockholder) does not appear at the annual or special meeting of stockholders of the Corporation to present a nomination or other proposed business, such nomination shall be disregarded or such proposed business shall not be transacted, as the case may be, notwithstanding that proxies in respect of such vote may have been received by the Corporation and counted for purposes of determining a quorum. For purposes of this Section 2.10, to be considered a qualified representative of the stockholder, a person must be a duly authorized officer, manager or partner of such stockholder or must be authorized by a writing executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as proxy at the meeting of stockholders and such person must produce such writing or electronic transmission, or a reliable reproduction of the writing or electronic transmission, at the meeting of stockholders.

(iv) Without limiting the foregoing provisions of this Section 2.10, a stockholder shall also comply with all applicable requirements of the Exchange Act with respect to the matters set forth in this Section 2.10; *provided*, *however*, that any references in these Bylaws to the Exchange Act are not intended to and shall not limit any requirements applicable to nominations or proposals as to any other business to be considered pursuant

to this Section 2.10, and compliance with paragraphs (a)(i)(C) and (b) of this Section 2.10 shall be the exclusive means for a stockholder to make nominations or submit other business (other than as provided in this Section 2.10(c)(iv)).

(v) Notwithstanding anything to the contrary, the notice requirements set forth herein with respect to the proposal of any business pursuant to this Section 2.10 shall be deemed satisfied by a stockholder if such stockholder has submitted a proposal to the Corporation in compliance with Rule 14a-8 under the Exchange Act, and such stockholder's proposal has been included in a proxy statement that has been prepared by the Corporation to solicit proxies for the meeting of stockholders.

ARTICLE 3
DIRECTORS

Section 3.01. *General Powers.* Except as otherwise provided in Delaware Law or the Amended and Restated Certificate of Incorporation, the business and affairs of the Corporation shall be managed by or under the direction of the Board of Directors. No director shall be deemed an "agent" of the Corporation as that term is used in the federal Surface Mining Control and Reclamation Act or its state analogues.

Section 3.02. *Number, Election and Term Of Office.* The number of directors which shall constitute the Board of Directors shall be fixed exclusively by one or more resolutions adopted from time to time solely by the affirmative vote of a majority of the Board of Directors. Each director shall be elected annually at each annual meeting of stockholders to hold office for a term expiring at the next annual meeting of stockholders, with each director to hold office until such director's successor shall have been duly elected and qualified or until such director's earlier death, resignation or removal. In no event will a decrease in the number of directors shorten the term of any incumbent director. There shall be no cumulative voting in the election of directors.

Section 3.03. *Quorum and Manner of Acting.* Unless the Amended and Restated Certificate of Incorporation or these Bylaws require a greater number, a majority of the Board of Directors shall constitute a quorum for the transaction of business at any meeting of the Board of Directors and, except as otherwise expressly required by law or by the Amended and Restated Certificate of Incorporation, the act of a majority of the directors present at a meeting at which a quorum is present shall be the act of the Board of Directors. When a meeting is adjourned to another time or place (whether or not a quorum is present), notice need not be given of the adjourned meeting if the time and place thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the Board of Directors may transact any business which might have been transacted at the original meeting. If a quorum shall not be present at any meeting of the Board of Directors, the directors present thereat shall adjourn the

meeting, from time to time, without notice other than announcement at the meeting, until a quorum shall be present.

Section 3.04. *Time and Place of Meetings.* The Board of Directors shall hold its meetings at such place, either within or without the State of Delaware, and at such time as may be determined from time to time by the Board of Directors (or the Chairman in the absence of a determination by the Board of Directors).

Section 3.05. *Annual Meeting.* The Board of Directors shall meet for the purpose of organization, the election of officers and the transaction of other business, as soon as practicable after each annual meeting of stockholders, on the same day and at the same place where such annual meeting shall be held. Notice of such meeting need not be given. In the event such annual meeting is not so held, the annual meeting of the Board of Directors may be held at such place either within or without the State of Delaware, on such date and at such time as shall be specified in a notice thereof given as hereinafter provided in Section 3.07 herein or in a waiver of notice thereof signed by any director who chooses to waive the requirement of notice, subject to the written consent provision in Section 3.09 herein.

Section 3.06. *Regular Meetings.* After the place and time of regular meetings of the Board of Directors shall have been determined and notice thereof shall have been once given to each member of the Board of Directors, regular meetings may be held without further notice being given.

Section 3.07. *Special Meetings.* Special meetings of the Board of Directors may be called by the Chairman of the Board or the President and shall be called by the Chairman of the Board, President or Secretary on the written request of two directors. Notice of special meetings of the Board of Directors shall be given to each director at least 48 hours before the date of the meeting in such manner as is determined by the Board of Directors.

Section 3.08. *Committees.* The Board of Directors may designate one or more committees, each committee to consist of one or more of the directors of the Corporation. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. In the absence or disqualification of a member of a committee, the member or members present at any meeting and not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member. Any such committee, to the extent provided in the resolution of the Board of Directors, shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the Corporation, and may authorize the seal of the Corporation to be affixed to all papers which may require it; but no such committee shall have the power or authority in reference to any of the following matters: (a) approving or adopting, or recommending to the stockholders, any action or matter expressly required by Delaware Law to be submitted to the stockholders for approval or

(b) adopting, amending or repealing any bylaw of the Corporation. Each committee shall keep regular minutes of its meetings and report the same to the Board of Directors when required.

Section 3.09. *Action by Consent.* Unless otherwise restricted by the Amended and Restated Certificate of Incorporation or these Bylaws, any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board of Directors or committee, as the case may be, consent thereto in writing or by electronic transmission, and the writing or writings or electronic transmission or transmissions, are filed with the minutes of proceedings of the Board of Directors or committee. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

Section 3.10. *Telephonic Meetings.* Unless otherwise restricted by the Amended and Restated Certificate of Incorporation or these Bylaws, members of the Board of Directors, or any committee designated by the Board of Directors, may participate in a meeting of the Board of Directors, or such committee, as the case may be, by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and such participation in a meeting shall constitute presence in person at the meeting.

Section 3.11. *Resignation.* Any director may resign at any time by giving notice in writing or by electronic transmission to the Board of Directors or to the Secretary of the Corporation. The resignation of any director shall take effect upon receipt of notice thereof or at such later time as shall be specified in such notice; and unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

Section 3.12. *Vacancies*. Vacancies on the Board of Directors resulting from death, resignation, removal or otherwise and newly created directorships resulting from any increase in the number of directors shall, unless the Board of Directors calls a special meeting for which the election of directors is included as business or as otherwise required by law, be filled solely by a majority of the directors then in office (although less than a quorum) or by the sole remaining director, and each director so elected shall hold office for a term ending at the next annual meeting of stockholders, and until such director's successor shall have been duly elected and qualified or until such director's earlier death, resignation or removal.

Section 3.13. *Removal.* Any director or the entire Board of Directors may be removed, with or without cause, at any time by the affirmative vote of the holders of a majority of the outstanding capital stock of the Corporation then entitled to vote at any election of directors and the vacancies thus created shall be filled in accordance with Section 3.12 herein.

Section 3.14. *Compensation.* Unless otherwise restricted by the Amended and Restated Certificate of Incorporation or these Bylaws, the Board of Directors shall have authority to fix the compensation of directors, including fees and reimbursement of expenses.

Section 3.15. *Preferred Stock Directors.* Notwithstanding anything else contained herein, whenever the holders of one or more classes or series of preferred stock shall have the right, voting separately as a class or series, to elect directors, the election, term of office, filling of

vacancies, removal and other features of such directorships shall be governed by the terms of such class or series of preferred stock adopted by resolution or resolutions adopted by the Board of Directors pursuant to the Amended and Restated Certificate of Incorporation, and such directors so elected shall not be subject to the provisions of this Article 3 unless otherwise provided in such terms.

ARTICLE 4
OFFICERS

Section 4.01. *Principal Officers.* The principal officers of the Corporation shall be a Chief Executive Officer, a President, one or more Vice Presidents, a Treasurer and a Secretary who shall have the duty, among other things, to record the proceedings of the meetings of stockholders and directors in a book kept for that purpose. The Corporation may also have such other principal officers, including one or more Controllers, as the Board of Directors may in its discretion appoint. One person may hold the offices and perform the duties of any two or more of said offices, except that no one person shall hold the offices and perform the duties of President and Secretary.

Section 4.02. *Appointment, Term of Office and Remuneration.* The principal officers of the Corporation shall be appointed by the Board of Directors in the manner determined by the Board of Directors. Each such officer shall hold office until his or her successor is appointed, or until his or her earlier death, resignation or removal. The remuneration of all officers of the Corporation shall be fixed by the Board of Directors. Any vacancy in any office shall be filled in such manner as the Board of Directors shall determine.

Section 4.03. *Subordinate Officers.* In addition to the principal officers enumerated in Section 4.01 herein, the Corporation may have one or more Assistant Treasurers, Assistant Secretaries and Assistant Controllers and such other subordinate officers, agents and employees as the Board of Directors may deem necessary, each of whom shall hold office for such period as the Board of Directors may from time to time determine. The Board of Directors may delegate to any principal officer the power to appoint and to remove any such subordinate officers, agents or employees.

Section 4.04. *Removal.* Except as otherwise permitted with respect to subordinate officers, any officer may be removed, with or without cause, at any time, by resolution adopted by the Board of Directors.

Section 4.05. *Resignations.* Any officer may resign at any time by giving written notice to the Board of Directors (or to a principal officer if the Board of Directors has delegated to such principal officer the power to appoint and to remove such officer). The resignation of any officer shall take effect upon receipt of notice thereof or at such later time as shall be specified in such notice; and unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

Section 4.06. *Powers and Duties.* The officers of the Corporation shall have such powers and perform such duties incident to each of their respective offices and such other duties as may from time to time be conferred upon or assigned to them by the Board of Directors.

ARTICLE 5
CAPITAL STOCK

Section 5.01. *Certificates For Stock; Uncertificated Shares.* The shares of the Corporation shall be represented by certificates, provided that the Board of Directors may provide by resolution or resolutions that some or all of any or all classes or series of its stock shall be uncertificated shares or a combination of certificated and uncertificated shares. Any such resolution that shares of a class or series will only be uncertificated shall not apply to shares represented by a certificate until such certificate is surrendered to the Corporation. Except as otherwise required by law, the rights and obligations of the holders of uncertificated shares and the rights and obligations of the holders of shares represented by certificates of the same class and series shall be identical. Every holder of stock represented by certificates shall be entitled to have a certificate representing the number of shares registered in certificate form, signed by, or in the name of, the Corporation by the Chairman or Vice Chairman of the Board of Directors, or the Chief Executive Officer, President or Vice President, and by the Treasurer or an Assistant Treasurer, or the Secretary or an Assistant Secretary of such Corporation. Any or all of the signatures on the certificate may be a facsimile. In case any officer, transfer agent or registrar who has signed or whose facsimile signature has been placed upon a certificate shall have ceased to be such officer, transfer agent or registrar before such certificate is issued, it may be issued by the Corporation with the same effect as if such person were such officer, transfer agent or registrar at the date of issue. The Corporation shall not have power to issue a certificate in bearer form.

Section 5.02. *Transfer Of Shares.* Shares of the stock of the Corporation may be transferred on the record of stockholders of the Corporation by the holder thereof or by such holder's duly authorized attorney upon surrender of a certificate therefor properly endorsed or upon receipt of proper transfer instructions from the registered holder of uncertificated shares or by such holder's duly authorized attorney and upon compliance with appropriate procedures for transferring shares in uncertificated form, unless waived by the Corporation.

Section 5.03. *Authority for Additional Rules Regarding Transfer.* The Board of Directors shall have the power and authority to make all such rules and regulations as they may deem expedient concerning the issue, transfer and registration of certificated or uncertificated shares of the stock of the Corporation, as well as for the issuance of new certificates in lieu of those which may be lost or destroyed, and may require of any stockholder requesting replacement of lost or destroyed certificates, a bond in such amount and in such form as they may deem expedient to

indemnify the Corporation, the transfer agents and/or the registrars of the Corporation's stock against any claims arising in connection therewith.

ARTICLE 6
GENERAL PROVISIONS

Section 6.01. *Fixing the Record Date.* In order that the Corporation may determine the stockholders entitled to notice of any meeting of stockholders or any adjournment thereof, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing such record date is adopted by the Board of Directors, and which record date shall not be more than 60 nor less than 10 days before the date of such meeting. If the Board of Directors so fixes a date, such date shall also be the record date for determining the stockholders entitled to vote at such meeting unless the Board of Directors determines, at the time it fixes such record date, that a later date on or before the date of the meeting shall be the date for making such determination. If no record date is fixed by the Board of Directors, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day preceding the day on which notice is given, or, if notice is waived, at the close of business on the day preceding the day on which the meeting is held. A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; *provided* that the Board of Directors may in its discretion or as required by law fix a new record date for determination of stockholders entitled to vote at the adjourned meeting, and in such case shall fix the same date or an earlier date as the record date for stockholders entitled to notice of such adjourned meeting.

In order that the Corporation may determine the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights or the stockholders entitled to exercise any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted, and which record date shall be not more than 60 days prior to such action. If no record date is fixed, the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

Section 6.02. *Dividends.* Subject to limitations contained in Delaware Law and the Amended and Restated Certificate of Incorporation, the Board of Directors may declare and pay dividends upon the shares of capital stock of the Corporation, which dividends may be paid either in cash, in property or in shares of the capital stock of the Corporation.

Section 6.03. *Year.* The fiscal year of the Corporation shall commence on January 1 and end on December 31 of each year.

Section 6.04. *Corporate Seal.* The corporate seal shall have inscribed thereon the name of the Corporation, the year of its organization and the words "Corporate Seal, Delaware". The seal

may be used by causing it or a facsimile thereof to be impressed, affixed or otherwise reproduced.

Section 6.05. *Voting of Stock Owned by the Corporation.* The Board of Directors may authorize any person, on behalf of the Corporation, to attend, vote at and grant proxies to be used at any meeting of stockholders of any corporation (except this Corporation) in which the Corporation may hold stock.

Section 6.06. *Forum.* Unless the Corporation consents in writing to the selection of an alternative forum, to the fullest extent permitted by law, the sole and exclusive forum for (a) any derivative action or proceeding brought on behalf of the Corporation, (b) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the Corporation to the Corporation or the Corporation's stockholders, (c) any action asserting a claim arising pursuant to any provision of Delaware Law or the Amended and Restated Certificate of Incorporation (including any certificate of designations relating to any class or series of Preferred Stock) or the Bylaws (in each case, as they may be amended from time to time), or (d) any action asserting a claim governed by the internal affairs doctrine shall, in any such case, be the Court of Chancery of the State of Delaware, (or, if the Court of Chancery lacks subject matter jurisdiction, another state or federal court located within the state of Delaware, in all cases subject to the court's having personal jurisdiction over the indispensable parties named as defendants). Unless the Corporation consents in writing to the selection of an alternative forum, the federal district courts of the United States of America shall, to the fullest extent permitted by law, be the sole and exclusive forum for resolution of any claim arising under the Securities Act of 1933, as amended, and the rules and regulations thereunder. Any person or entity purchasing or otherwise acquiring or holding any interest in shares of capital stock of the Corporation shall be deemed to have notice of and consented to the provisions of this Section 6.06.

Section 6.07. *Amendments.* These Bylaws or any of them, may be altered, amended or repealed, or new Bylaws may be made, by the stockholders entitled to vote thereon at any annual or special meeting thereof or by the Board of Directors. Unless a higher percentage is required by the Certificate of Incorporation as to any matter that is the subject of these Bylaws, all such amendments must be approved by the affirmative vote of the holders of not less than a majority of the total voting power of all outstanding securities of the Corporation, generally entitled to vote in the election of directors, voting together as a single class, or by a majority of the Board of Directors.

Adopted by the Board of Directors on March 12, 2020
Amended on January 18, 2021
Amended on November 4, 2021

DESCRIPTION OF SECURITIES REGISTERED
PURSUANT TO SECTION 12 OF THE
SECURITIES EXCHANGE ACT OF 1934

The following is a summary of the material terms of the securities of Alpha Metallurgical Resources, Inc. registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), as of February 28, 2022. Our authorized capital stock under our second amended and restated certificate of incorporation, as amended, consists of 50,000,000 shares of common stock, par value $0.01 per share and 5,000,000 shares of preferred stock, par value $0.01 per share. "Alpha", "our" or "the Company" refers to Alpha Metallurgical Resources, Inc.

DESCRIPTION OF ALPHA CAPITAL STOCK

The following is a description of the material terms of our second amended and restated certificate of incorporation, as amended, and third amended and restated bylaws, as amended, in each case as in effect and affecting the rights of our stockholders upon the completion of this offering. We refer you to our second amended and restated certificate of incorporation, and the amendment thereto, and third amended and restated bylaws, and the amendment thereto, copies of which are filed as exhibits to our Annual Report on Form 10-K, of which this exhibit forms a part. We encourage you to read our second amended and restated certificate of incorporation, as amended, and third amended and restated bylaws, as amended, and the applicable provisions of the General Corporation Law of the State of Delaware (the "DGCL") for additional information.

Common Stock

Common stock outstanding. As of February 28, 2022, there were 18,532,992 shares of common stock outstanding, which were held of record by 109 stockholders. All outstanding shares of common stock are fully paid and non-assessable.

Voting rights. The holders of common stock are entitled to one vote per share on all matters to be voted upon by the stockholders.

Dividend rights. Subject to preferences that may be applicable to any outstanding preferred stock, the holders of common stock are entitled to receive ratably such dividends, if any, as may be declared from time to time by the board of directors out of funds legally available therefor.

Rights upon liquidation. In the event of our liquidation, dissolution or winding up, the holders of common stock are entitled to share ratably in all assets remaining after payment of liabilities, subject to prior distribution rights of preferred stock, if any, then outstanding.

Other rights. The holders of common stock have no preemptive or conversion rights or other subscription rights. There are no redemption or sinking fund provisions applicable to the common stock.

Preferred Stock

As of February 28, 2022, there were no shares of preferred stock outstanding. Alpha's board of directors has the authority to issue the preferred stock in one or more series and to fix the designations, powers, preferences and relative, participating, optional or other rights, if any, and the qualifications, limitations or restrictions thereof, if any, with respect to each such class or series of preferred stock and the number of shares constituting each such class or series, and to increase or decrease the number of shares of any such class or series to the extent permitted by Delaware law.

The issuance of preferred stock may have the effect of delaying, deferring or preventing a change in control of Alpha without further action by the stockholders and may adversely affect the voting and other rights of the holders of common stock. At present, Alpha has no plans to issue any of the preferred stock.

Description of Certain Provisions of Alpha's Second Amended and Restated Certificate of Incorporation, as amended, and Third Amended and Restated Bylaws, as amended, and Delaware Law

Removal of Directors; Vacancies

Our board of directors currently consists of seven directors. The exact number of directors will be fixed from time to time by resolution of the board. Any director may be removed, with or without cause, at any time by the affirmative vote of shares representing a majority of the shares then entitled to vote at an election of directors. Any vacancy occurring on the board of directors and any newly created directorship shall, unless the board calls a special meeting for which the election of directors is included as business or as otherwise required by law, be filled solely by a majority of the remaining directors in office.

No Cumulative Voting

The DGCL provides that stockholders are not entitled to the right to cumulate votes in the election of directors unless Alpha's second amended and restated certificate of incorporation, as amended, provides otherwise. Alpha's second amended and restated certificate of incorporation, as amended, prohibits cumulative voting.

Calling of Special Meetings of Stockholders

Alpha's second amended and restated certificate of incorporation, as amended, and Alpha's third amended and restated bylaws, as amended, provide that special meetings of Alpha's stockholders may be called only by Alpha's board of directors, subject to the rights of the holders of any series of preferred stock.

No Stockholder Action by Written Consent

Alpha's second amended and restated certificate of incorporation, as amended, and Alpha's third amended and restated bylaws, as amended, provide that any action required or permitted to be taken by Alpha's stockholders must be effected by a duly called annual or special meeting of stockholders and may not be effected by any consent in lieu of a meeting of such stockholders, subject to the rights of the holders of any series of preferred stock.

Advance Notice Requirements for Stockholder Proposals and Director Nominations

Alpha's third amended and restated bylaws, as amended, provide that stockholders seeking to nominate candidates for election as directors or to bring business before an annual meeting of stockholders must provide timely notice of their proposal in writing to Alpha's corporate secretary.

Generally, to be timely, a stockholder's notice must be received at Alpha's principal executive offices not less than 120 days nor more than 150 days prior to the first anniversary date of the date on which the Company first mailed its proxy materials for the previous year's annual meeting. Alpha's third amended and restated bylaws, as amended, also specify requirements as to the form and content of a stockholder's notice. These provisions may impede stockholders' ability to bring matters before an annual meeting of stockholders or make nominations for directors at an annual meeting of stockholders.

Amendments to Alpha's Second Amended and Restated Certificate of Incorporation, as Amended, and Third Amended and Restated Bylaws, as Amended

Alpha's second amended and restated certificate of incorporation, as amended, grants Alpha's board of directors the authority to adopt, amend or repeal Alpha's third amended and restated bylaws, as amended, without a stockholder vote in any manner not inconsistent with the laws of the State of Delaware. Alpha's second amended and restated certificate of incorporation, as amended, and third amended and restated bylaws, as amended, may be amended by the affirmative vote of the holders of at least two-thirds of the shares of common stock.

Limitations on Liability and Indemnification of Officers and Directors

Alpha's second amended and restated certificate of incorporation, as amended, provides that no director will be personally liable to Alpha or its stockholders for monetary damages for breach of fiduciary duty as a director, except as required by applicable law, as in effect from time to time. Currently, Delaware law requires that liability be imposed for the following:

- any breach of the director's duty of loyalty to Alpha or its stockholders;
- any act or omission not in good faith or which involved intentional misconduct or a knowing violation of law;
- unlawful payments of dividends or unlawful stock repurchases or redemptions under Section 174 of the Delaware General Corporation Law; and
- any transaction from which the director derived an improper personal benefit.

As a result, neither Alpha nor its stockholders have the right, through stockholders' derivative suits on their behalf, to recover monetary damages against a director for breach of fiduciary duty as a director, including breaches resulting from grossly negligent behavior, except in the situations described above.

Alpha’s second amended and restated certificate of incorporation, as amended, provides that, to the fullest extent permitted by law, Alpha will indemnify any officer or director of Alpha against all damages, claims and liabilities arising out of the fact that the person is or was Alpha’s director or officer, or served any other enterprise at Alpha’s request as a director, officer, employee, agent or fiduciary. Alpha will reimburse the expenses, including attorneys’ fees, incurred by a person indemnified by this provision when Alpha receives an undertaking to repay such amounts if it is ultimately determined that the person is not entitled to be indemnified by Alpha. Amending this provision will not reduce Alpha’s indemnification obligations relating to actions taken before an amendment.

Delaware Anti-Takeover Statute

Alpha is subject to Section 203 of the DGCL. Subject to specified exceptions, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years after the date of the transaction in which the person became an interested stockholder. “Business combinations” include mergers, asset sales and other transactions resulting in a financial benefit to the “interested stockholder.” Subject to various exceptions, an “interested stockholder” is a person who together with his or her affiliates and associates, owns, or within three years did own, 15% or more of the corporation’s outstanding voting stock.

Certain of the above-described provisions of Alpha's second amended and restated certificate of incorporation, as amended, Alpha's third amended and restated bylaws, as amended and the DGCL may have the effect of making it more difficult for a third party to acquire, or discouraging a third party from attempting to acquire, control of Alpha.

Exclusive Forum Provision of Alpha’s Third Amended and Restated Bylaws, as Amended

Under Alpha’s third amended and restated bylaws, as amended, to the fullest extent permitted by law and unless Alpha consents in writing to the selection of an alternative forum, the Court of Chancery of the state of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of Alpha, (ii) any action asserting a claim of breach of a fiduciary duty owed by any Alpha director, officer or other employee to Alpha or its stockholders, (iii) any action asserting a claim arising pursuant to any provision of the DGCL or the Alpha charter (including any certificate of designations relating to any class or series of preferred stock) or the Alpha bylaws (in each case, as they may be amended from time to time), or (iv) any action asserting a claim governed by the internal affairs doctrine. In addition, Alpha's third amended and restated bylaws, as amended provide that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act of 1933, as amended.

By limiting the ability of third parties and Alpha’s stockholders to file such lawsuits in the forum of their choosing, these exclusive forum provisions could increase the costs to a plaintiff of bringing such a lawsuit and could have the effect of deterring such lawsuits, which could include potential takeover-related lawsuits.

Authorized but Unissued Capital Stock

The DGCL does not require stockholder approval for any issuance of authorized shares. However, the listing requirements of the New York Stock Exchange, which would apply so long as Alpha's common stock is listed on the New York Stock Exchange, require stockholder approval of certain issuances equal to or exceeding 20% of the then-outstanding voting power or then-outstanding number of shares of common stock. These additional shares may be used for a variety of corporate purposes, including future public offerings, to raise additional capital or to facilitate acquisitions.

One of the effects of the existence of unissued and unreserved common stock may be to enable Alpha's board of directors to issue shares to persons friendly to current management, which issuance could render more difficult or discourage an attempt to obtain control of Alpha by means of a merger, tender offer, proxy contest or otherwise, and thereby protect the continuity of our management and possibly deprive the stockholders of opportunities to sell their shares of common stock at prices higher than prevailing market prices.

Transfer Agent and Registrar

Computershare Trust Company, N.A. is the transfer agent and registrar for Alpha's common stock.

Exhibit 21.1

LIST OF SUBSIDIARIES

Name of Entity	State of Incorporation / Organization
Alex Energy, LLC	West Virginia
Alpha American Coal Company, LLC	Delaware
Alpha American Coal Holding, LLC	Delaware
Alpha Appalachia Holdings, LLC	Delaware
Alpha Appalachia Services, LLC	West Virginia
Alpha Coal Sales Co., LLC	Delaware
Alpha European Marketing, LLC	Delaware
Alpha European Sales, LLC	Virginia
Alpha India, LLC	Delaware
Alpha Land and Reserves, LLC	Delaware
Alpha Metallurgical Coal Sales, LLC	Delaware
Alpha Metallurgical Resources, Inc.	Delaware
Alpha Metallurgical Resources, LLC	Delaware
Alpha Metallurgical Services, LLC	Delaware
Alpha Metallurgical Terminal, LLC	Delaware
Alpha Natural Resources Holdings, Inc.	Delaware
Alpha Natural Resources International, LLC	Delaware
Alpha Natural Resources Services, LLC	Delaware
Alpha Natural Resources, LLC	Delaware
AMFIRE Mining Company, LLC	Delaware
AMFIRE, LLC	Delaware
ANR Second Receivables Funding, LLC	Delaware
ANR, Inc.	Delaware
Appalachia Coal Sales Company, LLC	Virginia
Appalachia Holding Company, LLC	Virginia
Aracoma Coal Company, LLC	West Virginia
Bandmill Coal LLC	West Virginia
Bandytown Coal Company	West Virginia
Barbara Holdings Inc.	Delaware
Barnabus Land Company	West Virginia
Belfry Coal Corporation	West Virginia
Big Bear Mining Company, LLC	West Virginia
Black Castle Mining Company, LLC	West Virginia
Black King Mine Development Co.	West Virginia
Boone East Development Co., LLC	West Virginia
Brooks Run South Mining, LLC	Delaware
Clear Fork Coal Company	West Virginia
Contura CAPP Land, LLC	Delaware
Contura Excavating & Grading, LLC	Delaware
Contura Freeport, LLC	Delaware
Contura Mining Holding, LLC	Delaware
Crystal Fuels Company	West Virginia
Dehue Coal Company	West Virginia
Delbarton Mining Company, LLC	West Virginia

Dickenson-Russell Contura, LLC	Delaware
Dominion Terminal Associates LLP	Virginia
DRIH Corporation	Delaware
Duchess Coal Company	West Virginia
Eagle Energy, Inc.	West Virginia
Elk Run Coal Company, LLC	West Virginia
Emerald Coal Resources, LLC	Delaware
Enterprise Mining Company, LLC	Delaware
Esperanza Coal Co., LLC	Delaware
Foundation Royalty Company	Delaware
Goals Coal Company	West Virginia
Green Valley Coal Company, LLC	West Virginia
Greyeagle Coal Company	Kentucky
Harlan Reclamation Services LLC	Virginia
Highland Mining Company	West Virginia
Hopkins Creek Coal Company	Kentucky
Independence Coal Company, LLC	West Virginia
Jacks Branch Coal Company	West Virginia
Kanawha Energy Company, LLC	West Virginia
Kepler Processing Company, LLC	West Virginia
Kingston Mining, Inc.	West Virginia
Kingwood Mining Company, LLC	Delaware
Knox Creek Coal Corporation	Virginia
Laxare, Inc.	West Virginia
Litwar Processing Company, LLC	West Virginia
Logan County Mine Services, Inc.	West Virginia
Logan I, LLC	West Virginia
Logan III, LLC	West Virginia
Long Fork Coal Company, LLC	Kentucky
Lynn Branch Coal Company, Inc.	West Virginia
Maple Meadow Mining Company, LLC	Delaware
Marfork Coal Company, LLC	West Virginia
Marshall Land LLC	West Virginia
Martin County Coal, LLC	Kentucky
Maxxim Rebuild Co., LLC	Delaware
Maxxim Shared Services, LLC	Delaware
Mill Branch Coal, LLC	Virginia
New Ridge Mining Company	Kentucky
Neweagle Industries, Inc.	Virginia
Nicewonder Contracting, Inc.	West Virginia
Nicholas Contura, LLC	Delaware
North Fork Coal Corporation	Virginia
Old ANR, LLC	Delaware
Omar Mining Company, LLC	West Virginia
Paramont Coal Company Virginia, LLC	Delaware
Paramont Contura, LLC	Delaware
Paynter Branch Mining, Inc.	West Virginia

Peerless Eagle Coal Co., LLC	West Virginia
Performance Coal Company, LLC	West Virginia
Peter Cave Mining Company	Kentucky
Pigeon Creek Processing Corporation	Virginia
Pilgrim Mining Company, Inc.	Kentucky
Pioneer Fuel Corporation	West Virginia
Plateau Mining, LLC	Delaware
Power Mountain Contura, LLC	Delaware
Premium Energy, LLC	Delaware
Rawl Sales & Processing Co., LLC	West Virginia
Republic Energy, LLC	West Virginia
Resource Insurance Company, Inc.	Tennessee
Riverside Energy Company, LLC	West Virginia
Riverton Coal Production, LLC	Delaware
Road Fork Development Company, LLC	Kentucky
Robinson-Phillips Coal Company	West Virginia
Rockspring Development, Inc.	Delaware
Rostraver Energy Company	Pennsylvania
Rum Creek Coal Sales, Inc.	West Virginia
Russell Fork Coal Company	West Virginia
Shannon-Pocahontas Coal Corporation	West Virginia
Shannon-Pocahontas Mining Company	West Virginia
Sidney Coal Company, LLC	Kentucky
Spartan Mining Company, LLC	West Virginia
Stirrat Coal Company, LLC	West Virginia
Sycamore Fuels, Inc.	West Virginia
T. C. H. Coal Co.	Kentucky
Tennessee Consolidated Coal Company	Tennessee
Trace Creek Coal Company	Pennsylvania
Twin Star Mining, Inc.	West Virginia
Wabash Mine Holding Company	Delaware
West Kentucky Energy Company	Kentucky
White Buck Coal Company	West Virginia
Williams Mountain Coal Company	West Virginia
Wyomac Coal Company, Inc.	West Virginia

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-257563 and 333-228293) of Alpha Metallurgical Resources, Inc. (formerly Contura Energy, Inc.) of our report dated March 7, 2022 relating to the consolidated financial statements and the effectiveness of internal control over financial reporting of Alpha Metallurgical Resources, Inc., appearing in this Annual Report on Form 10-K of Alpha Metallurgical Resources, Inc. for the year ended December 31, 2021.

/s/ RSM US LLP

Atlanta, Georgia
March 7, 2022

582 Industrial Park Road, Bluefield, VA 24605-9364 ■ Phone 276.322.5467
www.mma1.com ■ info@mma1.com

CONSENT OF MARSHALL MILLER & ASSOCIATES, INC.

March 7, 2022

Alpha Metallurgical Resources, Inc.
340 Martin Luther King Jr. Blvd.
Bristol, Tennessee 37620

Reference: Consent of Independent Experts

We hereby consent to the reference to Marshall Miller & Associates, Inc. in the Annual Report on Form 10-K of Alpha Metallurgical Resources, Inc. for the year ended December 31, 2021.

We further wish to advise that Marshall Miller & Associates, Inc. was not employed on a contingent basis and that at the time of preparation of our reports, as well as at present, neither Marshall Miller & Associates, Inc. nor any of its employees had, or now has, a substantial interest in Alpha Metallurgical Resources, Inc. or any of its affiliates or subsidiaries.

We also consent to the filing and use of references to Marshall Miller & Associates, Inc.'s name, including our firm's status as an expert or "qualified person," and any quotation or summarization of the following Technical *Report Summaries:*

a. *"Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Aracoma Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022"*
b. *"Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Kepler Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022"*
c. *"Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Mid-West Virginia Surface Business Unit in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022"*
d. *"Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Mid-West Virginia Underground Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, West Virginia, USA, February 2022"*
e. *"Alpha Metallurgical Resources, Inc. Statement of Coal Resources and Reserves for the Virginia Complex in Accordance with United States SEC Standards as of December 31, 2021, Central Appalachian Coal Basin, Virginia, USA, February 2022"*

We also consent to the incorporation by reference in Alpha Metallurgical Resource's Registration Statements on Form S-8 (Nos 333-228293 and 333-257563) of the above items.

Respectfully submitted,
Marshall Miller & Associates, Inc.

By: */s/ Justin S. Douthat*
Name: Justin S. Douthat, PE, MBA
Title: Executive Vice President (MM&A Representative)
Date: March 7, 2022

Exhibit 31

CERTIFICATIONS

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER AND PRINCIPAL FINANCIAL OFFICER

Each of the officers below certifies that:

1. I have reviewed this Annual Report on Form 10-K (this "Report") of Alpha Metallurgical Resources, Inc. (the "Registrant");
2. Based on my knowledge, this 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 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 by Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and 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 quarterly 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 fiscal 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;
5. The Registrant's other certifying officer and I have disclosed 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: March 7, 2022

By: */s/ David J. Stetson*

David J. Stetson
Chief Executive Officer
(Principal Executive Officer)

Date: March 7, 2022

By: */s/ Charles Andrew Eidson*

Charles Andrew Eidson
President and Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)

Exhibit 32

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Alpha Metallurgical Resources, Inc. (the "Registrant") for the period ended December 31, 2021, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers of the Registrant certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to his knowledge:

1) The 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 the Registrant.

Date: March 7, 2022

By: */s/ David J. Stetson*

David J. Stetson
Chief Executive Officer
(Principal Executive Officer)

Date: March 7, 2022

By: */s/ Charles Andrew Eidson*

Charles Andrew Eidson
President and Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)

Exhibit 95

Mine Safety and Health Administration Data

Our subsidiaries' mining operations have consistently been recognized with numerous local, state and national awards over the years for outstanding safety performance.

Our behavior-based safety process involves all employees in accident prevention and continuous improvement. Safety leadership and training programs are based upon the concepts of situational awareness and observation, changing behaviors and, most importantly, employee involvement. The core elements of our safety training include identification of critical behaviors, frequency of those behaviors, employee feedback and removal of barriers for continuous improvement.

All employees are empowered to champion the safety process. Every person is challenged to identify hazards and initiate corrective actions, ensuring that hazards are addressed in a timely manner.

All levels of the organization are expected to be proactive and commit to perpetual improvement, implementing new safety processes that promote a safe and healthy work environment.

Our subsidiaries operate multiple mining complexes in two states and are regulated by both the U.S. Mine Safety and Health Administration ("MSHA") and state regulatory agencies. As described in more detail in the "Environmental and Other Regulatory Matters" section of our Annual Report on Form 10-K for the year ended December 31, 2021, the Federal Mine Safety and Health Act of 1977, as amended (the "Mine Act"), among other federal and state laws and regulations, imposes stringent safety and health standards on all aspects of mining operations. Regulatory inspections are mandated by these agencies with thousands of inspection shifts at our properties each year. Citations and compliance metrics at each of our mines and coal preparation facilities vary due to the size and type of the operation. We endeavor to conduct our mining and other operations in compliance with all applicable federal, state and local laws and regulations. However, violations occur from time to time. None of the violations identified or the monetary penalties assessed upon us set forth in the tables below has been material.

For purposes of reporting regulatory matters under Section 1503(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"), we include the following table that sets forth the total number of specific citations and orders and the total dollar value of the proposed civil penalty assessments that were issued by MSHA during the current reporting period for each of our subsidiaries that is a coal mine operator, by individual mine. During the current reporting period, none of the mines operated by our subsidiaries received written notice from MSHA of a pattern of violations under Section 104(e) of the Mine Act.

		Year Ended December 31, 2021						
MSHA Mine ID	Operator	Significant and Substantial Citations Issued (Section 104 of the Mine Act) *Excludes 104(d) citations/orders	Failure to Abate Orders (Section 104(b) of the Mine Act)	Unwarrantable Failure Citations/Orders Issued (Section 104(d) of the Mine Act)	Flagrant Violations (Section 110(b)(2) of the Mine Act)	Imminent Danger Orders Issued (Section 107(a) of the Mine Act)	Dollar Value of Proposed Civil Penalty Assessments (in Thousands)[2]	Mining Related Fatalities
3605018	Cumberland Contura, LLC	—	—	—	—	—	$3.35	—
4405270	Paramont Contura, LLC	1	—	—	—	—	$0.73	—
4405311	Dickenson-Russell Contura, LLC	3	—	—	—	—	$1.98	—
4407163	Paramont Contura, LLC	1	—	—	—	—	$1.90	—
4407223	Paramont Contura, LLC	42	—	—	—	—	$46.22	—
4407308	Paramont Contura, LLC	21	—	—	—	—	$31.41	—
4407381	Paramont Contura, LLC	1	—	—	—	—	$1.45	—
4601544	Spartan Mining Company, LLC	—	—	—	—	—	$0.17	—
4603317	Mammoth Coal Co.	—	—	—	—	—	$0.88	—
4604343	Kingston Mining, Inc.	—	—	—	—	—	$0.13	—
4604637	Kepler Processing Company LLC	—	—	—	—	—	$1.00	—
4604669	Rum Creek Coal Sales Inc	—	—	—	—	—	$0.75	—
4605086	Bandmill Coal, LLC	6	—	—	—	—	$3.93	—
4605649	Delbarton Mining Company, LLC	—	—	—	—	—	$0.38	—
4605992	Black Castle Mining Company, LLC	—	—	—	—	—	$0.13	—
4606263	Brooks Run South Mining, LLC	—	—	—	—	—	$1.84	—
4606880	Power Mountain Contura LLC	—	—	—	—	—	$0.25	—
4608159	Mammoth Coal Co.	—	—	—	—	—	$4.12	—
4608374	Marfork Coal Company, LLC	1	—	2	—	1	$6.17	—
4608787	Nicholas Contura LLC	11	—	—	—	—	$31.43	—
4608801	Aracoma Coal Company, LLC	6	—	—	—	—	$30.16	—

4608802	Aracoma Coal Company, LLC	—	—	—	—	—	$0.16	—
4608808	Spartan Mining Company, LLC	—	—	—	—	—	$0.36	—
4608837	Marfork Coal Company, LLC	3	—	—	—	—	$10.31	—
4608932	Kingston Mining, Inc.	27	—	1	—	—	$156.84	—
4609026	Republic Energy LLC	—	—	—	—	—	$0.79	—
4609048	Marfork Coal Company, LLC	4	—	—	—	—	$8.89	—
4609054	Republic Energy LLC	1	1	—	—	—	$1.10	—
4609091	Marfork Coal Company, LLC	46	—	—	—	—	$256.33	1
4609092	Marfork Coal Company, LLC	1	—	—	—	—	$17.71	—
4609148	Mammoth Coal Co.	—	—	—	—	—	$1.51	—
4609204	Highland Mining Company	1	—	—	—	—	$1.62	—
4609212	Marfork Coal Company, LLC	14	1	—	—	—	$126.11	—
4609221	Mammoth Coal Co.	19	—	3	—	—	$172.63	—
4609361	Aracoma Coal Company, LLC	11	—	—	—	—	$16.21	—
4609475	Republic Energy LLC	5	—	—	—	—	$7.39	—
4609522	Spartan Mining Company, LLC	51	—	—	—	—	$81.39	—
4609550	Marfork Coal Company, LLC	149	1	5	—	—	$369.71	—
4609574	Aracoma Coal Company, LLC	19	—	—	—	—	$20.34	1
4609575	Aracoma Coal Company, LLC	18	—	—	—	—	$20.05	—

For purposes of reporting regulatory matters under Section 1503(a) of the Dodd-Frank Act, we include the following table that sets forth a list of legal actions pending before the Federal Mine Safety and Health Review Commission, including the Administrative Law Judges thereof, pursuant to the Mine Act, and other required information, for each of our subsidiaries that is a coal mine operator, by individual mine including legal actions and other required information.

As of and For the Year Ended December 31, 2021

Mine ID	Operator Name	MSHA Pending Legal Actions (as of last day of reporting period)	New MSHA Dockets commenced during reporting period	MSHA dockets in which final orders were entered (not appealed) during reporting period	Contests of Citations/Orders referenced in Subpart B, 29 CFR Part 2700	Contests of Proposed Penalties referenced in Subpart C, 29 CFR Part 2700	Complaints for compensation referenced in Subpart D, 29 CFR Part 2700	Complaints for discharge, discrimination, or interference referenced in Subpart E, 29 CFR Part 2700	Applications for temporary relief referenced in Subpart F 29 CFR Part 2700	Appeals of judges' decisions or orders to FMSHRC referenced in Subpart H 29 CFR Part 2700
3605018	Cumberland Contura, LLC [2]	—	—	1	—	—	—	—	—	—
4407223	Paramont Contura, LLC	—	1	2	—	—	—	—	—	—
4407308	Paramont Contura, LLC	—	2	2	—	—	—	—	—	—
4601544	Spartan Mining Company, LLC	—	1	1	—	—	—	—	—	—
4604343	Kingston Mining Inc.	—	1	1	—	—	—	—	—	—
4605086	Bandmill Coal, LLC	—	1	2	—	—	—	—	—	—
4608374	Marfork Coal Company, LLC	4	5	1	3	1	—	—	—	—
4608625	Kingston Mining, Inc.	—	1	1	—	—	—	—	—	—
4608787	Nicholas Contura LLC	—	1	1	—	—	—	—	—	—
4608801	Aracoma Coal Company, LLC	—	1	1	—	—	—	—	—	—
4608837	Marfork Coal Company, LLC	—	2	2	—	—	—	—	—	—
4608932	Kingston Mining, Inc.	2	7	6	2	—	2	—	—	—
4609048	Marfork Coal Company, LLC	—	1	2	—	—	—	—	—	—
4609091	Marfork Coal Company, LLC	1	10	13	—	1	—	—	—	—
4609092	Marfork Coal Company, LLC	—	1	1	—	—	—	—	—	—
4609212	Marfork Coal Company, LLC	1	2	1	—	1	—	—	—	—
4609221	Mammoth Coal Co.	—	2	2	—	—	—	—	—	—

4609475	Republic Energy LLC	—	—	1	—	—	—	—	—	—
4609522	Spartan Mining Company, LLC	2	2	—	—	2	—	—	—	—
4609550	Marfork Coal Company, LLC	3	5	3	—	3	—	—	—	—

(1) The MSHA proposed assessments issued during the current reporting period do not necessarily relate to the citations or orders issued by MSHA during the current reporting period or to the pending legal actions reported herein.
(2) On November 11, 2020, the Company entered into an unit purchase agreement to sell its thermal coal mining operations located in Pennsylvania consisting primarily of its Cumberland mining complex and related property ("Cumberland Transaction") to a third party purchaser Iron Senergy Holdings, LLC. The citations and dockets for Cumberland Contura, LLC relate to citations issued before the Cumberland Transaction closed on December 10, 2020.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

February 2022

Prepared for:
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Statement of Use and Preparation

This Technical Report Summary (*TRS*) was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors. Copies or references to information in this report may not be used without the written permission of Alpha.

The report provides a statement of coal resources and coal reserves for Alpha, as defined under the **United**

States Securities and Exchange Commission (*SEC*).

The statement is based on information provided by Alpha and reviewed by various professionals within **Marshall Miller & Associates, Inc. (*MM&A*)**.

MM&A professionals who contributed to the drafting of this report meet the definition of *Qualified Persons* (*QPs*), consistent with the requirements of the SEC.

The information in this TRS related to coal resources and reserves is based on, and fairly represents, information compiled by the QPs. At the time of reporting, MM&A's QPs have sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity they are undertaking to qualify as a QP as defined by the SEC.

Certain information set forth in this report contains "forward-looking information", including production, productivity, operating costs, capital costs, sales prices, and other assumptions. These statements are not guarantees of future performance and undue reliance should not be placed on them. The assumptions used to develop the forward-looking and the risks that could cause the actual results to differ materially are detailed in the body of this report.

Marshall Miller & Associates, Inc. (*MM&A*) hereby consents (i) to the use of the information contained in this report dated December 31, 2021, relating to estimates of coal resources and coal reserves controlled by Alpha, (ii) to the use of MM&A's name, any quotations from or summarizations of this TRS in Alpha's SEC filings, and (iii) to the filing of this TRS as an exhibit to Alpha's SEC filings.

Qualified Person:	**/s/ Marshall Miller & Associates, Inc.**
Date:	February 15, 2022

Table of Contents

1 **Executive Summary** **7**
1.1 Property Description 7
1.2 Ownership 8
1.3 Geology 8
1.4 Exploration Status 9
1.5 Operations and Development 9
1.6 Mineral Resource 9
1.7 Mineral Reserve 10
1.8 Capital Summary 11
1.9 Operating Costs 12
1.10 Economic Evaluation 13
1.10.1 Discounted Cash Flow Analysis 16
1.10.2 Sensitivity Analysis 16
1.11 Permitting 17
1.12 Conclusion and Recommendations 17
2 **Introduction** **17**
2.1 Registrant and Terms of Reference 17
2.2 Information Sources 18
2.3 Personal Inspections 18
3 **Property Description** **18**
3.1 Location 18
3.2 Titles, Claims or Leases 19
3.3 Mineral Rights 19
3.4 Encumbrances 20
3.5 Other Risks 20
4 **Accessibility, Climate, Local Resources, Infrastructure and Physiography** **20**
4.1 Topography, elevation and Vegetation 20
4.2 Access and Transport 20
4.3 Proximity to Population Centers 20
4.4 Climate and Length of Operating Season 21
4.5 Infrastructure 21
5 **History** **21**
5.1 Previous Operation 21

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

5.2 Previous Exploration 22
6 **Geological Setting, Mineralization and Deposit** **22**
6.1 Regional, Local and Property Geology 22
6.2 Mineralization 23
6.3 Deposits 23
7 **Exploration** **24**
7.1 Nature and Extent of Exploration 24

7.1 Nature and Extent of Exploration 24
7.2 Drilling Procedures 26
7.3 Hydrology 26
7.4 Geotechnical Data 26
8 **Sample Preparation Analyses and Security 27**
8.1 Prior to Sending to the Lab 27
8.2 Lab Procedures 27
9 **Data Verification 28**
9.1 Procedures of Qualified Person 28
9.2 Limitations 28
9.3 Opinion of Qualified Person 28
10 **Mineral Processing and Metallurgical Testing 29**
10.1 Testing Procedures 29
10.2 Relationship of Tests to the Whole 29
10.3 Lab Information 30
10.4 Relevant Results 30
11 **Mineral Resource Estimates 30**
11.1 Assumptions, Parameters and Methodology 30
11.1.1 Geostatistical Analysis 32
11.2 Resources Exclusive of Reserves 35
11.2.1 Initial Economic Assessment 36
11.3 Qualified Person's Estimates 37
11.4 Qualified Person's Opinion 38
12 **Mineral Reserve Estimates 38**
12.1 Assumptions, Parameters and Methodology 38
12.2 Mineral Reserves 40
12.2.1 Upper Chilton Seam 40
12.2.2 Upper Cedar Grove Seam 40
12.2.3 Lower Cedar Grove Seam 40

12.2.4 Alma Seam 40
12.2.5 No. 2 Gas Seam 40
12.3 Qualified Person's Estimates 41
12.4 Qualified Person's Opinion 41
13 **Mining Methods 42**
13.1 Geotech and Hydrology 42
13.2 Production Rates 42
13.3 Mining Related Requirements 44
13.3.1 Underground 44
13.4 Required Equipment and Personnel 44
13.4.1 Underground Mines 44
14 **Processing and Recovery Methods 47**
14.1 Description or Flowsheet 47
14.2 Requirements for Energy, Water, Material and Personnel 48
15 **Infrastructure 48**
16 **Market Studies 50**
16.1 Market Description 50
16.2 Price Forecasts 50
16.3 Contract Requirements 51
17 **Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals 51**
17.1 Results of Studies 51
17.2 Requirements and Plans for Waste Disposal 51
17.3 Permit Requirements and Status 52
17.4 Local Plans, Negotiations or Agreements 53
17.5 Mine Closure Plans 53
17.6 Qualified Person's Opinion 54
18 **Capital and Operating Costs 54**
18.1 Capital Cost Estimate 54
18.2 Operating Cost Estimate 56
19 **Economic Analysis 57**
19.1 Economic Evaluation 57
19.1.1 Introduction 57
19.1.2 Cash Flow Summary 61
19.1.3 Discounted Cash Flow Analysis 63
19.1.4 Sensitivity Analysis 63

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

20 **Adjacent Properties 64**
20.1 Information Used 64
21 **Other Relevant Data and Information 64**
22 **Interpretation and Conclusions 65**
22.1 Conclusion 65
22.2 Risk Factors 65
22.2.1 Governing Assumptions 66

22.2.1 Governing Assumptions 66
22.2.2 Limitations 66
22.2.3 Methodology 66
22.2.4 Development of the Risk Matrix 67
22.2.5 Categorization of Risk Levels and Color Code Convention 70
22.2.6 Description of the Coal Property 70
22.2.7 Summary of Residual Risk Ratings 71
22.2.8 Risk Factors 71
23 **Recommendations 78**
24 **References 78**
25 **Reliance on Information Provided by Registrant 78**

FIGURES (IN REPORT)

Figure 1-1: Alpha's Aracoma Property Location Map 8
Figure 1-2: Projected Capital Expenditures – Consolidated Aracoma Operations 12
Figure 1-3: Aracoma Operating Costs 13
Figure 1-4: Sensitivity of NPV 16
Figure 6-1: Aracoma Stratigraphic Column 23
Figure 7-1: Aracoma Cross-Section 25
Figure 11-1: Histogram of the Total Seam Thickness for the No. 2 Gas Seam Present in the Aracoma Complex 32
Figure 11-2: Scatter plot of the Total Seam Thickness for the No. 2 Gas Seam Present in the Aracoma Complex 32
Figure 11-3: Variogram of the Total Seam Thickness for the No. 2 Gas Seam Present in the Aracoma Complex 33
Figure 11-4: Result of DHSA for the No. 2 Gas Seam Present in the Aracoma Complex 34
Figure 11-5: Results of Initial Economic Assessment 37
Figure 15-1: Aracoma Surface Facilities 49
Figure 15-2: Bandmill Preparation Plant 49
Figure 18-1: Projected Capital Expenditures – Consolidated Aracoma Operations 55
Figure 18-2: Aracoma Operating Costs 57
Figure 19-1: Projection of Sales Tons 58

Figure 19-2: Consolidated Annual Revenue 59
Figure 19-3: Revenue, Cash Costs, and EBITDA 60
Figure 19-4: Annual EBITDA 61
Figure 19-5: Net Cash Flow after Tax (Before Debt Service) 63
Figure 19-6: Sensitivity of NPV 64

TABLES (IN REPORT)

Table 1-1: Coal Resources Summary as of December 31, 2021 10
Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 11
Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 14
Table 1-4: Project Cash Flow Summary (000) 14
Table 11-1: General Reserve & Resource Criteria 31
Table 11-2: DHSA Results Summary for Radius from a Central Point 34
Table 11-3: Results of Initial Economic Assessment ($/ton) 36
Table 11-4: Coal Resources Summary as of December 31, 2021 37
Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 41
Table 13-1: Aracoma Complex Underground Mine Production Schedule (x 1,000 Saleable Tons) . 43
Table 16-1: Quality Specifications 50
Table 16-2: Price Forecasts 50
Table 17-1: Aracoma Refuse Disposal Summary 52
Table 17-2: Aracoma Mining Permits 53
Table 18-1: Summary of Capital Expenditures Schedule by Mine 55
Table 18-2: Estimated Coal Production Taxes and Sales Costs 56
Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 60
Table 19-2: Project Cash Flow Summary (000) 61
Table 22-1: Probability Level Table 68
Table 22-2: Consequence Level Table 69
Table 22-3: Risk Matrix 70
Table 22-4: Risk Assessment Matrix 71
Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2) 72
Table 22-6: Environmental (Risks 3 and 4) 73
Table 22-7: Regulatory Requirements (Risk 5) 73
Table 22-8: Market and Transportation (Risk 6) 74
Table 22-9: Market and Transportation (Risk 7) 74
Table 22-10: Methane Management (Risk 8) 75
Table 22-11: Mine Fires (Risk 9) 75
Table 22-12: Ground Control (Risk 10) 76
Table 22-13: Availability of Supplies and Equipment (Risk 11) 76
Table 22-14: Labor – Work Stoppage (Risk 12) 77
Table 22-15: Labor – Retirement (Risk 13) 77
Table 22-16: Health and Safety (Risk 14) 77
Table 25-1: Information from Registrant Relied Upon by MM&A 79

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Appendices
A ..... Summary Tables
B .....Initial Economic Assessment, Resources Exclusive of Reserves
C .....Maps

1 Executive Summary

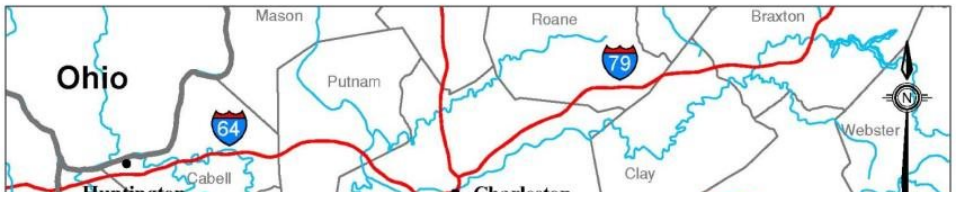
1.1 Property Description

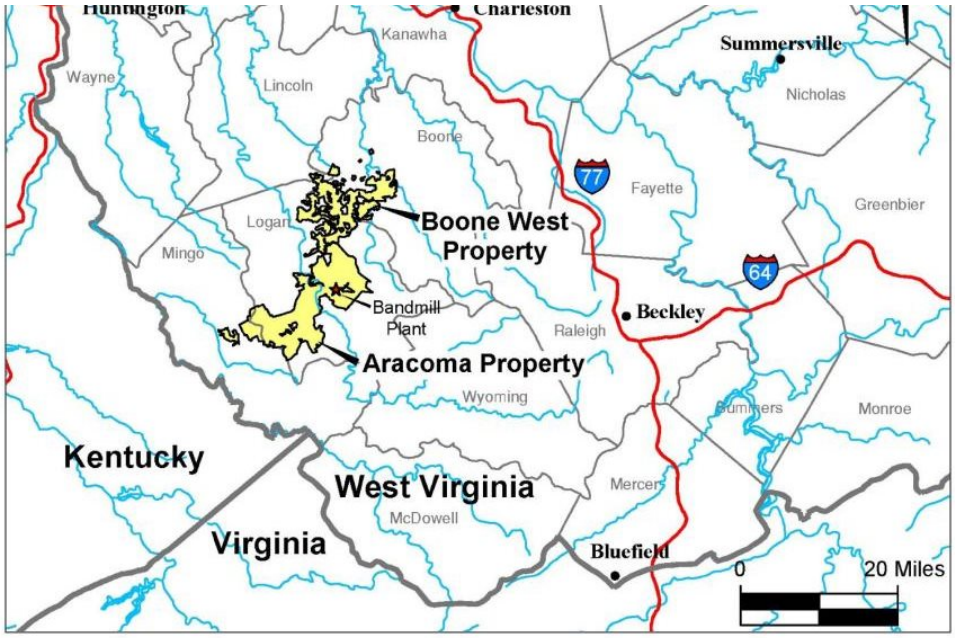
Alpha Metallurgical Resources, Inc. (*Alpha*) authorized **Marshall Miller & Associates, Inc. (*MM&A*)** to prepare this Technical Report Summary (*TRS*) of its controlled coal reserves located at the **Aracoma Complex (*Aracoma*)** in Logan County and Mingo counties, West Virginia.

Active surface facilities for the operations are located along Rum Creek, a tributary of the Guyandotte River adjacent to a CSX rail line. The property which is located about 7 miles south of the town of Logan, West Virginia, the county seat of Logan County, and approximately 70 miles west southwest of Beckley (see *Figure 1-1*) is composed of approximately 114,300 total acres of mineral control, of which nearly all are contained within 30 separate leases. The mentioned leases are all subject to Alpha renewing the rights to extend the term of all leases which have various expiration dates, some of which expire in the next several years but are anticipated to be renewed by Alpha. Additionally, it is industry practice for major leases to have automatic renewal provisions in favor of the lessee.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 1-1: Alpha's Aracoma Property Location Map





1.2 Ownership

The Aracoma property involves a complex combination of previous ownership. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)** and **Massey Energy (*Massey*)** previously held mining rights on the majority of the property.

1.3 Geology

Operations at the Aracoma Mine Complex currently extract coal from the Upper Chilton, Upper Cedar Grove, and No. 2 Gas seams by underground continuous mining method. These seams are all historically utilized as coking coal. Strata on the property reside in the Pennsylvanian-aged (approximately 290 to 330 million years ago) Kanawha Formation. Due to the high value of these coking coals, all the seams have been extensively mined in the past. The rock formations between the coal

seams are characterized by large proportions of sandstone interspersed with shale units. The coal seams reach the highest structural elevations along the southeastern margin of the property, generally dipping toward the northwest.

1.4 Exploration Status

The Property has been extensively explored, largely by drilling using continuous coring and rotary drilling methods but also by obtaining coal measurements at mine exposures, and by downhole geophysical methods. A significant amount of historical data was acquired or generated by previous owners of the Property. These sources comprise the primary data used in the evaluation of the coal resources and coal reserves on the Property. MM&A examined the data available for the evaluation and incorporated all pertinent information into this TRS. Where data appeared to be anomalous or not representative, that data was excluded from the digital databases and subsequent processing by MM&A.

Ongoing exploration has been carried out by Alpha since acquiring the Aracoma Complex. The Alpha acquired exploration data has been consistent with past drilling activities.

1.5 Operations and Development

As of December 31, 2021, underground mine operations were active at the Davy Branch Deep Mine in the Upper Chilton seam, the Cedar Grove No. 2 Deep Mine in the Upper Cedar Grove seam, and the Lynn Branch Deep Mine in the No. 2 Gas coal seam. The Rum Creek mine and the Cedar Grove No. 3 mine are currently in the conceptual stage and are planned to operate in the No. 2 Gas coal seam and the Cedar Grove seam, respectively. These mines produce a High Vol-B metallurgical coal blend.

Based on the mine plans developed as part of this TRS, annual deep mine production peaks at 2.1 million tons in 2040. Underground reserves will be depleted in 2047.

In addition to the mines, the Aracoma Complex also includes the Bandmill Preparation Plant, which is also referred to as the Rum Creek Prep Plant. Last rebuilt in 2010, the plant site includes raw coal storage, clean coal storage, a centrifugal dryer, a railroad loadout as well as a refuse disposal area. Low density cyclones are used for intermediated separation and froth flotation & spirals are utilized for fine coal separation. The plant has a feed rate capacity of 1200 raw tons per hour and produces 7.31% ash at less than 1.1% sulfur. For year end 2021 the average utilization rate of the Bandmill Preparation Plant was 60.4%

1.6 Mineral Resource

A coal resource estimate, summarized in *Table 1-1* was prepared as of December 31, 2021, for property controlled by Alpha.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 1-1: Coal Resources Summary as of December 31, 2021

Area	Seam	Coal Resource (Dry Tons, In Situ)			
		Measured	Indicated	Inferred	Total
Inclusive of Mine Plan					
Davy Branch	Upper Chilton (41000)	14,608,000	8,369,000	0	22,977,000
Hatfield Area	Upper Chilton (41000)	17,538,000	10,930,000	0	28,468,000
Lauren Land	Upper Cedar Grove (30100)	8,129,000	1,969,000	0	10,098,000
Lauren Land	Lower Cedar Grove (30000)	5,484,000	2,991,000	0	8,475,000
Beech Branch	Alma (25800)	2,560,000	1,226,000	0	3,787,000
Rum Creek	No. 2 Gas (24000)	19,097,000	8,818,000	0	27,915,000
Lynn Branch	No. 2 Gas (24000)	37,713,000	20,656,000	0	58,369,000

Lynn Branch	No. 2 Gas (24000)	27,712,000	20,656,000	0	48,369,000
Boone West	No. 2 Gas (24000)	6,072,000	8,662,000	701,000	15,435,000
Total Inclusive of Mine Plan		**101,201,000**	**63,621,000**	**701,000**	**165,523,000**
Exclusive of Mine Plan					
Davy Branch	Upper Chilton (41000)	0	0	22,000	22,000
Hatfield Area	Upper Chilton (41000)	0	0	0	0
Boone West	Chilton (47000)	7,306,000	1,990,000	0	9,296,000
Lauren Land	Upper Cedar Grove (30100)	31,574,000	17,551,000	225,000	49,351,000
Lauren Land	Lower Cedar Grove (30000)	0	0	0	0
Rum Creek	No. 2 Gas (24000)	10,663,000	10,690,000	154,000	21,507,000
Lynn Branch	No. 2 Gas (24000)	8,328,000	6,177,000	246,000	14,752,000
Boone West	No. 2 Gas (24000)	29,094,000	17,283,000	86,000	46,463,000
Total Exclusive of Mine Plan		**86,965,000**	**53,692,000**	**733,000**	**141,390,000**
Grand Total					
Inclusive of Mine Plan		101,201,000	63,621,000	701,000	165,523,000
Exclusive of Mine Plan		86,965,000	53,692,000	733,000	141,390,000
Grand Total		**188,166,000**	**117,313,000**	**1,434,000**	**306,913,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Note (3): The Property contains 140.66 Mt of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.
Totals may not add due to rounding.
See Appendix A for more detailed breakdown.

1.7 Mineral Reserve

The Resource estimate outlined in *Table 1-1* **inclusive** of reserves has been used as the basis for this Reserve calculation, which utilizes a reasonable Preliminary Feasibility Study, a Life-of Mine (*LOM*) Mine Plan and practical recovery factors. Production modeling was completed with an effective start date of January 1, 2022.

Factors that would typically preclude conversion of a coal resource to coal reserve, include the following: inferred resource classification; absence of coal quality; poor mine recovery; lack of access; geological encumbrances associated with overlying and underlying strata; seam thinning; structural complication; and insufficient exploration have all been considered. Reserve consideration excludes those portions of the resource area, which exhibit the aforementioned geological and operational encumbrances.

Proven and probable coal reserves were derived from the defined in-situ coal resource considering relevant processing, economic (including technical estimates of capital, revenue and cost), marketing, legal, environmental, socioeconomic, and regulatory factors. The proven and probable coal reserves on the Property are summarized below in *Table 1-2*.

Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

Area/Mine	Seam	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
		By Reliability Category			By Control Type				
		Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%*
Davy Branch	Upper Chilton (41000)	3,816,000	2,007,000	5,823,000	0	5,823,000	7	0.9	39
Hatfield Area	Upper Chilton (41000)	5,106,000	2,663,000	7,768,000	0	7,768,000	7	0.9	36
Lauren Land	Upper Cedar Grove (30100)	1,799,000	432,000	2,231,000	0	2,231,000	7	1.4	38
Lauren Land	Lower Cedar Grove (30000)	1,905,000	1,038,000	2,943,000	0	2,943,000	3	0.7	-
Beech Branch	Alma (25800)	998,000	431,000	1,429,000	0	1,429,000	4	0.9	39
Rum Creek	No. 2 Gas (24000)	2,530,000	1,051,000	3,581,000	0	3,581,000	5	0.7	36
Lynn Branch	No. 2 Gas (24000)	8,371,000	7,011,000	15,381,000	1,217,000	14,165,000	4	0.8	36
Boone West	No. 2 Gas (24000)	1,712,000	3,312,000	5,024,000	4,033,000	991,000	4	0.9	-
Grand Total		**26,237,000**	**17,944,000**	**44,182,000**	**5,250,000**	**38,932,000**	**5**	**0.8**	**37**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
**Volatile Matter analysis is not available for all reserve areas. All Aracoma reserves are priced as a High-Vol. B product.*
Totals may not add due to rounding.
See Appendix A for more detailed breakdown.

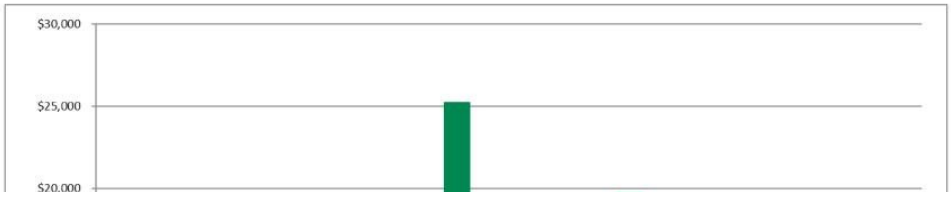
In summary, as of December 31, 2021, Alpha controls a total of 44.18 Mt (moist basis) of marketable coal reserves at Aracoma. Of that total, 59 percent are proven, and 41 percent are probable. Approximately 5.25 Mt are owned, and the remaining 38.93 Mt are leased coal reserves. The maps included in *Appendix C* reflect mining depletion at the time of the resource/reserve calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

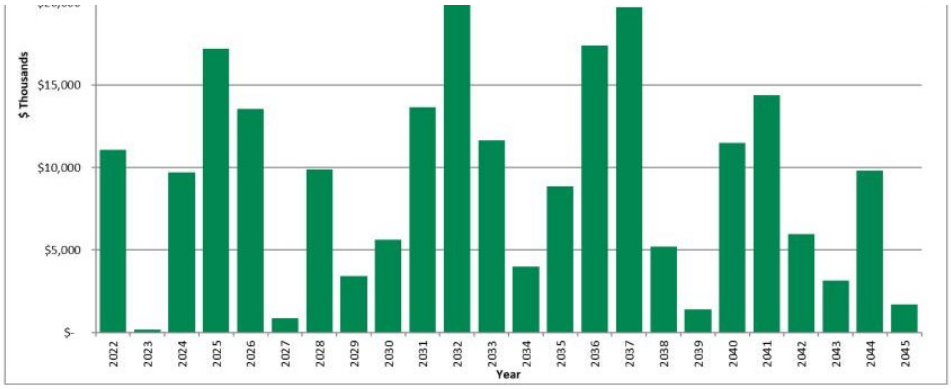
1.8 Capital Summary

Alpha provided MM&A with information related to the number of currently operating production units at Aracoma. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated Aracoma operations is provided in *Figure 1-2* below.

Figure 1-2: Projected Capital Expenditures – Consolidated Aracoma Operations





1.9 Operating Costs

Alpha provided historical costs and budgeted projections of operating costs for its active mines; Davy Branch Deep Mine, Cedar Grove No. 2 ,Lynn Branch No. 2 Mine, and the recently closed Aracoma Alma Mine for MM&A's review. MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for each mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

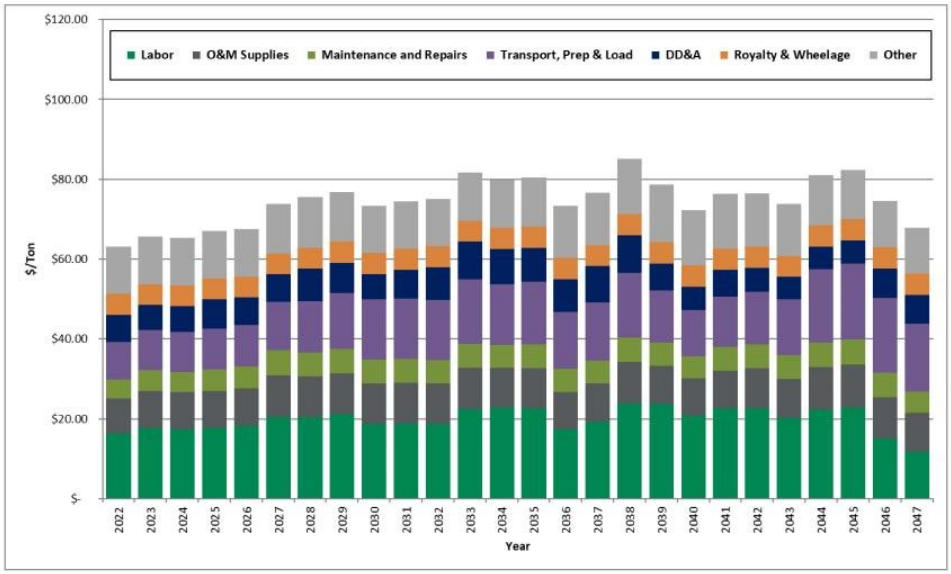
Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long term

realization of $117 per short ton port pricing, with an average $87.72 per ton netback pricing reflective of the high-volatile product currently sold at Aracoma. These estimates are based on long term pricing published by third party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha and their Aracoma business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the Aracoma business unit.

A summary of the projected operating costs for the consolidated Aracoma operations is provided in *Figure 1-3*.

Figure 1-3: Aracoma Operating Costs



1.10 Economic Evaluation

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation, refuse disposal, coal loading, reclamation, and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production

royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

Table 1-3 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at Aracoma.

Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Lynn Branch N2G	15,777	$249,867	$15.84	$385,275	$24.42
Davey Branch UCH	5,981	$93,583	$15.65	$143,155	$23.94
Lauren Land LCG	2,943	$38,391	$13.04	$51,256	$17.42
Lauren Land - Hatfield UCH	7,768	$41,812	$5.38	$113,058	$14.55
Laurel Br UCG	2,231	$31,402	$14.08	$43,512	$19.51
Rum Creek N2G	3,581	$97,068	$27.11	$114,272	$31.91
Alma Beech Br	1,429	$11,147	$7.80	$20,500	$14.34
Boone West N2G	5,258	$27,991	$5.32	$63,500	$12.08
Grand Total	**44,968**	**$591,261**	**$13.15**	**$934,529**	**$20.78**

Note: (1) The financial model contains 0.286 million tons of inferred coal that has been excluded from reserves. LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (500,817 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 1-3,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated Aracoma operations show positive LOM P&L and EBITDA of $591.2 million and $934.5 million, respectively.

Alpha's consolidated Aracoma cash flow summary in constant dollars, excluding debt service, is shown in *Table 1-4* below.

Table 1-4: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	44,968	296	2,219	2,053	2,091	2,052	2,002
Total Revenue	$3,944,417	$25,973	$194,607	$180,056	$183,406	$180,029	$175,567
EBITDA	$934,529	$3,406	$69,442	$58,063	$60,118	$57,436	$54,089
Net Income	$483,724	($15,755)	$47,517	$37,043	$38,187	$34,151	$32,200
Net Cash Provided by Operating Activities	$826,992	$2,595	$49,287	$52,092	$51,389	$50,025	$46,661
Purchases of Property, Plant, and Equipment	($230,529)	($5,182)	($11,084)	($180)	($9,720)	($17,232)	($13,563)
Net Cash Flow	$596,463	($2,587)	$38,203	$51,912	$41,669	$32,793	$33,098

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	1,780	1,827	1,803	1,857	1,845	1,856	1,545
Total Revenue	$156,147	$160,275	$158,143	$162,916	$161,802	$162,828	$135,481
EBITDA	$36,852	$37,045	$33,362	$38,545	$37,795	$38,832	$23,898
Net Income	$20,614	$17,965	$15,717	$21,918	$19,797	$18,595	$7,125
Net Cash Provided by Operating Activities	$36,032	$34,150	$31,553	$33,499	$34,341	$35,084	$25,933
Purchases of Property, Plant, and Equipment	($868)	($9,900)	($3,420)	($5,640)	($13,660)	($25,272)	($11,668)
Net Cash Flow	$35,163	$24,249	$28,133	$27,859	$20,681	$9,812	$14,265
	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	1,526	1,548	2,087	1,981	1,806	1,890	2,102
Total Revenue	$133,824	$135,808	$183,057	$173,738	$158,377	$165,763	$184,384
EBITDA	$25,452	$24,553	$46,935	$40,008	$21,872	$29,975	$44,789
Net Income	$9,734	$9,112	$23,293	$17,042	$3,045	$14,406	$28,807
Net Cash Provided by Operating Activities	$24,456	$23,992	$37,687	$38,126	$25,274	$27,079	$27,430
Purchases of Property, Plant, and Equipment	($3,972)	($8,855)	($17,428)	($19,754)	($5,216)	($1,392)	($11,500)
Net Cash Flow	$20,484	$15,137	$20,259	$18,372	$20,057	$25,686	$15,930
	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	2,046	1,816	1,777	1,088	1,016	740	320
Total Revenue	$179,457	$159,325	$155,898	$95,452	$89,117	$64,891	$28,095
EBITDA	$37,151	$31,400	$34,762	$13,475	$11,460	$15,227	$8,687
Net Income	$19,336	$17,336	$21,044	$6,707	$4,722	$8,353	$5,911
Net Cash Provided by Operating Activities	$31,011	$27,999	$29,926	$16,010	$11,120	$13,811	$11,473
Purchases of Property, Plant, and Equipment	($14,384)	($5,972)	($3,138)	($9,827)	($1,700)	$0	$0
Net Cash Flow	$16,627	$22,026	$26,788	$6,183	$9,420	$13,811	$11,473
	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0
EBITDA	($56)	($23)	($12)	($6)	($2)	$0	$0
Net Income	($113)	($46)	($23)	($12)	($4)	$0	$0
Net Cash Provided by Operating Activities	($615)	($214)	($107)	($72)	($35)	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($615)	($214)	($107)	($72)	($35)	$0	$0

Note: (1) The financial model contains 0.286 million tons of inferred coal that has been excluded from reserves. LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (500,817 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

Consolidated cash flows are driven by annual sales tonnage, which peaks at 2.2 million tons in 2022. Between years 2023 and 2043, sales ranges from 1.5 million to 2.1 million tons and between years 2044-2047, sales range from 0.3 million tons to 1.1 million tons. Projected consolidated revenue peaks at $194.6 million in 2022 and totals $3.9 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $52.1 million in 2023 and totals $827.0 million over the project life. Capital expenditures total $57.0 million during the first five years and $230.5 million over the project's life.

1.10.1 Discounted Cash Flow Analysis

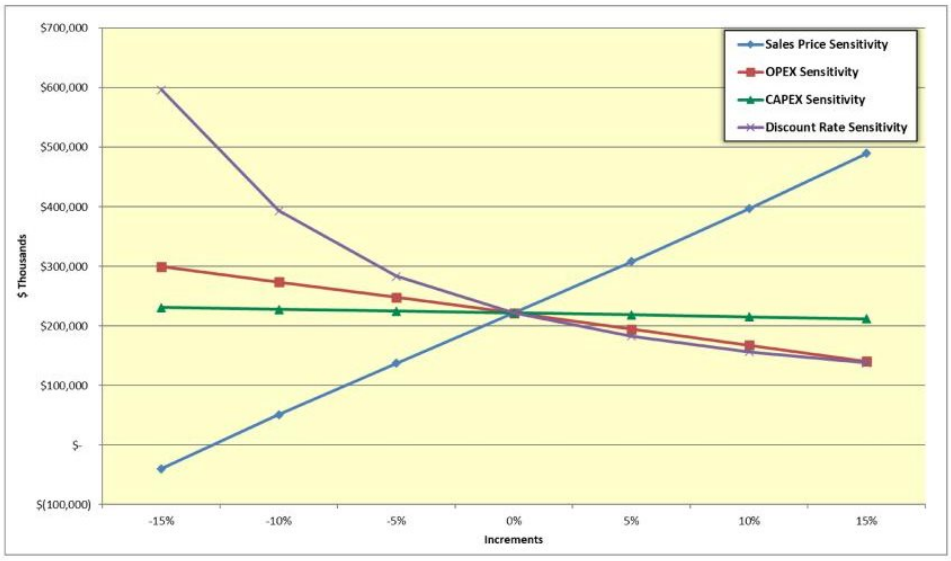
Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $221.8 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the Aracoma reserves. The pre-feasibility financial model prepared

for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its Aracoma assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

1.10.2 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs, and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 1-4: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price, operating cost estimates and the discount rate, and slightly sensitive to changes in capital cost estimates.

1.11 Permitting

Alpha has obtained all mining and discharge permits to operate its active mines and processing, loadout or related support facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Alpha, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

1.12 Conclusion and Recommendations

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Aracoma Property and reviewed in the study. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study concludes that the 44.18 Mt of marketable underground coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

2 Introduction

2.1 Registrant and Terms of Reference

This report was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors.

The report provides a statement of coal reserves for Alpha. Exploration results and Resource calculations were used as the basis for the mine planning and the preliminary feasibility study completed to determine the extent and viability of the reserve.

Coal resources and coal reserves are herein reported in imperial units of measurement and are rounded to millions of short tons (*Mt*).

2.2 Information Sources

The technical report is based on information provided by Alpha and reviewed by MM&A's professionals, including geologists, mining engineers, civil engineers, and environmental scientists. MM&A's professionals hold professional registrations and memberships which qualify them as Qualified Persons in accordance with SEC guidelines.

Alpha engaged MM&A to conduct a coal reserve evaluation of the Alpha coal properties as of December

31, 2021. For the evaluation, the following tasks were to be completed:

> Conduct site visits of the mines and mine infrastructure facilities;

> Process the information supporting the estimation of coal resources and reserves into geological models;

> Develop life-of-reserve mine (*LOM*) plans and financial models;

> Hold discussions with Alpha company management; and

> Prepare and issue a Technical Report Summary providing a statement of coal reserves which would include:

- A description of the mines and facilities.
- A description of the evaluation process.
- An estimation of coal reserves with compliance elements as stated under the new SEC Guidelines which will become effective for the first fiscal year commencing on or after January 1, 2022.

2.3 Personal Inspections

MM&A is very familiar with Aracoma, having provided a variety of services in recent years and QP's involved in this TRS have conducted multiple site visits.

3 Property Description

3.1 Location

The Aracoma Mine Complex is located in the Central Appalachian Basin in southern West Virginia (see *Figure 1-1*) approximately 7 miles south of the town of Logan, West Virginia, the county seat of Logan County and 70 miles west of Beckley, which is the county seat of Raleigh County. Surface facilities for the operation are located in the Guyandotte River drainage basin, central to the active Mines as well as those currently in development. Numerous small communities are present throughout the property such as the previously mentioned Logan, as well as Stollings, Omar and Barnabus.

The nearest major population centers are Charleston, West Virginia (65 miles north), Bristol, Virginia (140 miles south), Roanoke, Virginia (190 miles east), and Morgantown, West Virginia (220 miles north), and Lexington, Kentucky (190 miles west). The property is located on the following **United States Geological Survey (*USGS*)** Quadrangles: Holden, Barnabus, Man, Mallory, Amherstdale, Lorado, Wharton, Clothier, and Logan. The coordinate system and datum used for the model of the Aracoma Mine complex and the subsequent maps were produced in the West Virginia State Plane South system, NAD 27.

3.2 Titles, Claims or Leases

The property is composed of over 114,000 total acres of mineral control, nearly all of which is leased. Alpha's control is comprised of over 30 separate leases with varying expiration dates. Some leases expire over the next several years, but Alpha does not anticipate any challenges related to lease renewal. MM&A has not carried out a separate title verification for the coal properties and has not verified leases, deeds, surveys, or other property control instruments pertinent to the subject resources. Alpha has represented to MM&A that it controls the mining rights to the reserves as shown on its property maps, and MM&A has accepted these as being a true and accurate depiction of the mineral rights controlled by Alpha. The TRS assumes the property is developed under responsible and experienced management.

3.3 Mineral Rights

Alpha supplied property control maps to MM&A related to properties for which mineral and/or surface property are controlled by Alpha. While MM&A accepted these representations as being true and accurate, through past knowledge of the Property MM&A has no knowledge of past property boundary disputes or other concerns, that could impact future mining operations or development potential.

Property control in Appalachia can be intricate. Coal mining properties are typically composed of numerous property tracts which are owned and/or leased from both land holding companies and private individuals or companies. It is common to encounter severed ownership, with different entities or individuals controlling the surface and mineral rights. Mineral control in the region is typically characterized by leases or ownership of larger tracts of land, with surface control generally comprised of smaller tracts, particularly in developed areas.

Control of the surface property is necessary to conduct surface mining but is not necessary to conduct underground mining aside from relatively limited areas required for seam access or ventilation infrastructure. Alpha's executive management team has a history of mining in Central Appalachia and has conveyed to MM&A that it has been successful in acquiring surface rights where needed for past operations.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

3.4 Encumbrances

No Title Encumbrances are known. By assignment, MM&A did not complete a query related to Title Encumbrances.

3.5 Other Risks

There is always risk involved in property control. As is common practice, Alpha, and its predecessors, have had their land teams examine the deeds and title control to minimize this risk. Historically

have had their land teams examine the deeds and title control to minimize this risk. Historically, property control has not posed any significant challenges related to Aracoma's operations.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, elevation and Vegetation

Topography of the area surrounding the Aracoma mine complex is typical of the Central Appalachian Plateau's physiographic province, being rugged and deeply dissected by V-shaped river valleys and flanked by steep-sided upland regions. Slopes in the area are mostly steep to very steep with some gently sloping with relatively narrow ridges. Surface elevations near the mine complex range from approximately 1,200 feet above sea level at streams to approximately 2,200 feet at ridge tops. The area is heavily vegetated and has a significant amount of hardwood forests. The property is not situated near any major urban centers.

4.2 Access and Transport

There is general access to the Aracoma property via a well-developed network of primary, secondary, and unimproved roads. Interstates 64 and 77 converge at Beckley, WV, and are the primary roads in the area connecting to Beckley, Charleston, and Huntington, West Virginia, to the West and Lexington, Virginia, to the East. Numerous secondary and unimproved roads provide direct access to the mine property, some being federal-, state-, and town-maintained. These include State Route 119 running east-west from Danville to Logan and State Route 10 running north-south from Logan to Man. These roads typically stay open throughout the year. Within the property, unimproved roads are utilized to access gas drainage wells and surface based deep mine infrastructure. An Alpha-owned preparation plant and rail loadout are located approximately 12 miles southeast of the town of Logan along the CSX railroad system and serve as the primary transport means of processed coal.

4.3 Proximity to Population Centers

The Aracoma Mine Complex is located near the town of Logan and is primarily in Logan and Boone Counties, West Virginia, with small portions falling in Mingo County. There are no large population centers in proximity. The nearest major population centers are Charleston, West Virginia (65 miles

north), Bristol, Virginia (140 miles south), Roanoke, Virginia (190 miles east), and Morgantown, West Virginia (220 miles north), and Lexington, Kentucky (190 miles west). As of the 2010 census, Logan County had just over 36,700 residents.

4.4 Climate and Length of Operating Season

The climate of the region is classified as humid continental with four distinct seasons: warm summers, cold winters, and moderate fall and spring seasons. Precipitation in the region is consistent throughout the year, approximately 3 to 5 inches per month, with the most rain falling in spring and the early months of summer. Average yearly precipitation is 47 inches. Summer months typically begin in late May and end in early September and range in average temperature from 50 to 83 degrees Fahrenheit. Winters typically begin in mid to late November and run until mid to late March with average temperatures ranging from 23 to 54 degrees Fahrenheit. Precipitation in the winter typically comes in the form of snowfall or as a wintery mix (sleet and snow) with severe snowfall events occurring occasionally. Seasonal variations in climate typically do not affect underground mining in West Virginia. However, weather events could potentially negatively impact efficiency of surface and preparation plant operations on a very limited basis and lasting less than a few days.

4.5 Infrastructure

The Aracoma Mine Complex has sources of water, power, personnel, and supplies readily available for use. Personnel have historically been sourced from the surrounding communities in Logan, Mingo, Wyoming, and Boone Counties and have proven to be adequate in numbers to conduct mining operations. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners. Water is sourced locally from public water sources or rivers, and electricity is sourced from **Appalachian Power**, a subsidiary of **American Electric Power (*AEP*)**. The service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc. Alpha's Bandmill preparation plant services consumers in with washed coal, which is transported via the adjacent CSX rail line at the Aracoma loadout. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to the preparation plant.

5 History

5.1 Previous Operation

The Aracoma property involves a complex combination of previous ownership. Coal mining in the area occurred for nearly a century. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)** and **Massey Energy (*Massey*)** previously held mining rights on much of the property.

5.2 Previous Exploration

Extensive exploration in the form of subsurface drill efforts has been carried out on the property by numerous entities, most of which efforts were completed prior to the inception of Alpha. Diamond core and rotary drilling are the primary types of exploration on the property. Data for correlation and mining conditions are derived from core descriptions and geophysical logging (e-logging). Coal-quality analyses were also employed during the core-exploration process. Development of this report included an assessment of over 5,375 coal measurements, largely comprised of exploration drill holes.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recently drilled holes.

6 Geological Setting, Mineralization and Deposit

6.1 Regional, Local and Property Geology

The property lies in the Central Appalachian Coal basin in the Appalachian Plateau physiographic province.

The coal deposits in the eastern US are the oldest and most extensively developed coal deposits in the country. The coal deposits on the Property are Carboniferous in age, being of the Pennsylvanian system. Overall, these Carboniferous coals contain two-fifths of the US's bituminous coal deposits and extend over 900 miles from northern Alabama to Pennsylvania and are part of what is known as the *Appalachian Basin*. The Appalachian Basin is more than 250 miles wide and, in some portions, contains over 60 coal seams of varying economic significance.

Seams and zones of economic significance typically range between 24 and 48 inches in thickness, with relatively little structural deformation. Regional structure is typically characterized by gently dipping strata to the northwest at one to four percent, averaging three percent.

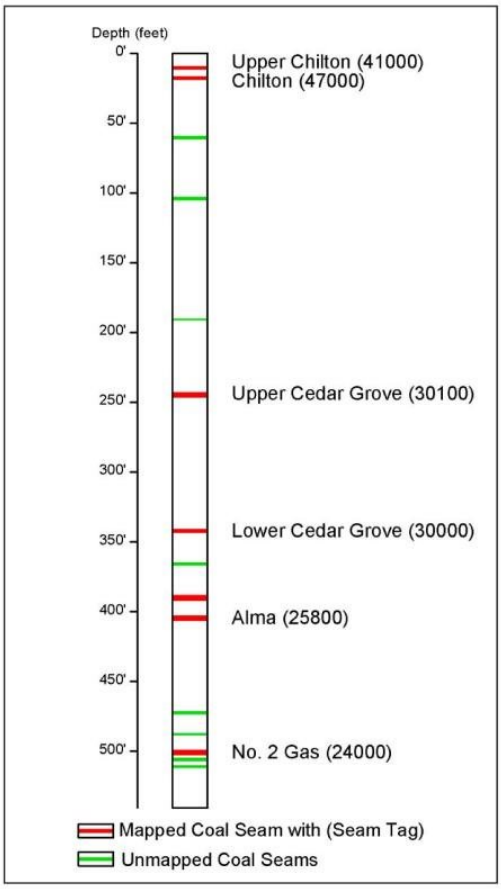
Strata on the property are of the Pennsylvanian-age Kanawha Formation of the Pottsville Series. The rock formations between the coal seams are characterized by large proportions of sandstone interspersed with shale units.

Seams with remaining reserve or resource potential include, in stratigraphically ascending order the: No. 2 Gas, Alma, Lower Cedar Grove, Upper Cedar Grove Chilton and Upper Chilton.

6.2 Mineralization

The generalized stratigraphic columnar section in *Figure 6-1* demonstrates the vertical relationship of the principal coal seams and rock formations on the Property.

Figure 6-1: Aracoma Stratigraphic Column



(not to scale)

6.3 Deposits

The coal produced at the Aracoma complex is a High-Volatile-B bituminous coal.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Due to the high value of these High volatile coking coals, all the seams have been extensively mined in the past. The coal seams reach the highest structural elevations along the southeastern margin of the property, generally dipping toward the northwest. The upper seams of interest are situated above drainage and are accessible via outcrop, the deeper No. 2 Gas seam is below drainage where slope and shaft access are required. The rock formations between the coal seams are characterized by large portions of sandstone with shale units interspersed throughout.

7 Exploration

7.1 Nature and Extent of Exploration

The Property has been extensively explored by subsurface drilling efforts carried out by numerous entities, most of which were completed prior to ownership by Alpha.

Diamond core and rotary drilling are the primary types of exploration on the property. Data for correlation and mining conditions are derived from core descriptions and geophysical logging (e-logging). Coal-quality analyses were also employed during the core-exploration process.

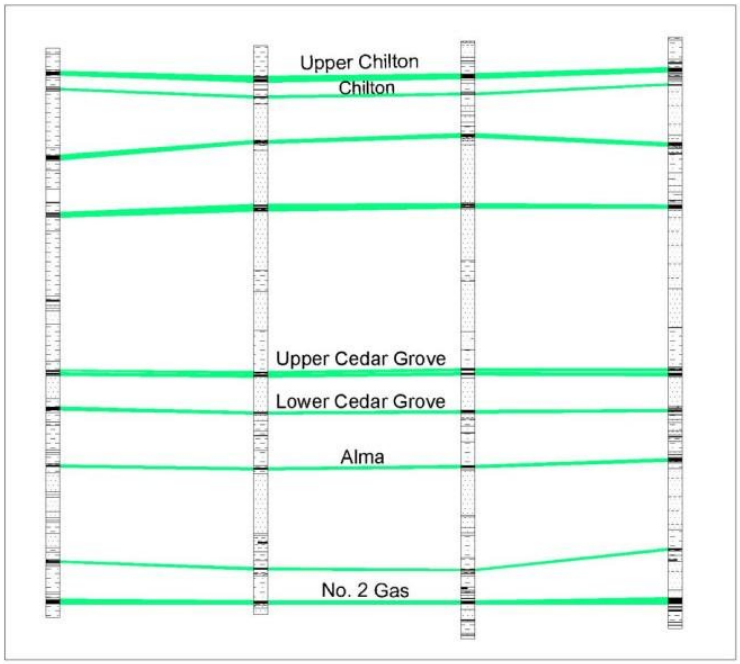
Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recently drilled holes.

The location of the drilling is shown on the maps included in *Appendix C.*

The concentration of exploration varies slightly across the property. Drilling on the property is typically sufficient for delineation of potential surface, highwall miner, and deep mineable coal horizons. Core logging is carried out by geologists in cases where roof and floor strata are of particular interest and in cases where greater resolution and geologic detail are needed. In many cases the drill hole data comes from simplified driller's logs, which may lack specific details regarding geotechnical conditions and specific geology, making correlations and floor and roof conditions difficult to determine. Geophysical logging (e-logging) techniques, by contrast, document specific details useful for geologic interpretation and mining conditions. Given the variability of data-gathering methods, *definitive* mapping of future mining conditions may not be possible, but projections and assumptions can be made within a *reasonable* degree of certainty. A significant effort was put into verifying the integrity of the database. Once this was established, stratigraphic columnar sections were generated using cross-sectional analysis to establish or confirm coal seam correlations.

A typical cross-section is shown in *Figure 7-1.*

Figure 7-1: Aracoma Cross-Section



Due to the long history of exploration by various parties on the Property, a wide variety of survey techniques exist for documentation of data point locations. Many of the older exploration drill holes appear to have been located by survey and more recently completed drill holes are often located by high-resolution Global Positioning System (*GPS*) units. However, some holes appear to have been approximately located using USGS topography maps or other methods which are less accurate. Therefore, discretion had to be used regarding the accuracy for the location and ground surface elevation of some of these older drill holes. In instances where a drill hole location (or associated coal seam elevations) appeared to be inconsistent with the overall structural trend (or surface topography for surface-mineable areas), the data point was not honored for geological modeling. Others with apparently minor variances were adjusted and then used by MM&A.

Surveying of the underground and surface mined areas has been performed by the mine operators and/or their consulting surveyors. By assignment, MM&A did not verify the accuracy or completeness of supplied mine maps but accepted this information as being the work of responsible engineers and surveyors, as required by both State and Federal Law.

MM&A compiled comprehensive topographic map files by selecting the best available aerial mapping for each area and filling any gaps with digital USGS topographic mapping.

7.2 Drilling Procedures

Core drilling methods utilize NX-size ($2^1/_8$ inch) or similar-sized core cylinders to recover core samples, which can be used to delineate geologic characteristics, and for coal quality testing and geotechnical logging. For the core holes, the geophysical logs are especially useful in verifying the core recovery of

both the coal samples (for assurance that sample is representative of the full seam) and of the roof and floor rock samples (for evaluating ground control characteristics of deep mineable coal seams). In addition to the core holes, rotary drilled holes also exist on most of the Property. Data for the rotary drilled holes is mainly derived from downhole geophysical logs, which are used to interpret coal and rock thickness and depth since logging of the drill cuttings is not reliable.

A wide variety of core-logging techniques exist for the Property. For many of the core holes, the primary data source is a generalized lithology description by the driller, typically supplemented by a more detailed core log completed by a geologist. These drilling logs were provided to MM&A as a geological database. MM&A geologists were not involved in the production of original core logs but did perform a basic check of information within the provided database. Where geophysical logs for such holes are available, they were used by MM&A geologists to verify the coal thickness and core recovery of seams.

7.3 Hydrology

Hydrologic testing and forecasting are necessary parts of the permitting process and as such are routinely considered in the mine planning process.

Aracoma has a lengthy history of operation and three currently active mines with no significant hydrologic concerns or material issues experienced in its history. Future mining is projected to occur in areas exhibiting similar hydrogeological conditions as past mining. Based upon the successful history of the operation with regards to hydrogeological features, MM&A assumes that the operation will not be hindered by such issues in the future.

7.4 Geotechnical Data

Life-of-Mine (*LOM*) Mining plans for potential underground mines were developed by MM&A through incorporation of budget maps from Alpha. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS)* program that was developed by the **National Institute for Occupational Safety and Health (*NIOSH*)**. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan. Coal and rock strengths from core testing are used to verify the empirical assumptions integral to ACPS.

8 Sample Preparation Analyses and Security

8.1 Prior to Sending to the Lab

Most of the coal samples have been obtained from the Property by subsurface exploration using core drilling techniques. The protocol for preparing and testing the samples has varied over time and is not well documented for the older holes drilled on the Property. Typical US core drilling sampling technique is for the coal core sample, once recovered from the core barrel, to be described then wrapped in a sealed plastic sleeve and placed into a covered core box, which is the length of the sample so that the core can be delivered to a laboratory in relatively intact condition and with original moisture content. The core identification number and the depth are scribed on the sample box lid to identify the sample. This process has been the norm for both historical and ongoing exploration activities at Aracoma.

This work is typically performed by the supervising driller, geologist or company personnel. Samples are most often delivered to the company by the driller after each shift or acquired by company personnel or representatives. Most of the coal core samples were obtained by previous operators on the Property. MM&A did not participate in the collection, sampling, and analysis of the majority of core samples within the exploration database. However, it is reasonable to assume, given the sophistication level of the previous operators, that these samples were generally collected and processed under industry best-practices. This assumption is based on MM&A's familiarity with the operating companies and the companies used to perform the analysis.

8.2 Lab Procedures

Coal quality testing has been performed over a large number of years by operating companies using different laboratories and testing regimens. Some of the samples have raw analyses and washabilities on the full seam (with coal and rock parting layers co-mingled) and are mainly useful for characterizing the coal quality for projected production from underground and highwall mining. Other samples have coal and rock analyzed separately, the results of which can be manipulated to forecast either surface or underground mining quality. Care has been taken to use only those analyses that are representative of the coal quality parameters for the appropriate mining type for each sample.

Standard procedure upon receipt of core samples by the testing laboratory is to log the depth and thickness of the sample, then perform testing as specified by a representative of the operating company. Each sample is then analyzed in accordance with procedures defined under **American Society for Testing and Materials (*ASTM*)** standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

9 Data Verification

9.1 Procedures of Qualified Person

MM&A reviewed the Alpha-supplied digital geologic database and supplemented the database with its own in-house records which have been maintained for both Alpha and previous operators of the property. The database consists of data records, which include drill hole information for holes that lie

within and adjacent to the Property along with records for numerous supplemental coal seam thickness measurements. Once the initial integrity of the database was established, stratigraphic columnar sections were generated using in cross-sectional analysis to establish or confirm coal seam correlations. Geophysical logs were used wherever available to assist in confirming the seam correlation and to verify proper seam thickness measurements and recovery of coal samples.

After establishing and/or verifying proper seam correlation, seam data control maps and geological cross-sections were generated and again used to verify seam correlations and data integrity. Once the database was fully vetted, seam thickness, base-of-seam elevation, roof and floor lithology, and overburden maps were independently generated for use in the mine planning process.

Coal quality was analyzed and summarized by MM&A's team of geologists and engineers. Quality was provided by Alpha in various database formats, laboratory data sheets, and also obtained directly from MM&A's files. Care was taken to ensure that sampled data was representative of the mineable section. In instances where minimal representative data was noted, geological tonnages were estimated based upon applying assumed densities of coal and non-coal material to thicknesses expressed in geological database files.

9.2 Limitations

As with any exploration program, localized anomalies, such as a thin coal area or poor mining conditions, cannot always be identified. The greater the density of the samples taken, the less the risk. Once an area is identified as being of interest for inclusion in the mine plan, additional samples are taken to help reduce the risk in those specific areas. In general, provision is made in the mine planning portion of the study to allow for localized anomalies that are typically classed more as a nuisance than a hinderance.

9.3 Opinion of Qualified Person

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Aracoma Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

10 Mineral Processing and Metallurgical Testing

10.1 Testing Procedures

Basic chemical analyses (both raw and washed quality), petrographic data, rheological data and ash, ultimate and sulfur analysis are available but not summarized for this filing. Available coal quality data sourced from MM&A's vaults (associated with former projects for Alpha and its predecessors) was tabulated by resource area in a Microsoft® EXCEL workbook. Such data contained laboratory sheets which MM&A utilized to confirm that sampled intervals were representative of geological models and confirm that appropriate laboratory procedures were utilized to derive raw and clean coal parameters. Additionally, Alpha provided MM&A with a database of its own in-house coal quality information which did **not** include backup laboratory information or sampled intervals. MM&A compared wash recovery values from Alpha's dataset to proximal holes with wash recovery data in MM&A's dataset and calculated estimates of wash recovery based upon the relative percentages of coal and rock from lithologic descriptions. In general, MM&A found that Alpha's dataset was representative and appropriate for inclusion in coal quality summaries. Quality tables also provide basic statistical analyses of the coal quality datasets, including average value; maximum and minimum values; and the number of samples available to represent each quality parameter of the seam. Coal samples that were deemed by MM&A geologists to be unrepresentative were not used for statistical analysis of coal quality, as documented in the tabulations.

Specific to the surface mine reserve areas, exploration quality was supplemented with historical pit sampling. Tabulations were completed based upon annual arithmetic averages on in-pit samples for washed quality. The general consistency in quality suggests confidence in the mines' ability to continue to produce a comparable metallurgical product.

The amount and areal extent of coal sampling for geological data is generally sufficient to represent the quality characteristics of the coal horizons and allow for proper market placement of the subject coal seams. For some of the coal deposits there are considerable laboratory data from core samples that are representative of the full extent of the resource area; and for others there are more limited data to represent the resource area. For example, in the active operations with considerable previous mining, there may be limited quality data within some of the remaining resource areas; however, in those cases the core sampling data can be supplemented with operational data from mining and shipped quality samples representative of the resource area.

10.2 Relationship of Tests to the Whole

The extensive sampling and testing procedures typically followed in the Coal Industry result in an excellent correlation between samples and Marketable product. As shipped analyses of the coal from Aracoma were reviewed to verify that the coal quality and characteristics were as expected. The

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Aracoma Property has a long history of saleable production, under various owners, in the High-volatile metallurgical and thermal markets, confirming exploration results.

10.3 Lab Information

Each sample is analyzed at area Laboratories that operate in accordance with procedures defined under ASTM standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); Free Swell Index (*FSI*) (ASTM

D720).

10.4 Relevant Results

No critical factors have been found that would adversely affect the recovery of the Reserve. Any quality issues that occur, either localized or generally are accounted for in the Marketing Study done for this TRS.

11 Mineral Resource Estimates

MM&A independently created a geologic model to define the coal resources at Aracoma. Coal resources were estimated as of December 31, 2021.

11.1 Assumptions, Parameters and Methodology

Geological data was imported into Carlson Mining® (formerly SurvCADD®) geological modelling software in the form of Microsoft® Excel files incorporating drill hole collars, seam and thickness picks, bottom seam elevations and raw and washed coal quality. These data files were validated prior to importing into the software. Once imported, a geologic model was created, reviewed, and verified- with a key element being a gridded model of coal seam thickness. Resource tons were estimated by using the seam thickness grid based on each valid point of observation and by defining resource confidence arcs around the points of observation. Points of observation for Measured and Indicated confidence arcs were defined for all valid drill holes that intersected the seam using standards deemed acceptable by MM&A based on a detailed geologic evaluation and a statistical analysis of all drill holes within the projected reserve areas as described in *Section 11.1.1*. The geological evaluation incorporated an analysis of seam thickness related to depositional environments, adjacent roof and floor lithologies, and structural influences.

After validating coal seam data and establishing correlations, the thickness and elevation for seams of economic interest were used to generate a geologic model. Due to the relative structural simplicity of the deposits and the reasonable continuity of the tabular coal beds, the principal geological interpretation necessary to define the geometry of the coal deposits is the proper modeling of their thickness and elevation. Both coal thickness and quality data are deemed by MM&A to be reasonably

sufficient within the resource areas. Therefore, there is a reasonable level of confidence in the geologic interpretations required for coal resource determination based on the available data and the techniques applied to the data.

Table 11-1 below provides the geological mapping and coal tonnage estimation criteria used for the coal resource and reserve evaluation. These cut-off parameters have been developed by MM&A based on its experience with the Alpha Property and are typical of mining operations in the Central Appalachian coal basin. This experience includes technical and economic evaluations of numerous properties in the region for the purposes of determining the economic viability of the subject coal reserves.

Table 11-1: General Reserve & Resource Criteria

Item	Parameters	Technical Notes & Exceptions*
• **General Reserve Criteria**		
Reserve Classification	Reserve and Resource	Coal resources as reported are inclusive of coal reserves.
Reliability Categories	Reserve (Proven and Probable) Resource (Measured, Indicated & Inferred)	To better reflect geological conditions of the coal deposits, distance between points of observation is determined via statistical analysis
Effective Date of Resource Estimate	December 31, 2021	Coal resources were estimated based upon depletion maps with effective dates of September 31, 2021, with a production depletion adjustment though 12/31/21.
Effective Date of Reserve Estimate	December 31, 2021	Coal reserves were estimated based upon depletion maps with effective dates of September 31, 2021, with a production depletion adjustment though 12/31/21.
Seam Density	With raw seam analysis: SG = 1.25+(Raw Ash% / 100 In the absence of laboratory data, estimated by (1) assuming specific gravity of 1.30 for coal and 2.25 for rock parting	
• **Underground-Mineable Criteria**		
Map Thickness	Total seam thickness	
Minimum Seam Thickness	30 inches	Minor Exceptions for localized zones of thinner coal
Minimum Mining Thickness	52 inches	
Minimum Total Coal Thickness	27 inches	Minor Exceptions for localized zones of thinner coal
Minimum In-Seam Wash Recovery	Determined as function of seam thickness	
Wash Recovery Applied to Coal Reserves	Based on average yield for drill holes within reserve area, or in the absence of laboratory washability data, based on estimated visual recovery using specific gravities noted above and 95 percent yield on "clean" coal	
Out-of-Seam Dilution Thickness for Run-of-Mine Tons Applied to ROM tonnages	Delta between minimum mining thickness (52 inches) and seam thickness	2 inches minimum OSD
Mine Barrier	200-foot distance from abandoned mines and sealed or pillared areas	
Minimum Reserve Tonnage	400 thousand recoverable tons for individual area (logical mining unit)	
Minimum Overburden Depth	100 feet	
Minimum Interval to Rider Coal	Considered on a case-by-case basis, depending on interval lithology, etc.	
Minimum Interval to Overlying or Underlying Reserves	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Minimum Interval to Overlying or Underlying Mined Areas	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Adjustments Applied to Coal Reserves	6.5 percent moisture increase; 5 percent preparation plant inefficiency	

Note: Exceptions for application of these criteria to reserve estimation are made as warranted and demonstrated by either actual mining experience or detailed data that allows for empirical evaluation of mining conditions. Final classification of coal reserve is made based on the pre-feasibility evaluation.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

11.1.1 Geostatistical Analysis

MM&A completed a geostatistical analysis on drill holes within the reserve boundaries to determine the applicability of the common United States classification system for measured and indicated coal resources. Historically, the United States has assumed that coal within ¼-mile (1,320 feet) of a point of observation represents a measured resource whereas coal between ¼-mile (1,320 feet) and ¾-mile (3,960 feet) from a point of observation is classified as indicated. Inferred resources are commonly assumed to be located between ¾-mile (3,960 feet) and 3 miles (15,840 feet) from a point of

observation. Per SEC regulations, only measured and indicated resources may be considered for reserve classification, respectively, as proven and probable reserves.

MM&A performed a geostatistical analysis test of the Aracoma data set using the Drill Hole Spacing Analysis (*DHSA*) method. This method attempts to quantify the uncertainty of applying a measurement from a central location to increasingly larger square blocks and provides recommendations for determining the distances between drill holes for measured, indicated, and inferred resources.

To perform DHSA the data set was processed to remove any erroneous data points, clustered data points, as well as directional trends. This was achieved through the use of histograms, as seen in *Figure 11-1*, color coded scatter plots showing the geospatial positioning of the borings, *Figure 11-2*, and trend analysis.

Figure 11-1: Histogram of the Total Seam Thickness for the No. 2 Gas Seam Present in the Aracoma Complex

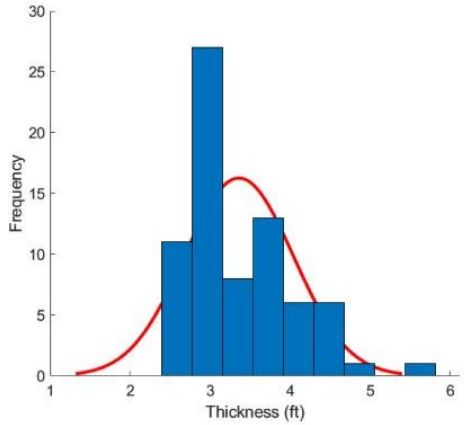
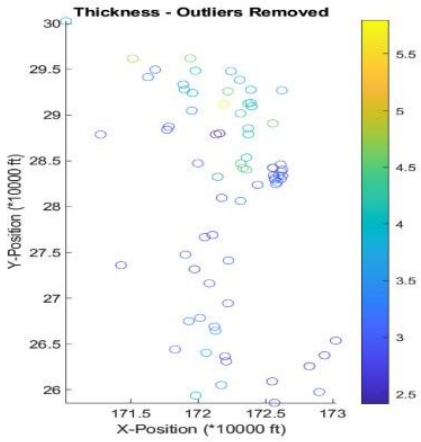
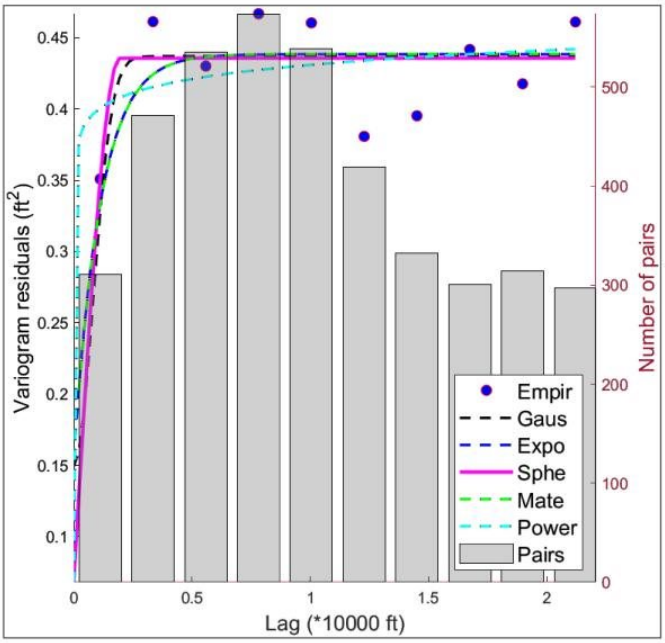


Figure 11-2: Scatter plot of the Total Seam Thickness for the No. 2 Gas Seam Present in the Aracoma Complex



Following the completion of data processing, a variogram of the data set was created, *Figure 11-3*. The variogram plots average square difference against the separation distance between the data pairs. The separation distance is broken up into separate bins defined by a uniform lag distance (e.g., for a lag distance of 500 feet the bins would be 0 – 500 feet, 501 – 1,000 feet, etc.). Each pair of data points that are less than one lag distance apart are reported in the first bin. If the data pair is further apart than one lag distance but less than two lag distances apart, then the variance is reported in the second bin. The numerical average for differences reported for each bin is then plotted on the variogram. Care was taken to define the lag distance in such a way as to not overestimate any nugget effect present in the data set. Lastly, modeled equations, often spherical, gaussian, or exponential, are applied to the variogram in order to represent the data set across a continuous spectrum.

Figure 11-3: Variogram of the Total Seam Thickness for the No. 2 Gas Seam Present in the Aracoma Complex



The estimation variance is then calculated using information from the modeled variogram as well as charts published by Journel and Huijbregts (1978). This value estimates the variance from applying a single central measurement to increasingly larger square blocks. Care was taken to ensure any nugget effect present was added back into the data. This process was repeated for each test block size.

The final step of the process is to calculate the global estimation variance. In this step the number square blocks that would fit inside the selected study area is determined for each block size that was investigated in the previous step. The estimation variance is then divided by the number of blocks that would fit inside the study area for each test block size. Following this determination, the data is then transformed back to represent the relative error in the 95th-percentile range.

Figure 11-4 shows the results of the DHSA performed on the No. 2 Gas seam data for the Aracoma Complex. DHSA provides hole-to-hole spacing values, these distances need to be converted to radius

Complex. DHSA provides hole to hole spacing values, these distances need to be converted to radius from a central point in order to compare to the historical standards. A summary of the radius data is shown in *Table 11-2*. DHSA prescribes measured, indicated, and inferred drill hole spacings be determined at the 10-percent, 20-percent, and 50-percent levels of relative error, respectively.

Figure 11-4: Result of DHSA for the No. 2 Gas Seam Present in the Aracoma Complex

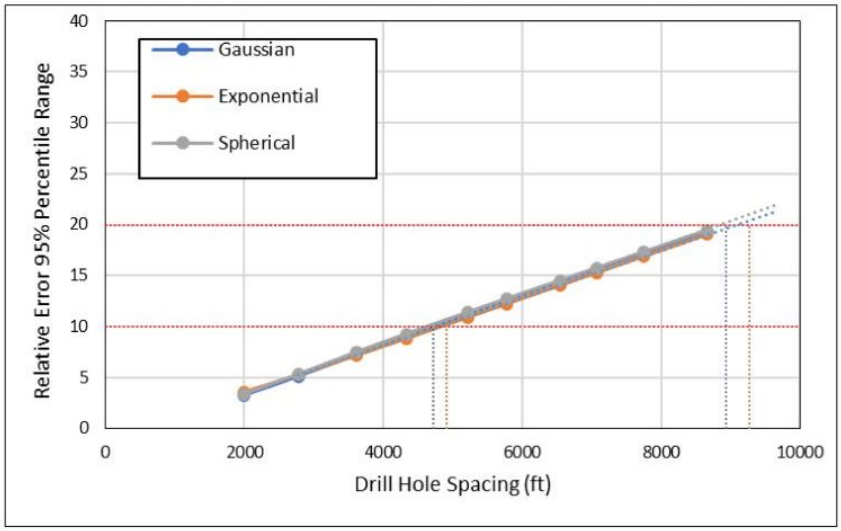


Table 11-2: DHSA Results Summary for Radius from a Central Point

Model:	Measured Radial Distance (10% Relative Error) (Miles)	Indicated Radial Distance (20% Relative Error) (Miles)	Inferred Radial Distance (50% Relative Error) (Miles)
Gaussian:	0.47	0.88	2.11
Spherical:	0.45	0.85	2.08
Exponential:	0.47	0.88	2.11

Comparing the results of the DHSA to the historical standards, it is evident that the historical standards are more conservative than even the most conservative DHSA model with regards to determining

measured resources. The Spherical model recommends using a radius of 0.45 miles for measured resources compared to the historical value of 0.25 miles. With respect to indicated resources the DHSA falls in line closely with the historical standards. The Spherical model recommends using a radius 0.85 miles, while the Gaussian and Exponential models recommend a radius of 0.88 miles. These values line up closely with the historical radius of 0.75 miles. These results have led the QP's to report the data following the historical classification standards, rather than use the results of the DHSA.

11.2 Resources Exclusive of Reserves

The Aracoma property contains multiple resource blocks which were not deemed to exhibit reserve potential at the time of the study. These resources, formally identified as resources exclusive of reserves, are in the Upper Chilton, Upper Cedar Grove, Lower Cedar Grove, Alma and No. 2 Gas seams. Reasons which may preclude elevation of resources to reserves include, but are not limited to:

1. Unfavorable geology, mine access or social/political constraint that will increase mine operating cost or capital development costs.
    a. *Map 5*, No. 2 Gas seam, shows resource classification for peripheral blocks adjacent to the Rum Creek Area Reserves. Geology indicates the roof and floor will be hard cutting, limiting the mine height and equipment size.
2. Coal quality inconsistent with typical metallurgic properties preferred for coking coal.
    a. Shown on *Map 2*, Upper Cedar Grove seam, the Cedar Grove #2 mine experienced higher than desirable Sulfur content when mining in the portions of Block A. Portions of Block A, B and C that are projected to have higher than 1.6% Sulfur, were subsequently designated as resource tons rather than as reserves. Block C was further limited by projected low estimated visual recovery (*EVR*) caused by seam splitting.
    b. *Map 5*, No. 2 Gas seam, shows resource classifications for blocks LB- G, and H, resulting from projected low Fluidity in the Lynn Branch No. 2 mine. Further exploration with subsequent coal analysis with rheological properties is suggested to further delineate the mineable reserve.
3. Isolation of resource blocks in which seam access costs are cost prohibitive at the time of the study.
    a. *Map 7*, Chilton Seam, Blocks BW-A1 through BW-A5 and BW-B through BW-F, have all been classified as resource as they are isolated and separated by adverse mineral and out crops. The resources have the potential be both surface mined or underground mined or a combination of the methods. The seam is located high on the hills, so cover is generally shallow and variable.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

4. Unfavorable economics at the PFS level, yet economics could become attractive in the future under different market conditions.
5. Exclusion from LOM planning by mining operator due to remaining resource blocks which are relatively small, isolated blocks and not currently attractive from an operational perspective.
    a. Portions of the Boone West No. 2 Gas, Blocks BW-A, B, B1, D1, D2, and E - on *Map 5*, located immediately north of the reserve block BW-C, have been designated as resource as they are relatively small, isolated controlled blocks of coal. Additional

resource as they are relatively small, isolated controlled blocks of coal. Additional mineral control with associated exploration drilling could define a contiguous block suitable for mine development.

11.2.1 Initial Economic Assessment

MM&A completed an initial economic assessment to determine the potential economic viability of resources exclusive of reserves. MM&A applied relevant technical factors to estimate potential saleable tons without the resource blocks, should the resources be extracted via deep, continuous mining methods. MM&A developed cash cost profiles for the resource blocks, including direct cash costs (labor, supplies, roof control, maintenance and repair, power, and other); washing, trucking, materials handling, general and administrative, and environmental costs; and indirect cash costs (royalties, production taxes, property tax, insurance). Costs were developed based off relevant cost drivers (per-ft, per-raw-ton, per-clean-ton). Additionally, MM&A estimated capital costs to access resources. Capital costs associated with mine development were amortized across the resource's potential saleable tonnages). Additional non-cash items (depreciation of equipment and depletion) and cash costs were compared to an assumed sale price of $115 per ton netback FOB loadout (approximately $153 per ton U.S. East Coast basis) for high-volatile markets. This resource assumed sales value was developed as a premium to the market-based reserve sales value to properly estimate the sales related expenses should these resources be extracted during higher-than-average market conditions. Pricing used for the primary product was selected by the QP and deemed reasonable based on a review of historical average pricing for the Aracoma complex coal products over the past 5 years. Results of the analysis are shown below and demonstrate potential profitability on a fully loaded cost basis. Detailed summaries are shown in *Appendix B*.

Table 11-3: Results of Initial Economic Assessment ($/ton)

Mine	Resource Block	Direct Cash	Transportation, Washing, Enviro, G&A	Indirect	Non-Cash	Total Cost	Fully Loaded P&L
BW Chilton	Chilton	$47.24	$31.09	$13.82	$22.78	$114.94	$0.06
UCG Lauren Land	UCG	$50.82	$24.02	$13.82	$6.00	$94.66	$20.34
UCG Lauren Land	UCG	$46.80	$26.44	$13.82	$6.00	$93.05	$21.95
N2G BW	N2G	$65.43	$29.20	$13.82	$6.00	$114.44	$0.56
N2G LB	N2G	$48.61	$19.93	$13.82	$6.00	$88.36	$26.64
N2G RC	N2G	$72.42	$14.90	$13.82	$6.00	$107.14	$7.86

Figure 11-5: Results of Initial Economic Assessment

11.3 Qualified Person's Estimates

Based on the work previously described and detailed modelling of those areas along with consideration all modifying factors, a coal resource estimate, summarized in *Table 11-4*, was prepared as of December 31, 2021, for property controlled by Alpha.

Table 11-4: Coal Resources Summary as of December 31, 2021

Area	Seam	Coal Resource (Dry Tons, In Situ)			
		Measured	Indicated	Inferred	Total
Inclusive of Mine Plan					
Davy Branch	Upper Chilton (41000)	14,608,000	8,369,000	0	22,977,000
Hatfield Area	Upper Chilton (41000)	17,538,000	10,930,000	0	28,468,000
Lauren Land	Upper Cedar Grove (30100)	8,129,000	1,969,000	0	10,098,000
Lauren Land	Lower Cedar Grove (30000)	5,484,000	2,991,000	0	8,475,000
Beech Branch	Alma (25800)	2,560,000	1,226,000	0	3,787,000
Rum Creek	No. 2 Gas (24000)	19,097,000	8,818,000	0	27,915,000
Lynn Branch	No. 2 Gas (24000)	27,712,000	20,656,000	0	48,369,000
Boone West	No. 2 Gas (24000)	6,072,000	8,662,000	701,000	15,435,000
Total Inclusive of Mine Plan		**101,201,000**	**63,621,000**	**701,000**	**165,523,000**
Exclusive of Mine Plan					
Davy Branch	Upper Chilton (41000)	0	0	22,000	22,000
Hatfield Area	Upper Chilton (41000)	0	0	0	0
Boone West	Chilton (47000)	7,306,000	1,990,000	0	9,296,000
Lauren Land	Upper Cedar Grove (30100)	31,574,000	17,551,000	225,000	49,351,000
Lauren Land	Lower Cedar Grove (30000)	0	0	0	0
Rum Creek	No. 2 Gas (24000)	10,663,000	10,690,000	154,000	21,507,000
Lynn Branch	No. 2 Gas (24000)	8,328,000	6,177,000	246,000	14,752,000
Boone West	No. 2 Gas (24000)	29,094,000	17,283,000	86,000	46,463,000
Total Exclusive of Mine Plan		**86,965,000**	**53,692,000**	**733,000**	**141,390,000**

Area	Seam	Coal Resource (Dry Tons, In Situ, Mt)			
		Measured	Indicated	Inferred	Total
Grand Total					
Inclusive of Mine Plan		101,201,000	63,621,000	701,000	165,523,000
Exclusive of Mine Plan		86,965,000	53,692,000	733,000	141,390,000
Grand Total		**188,166,000**	**117,313,000**	**1,434,000**	**306,913,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Note (3): The Property contains 140.66 Mt of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.
Totals may not add due to rounding.
See Appendix A for more detailed breakdown.

11.4 Qualified Person's Opinion

While there is some stratigraphically controlled seam-thickness variability due to seam splitting, sand channels, etc., MM&A geologists and engineers modeled the deposit and resource areas to reflect realistic mining scenarios, giving special consideration to seam thickness, floor and roof conditions, mining equipment, etc. This statistical study demonstrates that for each configuration of mineable seams, the classification system of **measured** (0 – ¼ mile), **indicated** (¼ to ¾ mile), and **inferred** (¾ to 3 miles) is reasonably adequate to predict seam thickness variation for modeling and mining purposes. Based on MM&A's geostatistical analysis, it would be possible to extend the measured, indicated and inferred arcs slightly beyond historically accepted practices due to consistent geological settings. The QP's have again elected not to extend arc distances, introducing a level of conservatism in measured and indicated coal classification.

Based on the data review, the attendant work done to verify the data integrity and the creation of an independent Geologic Model, MM&A believes this is a fair and accurate representation of the Aracoma coal resources.

12 Mineral Reserve Estimates

12.1 Assumptions, Parameters and Methodology

Coal Reserves are classified as *proven* or *probable* considering "modifying factors" including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors.

- **Proven Coal Reserves** are the economically mineable part of a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.
- **Probable Coal Reserves** are the economically mineable part of an indicated coal resource, and in some circumstances a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in

consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.

Upon completion of delineation and calculation of coal resources, MM&A generated a LOM plan for Aracoma. The footprint of each reserve area is shown on the maps in *Appendix C*. The Mine plan was generated based on budget mine plans provided by Alpha and supplemented with additional projections by MM&A to reflect LOM plans that honor property control limits, geologic mapping, or other factors determined during the evaluation.

Carlson Mining software was used to generate the LOM plan for Aracoma. The mine plan was sequenced based on productivity schedules provided by Alpha. MM&A judged the productivity estimates and plans to be reasonable based on experience and current industry practice.

Raw, ROM production data outputs from LOM plan sequencing were processed into Microsoft® EXCEL spreadsheets and summarized on an annual basis for processing into the economic model. Average seam densities were estimated to determine raw coal tons produced from the LOM plan. Average mine recovery and wash recovery factors were applied to determine coal reserve tons.

Coal reserve tons in this evaluation are reported at a 6.0-percent moisture and represent the saleable product from the Property.

Pricing data as provided by Alpha is described in *Table 16-2*. The pricing data assumes a flat-line mine realization of $117 per short ton port pricing, with an average $87.72 per ton netback pricing, reflective of the high-volatile product currently sold at Aracoma.

The coal resource mapping and estimation process, described in the report, was used as a basis for the coal reserve estimate. Proven and probable coal reserves were derived from the defined coal resource considering relevant processing, economic (including technical estimates of capital, revenue, and cost), marketing, legal, environmental, socio-economic, and regulatory factors and are presented on a moist, recoverable basis.

As is customary in the US, the categories for proven and probable coal reserves are based on the distances from valid points of measurement as determined by the QP for the area under consideration. For this evaluation, measured resource, which may convert to a proven reserve, is based on a ¼-mile radius from a valid point of observation.

Points of observation include exploration drill holes, and mine measurements which have been fully vetted and processed into a geologic model. The geologic model is based on seam depositional modeling, the interrelationship of overlying and underlying strata on seam mineability, seam thickness trends, the impact of seam structure, intra-seam characteristics, etc. Once the geologic model was completed, a statistical analysis, described in *Section 11.1.1* was conducted and a ¼-mile radius from a valid point of observation was selected to define Measured Resources.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Likewise, the distance between ¼ and ¾ of a mile radius was selected to define Indicated Resources. Indicated Resources may convert to Probable Reserves.

Inferred Resources (greater than a ¾-mile radius from a valid point of observation) have been excluded from Reserve consideration.

12.2 Mineral Reserves

Aracoma reserves were derived from multiple coal seams of *Figure 7-1* located on the Property. All reserves are planned to be mined by underground mining methods. The above-drainage underground seams include the Upper Chilton seam at Davey Branch and Hatfield and the Upper Cedar Grove seam at Laurel Branch Mine. Below-drainage underground reserves are in the Lower Cedar Grove seam, the Alma seam at Beech Branch and the No. 2 Gas seam at Boone West, Lynn Branch and Rum Creek. *Table 12-1* shows the demonstrated tonnage by Proven and Probable.

12.2.1 Upper Chilton Seam

The Upper Chilton reserve are contained in two blocks, the active Day Branch mine block and, to the west, the Hatfield block. Seam thickness is generally between 3 and 4 feet. Localized areas of hard roof and floor are excluded from the reserves.

12.2.2 Upper Cedar Grove Seam

The Upper Cedar Grove resource is also in two blocks, the active Cedar Grove No. 2 mine block and a separate block to the west. The reserve is defined by areas with less than 1.60% sulfur and greater than 50% inseam yield, as an estimated visual recovery. There are no reserves defined in the active Cedar Grove No. 2 mine block, all reserve is in the west block (Laurel Branch).

12.2.3 Lower Cedar Grove Seam

The Lower Cedar Grove reserve is in an unmined block surrounded by abandoned mines. Access would be through a short slope. Seam thickness ranges from 2.50 to 3.50 feet.

12.2.4 Alma Seam

Alma seam reserve is located in one block south of the Guyandotte River and the closed Aracoma Alma No.1 Mine. The east side of the reserve block outcrops along the river and the west side with reserve access is below drainage. The seam thickness is less than 3.0 feet, and the reserve cutoff is 2.5 feet.

12.2.5 No. 2 Gas Seam

The No. 2 Gas seam reserve is in three areas: the active Lynn Branch No. 2 Mine, the Rum Creek area and the Boone West area. Lynn Branch is the largest block of the No. 2 Gas reserve and is located south of the Guyandotte river and south and west of previous mining. Seam thickness is generally greater than 3 feet. Areas with projected low fluidity are excluded from the reserve. The Run Creek reserve is

north of the Guyandotte River and along the north margin of abandoned mine workings. The seam splits to the north and the reserve area is bound by hard roof and floor rock that will limit the mining height. The Boone West reserve is north of Rum Creek. The reserve outcrops on the west side in Mill and Crooked Creeks.

12.3 Qualified Person's Estimates

The coal reserves, as shown in *Table 12-1*, are based on a technical evaluation of the geology and a preliminary feasibility study of the coal deposits. The extent to which the coal reserves may be affected by any known environmental, permitting, legal, title, socio-economic, marketing, political, or other relevant issues has been reviewed rigorously. Similarly, the extent to which the estimates of coal reserves may be materially affected by mining, metallurgical, infrastructure and other relevant factors has also been considered.

The results of this TRS define an estimated 44.18 Mt of proven and probable marketable coal reserves. The maps included in *Appendix C* reflect mining depletion at the time of the resource/reserve calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

		Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
		By Reliability Category			By Control Type				
Area/Mine	Seam	Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%*
Davy Branch	Upper Chilton (41000)	3,816,000	2,007,000	5,823,000	0	5,823,000	7	0.9	39
Hatfield Area	Upper Chilton (41000)	5,106,000	2,663,000	7,768,000	0	7,768,000	7	0.9	36
Lauren Land	Upper Cedar Grove (30100)	1,799,000	432,000	2,231,000	0	2,231,000	7	1.4	38
Lauren Land	Lower Cedar Grove (30000)	1,905,000	1,038,000	2,943,000	0	2,943,000	3	0.7	-
Beech Branch	Alma (25800)	998,000	431,000	1,429,000	0	1,429,000	4	0.9	39
Rum Creek	No. 2 Gas (24000)	2,530,000	1,051,000	3,581,000	0	3,581,000	5	0.7	36
Lynn Branch	No. 2 Gas (24000)	8,371,000	7,011,000	15,381,000	1,217,000	14,165,000	4	0.8	36
Boone West	No. 2 Gas (24000)	1,712,000	3,312,000	5,024,000	4,033,000	991,000	4	0.9	-
Grand Total		**26,237,000**	**17,944,000**	**44,182,000**	**5,250,000**	**38,932,000**	**5**	**0.8**	**37**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
**Volatile Matter analysis is not available for all reserve areas. All Aracoma reserves are priced as a High-Vol. B product.*
Totals may not add due to rounding.
See Appendix A for more detailed breakdown.

12.4 Qualified Person's Opinion

The estimate of coal reserves was determined in accordance with the new SEC Guidelines which will become effective for the first fiscal year falling on or after January 1, 2021.

The LOM mining plan for Aracoma was prepared to the level of preliminary feasibility. Mine projections were prepared, and timing scheduled to match production with coal seam characteristics. Production

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

timing was carried out from current locations to depletion of the coal reserve area. Coal reserve estimates could be materially affected by the risk factors described in *Section 22.2*.

Based on the Preliminary Feasibility Study and the attendant Economic Review, MM&A believes this is a fair and accurate calculation of the Aracoma coal reserves.

13 Mining Methods

Three underground mining areas were modeled and tested economically. Once the Resources were calculated, mine plans were created to project operating each resource area to depletion, with crews and equipment scheduled to move to subsequent mining areas as depletion occurs. Underground mine operations are projected to be exhausted in 2047. Individual mine lives range from 4 to 17 years.

13.1 Geotech and Hydrology

Mining plans for potential underground mines were developed by Alpha and MM&A. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS)* program that was developed by NIOSH. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan.

Hydrology has not been an issue of concern at Aracoma. Based on numerous site visits to the underground operations of the property by the QP's, it has been determined that this is not a significant concern. Mining of future reserves is projected to occur in areas which exhibit similar hydrogeological characteristics as those formerly mined areas.

13.2 Production Rates

Operations at Aracoma by Alpha and its predecessors have been on-going for many years. The Mine plan and productivity expectations reflect historical performance and efforts have been made to adjust the plan to reflect future conditions. MM&A is confident that the mine plan is reasonably representative to provide an accurate estimation of coal reserves. Mine development and operation have not been optimized within the TRS.

Carlson Mining software was used by MM&A to generate mine plans for the mineable coal seams. Mine plans were sequenced based on productivity schedules provided by Alpha, which were based on historically achieved productivity levels. All production forecasting ties assumed production rates to geological models as constructed by MM&A's team of geologists and mining engineers.

The Aracoma Mining Complex currently operates three underground mines with a total of seven (7) operating sections. The Cedar Grove #2 mine is phasing out of production as reserves deplete and the units are being introduced into Lynn Branch No. 2 Mine. The Aracoma Alma mine recently closed with

these units transitioning into similar conditions at the Lynn Branch No. 2 (No. 2 Gas seam) and Davy Branch (Upper Chilton seam) mines. The projected underground mines are set up similarly to the currently active operation. Lynn Branch No. 2 will operate three production sections and the Davy Branch Mine will operate two production sections. All sections are configured with dual continuous miners in a super section operation. In all cases, mines are forecasted to produce coal two shifts each day. Production is scheduled Monday through Friday each week, and every other Saturday.

As shown in *Table 13-1*, the three areas planned for underground mines produce coal until 2047. Clean coal production varies directly with coal thickness.

Table 13-1: Aracoma Complex Underground Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
Lynn Branch N2G	104	1,313	1,262	1,272	1,222	1,271	1,028	1,014
Davey Branch UCH	192	905	791	819	830	731	752	581
Lauren Land - Hatfield UCH	0	0	0	0	0.0	0	0	233
Lauren Land LCG	0	0	0	0	0	0	0	0
Boone West N2G	0	0	0	0	0	0	0	0
Rum Creek N2G	0	0	0	0	0	0	0	0
Alma Beech Br	0	0	0	0	0	0	0	0
Laurel Br UCG	0	0	0	0	0	0	0	0
Total	**296**	**2,219**	**2,053**	**2,091**	**2,052**	**2,002**	**1,780**	**1,827**
Mine Name	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Lynn Branch N2G	1,020	1,035	1,073	1,105	803	709	692	427
Davey Branch UCH	381	0	0	0	0	0	0	0
Lauren Land - Hatfield UCH	402	822	771	752	742	817	791	773
Lauren Land LCG	0	0	0	0	0	0	0	0
Boone West N2G	0	0	0	0	0	0	0	263
Rum Creek N2G	0	0	0	0	0	0	66	624
Alma Beech Br	0	0	0	0	0	0	0	0
Laurel Br UCG	0	0	0	0	0	0	0	0
Total	**1,803**	**1,857**	**1,845**	**1,856**	**1,545**	**1,526**	**1,548**	**2,087**
Mine Name	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
Lynn Branch N2G	323	103	0	0	0	0	0	0
Davey Branch UCH	0	0	0	0	0	0	0	0
Lauren Land - Hatfield UCH	790	711	165	0	0	0	0	0
Lauren Land LCG	0	0	0	0	0	163	366	672
Boone West N2G	436	334	586	725	697	728	740	416
Rum Creek N2G	432	363	439	492	382	400	383	0
Alma Beech Br	0	0	152	341	331	318	288	0
Laurel Br UCG	0	295	547	544	636	208	0	0
Total	**1,981**	**1,806**	**1,890**	**2,102**	**2,046**	**1,816**	**1,777**	**1,088**
Mine Name	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
Lynn Branch N2G	0	0	0	0	0	0	0	0
Davey Branch UCH	0	0	0	0	0	0	0	0
Lauren Land - Hatfield UCH	0	0	0	0	0	0	0	0
Lauren Land LCG	714	707	320	0	0	0	0	0
Boone West N2G	302	33	0	0	0	0	0	0
Rum Creek N2G	0	0	0	0	0	0	0	0
Alma Beech Br	0	0	0	0	0	0	0	0
Laurel Br UCG	0	0	0	0	0	0	0	0
Total	**1,016**	**740**	**320**	**0**	**0**	**0**	**0**	**0**

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

13.3 Mining Related Requirements

13.3.1 Underground

A mine plan with sequenced mining projections was prepared for each logical mining unit. For each mine plan, the appropriate number of production units is selected for the resource area, and a productivity level assigned, expressed in feet of advance per unit-shift of production. The productivity is based on the equipment and personnel configuration, mining height and expected physical

conditions.

13.4 Required Equipment and Personnel

13.4.1 Underground Mines

13.4.1.1 Lynn Branch No. 2 Mine (Map 5)

The Lynn Branch No. 2 Mine, which is in the early development stage, is currently operating three (3) continuous mining sections producing from the No. 2 Gas seam. This mine produces metallurgical coal from leased mineral property. The mine started its first mining unit in 2020, the second in March of 2021 and the third unit in July 2021.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. On each day, production sections are scheduled to produce coal on two shifts. The sections are configured as super sections with two continuous miners used for production on each section. Productivity is planned at the rate of 240 feet of advance per shift of operation.

Principal production equipment per section includes two continuous miners, two roof bolters, four shuttle cars, and one scoop. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stockpiled. Coal is then transported via highway truck haulage to the Bandmill Preparation Plant where it is processed and loaded onto CSX rail for transport to the consumer.

The Lynn Branch No. 2 Mine is operational at the time of this report; all necessary infrastructure and utilities are in place; all necessary permits have been obtained. Estimated expenditures for site closure and reclamation are included in the financial model for this site.

The mine is scheduled to deplete its mining assignment in 2038.

13.4.1.2 Davy Branch Deep Mine (Map 1)

The Davy Branch Deep Mine, which is currently operational with two (2) continuous mining sections producing coal in the Upper Chilton seam on leased mineral property. The Davy Branch Deep Mine is

a two (2) section mine with each working section operated as a super section (two sets of mining equipment operating simultaneously and sharing a common dumping point on the same section, with each set being ventilated by a separate split on intake air) Each super section operates two (2) Continuous Miners, two (2) Roof Bolters, four (4) Shuttle Cars and one (1) scoop. Like the Lynn Branch No. 2 Deep mine operation, coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stockpiled. Coal is then transported via highway truck haulage to the Bandmill Preparation Plant where it is processed and loaded into CSX rail for transport to the consumer.

The Davy Branch Deep Mine is also operational at the time of this report with all necessary infrastructure and utilities in place. All necessary permits have been obtained. Estimated expenditures for site closure and reclamation are included in the financial model for this site.

The mine is scheduled to deplete its mining assignment in 2028.

13.4.1.3 Cedar Grove #2 (Map 2)

Active at the time of this report, the Cedar Grove #2 Mine in the Upper Cedar Grove seam, is nearing completion with an estimated depletion date of first quarter 2023. The mine produces metallurgical grade coal using two (2) active sections with one (1) continuous miner, one (1) roof bolter, two (2) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is processed by the Bandmill preparation plant. Due to the favorable fluidity of this coal, a key factor in determining the coking quality of coal, Alpha uses coal produced from this mine to blend coal from other Alpha mining operations which may show slightly less favorable coking characteristics. Alpha is actively conducting exploration in adjacent Upper Cedar Grove resources to determine the true extent of the mineable reserves.

13.4.1.4 Hatfield Upper Chilton (Map 1)

The Hatfield Upper Chilton reserve is in conceptual stage at this point. A potential portal area was located along the outcrop near County Highway 13. The reserve can support two operating areas for two continuous miner production sections.

The physical location of the reserve is the furthest from the Bandmill preparation plant with a highway haul of 21.5 miles.

The report includes an initial starting date in 2027 with a second production unit starting in 2029. One continuous mining production unit will deplete its assignment in 2036 and the second production unit would deplete its assignment in 2038.

13.4.1.5 Rum Creek No. 2 Gas (Map 5)

Currently in the inception stage, the Rum Creek mine will potentially operate in Blocks RC-A, RC-B, RC-C, RC-D, RC-E and RC-G. Careful mine planning will require considerations for seam splitting, as well as

cuttability issues presented by simultaneous hard roof and hard floor conditions.

Utilizing available drilling data, MM&A identified on *Map 5* areas as "full seam" where the parting between the Upper and Lower No. 2 Gas seam benches is less than three feet in thickness allowing both benches to feasibly be mined together as one mining sequence. The areas identified as "Main Bench" have inseam parting thickness of greater than 3 feet in thickness, thereby limiting mining to the upper bench of the No. 2 Gas seam in Blocks RC-A, RC-C, RC-E and RC-G.

Evaluation of drilling records revealed the potential for sandstone roof and floor lithologies to exist simultaneously in Blocks RC-F and RC-K. At the time of this report, planned mining equipment is limited to a 54-inch minimum cutting height. Block-RC-A and RC-C having a seam thickness of less than 54 inches and show the potential for simultaneous hard roof and floor, have therefore been designated as resource.

Structural mapping of the No. 2 Gas bottom of coal elevation revealed an anticline, *a fold of rock layers that slope downward on both sides of a crest*. Due to potential mining encumbrances from a 10% gradient, Block RC-H is designated as resource.

Conceptual mining is projected to commence in 2035 and be completed in 2043.

13.4.1.6 Boone West (No. 2 Gas)

This reserve area is located north of the Bandmill Preparation Plant. A contour faceup would be used to access the coal seam. The reserve block can support two continuous miner units. The property has had limited mining activity with no undermining and limited overmining.

Peach Creek Road - County Route 12/02 comes directly to the proposed stockpile area. The County Road is a paved road, but only one lane wide traveling through populated areas. The distance to the preparation plant is 13.5 miles.

The report includes an initial starting date in 2037 with a second production unit starting in the same year. Both continuous mining production units will deplete their assignments in 2044.

13.4.1.7 Upper Cedar Grove #3

This reserve area has been defined by the sulfur isopach at a cut point of 1.60% sulfur in the projected clean product. The mine would be a one section operation and would start in 2039 and deplete in 2042.

The projected faceup from a contour bench is located along West Virginia Route 10, which has been upgraded as a divided 4-lane highway. Haul distance to the Bandmill Preparation Plant is 5.0 miles.

13.4.1.8 Alma Seam at Beech Branch

This reserve area is a small block that can be accessed from an outcrop portal. The mining has been projected as a single production unit. Mining would begin in 2039 and the reserve would be depleted in 2042.

The projected faceup from a contour bench is located along West Virginia Route 10, which has been upgraded as a divided 4-lane highway. Haul distance to the Bandmill Preparation Plant is 4.7 miles.

13.4.1.9 Lower Cedar Grove – Hatfield Area

This reserve area is a small block that would be accessed from an abandoned mine bench. The mine would face up in the Upper Split of the Lower Cedar Grove Seam and then ramp down in the Lower Cedar Grove Seam. This mine would support two continuous miner units with both starting in 2043 and the first finishing in 2046 and the second in 2047.

Run of Mine Coal would be trucked via County Route 13 to the Bandmill Preparation Plant located 18.9 miles away.

14 Processing and Recovery Methods

14.1 Description or Flowsheet

The Aracoma Division currently includes the Bandmill Preparation Plant in addition to the mines. The plant site includes raw coal storage, clean coal storage, a centrifugal dryer, a railroad loadout, and refuse disposal area. Feed rate capacity is 1200 raw tons per hour and produces a typical product containing 7.31% ash, 1.00% sulfur and 37.02% volatile matter. Primary separation equipment includes heavy media vessels, heavy media cyclones, spirals, and flotation cells, supported by the requisite screens, centrifuges, disk filters, plate presses, sumps, pumps, and distribution systems. For year end 2021 the average utilization rate of the Bandmill Preparation Plant was 60.4%. Additional plate presses have recently been installed to reduce the amount of slurry. Coarse and fine refuse are disposed in an adjacent combined fill refuse area and impoundment.

Processes and equipment are typical of those used in the coal industry and are in use in nearly all plants in the Central Appalachian Basin.

14.2 Requirements for Energy, Water, Material and Personnel

Personnel have historically been sourced from the surrounding communities in Logan, Mingo, Wyoming, and Boone Counties, and have proven to be adequate in numbers to conduct processing operations at Aracoma. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners.

Water is sourced locally from public water sources or rivers, and electricity is sourced from AEP. The

service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc.

15 Infrastructure

Alpha's Bandmill preparation plant services the area with washed coal, which is transported via the CSX rail line at the plant's loadout. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to the preparation plant. This practice will continue for future reserves.

As an active operation, the necessary support infrastructure for Aracoma is in place.

As new areas are developed, the infrastructure requirements will change. These changes have been considered in the LOM plans and financial model.

The underground mining resource areas which are located above drainage will require an access road and mine access development along the outcrop.

Typical mine facilities include a mine office, a change house, supply facilities, mine fan and a stacker conveyor if truck haulage is required.

A Photo of the existing facilities is shown in *Figures 15-1 and 15-2*.

Figure 15-1: Aracoma Surface Facilities

Figure 15-2: Bandmill Preparation Plant

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

16 Market Studies

16.1 Market Description

The quality characteristics for the subject coal resources and coal reserves have been reviewed in detail by MM&A. The drill hole data were utilized to develop average coal quality characteristics for the mining site. These average coal quality characteristics were then utilized as the basis for determining

the various markets into which the saleable coal will likely be placed.

Quality Specifications for the Aracoma High-Volatile B product is as shown in *Table 16-1*.

Table 16-1: Quality Specifications

	2021
Ash (%)	7.06
Sulfur (%)	0.93
Volatile Matter (%)	37.04

The mine production primarily serves the high-volatile metallurgical markets with lesser by-product PCI and thermal coal.

16.2 Price Forecasts

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long-term realization of $117 per short ton port pricing, with an average $87.72 per ton netback pricing reflective of the high-volatile product currently sold at Aracoma. These estimates are based on long-term pricing published by third party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the Aracoma business unit.

Table 16-2: Price Forecasts

Coal Quality	Market Pricing Per Ton [1] [2]
High-Vol. A	$138
High- Vol. B	$117
Mid-Vol.	$144
Low-Vol.	$144
Thermal	$76

(1) Market pricing shown on U.S. East Coast basis.
(2) Metallurgical and thermal pricing based on 10-year and 3-year average, respectively of forecasted pricing from pricing services.

16.3 Contract Requirements

Some contracts are necessary for successful marketing of the coal. For Aracoma, since all mining, preparation and marketing is done in-house, the remaining contracts required are:

> **Transportation** – Alpha contracts with the CSX Railroad to transport coal to market

> **Sales** – Sales contracts are a mix of spot and contract sales. With the volatility of the market, long-term contracts are not typically written.

17 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals

17.1 Results of Studies

MM&A completed an environmental review in 2011 of the Massey properties acquired by Alpha, including those operations that were active at Aracoma at that time. The environmental review completed by MM&A included site inspections, reviews of historical records, database searches of State and Federal regulatory records and interviews to identify potential recognized environmental conditions (*RECs*) that may create environmental liability for the sites. While MM&A identified RECs during both studies, MM&A's opinion was that those issues would not preclude the continued or future use of the properties as a coal mining/preparation venture.

Based on this former ESA completed by MM&A, it is MM&A's opinion that Aracoma has a generally typical coal industry record of compliance with applicable mining, water quality, and environmental laws. Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models.

17.2 Requirements and Plans for Waste Disposal

Based on a recent engineering review, done by Alpha, approximately 23.5 to 26.5 years of fine and coarse refuse disposal capacity at current rates have been identified, approximately 5 years is permitted and active. A 10-foot crest raise expansion at the Tinsley Branch slurry impoundment is approved by **West Virginia Department of Environmental Protection (*WVDEP*)** and in review by the **Mine Safety and Health Administration (*MSHA*)**. The Bandmill Hollow Combined Refuse Fill is approved by WVDEP and MSHA and is under review by the **U.S. Army Corps of Engineers (*ACOE*)**. Securing additional coarse and fines capacity will be critical to execute the business plan as outlined in this TRS. The table below outlines the current estimated capacities and permits of Aracoma's fine and coarse impoundments.

Table 17-1: Aracoma Refuse Disposal Summary

Refuse Facility	State SMCRA Permit Number	MSHA ID	Refuse Disposal Type	Classified as a Dam	Permit Status	Current Planned Maximum Coarse Life (Approved + Planned)	Current Planned Maximum Fines Life (Approved + Planned)	Est. Coarse/ Combined Refuse Life (Yrs.)	Est. Fine Slurry Refuse Life (Yrs.)
Tinsley Branch Refuse Impoundment (Aracoma)	O-5032-99	1211-WV04-0527-01	Slurry Impoundment - Downstream and Upstream	Yes	Active	6.8-9	6.5-9	2.5-3	2.5-3

Bandmill Hollow Impoundment (Aracoma)	O-5002-10	1211-WV04-05086-01	– Combined Refuse Fill	Yes	Not Started	7.5	7.5		
Highland Surface permits	O-5080-91	1211-WV-40528-01	– Combined Refuse Storage	No	Active	8-10	8-10	2	

17.3 Permit Requirements and Status

All mining operations are subject to federal and state laws and must obtain permits to operate mines, coal preparation and related facilities, haul roads, and other incidental surface disturbances necessary for mining to occur. Permits generally require that the permittee post a performance bond in an amount established by the regulatory program to provide assurance that any disturbance or liability created during mining operations is properly restored to an approved post-mining land use and that all regulations and requirements of the permits are fully satisfied before the bond is returned to the permittee. Significant penalties exist for any permittee who fails to meet the obligations of the permits including cessation of mining operations, which can lead to potential forfeiture of the bond. Any company, and its directors, owners and officers, which are subject to bond forfeiture can be denied future permits under the program.[1]

New permits or permit revisions will occasionally be necessary to facilitate the expansion or addition of new mining areas on the Property, such as amendments to existing permits and new permits for mining of reserve areas. Exploration permits also are required. Property under lease includes provisions for exploration among the terms of the lease. New or modified mining permits are subject to a public advertisement process and comment period, and the public is provided an opportunity to raise objections to any proposed mining operation. MM&A is not aware of any specific prohibition of mining on the subject property and given sufficient time and planning, Alpha should be able to secure new permits to maintain its planned mining operations within the context of current regulations. Necessary permits are in place to support current production on the Property, but future permits are required to maintain and expand production. Portions of the Property are located near local communities. Regulations prohibit mining activities within 300 feet of a residential dwelling, school, church, or similar structure unless written consent is first obtained from the owner of the structure.

[1] Monitored under the Applicant Violator System (AVS) by the Federal Office of Surface Mining.

Where required, Alpha reports that such consents have been obtained where mining is proposed beyond the regulatory limits.

Alpha has obtained all mining and discharge permits to operate its mines and processing, loadout or related facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Aracoma, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

The mining permits currently held by Aracoma are shown in *Table 17-2.*

Table 17-2: Aracoma Mining Permits

Type	Permit ID	Permit Name	Current Status	Issued Date	Expiration Date	Acres	NPDES No.
SMCRA	D001982	8-C Mine	Phase 1 Release	10/2/2020	10/2/2021	4.70	
SMCRA	U500699	Alma Mine	Active	2/26/2021	2/26/2022	48.02	WV1020111
SMCRA	U500500	Bee Hollow Deep Mine	Phase 1 Release	10/2/2020	10/2/2021	4.00	WV1020340
SMCRA	U500308	Cedar Grove	Inactive	2/26/2021	2/26/2022	18.51	WV1029771
SMCRA	U503008	Cedar Grove No 2	Active	2/26/2021	2/26/2022	17.13	
SMCRA	U500499	Chilton/Hernshaw Mine	Active	2/26/2021	2/26/2022	33.08	WV1020102
SMCRA	U500319	Davy Branch Deep Mine	Active	2/26/2021	2/26/2022	18.33	WV1028553
SMCRA	U500119, U505591	Lynn Branch Mine	Active	2/26/2021,	2/26/2022,	13.70	WV1011073, WV1028537
SMCRA	U502190	Princess Aracoma Deep Mine	Active	2/26/2021	2/26/2022	86.84	
SMCRA	P071800	Bandmill Preparation Plant	Active	1/18/91	1/25/2023	178.32	WV0093211
SMCRA	U061600	Coalburg #3 Mine	Active	7/29/2020	7/29/2021	31.11	WV0047074
SMCRA	S501390	Camp Branch Surface Mine	Active	2/26/2021	2/26/2022	143.22	WV1010689
SMCRA	U500400	Rich Creek Mine #1	Inactive	7/29/2020	7/29/2021	6.00	WV1020277

17.4 Local Plans, Negotiations or Agreements

MM&A found no indication of agreements beyond the scope of Federal or State Regulations.

17.5 Mine Closure Plans

Applicable regulations require that mines be properly closed, and reclamation commenced immediately upon abandonment. In general, site reclamation includes removal of structures, backfilling, regrading, and revegetation of disturbed areas. For surface mines, the majority of the expense for backfilling and regrading is completed as part of ongoing mining operations, with only reclamation of final pits and HWM benches required at end-of-mine life. Sediment control is required during the establishment of vegetation, and bond release generally requires a minimum five-year period of site maintenance, water sampling, and sediment control following mine completion. This requirement is reduced to two years for certain operations involving re-mining. Reclamation of underground mines includes closure and sealing of mine openings such as portals and shafts in addition to the items listed above.

Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models. As with all mining companies, an accretion calculation is performed annually so the necessary Asset Retirement Obligations (*ARO*) can be shown as a Liability on the Balance Sheet.

17.6 Qualified Person's Opinion

The Aracoma complex is an operating facility; all necessary permits for current production have been

obtained. MM&A knows of no reason that any permits revisions that may be required cannot be obtained.

Estimated expenditures for site closure and reclamation are included in the financial model for this site.

18 Capital and Operating Costs

18.1 Capital Cost Estimate

The production sequence selected for a property must consider the proximity of each reserve area to coal preparation plants, river docks and/or railroad loading points, along with suitability of production equipment to coal seam conditions. The in-place infrastructure was evaluated, and any future needs were planned to a level suitable for a Preliminary Feasibility Study and included in the Capital Forecast.

Alpha provided MM&A with information related to the number of currently operating production units at Aracoma. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated Aracoma operations is provided in *Figure 18-1* below. Total capital by mine is summarized in *Table 18-1*.

Figure 18-1: Projected Capital Expenditures – Consolidated Aracoma Operations

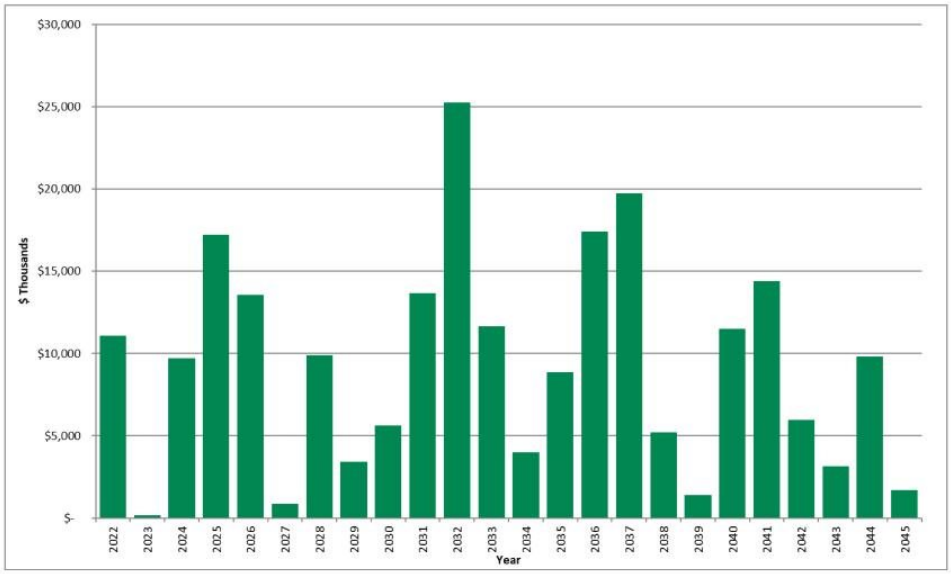


Table 18-1: Summary of Capital Expenditures Schedule by Mine

Item	Total	2021	2022	2023	2024	2025	2026	2027
Lynn Branch N2G	**$85,746**	$3,757	$11,084	$0	$3,240	$10,184	$7,572	$868
Davey Branch UCH	**$19,241**	$1,424	$0	$180	$6,480	$7,048	$868	$0
Lauren Land - Hatfield UCH	**$45,647**	$0	$0	$0	$0	$0	$5,122	$0
Lauren Land LCG	**$11,967**	$0	$0	$0	$0	$0	$0	$0
Boone West N2G	**$33,322**	$0	$0	$0	$0	$0	$0	$0
Rum Creek N2G	**$15,080**	$0	$0	$0	$0	$0	$0	$0
Alma Beech Br	**$11,950**	$0	$0	$0	$0	$0	$0	$0
Laurel Br UCG	**$7,576**	$0	$0	$0	$0	$0	$0	$0
Total	**$230,529**	**$5,182**	**$11,084**	**$180**	**$9,720**	**$17,232**	**$13,563**	**$868**

Item	2028	2029	2030	2031	2032	2033	2034	2035
Lynn Branch N2G	$3,240	$3,240	$4,040	$5,620	$13,784	$11,488	$0	$0
Davey Branch UCH	$3,240	$0	$0	$0	$0	$0	$0	$0
Lauren Land - Hatfield UCH	$3,420	$180	$1,600	$8,040	$11,488	$180	$180	$1,600
Lauren Land LCG	$0	$0	$0	$0	$0	$0	$0	$0
Boone West N2G	$0	$0	$0	$0	$0	$0	$0	$7,255
Rum Creek N2G	$0	$0	$0	$0	$0	$0	$3,792	$0
Alma Beech Br	$0	$0	$0	$0	$0	$0	$0	$0
Laurel Br UCG	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$9,900**	**$3,420**	**$5,640**	**$13,660**	**$25,272**	**$11,668**	**$3,972**	**$8,855**

Item	2036	2037	2038	2039	2040	2041	2042	2043
Lynn Branch N2G	$4,460	$2,824	$344	$0	$0	$0	$0	$0
Davey Branch UCH	$0	$0	$0	$0	$0	$0	$0	$0
Lauren Land - Hatfield UCH	$12,968	$688	$180	$0	$0	$0	$0	$0
Lauren Land LCG	$0	$0	$0	$0	$0	$0	$3,272	$2,794
Boone West N2G	$0	$5,760	$1,868	$524	$4,040	$6,424	$1,480	$344
Rum Creek N2G	$0	$4,460	$2,824	$344	$0	$3,240	$420	$0
Alma Beech Br	$0	$3,366	$0	$524	$4,040	$4,020	$0	$0
Laurel Br UCG	$0	$2,656	$0	$0	$3,420	$700	$800	$0
Total	**$17,428**	**$19,754**	**$5,216**	**$1,392**	**$11,500**	**$14,384**	**$5,972**	**$3,138**

Item	2044	2045	2046	2047	2048	2049	2050	2051
Lynn Branch N2G	$0	$0	$0	$0	$0	$0	$0	$0
Davey Branch UCH	$0	$0	$0	$0	$0	$0	$0	$0
Lauren Land - Hatfield UCH	$0	$0	$0	$0	$0	$0	$0	$0
Lauren Land LCG	$4,900	$1,000	$0	$0	$0	$0	$0	$0
Boone West N2G	$4,926	$700	$0	$0	$0	$0	$0	$0
Rum Creek N2G	$0	$0	$0	$0	$0	$0	$0	$0
Alma Beech Br	$0	$0	$0	$0	$0	$0	$0	$0
Laurel Br UCG	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$9,827**	**$1,700**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

18.2 Operating Cost Estimate

Alpha provided historical costs and budgeted projections of operating costs for its active mines (Cedar Grove #2, Lynn Branch No. 2 and Davy Branch Deep Mine) and planned mine (Rum Creek Deep Mine) for MM&A's review. MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for the mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Statutory sales related costs are summarized in *Table 18-2*.

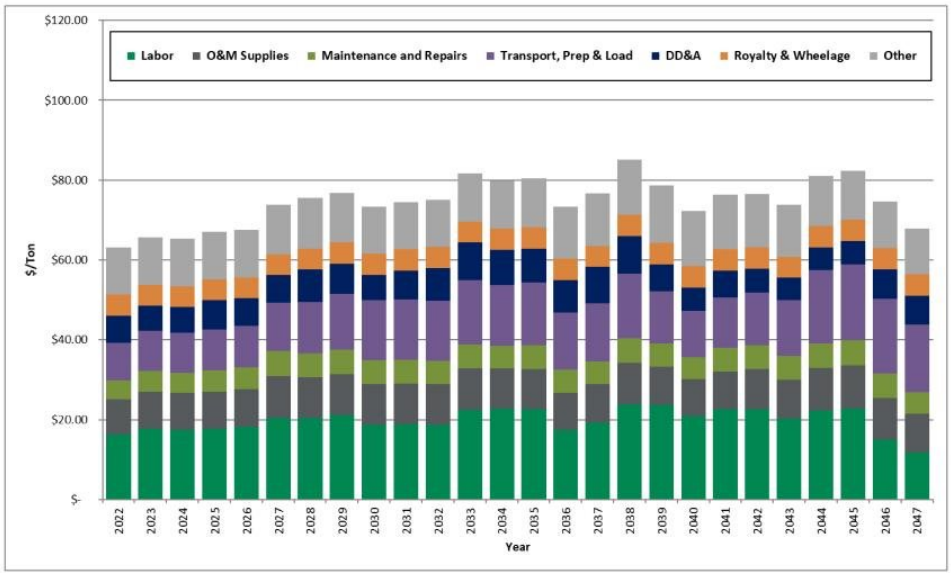
Table 18-2: Estimated Coal Production Taxes and Sales Costs

Description of Tax or Sales Cost	Basis of Assessment	Cost
Federal Black Lung Excise Tax - Underground	Per Ton	$1.10
Federal Reclamation Fees – Underground	Per Ton	$0.12
West Virginia Reclamation Tax - Underground	Per Ton	$0.279
West Virginia Severance Tax	Percentage of Revenue	1 to 5%
Royalties - Underground	Percentage of Revenue	6.0%

Notes: 1. Federal black lung excise tax is paid only on coal sold domestically. MM&A assumed 50% of sales will be into domestic market.

A summary of the projected operating costs for the consolidated Aracoma operations is provided in *Figure 18-2*.

Figure 18-2: Aracoma Operating Costs



19 Economic Analysis

19.1 Economic Evaluation

19.1.1 Introduction

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

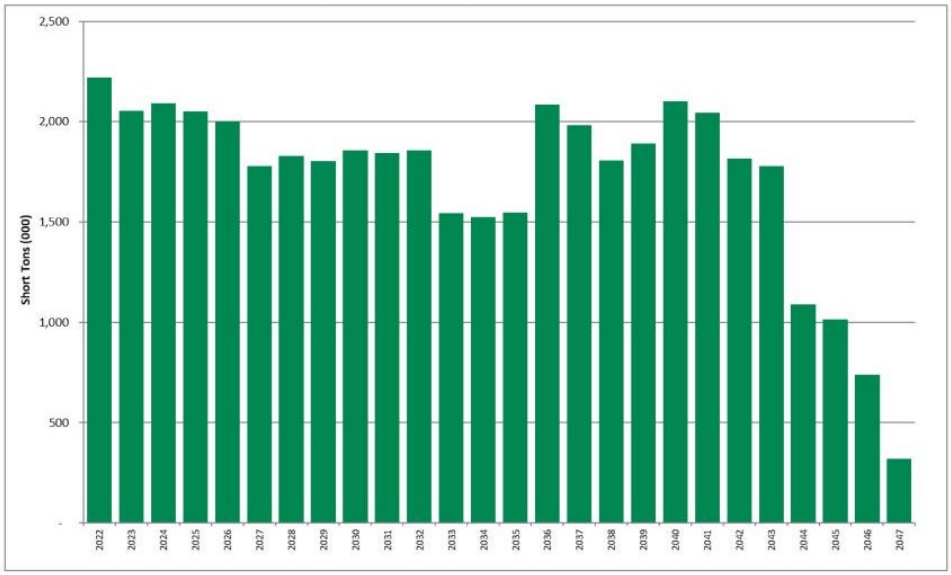
On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation,

refuse disposal, coal loading, reclamation and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

The operations are projected on a calendar year basis. MM&A's projection of annual sales tonnage is summarized in the chart below. While all Alpha coal resources properties deemed by MM&A to have

summarized in the chart below. While all Alpha coal resources properties deemed by MM&A to have potential for classification as coal reserves were evaluated as part of the economic model, some of those resource areas were determined to be uneconomical in the current market and were therefore excluded from coal reserves as discussed below.

Figure 19-1: Projection of Sales Tons



Sales revenue is based on the metallurgical coal price information provided to MM&A by Alpha. Only the revenue from Alpha's captive mining operations is included in the financial model used for this TRS.

The P&L projections of the individual mines of Alpha's Aracoma operations are then consolidated into a P&L and cash flow schedule for further testing of the economics. Projected debt service is excluded from the P&L and cash flow model in order to determine Enterprise Value of the aggregated entity.

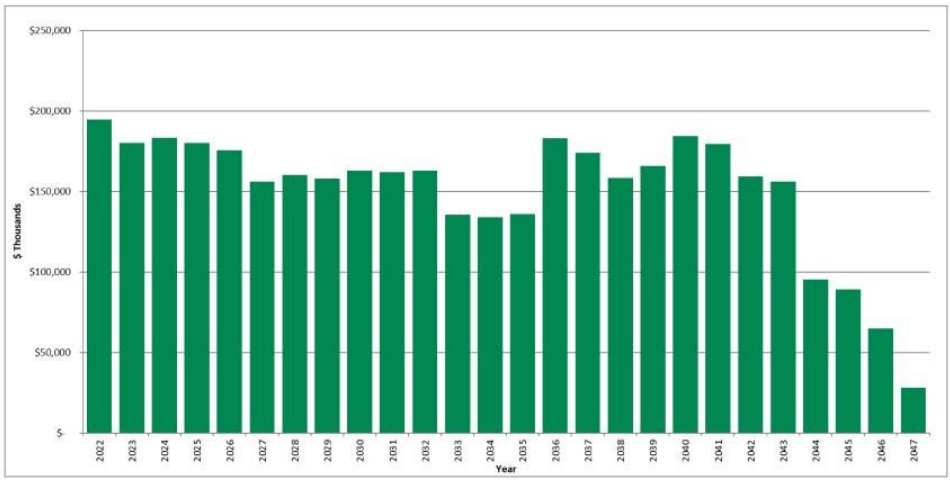
The financial model expresses coal sales prices, operating costs, and capital expenditures in current day dollars without adjustment for inflation. Capital expenditures and reclamation costs are included based on engineering estimates for each mine by year. MM&A also included an estimate of administrative costs in the financial projections.

Alpha will pay royalties for the various current and projected operations. The royalty rates vary by location as provided by Alpha. The royalty rates were assumed to be 6.0% of the sales revenue.

The projection model also includes consolidated income tax calculations at Alpha's Aracoma Division level, incorporating statutory depletion calculations, as well as state income taxes, and a federal tax rate of 21%. To the extent the Alpha mines generate net operating losses for tax purposes, the losses are carried over to offset future taxable income from Alpha mines. The terms "cash flows" and "project cash flows" used in this report refer to after-tax cash flows.

Alpha's projected consolidated annual revenue for the Aracoma operations is shown in the chart below:

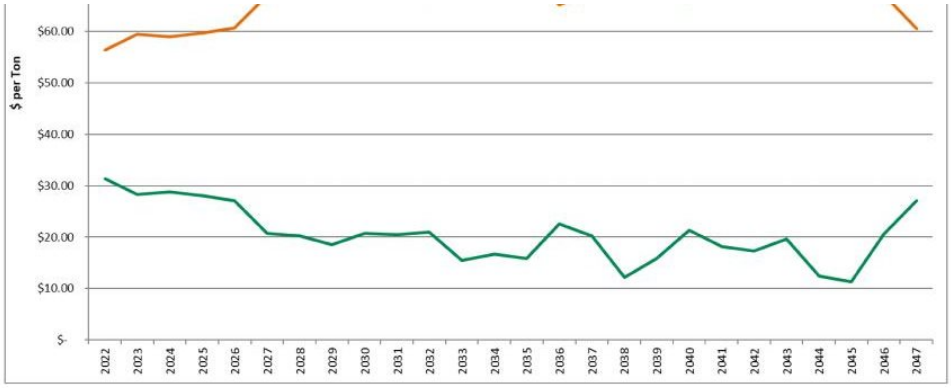
Figure 19-2: Consolidated Annual Revenue



Projected consolidated revenue, cash costs, and EBITDA for the Aracoma operations are expressed in dollars per ton in the graph below.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 19-3: Revenue, Cash Costs, and EBITDA



The above chart shows an assumed revenue of $87.72 per ton, cash costs of $56 to $68 per ton and EBITDA of $12 to $31 per ton. Positive EBITDA per ton averages $20.78 per ton over the life of the operations.

Table 19-1 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at Aracoma.

Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

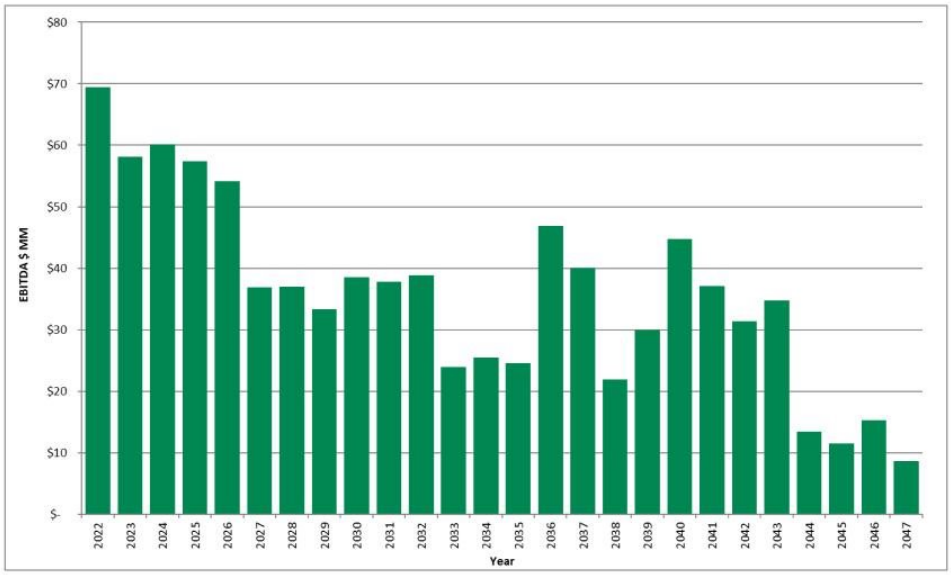
	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Lynn Branch N2G	15,777	$249,867	$15.84	$385,275	$24.42
Davey Branch UCH	5,981	$93,583	$15.65	$143,155	$23.94
Lauren Land LCG	2,943	$38,391	$13.04	$51,256	$17.42
Lauren Land - Hatfield UCH	7,768	$41,812	$5.38	$113,058	$14.55
Laurel Br UCG	2,231	$31,402	$14.08	$43,512	$19.51
Rum Creek N2G	3,581	$97,068	$27.11	$114,272	$31.91
Alma Beech Br	1,429	$11,147	$7.80	$20,500	$14.34
Boone West N2G	5,258	$27,991	$5.32	$63,500	$12.08
Grand Total	**44,968**	**$591,261**	**$13.15**	**$934,529**	**$20.78**

Note: (1) The financial model contains 0.286 million tons of inferred coal that has been excluded from reserves. LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (500,817 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 19-1,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated Aracoma operations show positive LOM P&L and EBITDA of $591.2 million and $934.5 million, respectively.

A breakdown of projected EBITDA for the consolidated Aracoma operations is shown in the chart below:

Figure 19-4: Annual EBITDA



19.1.2 Cash Flow Summary

Alpha's consolidated Aracoma cash flow summary in constant dollars, excluding debt service, is shown in *Table 19-2* below.

Table 19-2: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	44,968	296	2,219	2,053	2,091	2,052	2,002
Total Revenue	$3,944,417	$25,973	$194,607	$180,056	$183,406	$180,029	$175,567
EBITDA	$934,529	$3,406	$69,442	$58,063	$60,118	$57,436	$54,089
Net Income	$483,724	($15,755)	$47,517	$37,043	$38,187	$34,151	$32,200
Net Cash Provided by Operating Activities	$826,992	$2,595	$49,287	$52,092	$51,389	$50,025	$46,661
Purchases of Property, Plant, and Equipment	($230,529)	($5,182)	($11,084)	($180)	($9,720)	($17,232)	($13,563)
Net Cash Flow	$596,463	($2,587)	$38,203	$51,912	$41,669	$32,793	$33,098

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	1,780	1,827	1,803	1,857	1,845	1,856	1,545
Total Revenue	$156,147	$160,275	$158,143	$162,916	$161,802	$162,828	$135,481
EBITDA	$36,852	$37,045	$33,362	$38,545	$37,795	$38,832	$23,898
Net Income	$20,614	$17,965	$15,717	$21,918	$19,797	$18,595	$7,125
Net Cash Provided by Operating Activities	$36,032	$34,150	$31,553	$33,499	$34,341	$35,084	$25,933
Purchases of Property, Plant, and Equipment	($868)	($9,900)	($3,420)	($5,640)	($13,660)	($25,272)	($11,668)
Net Cash Flow	$35,163	$24,249	$28,133	$27,859	$20,681	$9,812	$14,265

	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31

	2034	2035	2036	2037	2038	2039	2040
Production & Sales tons	1,526	1,548	2,087	1,981	1,806	1,890	2,102
Total Revenue	$133,824	$135,808	$183,057	$173,738	$158,377	$165,763	$184,384
EBITDA	$25,452	$24,553	$46,935	$40,008	$21,872	$29,975	$44,789
Net Income	$9,734	$9,112	$23,293	$17,042	$3,045	$14,406	$28,807
Net Cash Provided by Operating Activities	$24,456	$23,992	$37,687	$38,126	$25,274	$27,079	$27,430
Purchases of Property, Plant, and Equipment	($3,972)	($8,855)	($17,428)	($19,754)	($5,216)	($1,392)	($11,500)
Net Cash Flow	$20,484	$15,137	$20,259	$18,372	$20,057	$25,686	$15,930
	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	2,046	1,816	1,777	1,088	1,016	740	320
Total Revenue	$179,457	$159,325	$155,898	$95,452	$89,117	$64,891	$28,095
EBITDA	$37,151	$31,400	$34,762	$13,475	$11,460	$15,227	$8,687
Net Income	$19,336	$17,336	$21,044	$6,707	$4,722	$8,353	$5,911
Net Cash Provided by Operating Activities	$31,011	$27,999	$29,926	$16,010	$11,120	$13,811	$11,473
Purchases of Property, Plant, and Equipment	($14,384)	($5,972)	($3,138)	($9,827)	($1,700)	$0	$0
Net Cash Flow	$16,627	$22,026	$26,788	$6,183	$9,420	$13,811	$11,473
	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0
EBITDA	($56)	($23)	($12)	($6)	($2)	$0	$0
Net Income	($113)	($46)	($23)	($12)	($4)	$0	$0
Net Cash Provided by Operating Activities	($615)	($214)	($107)	($72)	($35)	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($615)	($214)	($107)	($72)	($35)	$0	$0

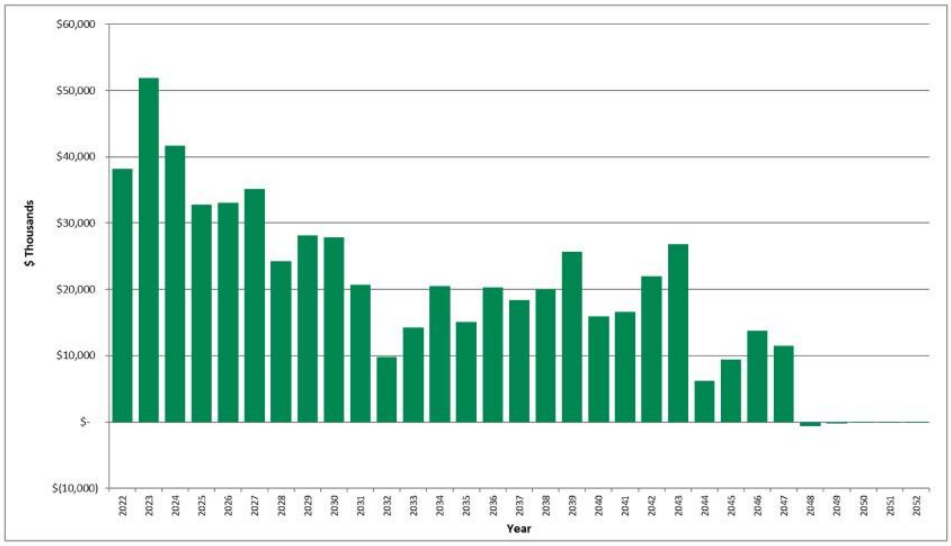
Note: (1) The financial model contains 0.286 million tons of inferred coal that has been excluded from reserves. LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (500,817 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

Consolidated cash flows are driven by annual sales tonnage, which peaks at 2.2 million tons in 2022. Between years 2023 and 2043, sales ranges from 1.5 million to 2.1 million tons and between years 2044-2047, sales range from 0.3 million tons to 1.1 million tons. Projected consolidated revenue peaks at $194.6 million in 2022 and totals $3.9 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $52.1 million in 2023 and totals $827.0 million over the project life. Capital expenditures total $57.0 million during the first five years and $230.5 million over the project's life.

Consolidated Aracoma net cash flow after tax, but before debt service, is shown by year in the chart below:

Figure 19-5: Net Cash Flow after Tax (Before Debt Service)



LOM Net cash flow is positive for this project. The cash flows after year 2047 are generally related to end of mine reclamation expenditures, which are accrued over the life of the mines.

19.1.3 Discounted Cash Flow Analysis

Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $221.8 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the Aracoma reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its Aracoma assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

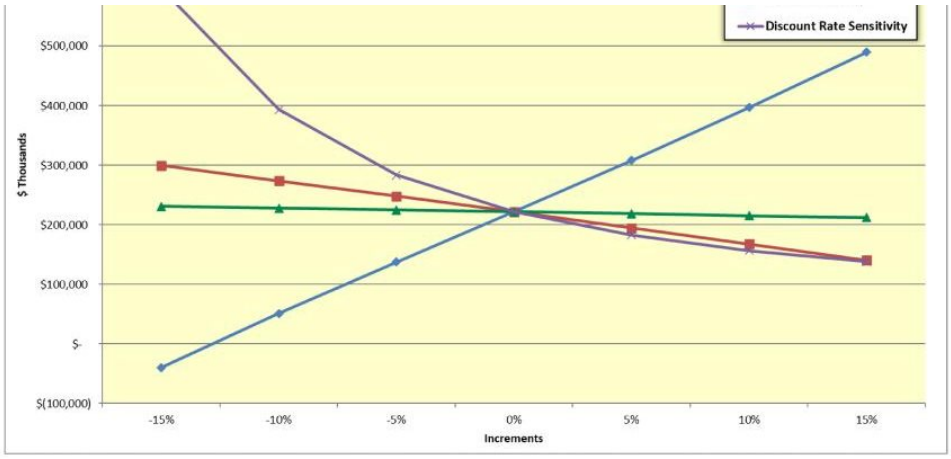
19.1.4 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

costs, capital costs, and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 19-6: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

20 Adjacent Properties

20.1 Information Used

No Proprietary information associated with neighboring properties was used as part of this study.

21 Other Relevant Data and Information

MM&A performed a previous audit of all the Property in year 2020 for Alpha based on **U.S. Securities and Exchange Commission (*SEC*)** Industry Guide 7 standards. MM&A utilized this former audit study as the basis of an updated study which meets those standards set forth by the SEC for 2021 reserve compliance.

22 Interpretation and Conclusions

22.1 Conclusion

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Aracoma Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study is sufficient to conclude that the 44.18 Mt of marketable coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

22.2 Risk Factors

Risks have been identified for operational, technical and administrative subjects addressed in the Pre-Feasibility Study. A risk matrix has been constructed to present the risk levels for all the risk factors identified and quantified in the risk assessment process. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

The purpose of the characterization of the project risk components is to inform the project stakeholders of key aspects of the Alpha projects that can be impacted by events whose consequences can affect the success of the venture. The significance of an impacted aspect of the operation is directly related to both the probability of occurrence and the severity of the consequences. The initial risk for a risk factor is herein defined as the risk level after the potential impact of the risk factor is addressed by competent and prudent management utilizing control measures readily available. Residual risk for a risk factor is herein defined as the risk level following application of special mitigation measures if management determines that the initial risk level is unacceptable. Initial risk and residual risk can be quantified numerically, derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

The probability and consequence parameters are subjective numerical estimates made by practiced mine engineers and managers. Both are assigned values from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

greatest consequence. The products, which define the Risk Level, are classified from very low to very high.

Risk Level Table (R = P x C)

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)

Risk aspects identified and evaluated during this assignment total 13. No residual risks are rated Very High. Three (3) residual risks are rated High. Six (6) of the risk aspects could be associated with Moderate residual risk. Four (4) of the risk aspects were attributed Low or Very Low residual risks.

22.2.1 Governing Assumptions

The listing of the aspects is not presumed to be exhaustive. Instead that listing is presented based on the experiences of the contributors to the TRS.

1. The probability and consequence ratings are subjectively assigned, and it is assumed that this subjectivity reasonably reflects the condition of the active and projected mine operations.
2. The Control Measures shown in the matrices presented in this chapter are not exhaustive. They represent a condensed collection of activities that the author of the risk assessment section has observed to be effective in coal mining scenarios.
3. Mitigation Measures listed for each risk factor of the operation are not exhaustive. The measures listed, however, have been observed by the author to be effective.
4. The monetary values used in ranking the consequences are generally accepted quantities for the coal mining industry.

22.2.2 Limitations

The risk assessment proposed in this report is subject to the limitations of the information currently collected, tested, and interpreted at the time of the writing of the report.

22.2.3 Methodology

The numerical quantities (i.e., risk levels) attributable to either “initial” or “residual” risks are derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

$$R = P \times C$$

Where: R = Risk Level
P = Probability of Occurrence
C = Consequence of Occurrence

The Probability (P) and Consequence (C) parameters recited in the formula are subjective numerical estimates made by practiced mine engineers and managers. Both P and C are assigned integer values ranging from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and greatest consequence. The products (R = P x C) which define the Risk Level, are thereafter classified from very low to very high.

Risk Level Table

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Very high initial risks are considered to be unacceptable and require corrective action well in advance of project development. In short, measures must be applied to reduce very high initial risks to a tolerable level.

As shown and discussed above, after taking into account the operational, technical, and administrative actions that have been applied or are available for action when required, the residual risk can be determined. The residual risk provides a basis for the management team to determine if the residual risk level is acceptable or tolerable. If the risk level is determined to be unacceptable, further actions should be considered to reduce the residual risk to acceptable or tolerable levels to provide justification for continuation of the proposed operation.

22.2.4 Development of the Risk Matrix

Risks have been identified for the technical, operational, and administrative subjects addressed in the TRS. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

22.2.4.1 Probability Level Table

Table 22-1: Probability Level Table

Category	Probability Level (P)		
1	Remote	Not likely to occur except in exceptional circumstances.	<10%
2	Unlikely	Not likely to occur; small in degree.	10 - 30%
3	Possible	Capable of occurring.	30 - 60%
4	Likely	High chance of occurring in most circumstances.	60 - 90%

5	Almost Certain	Event is expected under most circumstances; impossible to avoid.	>90%

The lowest rated probability of occurrence is assigned the value of 1 and described as remote, with a likelihood of occurrence of less than 10 percent. Increasing values are assigned to each higher probability of occurrence, culminating with the value of 5 assigned to incidents considered to be almost certain to occur.

22.2.4.2 Consequence Level Table

Table 22-2 lists the consequence levels.

Table 22-2: Consequence Level Table

Correlation of Events in Key Elements of the Project Program to Event Severity Category							
Category	Severity of the Event	Financial Impact of the Event	Unplanned Loss of Production (Impact on Commercial Operations)	Events Impacting on the Environment	Events Affecting the Program's Social and Community Relations	Resultant Regulatory / Sovereign Risk	Events Affecting Occupational Health & Safety
1	**Insignificant**	< USD $0.5 million	≤ 12 hours	Insignificant loss of habitat; no irreversible effects on water, soil and the environment.	Occasional nuisance impact on travel.		Event recurrence avoided by corrective action through established procedures (Engineering, guarding, training).
2	**Minor**	USD $0.5 million to $2.0 million	≤ 1 day	No significant change to species populations; short-term reversible perturbation to ecosystem function.	Persistent nuisance impact on travel. Transient adverse media coverage.		**First aid – lost time.** Event recurrence avoided by corrective action thought established procedures.
3	**Moderate**	USD $2.0 million to $10.0 million	≤ 1 week	Appreciable change to species population; medium-term (≤10 years) detriment to ecosystem function.	Measurable impact on travel and water/air quality. Significant adverse media coverage / transient public outrage.	Uncertainty securing or retaining essential approval / license. Change to regulations (tax; bonds; standards).	**Medical Treatment –** permanent incapacitation Avoiding event recurrence requires modification to established corrective action procedures**.**
4	**Major**	USD $10.0 million to $50.0 million	1 to 2 weeks	Change to species population threatening viability; long-term (>10 years) detriment to ecosystem function.	Long-term, serious impact on travel and use of water resources; degradation of air quality; sustained and effective public opposition.	Suspension / long-delay in securing essential approval / license. Change to laws (tax; bonds; standards).	**Fatality.** Avoiding event recurrence requires modification to established corrective action procedures and staff retraining.
5	**Critical**	>USD $50.0 million	>1 month	Species extinction; irreversible damage to ecosystem function.	Loss of social license.	Withdraw / failure to secure essential approval / license.	**Multiple fatalities.** Avoiding event recurrence requires major overhaul of policies and procedures.

The lowest rated consequence is assigned the value of 1 and is described as Insignificant Consequence with parameters that include non-reportable safety incidents with zero days lost accidents, no environmental damage, loss of production or systems for less than one week and cost of less than USD $0.5 million. Increasing values are assigned to each higher consequence, culminating with the value of 5 assigned to critical consequences, the parameters of which include multiple-fatality accidents, major environmental damage, and loss of production or systems for longer than one month and cost of greater than USD $50.0 million.

Composite Risk Matrix R = P x C and Color-Code Convention

The risk level, defined as the product of probability of occurrence and consequence, ranges in value from 1 (lowest possible risk) to 25 (maximum risk level). The values are color-coded to facilitate identification of the highest risk aspects.

Table 22-3: Risk Matrix

P x C = R	Consequence (C)				
	Insignificant	Minor	Moderate	Major	Critical
	1	2	3	4	5

Probability Level (P)							
	Remote	1	1	2	3	4	5
	Unlikely	2	2	4	6	8	10
	Possible	3	3	6	9	**12**	**15**
	Likely	4	4	8	**12**	**16**	**20**
	Almost Certain	5	5	10	**15**	**20**	**25**

22.2.5 Categorization of Risk Levels and Color Code Convention

Very high risks are considered to be unacceptable and require corrective action. Risk reduction measures must be applied to reduce very high risks to a tolerable level.

22.2.6 Description of the Coal Property

The Aracoma Mine Complex (*Aracoma*) is located in Logan, Mingo, Boone and McDowell Counties, West Virginia – is an active operation with three underground mines. The active underground operations within the Aracoma Mine Complex (Lynn Branch #2, Davy Branch Deep Mine, and Cedar Grove #2) utilize continuous mining production sections. The method provides continuity, preserving skilled work

groups and enabling effective utilization of production equipment. The active and projected mines are located above and below drainage and as such are accessed via a combination of drifts and box cuts.

22.2.7 Summary of Residual Risk Ratings

Each risk factor is numbered, and a risk level for each is determined by multiplying the assigned probability by the assigned consequence. The risk levels are plotted on a risk matrix to provide a composite view of the Alpha risk profile. The average risk level is 6.6, which is defined as Moderate.

Table 22-4: Risk Assessment Matrix

Consequence		<10% Remote	10-30% Unlikely	30-60% Possible	60-90% Likely	>90% Almost Certain
Critical	>$50 MM					
Major	$10-50MM	9			6	
Moderate	$2-10 MM	1, 12	2, 4, 8, 14	3		
Minor	$0.5-$2 MM			13	5, 7, 10	
Low	<$0.5 MM			11		

22.2.8 Risk Factors

A high-level approach is utilized to characterize risk factors that are generally similar across a number of the active and proposed mining operations. Risk factors that are unique to a specific operation or are particularly noteworthy are addressed individually.

22.2.8.1 Geological and Coal Resource

Coal mining is accompanied by risk that, despite exploration efforts, mining areas will be encountered where geological conditions render extraction of the resource to be uneconomic, or that coal quality characteristics disqualify the product for sale into target markets.

Offsetting the geological and coal resource risk are the size of the controlled property which allows flexibility in the selection of mine areas away from areas where coal quality and mineability are less favorable. In addition, many of the underground mines are designed to operate with multiple production sections each, which lessens the immediate impact when one section encounters difficulties. The large reserve areas also provide a mitigation strategy of varying the timing of

development of mines to offset expected or encountered adverse conditions, thereby maintaining consistent production and quality. This flexibility requires additional extension or development cost but increases performance consistency.

The larger reserve areas will be developed with multiple production sections and the small, replacement production reserve areas provide ready access to alternative locations if geological and coal resource characteristics require abandonment of an active production area.

Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Recoverable coal tons recognized to be significantly less than previously estimated.	Reserve base is adequate to serve market commitments and respond to opportunities for many years. Local adverse conditions may increase frequency and cost of production unit relocations.	Previous and ongoing exploration and extensive regional mining history provide a high level of confidence of coal seam correlation, continuity of the coal seams, and coal resource tons.	1	4	4	Optimize mine plan to increase resource recovery; develop mine plan to provide readily available alternate mining locations to sustain expected production level.	1	3	3
Coal quality locally proves to be lower than initially projected.	If uncontrolled, production and sale of coal that is out of specification can result in rejection of deliveries, cancellation of coal sales agreements and damage to reputation.	Exploration and vast experience and history in local coal seams provide confidence in coal quality; limited excursions can be managed with careful product segregation and blending.	2	5	10	Develop mine plan to provide readily available alternate mining locations to sustain expected production level; modify coal sales agreements to reflect coal quality.	2	3	6

22.2.8.2 Environmental

Water quality and other permit requirements are subject to modification and such changes could have a material impact on the capability of the operator to meet modified standards or to receive new permits and modifications to existing permits. Permit protests may result in delays or denials to permit applications.

Environmental standards and permit requirements have evolved significantly over the past 50 years and to-date, mining operators and regulatory bodies have been able to adapt successfully to evolving environmental requirements.

Table 22-6: Environmental (Risks 3 and 4)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Environmental performance standards are modified in the future.	Delays in receiving new permits and modifications to existing permits; cost of testing and treatment of water and soils	Work with regulatory agencies to understand and influence final standards; implement testing, treatment and other actions to comply with new standards.	3	4	12	Modify mining and reclamation plans to improve compliance with new standards while reducing cost of compliance.	3	3	9
New permits and permit modifications are increasingly delayed or denied.	Interruption of production and delayed implementation of replacement production from new mines.	Comply quickly with testing, treatment and other actions required; continue excellent compliance performance within existing permits.	2	4	8	Establish and maintain close and constructive working relationships with regulatory agencies, local communities and community action groups.	2	3	6

22.2.8.3 Regulatory Requirements

Federal and state health and safety regulatory agencies occasionally amend mine laws and regulations. The impact is industry wide. Mining operators and regulatory agencies have been able to adapt successfully to evolving health and safety requirements.

Table 22-7: Regulatory Requirements (Risk 5)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Federal and state mine safety and health regulatory agencies amend mine laws and regulations.	Cost of training, materials, supplies and equipment; modification of mine examination and production procedures; modification of mining plans.	Participate in hearings and workshops when possible to facilitate understanding and implementation; work cooperatively with agencies and employees to facilitate implementation of new laws and regulations.	4	3	12	Familiarity and experience with new laws and regulations results in reduced impact to operations and productivity and improved supplies and equipment options.	4	2	8

22.2.8.4 Market and Transportation

Most of the current and future production is expected to be directed to domestic and international metallurgical markets. Historically the metallurgical markets have been cyclical and highly volatile.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 22-8: Market and Transportation (Risk 6)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Volatile coal prices drop precipitously.	Loss of revenue adversely affects profitability; reduced cash flow may disrupt capital expenditures plan.	Cost control measures implemented; capital spending deferred.	4	5	20	High-cost operations closed, and employees temporarily furloughed.	4	4	16

Occasional delay or interruption of rail, river and terminals service may be expected. The operator can possibly minimize the impact of delays by being a preferred customer by fulfilling shipment obligations promptly and maintaining close working relationships.

Table 22-9: Market and Transportation (Risk 7)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Rail or river transport is delayed; storage and shipping access at river and ocean terminals is not available.	Fulfillment of coal sales agreements delayed; limited coal storage at mines may increase cost of rehandling; production may be temporarily idled.	Provide adequate storage capacity at mines; coordinate continuously with railroad and shipping companies to respond quickly and effectively to changing circumstances.	4	3	12	Provide back-up storage facility along with personnel, equipment and rehandle plan to sustain production and fulfill sales obligations timely.	4	2	8

22.2.8.5 Mining Plan

Occupational health and safety risks are inherent in mining operations. Comprehensive training and retraining programs, internal safety audits and examinations, regular mine inspections, safety meetings, along with support of trained fire brigades and mine rescue teams are among activities that greatly reduce accident risks. Employee health monitoring programs coupled with dust and noise monitoring and abatement reduce health risks to miners.

As underground mines are developed and extended, observation of geological, hydrogeological and geotechnical conditions lead to modification of mine plans and procedures to enable safe work within the mine environments.

Highlighted below are selected examples of safety and external factors relevant to Alpha's operations.

22.2.8.5.1 Methane Management

Coalbed methane is present in coal operations below drainage. Often the methane concentration in shallow coal seams is at such low levels that it can be readily managed with frequent testing and monitoring, vigilance and routine mine ventilation. Very high methane concentrations may be present

at greater depths. High methane concentrations may require degasification of the coal seam to assure safe mining. Methane is not expected to be present in most of the Aracoma property.

Table 22-10: Methane Management (Risk 8)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Methane hazard is present in mines operating below drainage.	Injury or loss of life; possible ignition of gas and mine explosion; potential loss of mine and equipment temporarily or permanently; additional mine fan, mine power, ventilation, monitoring and examination requirements.	Low to moderate levels can be managed with frequent examinations, testing and monitoring within the mine ventilation system. Excellent rock dust maintenance minimizes explosion propagation risk should an ignition occur.	2	5	10	Very high-level methane concentrations may require coal seam degasification and gob degasification where pillar extraction methods are employed.	2	3	6

22.2.8.5.2 Mine Fires

Mine fires, once common at mine operations, are rare today. Most active coal miners have not encountered a mine fire. Vastly improved mine power and equipment electrical systems, along with safe mine practices reduce mine fire risks. Crew training and fire brigade support and training improve response for containment and control if a fire occurs. Spontaneous combustion within coal mines, which is the source of most fires that occur today, is not expected to commonly occur at the Alpha property. When spontaneous combustion conditions are present, monitoring systems are employed for early detection and mine plans are designed to facilitate isolation, containment and rapid extinguishment.

Table 22-11: Mine Fires (Risk 9)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Mine fire at underground operation or plant stockpile fire.	Injury or loss of life; potential loss of mine temporarily or permanently; damage to equipment and mine infrastructure.	Inspection and maintenance of mine power, equipment and mine infrastructure; good housekeeping; frequent examination of conveyor belt entries; prompt removal of accumulations of combustible materials.	1	5	5	If spontaneous combustion conditions are present, enhanced monitoring and examination procedures will be implemented; mine design will incorporate features to facilitate isolation, containment and extinguishment of spontaneous combustion locations.	1	4	4

22.2.8.5.3 Ground Control

Underground mining exposes miners to the risks of roof falls and rib rolls. Ground control-based risks can be mitigated through effective roof control plans which are supplemented with a strong understanding of future geotechnical conditions. Foremen and crews should be trained to examine the roof, rib and floor conditions and identify pending and immediate hazards. Multiple publicly available software programs can be used to assess pillar sizing and stability.

Table 22-12: Ground Control (Risk 10)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Ground control issues cause roof failures, rib rolls, floor heave, etc.	Injury or loss of life; catastrophic damage to equipment; production interruption.	Regular inspection for change and signs of failure. Dynamic design of roof control plan and safety measures to honor observed conditions and exploration-based information; conservative pillar design.	4	3	12	Multiple operating sections to mitigate any lost production; availability of new working areas in case abandonment of section is required; availability of alternative roof control technologies in case of abrupt changes in mining conditions.	4	2	8

22.2.8.5.4 Availability of Supplies and Equipment

The industry has periodically experienced difficulty receiving timely delivery of mine supplies and equipment. Availability issues often accompanied boom periods for coal demand. Any future delivery of supplies and equipment delays are expected to be temporary with limited impact on production.

Table 22-13: Availability of Supplies and Equipment (Risk 11)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Disruption of availability for supplies and equipment.	Temporary interruption of production.	Force majeure provision in coal sales agreements to limit liability for delayed or lost sales.	3	2	6	Work closely with customers to assure delayed coal delivery rather than cancelled sales; monitory external conditions and increase inventory of critical supplies; accelerate delivery of equipment when possible.	3	1	3

22.2.8.5.5 Labor

Work stoppage due to labor protests are considered to be unlikely and accompanied by limited impact should it occur. Excellent employee relations and communications limit the exposure to outside protesters. Loss of supervisors and skilled employees to retirement is inevitable; the impact can be lessened with succession planning and training and training and mentorship of new employees.

Table 22-14: Labor – Work Stoppage (Risk 12)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Work stoppage due to slowdowns or secondary boycott activity.	Loss of production and coal sales; damaged customer and employee relations; reputation loss.	Maintain excellent employee relations and communications; maintain frequent customer communications.	2	3	6	Develop plan for employee communications and legal support to minimize impact of secondary boycott activities.	1	3	3

Table 22-15: Labor – Retirement (Risk 13)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Retirement of supervisors and skilled employees.	Loss of leadership and critical skills to sustain high levels of safety, maintenance and productivity.	Monitor demographics closely and maintain communications with employees who are approaching retirement age; maintain employee selection and training programs.	3	3	9	Maintain selection of candidates and implementation of in-house or third-party training for electricians and mechanics; develop employee mentoring program.	3	2	6

22.2.8.6 Comprehensive Health and Safety

While largely incorporated in mine plan-based risk factors, effective health and safety programs reduce the risk of accidents, associated loss of production and fines. Currently, coal mining and processing requires a robust health and safety team, consisting of executive level health and safety roles, regional health and safety managers, and multiple operational level health and safety coordinators.

Table 22-16: Health and Safety (Risk 14)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Failure to attain operations safety standards and associated occurrence of accidents	Injuries and possible loss of life; damage to morale and workforce confidence; loss of production and diminished productivity; regulatory issues, closures and fines; reputation loss	Safety and loss control awareness training to help employees recognize hazardous conditions and actions; frequent job observations and feedback; periodic employee performance reviews	2	5	10	Senior management's active participation in safety process; utilization of motivational methods to reinforce company's values and commitment to safety; regular comprehensive safety audits to assure safety standards are maintained.	2	3	6

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Aracoma Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

23 Recommendations

Alpha should continue to work both internally and with outside assistance to further define their Resource Base and to Optimize the LOM Plan.

24 References

Publicly available information from various State and Federal agencies was used where relevant.

JOURNEL, A.G., & HUIJBREGTS, CH, J., 1978: Mining Geostatistics, The Blackburn Press Caldwell, New Jersey.

25 Reliance on Information Provided by Registrant

For the purpose of this TRS, MM&A utilized the Geological and Coal Quality data provided by Alpha. This information was subjected to verification of its integrity and completeness.

Historical productivity and operating costs were also supplied by Alpha. This information was combined with the experience and knowledge of the QP's to forecast the LOM plan.

Alpha supplied a long-term price forecast based on published benchmark pricing. This benchmark pricing was adjusted by Alpha to reflect the effects of quality and transportation borne after FOB plant costs were calculated.

A summary of the information provided by Alpha relied upon by MM&A for the purposes of this TRS is provided in *Table 25-1*.

Table 25-1: Information from Registrant Relied Upon by MM&A

Category	Information Provided by Alpha	Report Section
Legal	Mineral control and surface control rights as shown on maps	3.2, 3.3
Geological	Geologic data including digital databases and original source data including geologist logs, driller's logs, geophysical logs	9.1
Coal Quality	Database of coal quality information supplemented with original source laboratory sheets where available	10.1
Mining	Historical productivities and manpower from operating and future Alpha mines	13.2, 13.4
Coal Preparation	Flow sheet and other information representing current and future methods of coal processing	14.1
Marketing	Long-term price forecast used in financial projections	16.2
Waste Disposal	Engineering data and estimates representing remaining capacities for coarse and fine coal waste disposal	17.2
Environmental	Permit and bonding information	17.3
Costs	Historical and budgetary operating cost information used to derive cost drivers for reserve financial modeling	18.2

APPENDIX

A

SUMMARY TABLES

Alpha Metallurgical Resources, Inc.

SEC Technical Report - Aracoma Complex

Summary of Coal Resource (Short Tons) • Effective December 31, 2021

Appendix A - Table 1

Area	Seam	Coal Resource (Dry Tonnes, In Situ)									Quality (Dry Basis)		
		By Reliability Category					By Control Type		By Permit Status				
		Measured	Indicated	Total	Inferred	Grand Total	Owned	Leased	Permitted	Not Permitted	Ash%	Sulfur%	VM%
Davy Branch	Upper Chilton (41000)	0	0	0	22,000	22,000	0	0	0	0	26	0.7	29
Hatfield Area	Upper Chilton (41000)	0	0	0	0	0	0	0	0	0	17	1.2	32
Boone West	Chilton (47000)	7,306,000	1,990,000	9,296,000	0	9,296,000	9,296,000	0	0	9,296,000	23	0.6	0
Lauren Land	Upper Cedar Grove (30100)	31,574,000	17,551,000	49,126,000	225,000	49,351,000	0	49,126,000	13,935,000	35,191,000	36	2.2	20
Lauren Land	Lower Cedar Grove (30000)	0	0	0	0	0	0	0	0	0	4	0.7	0
Rum Creek	No. 2 Gas (24000)	10,663,000	10,690,000	21,353,000	154,000	21,507,000	0	21,353,000	0	21,353,000	13	0.7	32
Lynn Branch	No. 2 Gas (24000)	8,328,000	6,177,000	14,506,000	246,000	14,752,000	2,645,000	11,861,000	3,271,000	11,234,000	8	0.9	34
Boone West	No. 2 Gas (24000)	29,094,000	17,283,000	46,377,000	86,000	46,463,000	37,296,000	9,081,000	0	46,377,000	21	1.0	0
Total		**86,965,000**	**53,692,000**	**140,657,000**	**733,000**	**141,390,000**	**49,237,000**	**91,421,000**	**17,206,000**	**123,451,000**	**18**	**1.1**	**32**

*Note(1): Resource tons are **exclusive** of reserve tons.*

Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.

Totals may not add due to rounding.

Alpha Metallurgical Resources, Inc.

SEC Technical Report - Aracoma Complex

Summary of Coal Reserves (Short Tons) • Effective December 31, 2021

Appendix A - Table 2

Area/Mine	Seam	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped, x1,000)											Quality (Dry Basis)		
		By Reliability Category			By Mining Type		By Control Type		Permit Status		By Market				
		Proven	Probable	Total	Surface	UG	Owned	Leased	Permitted	Not Permitted	Thermal	Met	Ash%	Sulfur%	VM%
Davy Branch	Upper Chilton (41000)	3,816,000	2,007,000	5,823,000	0	5,823,000	0	5,823,000	3,951,000	1,872,000	0	5,823,000	7	0.9	39
Hatfield Area	Upper Chilton (41000)	5,106,000	2,663,000	7,768,000	0	7,768,000	0	7,768,000	0	7,768,000	0	7,768,000	7	0.9	36
Lauren Land	Upper Cedar Grove (30100)	1,799,000	432,000	2,231,000	0	2,231,000	0	2,231,000	0	2,231,000	0	2,231,000	7	1.4	38
Lauren Land	Lower Cedar Grove (30000)	1,905,000	1,038,000	2,943,000	0	2,943,000	0	2,943,000	0	2,943,000	0	2,943,000	3	0.7	-
Beech Branch	Alma (25800)	998,000	431,000	1,429,000	0	1,429,000	0	1,429,000	0	1,429,000	0	1,429,000	4	0.9	39
Rum Creek	No. 2 Gas (24000)	2,530,000	1,051,000	3,581,000	0	3,581,000	0	3,581,000	0	3,581,000	0	3,581,000	5	0.7	36
Lynn Branch	No. 2 Gas (24000)	8,371,000	7,011,000	15,381,000	0	15,381,000	1,217,000	14,165,000	11,183,000	4,199,000	0	15,381,000	4	0.8	36
Boone West	No. 2 Gas (24000)	1,712,000	3,312,000	5,024,000	0	5,024,000	4,033,000	991,000	0	5,024,000	0	5,024,000	4	0.9	-
Grand Total		**26,237,000**	**17,944,000**	**44,182,000**	**0**	**44,182,000**	**5,250,000**	**38,932,000**	**15,134,000**	**29,047,000**	**0**	**44,182,000**	**5**	**0.8**	**37**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.

**Volatile Matter analysis is not available for all reserve areas. All Aracoma reserves are priced as a High-Vol B product.*

Totals may not add due to rounding.

APPENDIX

B

NITIAL ECONOMIC ASSESSMENT - RESOURCES EXCLUSIVE OF RESERVES (PER TON)

Alpha Metallurgical Resources, LLC
Initial Economic Assessment, Resources Exclusive of Reserves (per Ton)
Appendix B: Aracoma Complex

Seam: / Area:	Chilton Aracoma Boone West Chilton	Upper Cedar Grove Aracoma UCG Lauren Land A1-A6	Upper Cedar Grove Aracoma UCG Lauren Land B-C3	No.2 Gas Aracoma N2G Boone West	No.2 Gas Aracoma N2G Lynn Branch	No.2 Gas Aracoma N2G Rum Creek
In-Place Resource Tons	9,296,143	28,600,547	21,212,543	46,462,578	14,751,707	14,854,279
Potentially Recoverable Tons*	1,906,721	3,923,137	2,540,626	9,943,921	3,852,762	3,581,886
Mining Method	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM
Assumed Sales Realization at Plant**	$ 115	$ 115	$ 115	$ 115	$ 115	$ 115
Iniital Capex Estimate to Access Resources***	$ 32,000,000	$ -	$ -	$ -	$ -	$ -
Direct Mining Costs:						
Labor****	$ 27.47	$ 24.79	$ 23.84	$ 29.53	$ 27.93	$ 40.74

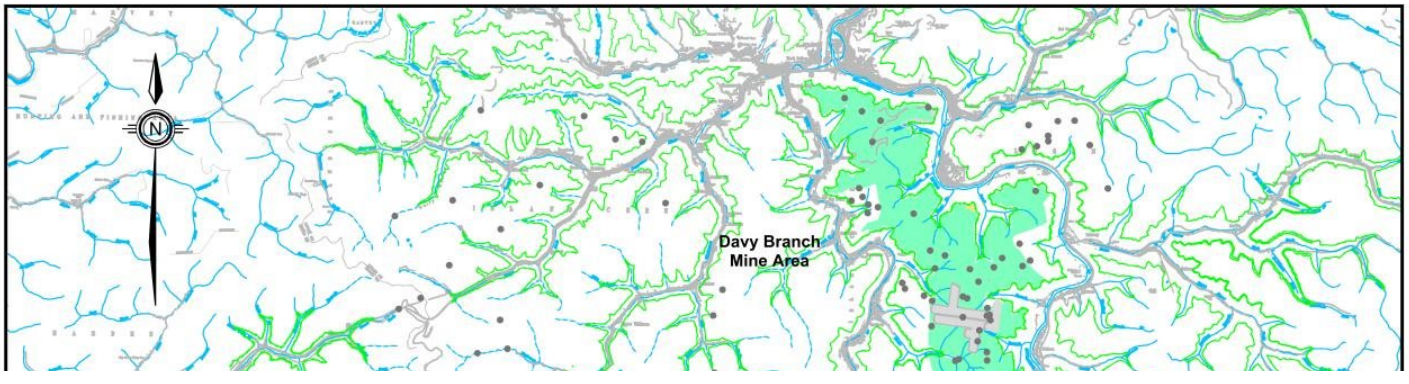
Labor****	$ 27.47	$ 24.79	$ 23.04	$ 38.53	$ 27.83	$ 48.74
Supplies, Excluding Roof Control	$ 5.49	$ 4.96	$ 4.61	$ 7.71	$ 5.57	$ 6.96
Roof Control	$ 5.49	$ 4.96	$ 4.61	$ 7.71	$ 5.57	$ 6.96
M&R	$ 5.27	$ 9.67	$ 8.72	$ 6.89	$ 5.79	$ 5.85
Power	$ 1.76	$ 3.22	$ 2.91	$ 2.30	$ 1.93	$ 1.95
Other	$ 1.76	$ 3.22	$ 2.91	$ 2.30	$ 1.93	$ 1.95
Total Direct Cash Costs	$ 47.24	$ 50.82	$ 46.80	$ 65.43	$ 48.61	$ 72.42
Transporation, Washing, Environmental & G&A Costs:						
Coal Prep*****	$ 7.03	$ 12.89	$ 11.63	$ 9.18	$ 7.72	$ 7.80
Materials Handling	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50
Raw Coal Trucking*****	$ 16.96	$ 4.03	$ 7.71	$ 12.91	$ 5.11	$ -
Clean Coal Trucking	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25
Enviro******	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35
G&A	$ 4.00	$ 4.00	$ 4.00	$ 4.00	$ 4.00	$ 4.00
Total Transporation, Washing, Environmental & G&A Costs:	$ 31.09	$ 24.02	$ 26.44	$ 29.20	$ 19.93	$ 14.90
Indirect Cash Costs						
Royalty	$ 6.90	$ 6.90	$ 6.90	$ 6.90	$ 6.90	$ 6.90
Black Lung Excise Tax	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55
SMCRA	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12
State Severance	$ 5.75	$ 5.75	$ 5.75	$ 5.75	$ 5.75	$ 5.75
Property Tax & Insurance	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Total Indirect Cash Costs	$ 13.82	$ 13.82	$ 13.82	$ 13.82	$ 13.82	$ 13.82
Non Cash Costs						
Amoritiztion of Development Capital	$ 16.78	$ -	$ -	$ -	$ -	$ -
Depreciation of Initial Equipment and Sustaining Capital	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00
Depletion	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Total Non Cash	$ 22.78	$ 6.00	$ 6.00	$ 6.00	$ 6.00	$ 6.00
Total Cash Cost	$ 92.15	$ 88.66	$ 87.05	$ 108.44	$ 82.36	$ 101.14
EBITDA	$ 22.85	$ 26.34	$ 27.95	$ 6.56	$ 32.64	$ 13.86
Fully Loaded Cost	$ 114.94	$ 94.66	$ 93.05	$ 114.44	$ 88.36	$ 107.14
Fully Loaded P&L	$ 0.06	$ 20.34	$ 21.95	$ 0.56	$ 26.64	$ 7.86
Passes Resource Initial Economic Assessment?	YES	YES	YES	YES	YES	YES

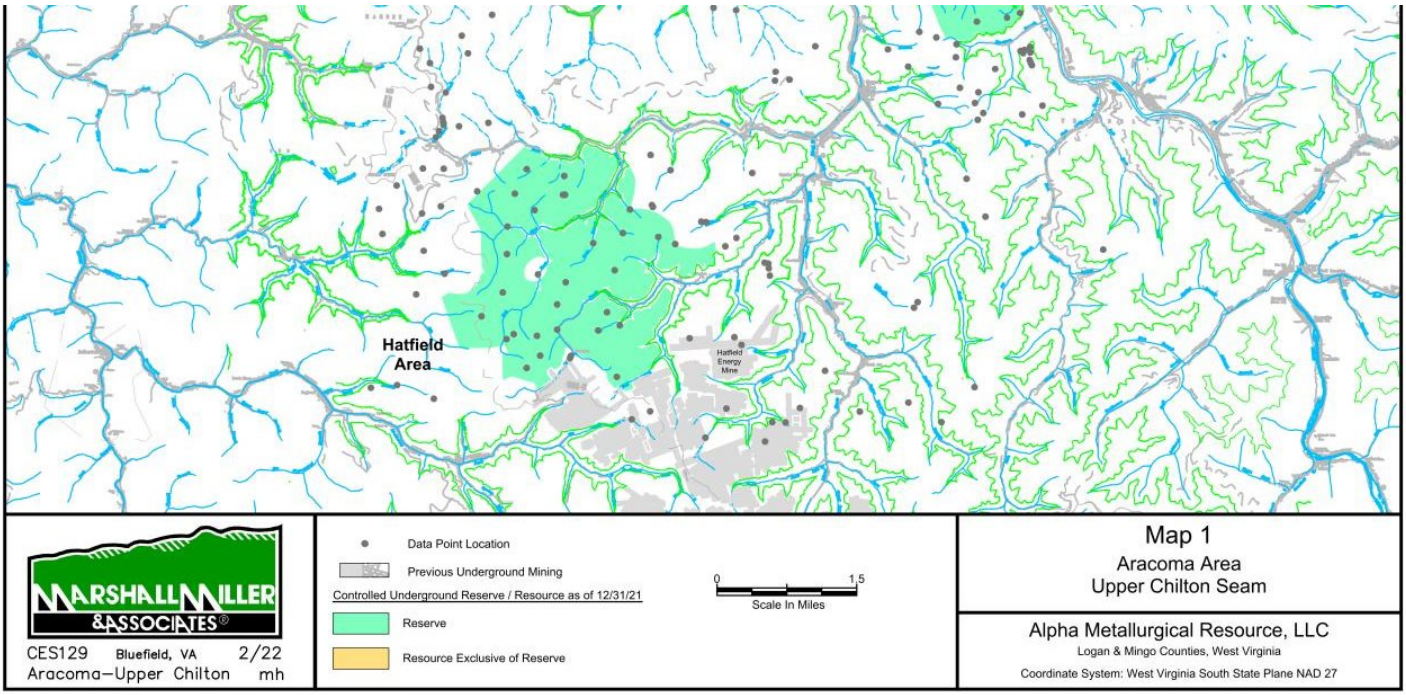
*Potentially recoverable tons are calculated by applying appropriate modifying factors to in-place resource tonnages
**Sales relization represents estimated long range sales price.
***No initial capital required where resources are accessible from existing mines.
****Labor rates are driven based off of super section productivities assuming 250 to 350 feet per unit shift per section.
*****Processing assumed to occur at Bandmill plant.
******Environmental costs assumed to include permiting, outfall maintenance, etc.

APPENDIX

C

MAPS





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
Aracoma–Upper Chilton mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 1.5
Scale In Miles

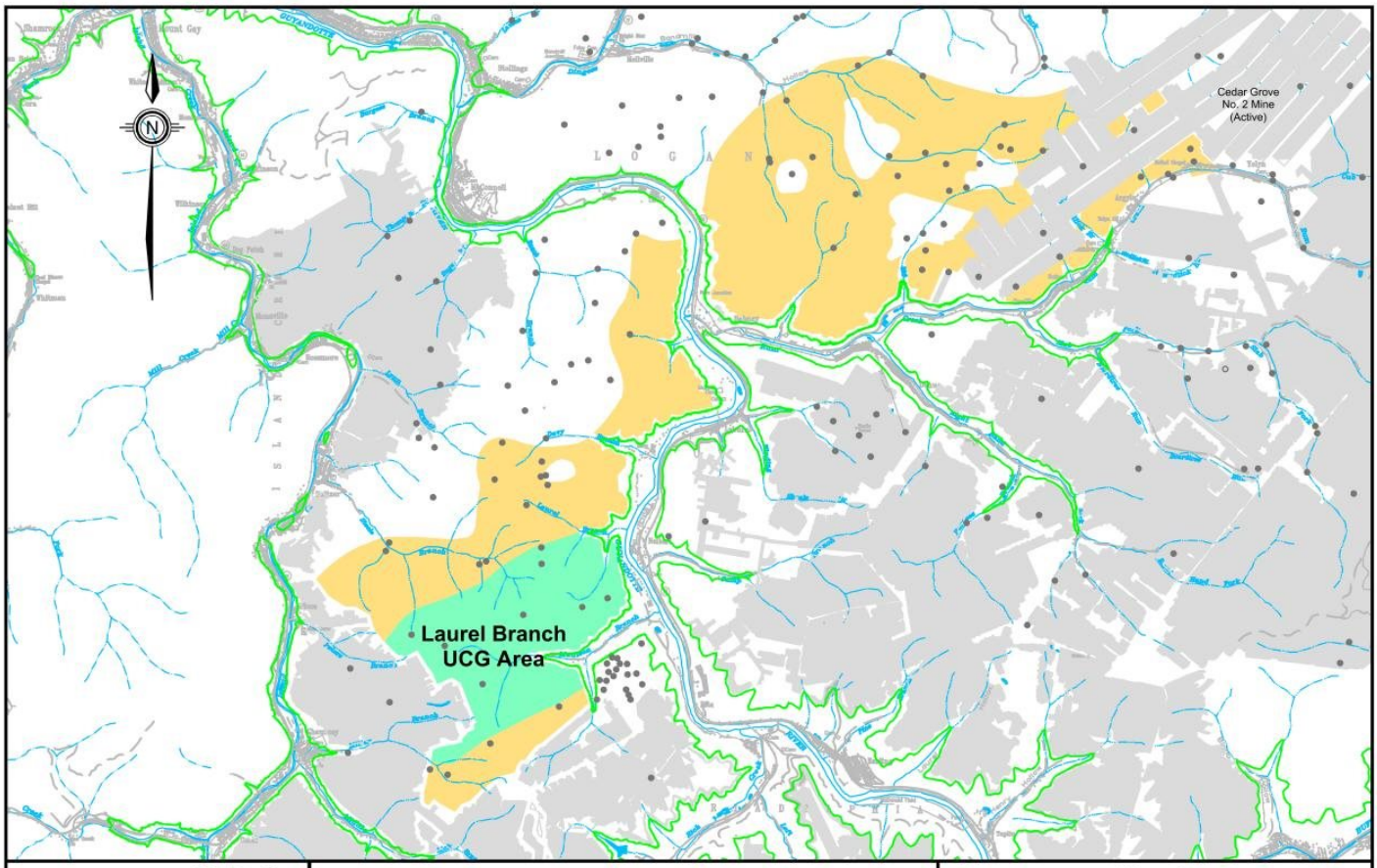
Map 1

Aracoma Area
Upper Chilton Seam

Alpha Metallurgical Resource, LLC

Logan & Mingo Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27



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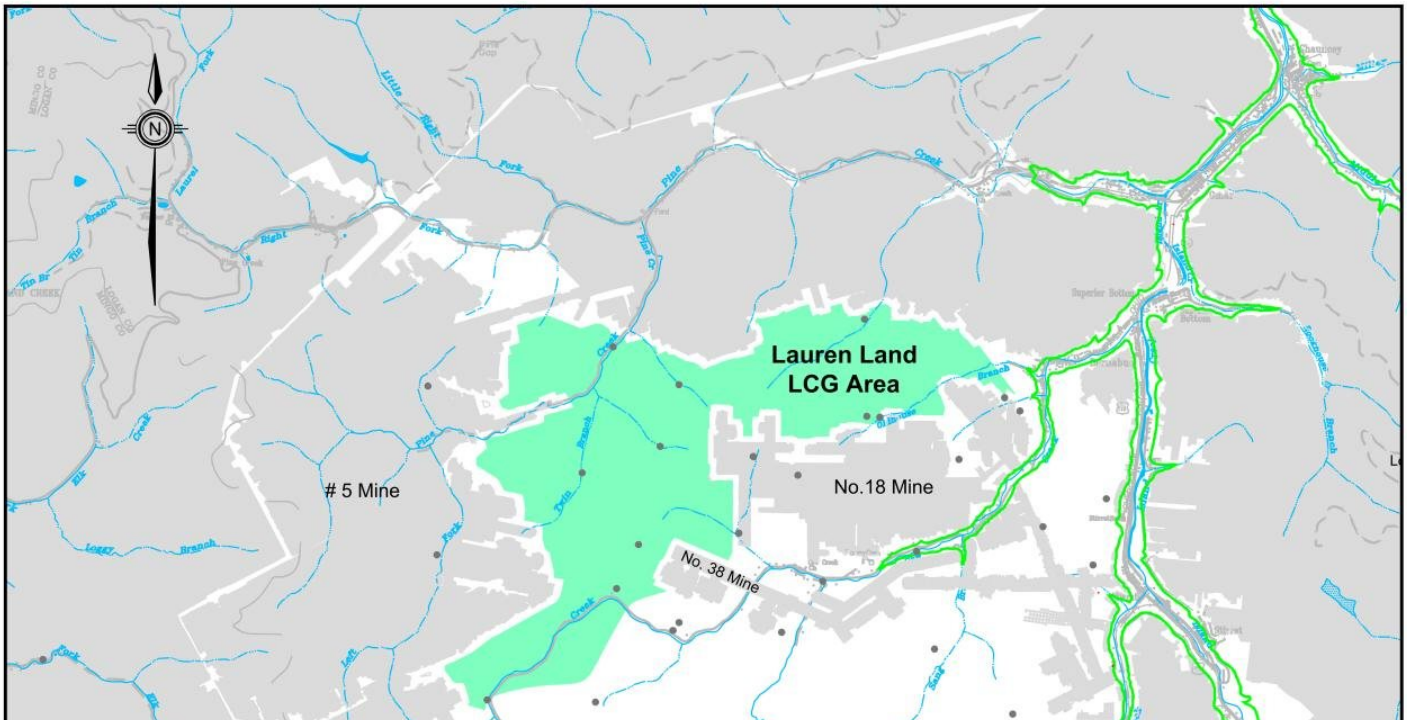
CES129 Bluefield, VA 2/22
Aracoma–UCG mh

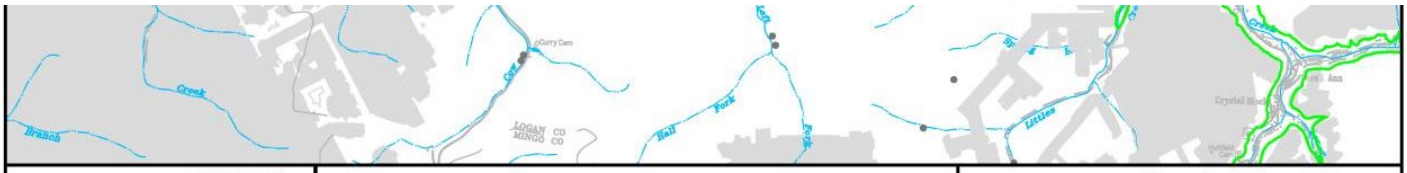
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve

0 1
Scale In Miles

Map 2
Aracoma Area
Upper Cedar Grove Seam

Alpha Metallurgical Resource, LLC
Logan County, West Virginia
Coordinate System: West Virginia South State Plane NAD 27





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CES129 Bluefield, VA 2/22
Aracoma–LCG mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

0 4000'
Scale In Feet

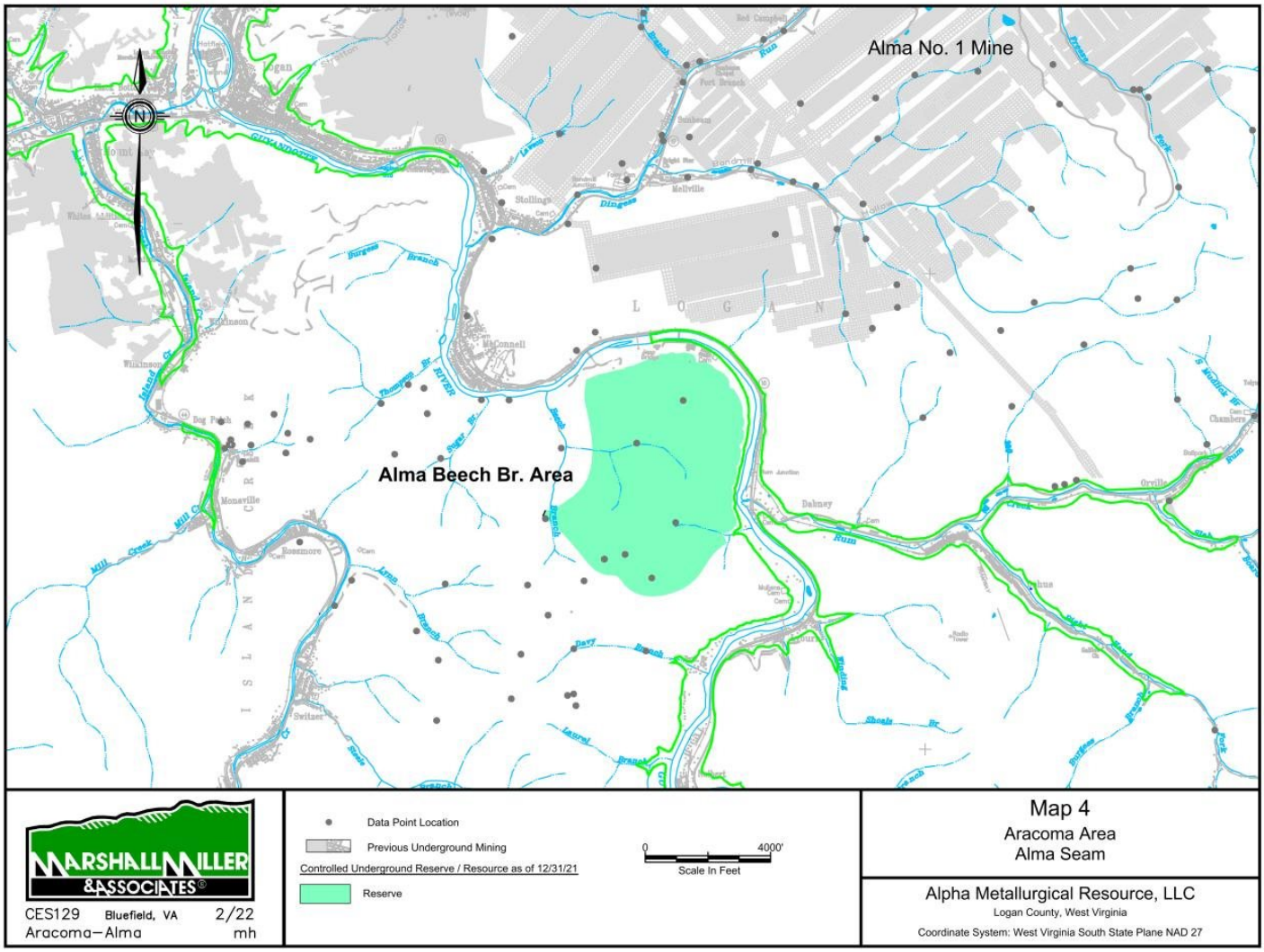
Map 3

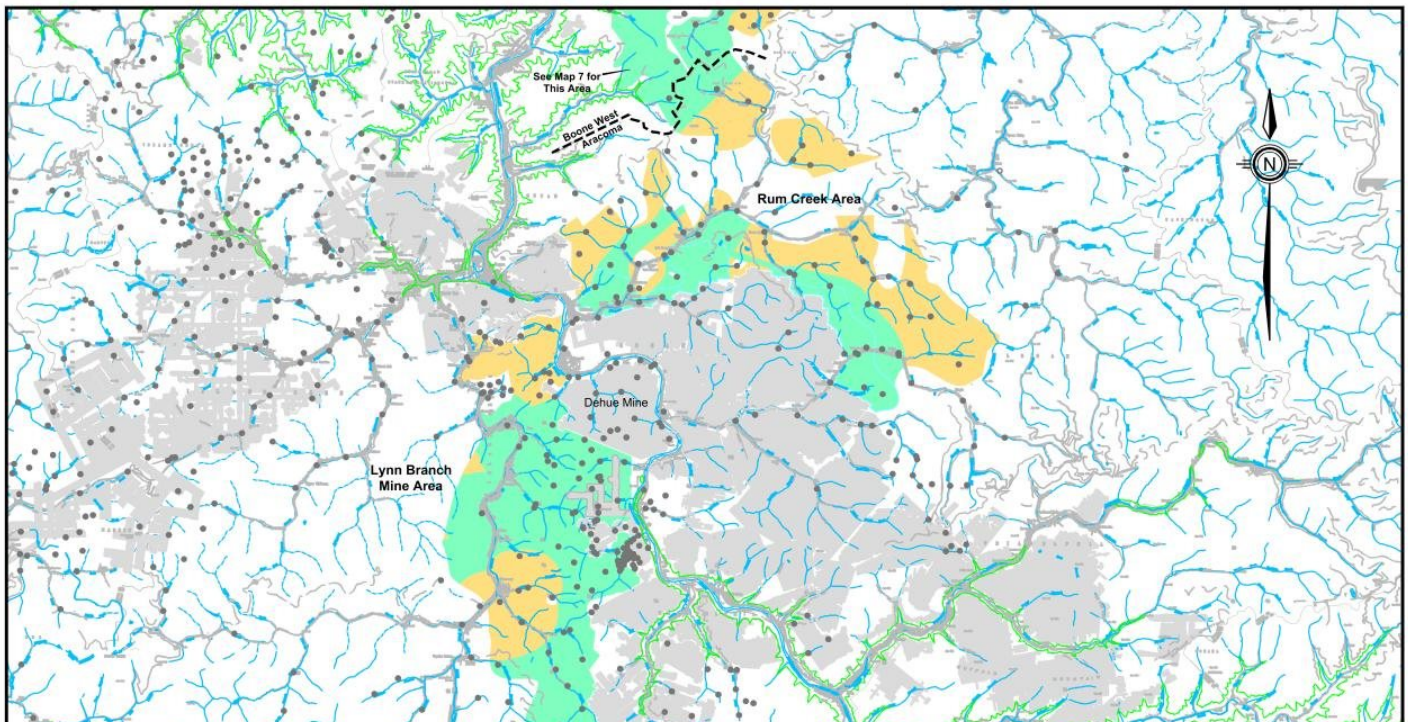
Aracoma Area
Lower Cedar Grove Seam

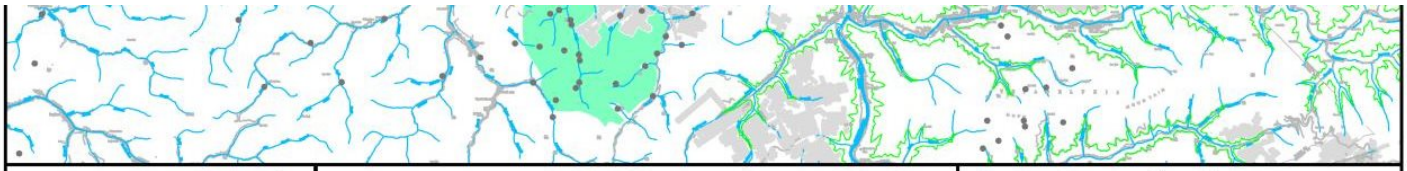
Alpha Metallurgical Resource, LLC

Logan County, West Virginia

Coordinate System: West Virginia South State Plane NAD 27


Alma No. 1 Mine
Alma Beech Br. Area
L O G A N
M I N G O
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
0
4000'
Scale In Feet
MARSHALL MILLER & ASSOCIATES
CES129 Bluefield, VA 2/22
Aracoma–Alma mh
Map 4
Aracoma Area
Alma Seam
Alpha Metallurgical Resource, LLC
Logan County, West Virginia
Coordinate System: West Virginia South State Plane NAD 27


See Map 7 for This Area
Boone West Aracoma
Rum Creek Area
Dehue Mine
Lynn Branch Mine Area



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
Aracoma–2 Gas mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 2.5
Scale In Miles

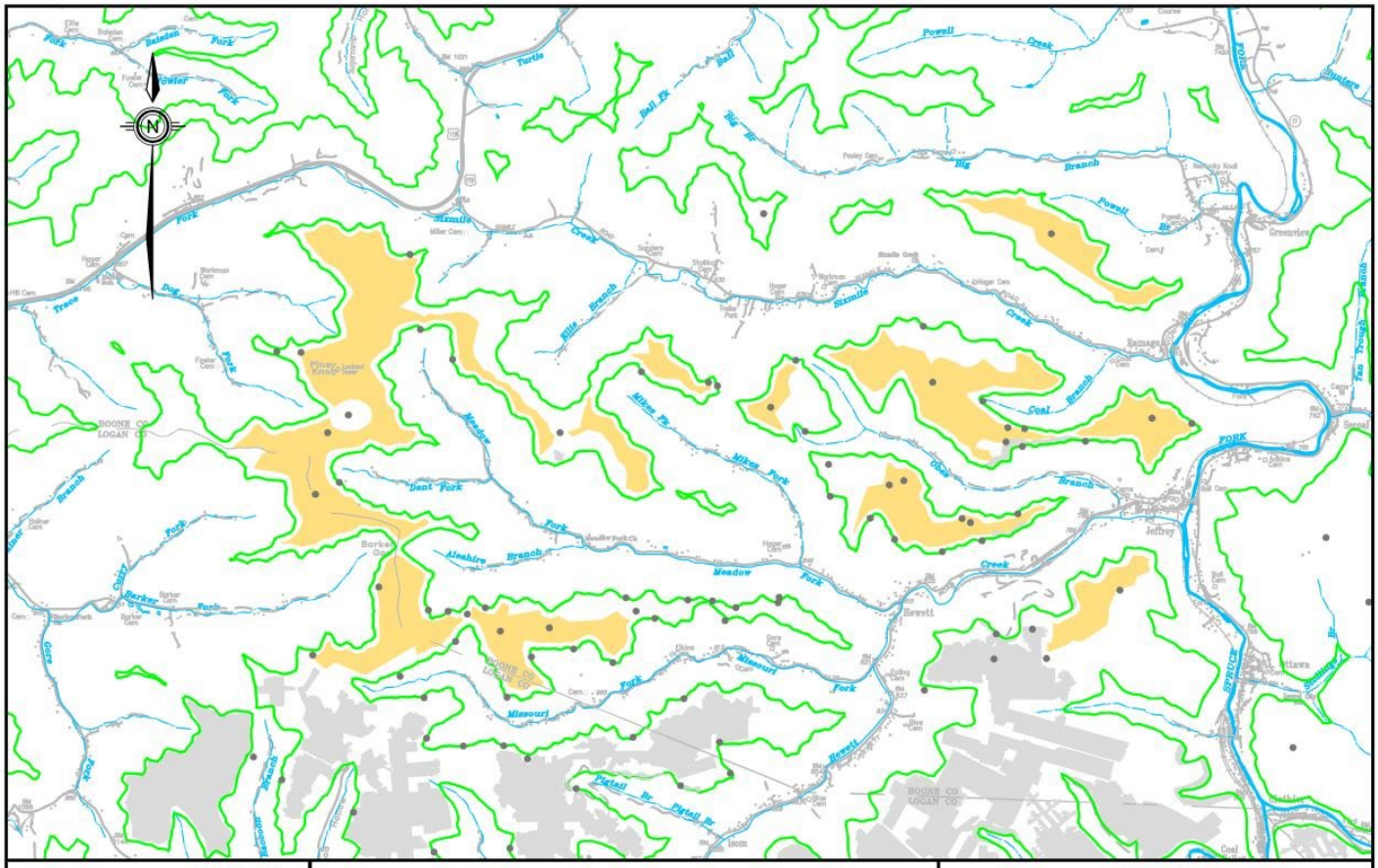
Map 5

Aracoma Area
No. 2 Gas Seam

Alpha Metallurgical Resource, LLC

Logan County, West Virginia

Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES

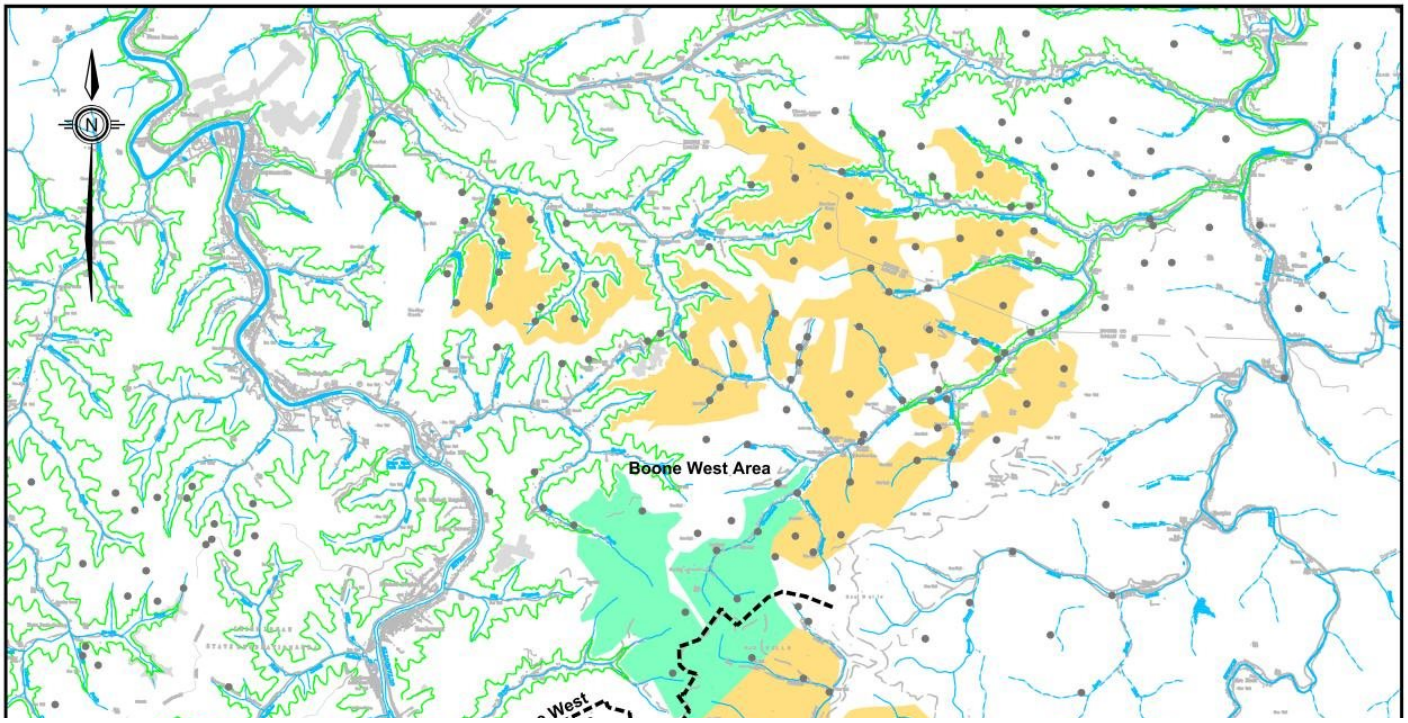
CES129 Bluefield, VA 2/22
Boone West–Chilton mh

- Data Point Location
- Previous Underground Mining
- Controlled Reserve / Resource as of 12/31/21
- Resource Exclusive of Reserve

0 4000'
Scale In Feet

Map 6
Boone West Area
Chilton Seam

Alpha Metallurgical Resource, LLC
Boone & Logan Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
Boone West–2 Gas mh

Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve

0 1.5
Scale In Miles

Map 7
Boone West Area
No. 2 Gas Seam

Alpha Metallurgical Resource, LLC
Logan & Boone Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

February 2022

Prepared for:
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Bluefield, Virginia 24605
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Statement of Use and Preparation

This Technical Report Summary (*TRS*) was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors. Copies or references to information in this report may not be used without the written permission of Alpha.

The report provides a statement of coal resources and coal reserves for **Alpha**, as defined under the **United States Securities and Exchange Commission (*SEC*)**.

The statement is based on information provided by Alpha and reviewed by various professionals within **Marshall Miller and Associates (*MM&A*)**.

MM&A professionals who contributed to the drafting of this report meet the definition of *Qualified Persons* (*QPs*), consistent with the requirements of the SEC.

The information in this TRS related to coal resources and reserves is based on, and fairly represents, information compiled by the QPs. At the time of reporting, MM&A's QPs have sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity they are undertaking to qualify as a QP as defined by the SEC.

Certain information set forth in this report contains "forward-looking information", including production, productivity, operating costs, capital costs, sales prices, and other assumptions. These statements are not guarantees of future performance and undue reliance should not be placed on them. The assumptions used to develop the forward-looking and the risks that could cause the actual results to differ materially are detailed in the body of this report.

Marshall Miller & Associates, Inc. (*MM&A*) hereby consents (i) to the use of the information contained in this report dated December 31, 2021, relating to estimates of coal resources and coal reserves controlled by Alpha, (ii) to the use of MM&A's name, any quotations from or summarizations of this TRS in Alpha's SEC filings, and (iii) to the filing of this TRS as an exhibit to Alpha's SEC filings.

Qualified Person:	**/s/ Marshall Miller & Associates, Inc.**
Date:	February 15, 2022

Table of Contents

Title Page

Statement of Use and Preparation

Table of Contents

1 **Executive Summary 7**
- 1.1 Property Description 7
- 1.2 Ownership 8
- 1.3 Geology 9
- 1.4 Exploration Status 9
- 1.5 Operations and Development 9
- 1.6 Mineral Resource 10
- 1.7 Mineral Reserve 10
- 1.8 Capital Summary 11
- 1.9 Operating Costs 12
- 1.10 Economic Evaluation 13
  - 1.10.1 Discounted Cash Flow Analysis 16
  - 1.10.2 Sensitivity Analysis 16
- 1.11 Permitting 17
- 1.12 Conclusion and Recommendations 17

2 **Introduction 18**
- 2.1 Registrant and Terms of Reference 18
- 2.2 Information Sources 18
- 2.3 Personal Inspections 19

3 **Property Description 19**
- 3.1 Location 19
- 3.2 Titles, Claims or Leases 19
- 3.3 Mineral Rights 20
- 3.4 Encumbrances 20
- 3.5 Other Risks 20

4 **Accessibility, Climate, Local Resources, Infrastructure and Physiography 20**
- 4.1 Topography, elevation and Vegetation 20
- 4.2 Access and Transport 21
- 4.3 Proximity to Population Centers 21
- 4.4 Climate and Length of Operating Season 21

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

- 4.5 Infrastructure 22

5 **History 22**
- 5.1 Previous Operation 22
- 5.2 Previous Exploration 22

6 **Geological Setting, Mineralization and Deposit 23**
- 6.1 Regional, Local and Property Geology 23
- 6.2 Mineralization 23

6.2 Mineralization 23
6.3 Deposits 24
7 **Exploration 24**
7.1 Nature and Extent of Exploration 24
7.2 Non-Drilling Procedures and Parameters 27
7.3 Drilling Procedures 27
7.4 Hydrology 27
7.5 Geotechnical Data 28
8 **Sample Preparation Analyses and Security 28**
8.1 Prior to Sending to the Lab 28
8.2 Lab Procedures 28
9 **Data Verification 29**
9.1 Procedures of Qualified Person 29
9.2 Limitations 29
9.3 Opinion of Qualified Person 30
10 **Mineral Processing and Metallurgical Testing 30**
10.1 Testing Procedures 30
10.2 Relationship of Tests to the Whole 31
10.3 Lab Information 31
10.4 Relevant Results 31
11 **Mineral Resource Estimates 31**
11.1 Assumptions, Parameters and Methodology 31
11.1.1 Statistical Analysis 33
11.2 Resources Exclusive of Reserves 37
11.2.1 Initial Economic Assessment 38
11.3 Qualified Person's Estimates 39
11.4 Qualified Person's Opinion 40
12 **Mineral Reserve Estimates 40**
12.1 Assumptions, Parameters and Methodology 40

12.2 Mineral Reserves 42
12.2.1 Sewell Seam (*Map 1*) 42
12.2.2 Beckley Seam (*Map 2*) 42
12.2.3 Pocahontas 3 (P3) Seam (*Map 5*) 42
12.3 Qualified Person's Estimates 42
12.4 Qualified Person's Opinion 43
13 Mining Methods 44
13.1 Geotech and Hydrology 44
13.2 Production Rates 44
13.3 Mining Related Requirements 46
13.3.1 Underground 46
13.4 Required Equipment and Personnel 46
13.4.1 Underground Mines 46
13.4.1.1 Road Fork 51 46
13.4.1.2 Road Fork 52 46
13.4.1.3 Wyoming 2 47
13.4.1.4 Sewell #1 47
13.4.1.5 Sewell #2 48
13.4.1.6 P3 North 49
13.4.1.7 Beckley West Mine 49
13.4.1.8 Beckley East Mine 50
14 Processing and Recovery Methods 51
14.1 Description or Flowsheet 51
14.2 Requirements for Energy, Water, Material and Personnel 52
15 Infrastructure 52
16 Market Studies 55
16.1 Market Description 55
16.2 Price Forecasts 56
16.3 Contract Requirements 56
17 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals 57
17.1 Results of Studies 57
17.2 Requirements and Plans for Waste Disposal 57
17.3 Permit Requirements and Status 58
17.4 Local Plans, Negotiations or Agreements 61

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

17.5 Mine Closure Plans 61
17.6 Qualified Person's Opinion 61
18 Capital and Operating Costs 61
18.1 Capital Cost Estimate 61
18.2 Operating Cost Estimate 63
19 Economic Analysis 65
19.1 Economic Evaluation 65

19.1 Economic Evaluation 65
19.1.1 Introduction 65
19.1.2 Cash Flow Summary 69
19.1.3 Discounted Cash Flow Analysis 72
19.1.4 Sensitivity Analysis 72
20 **Adjacent Properties 73**
20.1 Information Used 73
21 **Other Relevant Data and Information 73**
22 **Interpretation and Conclusions 74**
22.1 Conclusion 74
22.2 Risk Factors 74
22.2.1 Governing Assumptions 75
22.2.2 Limitations 75
22.2.3 Methodology 75
22.2.4 Development of the Risk Matrix 76
22.2.4.1 Probability Level Table 77
22.2.4.2 Consequence Level Table 77
22.2.5 Categorization of Risk Levels and Color Code Convention 79
22.2.6 Description of the Coal Property 79
22.2.7 Summary of Residual Risk Ratings 80
22.2.8 Risk Factors 80
22.2.8.1 Geological and Coal Resource 80
22.2.8.2 Environmental 81
22.2.8.3 Regulatory Requirements 82
22.2.8.4 Market and Transportation 82
22.2.8.5 Mining Plan 83
22.2.8.5.1 Methane Management 83
22.2.8.5.2 Mine Fires 84
22.2.8.5.3 Ground Control 84
22.2.8.5.4 Availability of Supplies and Equipment 85

22.2.8.5.5 Labor 85
22.2.8.6 Comprehensive Health and Safety 86
23 **Recommendations 87**
24 **References 87**
25 **Reliance on Information Provided by Registrant 87**

FIGURES (IN REPORT)

Figure 1-1: Alpha's Kepler Property Location Map 8
Figure 1-2: Projected Capital Expenditures – Consolidated Kepler Operations 12
Figure 1-3: Kepler Operating Costs 13
Figure 1-4: Sensitivity of NPV 17
Figure 6-1: Kepler Stratigraphic Column 24
Figure 7-1: Kepler Cross-Section 26
Figure 11-1: Histogram of the Total Seam Thickness for the Pocahontas No. 3 Seam Present in the Kepler Complex 34
Figure 11-2: Scatter plot of the Total Seam Thickness for the Pocahontas No. 3 Seam Present in the Kepler Complex 34
Figure 11-3: Variogram of the Total Seam Thickness for the Pocahontas No. 3 Seam Present in the Kepler Complex 35
Figure 11-4: Result of DHSA for the Pocahontas No. 3 Seam Present in the Kepler Complex 36
Figure 11-5: Results of Initial Economic Assessment 39
Figure 15-1: Kepler Surface Facilities 53
Figure 15-2: Kepler Preparation Plant 54
Figure 15-3: Feats Loadout Facility 55
Figure 18-1: Projected Capital Expenditures – Consolidated Kepler Operations 62
Figure 18-2: Kepler Operating Costs 64
Figure 19-1: Projection of Sales Tons 66
Figure 19-2: Consolidated Annual Revenue 67
Figure 19-3: Revenue, Cash Costs, and EBITDA 68
Figure 19-4: Annual EBITDA 69
Figure 19-5: Net Cash Flow after Tax (Before Debt Service) 71
Figure 19-6: Sensitivity of NPV 73

TABLES (IN REPORT)

Table 1-1: Coal Resources Summary as of December 31, 2021 10
Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 11
Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 14
Table 1-4: Project Cash Flow Summary (000) 14
Table 11-1: General Reserve & Resource Criteria 32
Table 11-2: Statistical Breakdown 34

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 11-3: DHSA Results Summary for Radius from a Central Point 36
Table 11-4: Results of Initial Economic Assessment 38
Table 11-5: Coal Resources Summary as of December 31, 2021 39
Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 43
Table 13-1: Kepler Complex Underground Mine Production Schedule (x 1,000 Saleable Tons) 45
Table 16-1: Quality Specifications 55
Table 16-2: Price Forecasts 56
Table 17-1: Kepler Refuse Disposal Summary 58

Table 17-2: Kepler Mining Permits 60
Table 18-1: Summary of Capital Expenditures Schedule by Mine 62
Table 18-2: Estimated Coal Production Taxes and Sales Costs 64
Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 68
Table 19-2: Project Cash Flow Summary (000) 70
Table 22-1: Probability Level Table 77
Table 22-2: Consequence Level Table 78
Table 22-3: Risk Matrix 79
Table 22-4: Risk Assessment Matrix 80
Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2) 81
Table 22-6: Environmental (Risks 3 and 4) 82
Table 22-7: Regulatory Requirements (Risk 5) 82
Table 22-8: Market and Transportation (Risk 6) 82
Table 22-9: Market and Transportation (Risk 7) 83
Table 22-10: Methane Management (Risk 8) 84
Table 22-11: Mine Fires (Risk 9) 84
Table 22-12: Ground Control (Risk 10) 85
Table 22-13: Availability of Supplies and Equipment (Risk 11) 85
Table 22-14: Labor – Work Stoppage (Risk 12) 86
Table 22-15: Labor – Retirement (Risk 13) 86
Table 22-16: Health and Safety (Risk 14) 86
Table 25-1: Information from Registrant Relied Upon by MM&A 87

Appendices

A ..... Summary Tables
B ..... Initial Economic Assessment, Kepler Resources Exclusive of Reserves
C ..... Maps

1 Executive Summary

1.1 Property Description

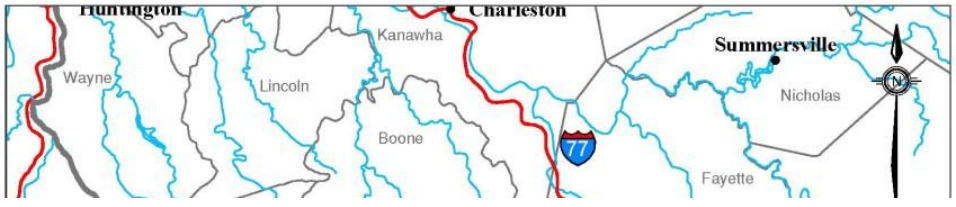
Alpha Metallurgical Resources, Inc. (*Alpha*) authorized **Marshall Miller & Associates, Inc. (*MM&A*)** to prepare this Technical Report Summary (*TRS*) of its controlled coal reserves located at the **Kepler Complex (*Kepler*)** in Wyoming County, Raleigh and McDowell counties, West Virginia.

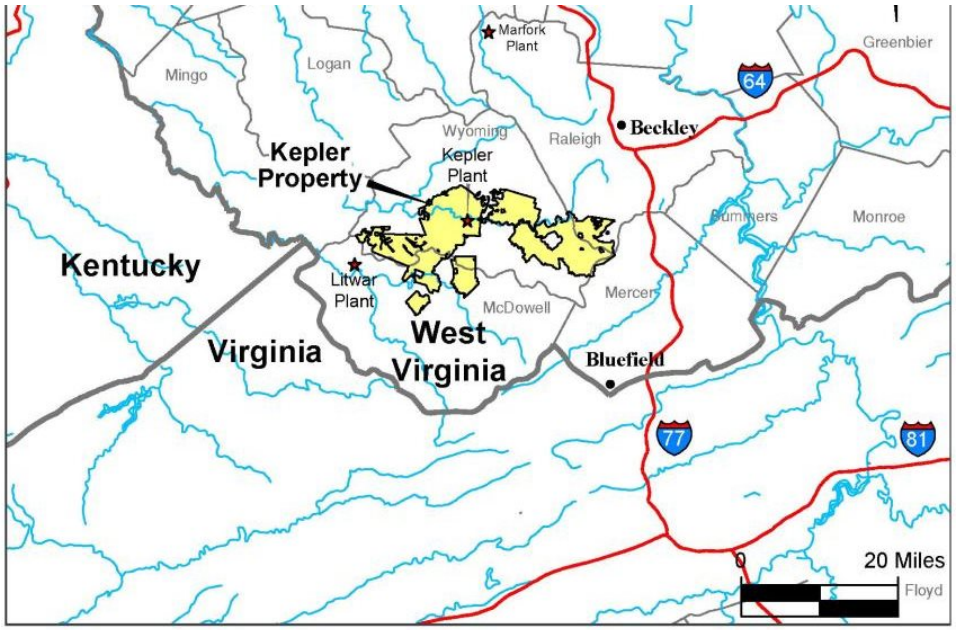
Coal resources and coal reserves are herein reported in imperial units of measurement.

Active surface facilities for the operation are located along the Guyandotte River near the Roadfork #52 mine portals and adjacent to a Norfolk Southern rail line about 1.8 miles west of the town of Pineville, West Virginia, the county seat of Wyoming County, and approximately 25 miles west southwest of Beckley (see *Figure 1-1*). The property is composed of approximately 140,000 total acres of mineral control, of which nearly all are contained within 30 separate leases. The mentioned leases are all subject to Alpha renewing the rights to extend the term of all leases which have various expiration dates, some of which expire in the next several years but are anticipated to be renewed by Alpha.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 1-1: Alpha's Kepler Property Location Map





1.2 Ownership

The Kepler property involves a complex combination of previous ownership. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)** and **Massey Energy (*Massey*)** previously held mining rights on the majority of the property. Additionally, reserves and resources associated with the former Pinnacle Mine (commonly referred to as Mine 50) were acquired by Alpha. The Pinnacle based reserves have undergone multiple ownership changes, with recent controllers including **Mission Coal**, **Cliffs Natural Resources**, **PinnOak Resources** and **US Steel**.

1.3 Geology

Operations at the Kepler Mine Complex currently extract coal from the Pocahontas No. 3 seam by underground continuous mining methods. Strata on the property are of the Pennsylvanian-age New River and Pocahontas Formations of the Pottsville Series. Seams with remaining reserve and resource potential include Pocahontas No. 3, 4, and 6 (in the Pocahontas Formation); and the Fire Creek, Beckley and Sewell (in the New River Formation). These seams are all historically utilized as coking coal and due to the high value of these coking coals, all of the seams have been extensively mined in the past. The rock formations between the coal seams are characterized by large proportions of sandstone interspersed with shale units. The coal seams reach the highest structural elevations along the southeastern margin of the property, generally dipping toward the northwest. The Pocahontas No. 3 and 4 seams are located below drainage throughout the property. With the exception of the Sewell seam which contains some reserves below drainage, reserves corresponding with the remaining seams are predominately below drainage.

1.4 Exploration Status

The Property has been extensively explored, largely by drilling using continuous coring and rotary drilling methods but also by obtaining coal measurements at mine exposures, and by downhole geophysical methods. The majority of the data was acquired or generated by previous owners of the Property. These sources comprise the primary data used in the evaluation of the coal resources and coal reserves on the Property. MM&A examined the data available for the evaluation and incorporated all pertinent information into this TRS. Where data appeared to be anomalous or not representative, that data was excluded from the digital databases and subsequent processing by MM&A.

Ongoing exploration has been carried out by Alpha since acquiring the Kepler Complex. The Alpha acquired exploration data has been consistent with past drilling activities.

1.5 Operations and Development

As of December 31, 2021, underground mine operations were active at the Roadfork #52 Mine in the Pocahontas No. 3 seam. The mine produce low-volatile metallurgical coal. The Wyoming 2 Mine in the Sewell seam was closed in October 2020.

Based on the mine plans developed as part of this TRS, annual deep mine production peaks at 1.6 million tons in 2031. Underground reserves will be depleted in 2060.

The Kepler Complex also includes the Kepler Preparation Plant in addition to the mines. The plant site includes raw coal storage, clean coal storage, a thermal dryer, a railroad loadout, and refuse disposal area. The plant has a feed rate capacity of 900 raw tons per hour with a typical product quality of 5.96% ash and, 0.80% sulfur and 19.32% volatile matter. Plant utilization averaged 50.78% in 2021.

1.6 Mineral Resource

A coal resource estimate, summarized in *Table 1-1* was prepared as of December 31, 2021, for property controlled by Alpha.

Table 1-1: Coal Resources Summary as of December 31, 2021

Mine/Area	Seam	Coal Resource (Dry Tons, In Situ)			
		Measured	Indicated	Inferred	Total

Inclusive of Reserves					
Sewell #2 West	Sewell	8,030,000	2,928,000	0	10,958,000
Sewell #1 East	Sewell	1,682,000	52,000	0	1,733,000
Proposed Beckley West Mine	Beckley	1,047,000	36,000	0	1,082,000
Proposed Beckley East Mine	Beckley	1,417,000	0	0	1,417,000
Road Fork 52	Pocahontas 3	41,241,000	30,159,000	0	71,401,000
Proposed P3 North	Pocahontas 3	9,330,000	17,842,000	0	27,172,000
Total Inclusive of Reserve		**62,747,000**	**51,016,000**	**0**	**113,763,000**
Exclusive of Reserve					
Wyoming 2	Sewell	3,180,000	254,000	0	3,434,000
Resource Only	Sewell	1,994,000	1,521,000	0	3,514,000
Resource Only	Beckley	386,000	0	0	386,000
Resource Only	Pocahontas 6	0	23,565,000	0	23,565,000
Resource Only	Pocahontas 4	13,276,000	1,474,000	0	14,750,000
Road Fork 52	Pocahontas 3	9,982,000	3,102,000	0	13,084,000
Total Exclusive of Reserve		**28,818,000**	**29,916,000**	**0**	**58,734,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Totals may not add due to rounding.
See Appendix A for a detailed breakdown.

1.7 Mineral Reserve

The Resource estimate outlined in *Table 1-1* **inclusive** of reserves has been used as the basis for this Reserve calculation, which utilizes a reasonable Preliminary Feasibility Study, a Life-of Mine (*LOM*) Mine Plan and practical recovery factors. Production modeling was completed with an effective start date of January 1, 2022.

Factors that would typically preclude conversion of a coal resource to coal reserve, which include the following: inferred resource classification; absence of coal quality; poor mine recovery; lack of access; geological encumbrances associated with overlying and underlying strata; seam thinning; structural complication; and insufficient exploration have all been considered. Reserve consideration excludes those portions of the resource area, which exhibit the aforementioned geological and operational encumbrances.

Proven and probable coal reserves were derived from the defined in-situ coal resource considering relevant processing, economic (including technical estimates of capital, revenue and cost), marketing, legal, environmental, socioeconomic, and regulatory factors. The proven and probable coal reserves on the Property are summarized below in *Table 1-2*.

Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

Mine	Seam	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
		By Reliability Category			By Control Type				
		Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%*
Sewell #2 West	Sewell	3,222,000	1,220,000	4,442,000	3,000	4,438,000	3	0.5	24
Sewell #1 East	Sewell	581,000	3,000	584,000	0	584,000	4	0.7	23
Proposed Beckley West Mine	Beckley	419,000	10,000	429,000	0	429,000	4	1.3	-
Proposed Beckley East Mine	Beckley	488,000	0	488,000	0	488,000	4	1.3	-
Road Fork 52	Pocahontas 3	18,275,000	13,061,000	31,337,000	255,000	31,082,000	6	0.9	19
Proposed P3 North	Pocahontas 3	3,846,000	7,486,000	11,332,000	0	11,332,000	6	0.8	20
Grand Total		**26,830,000**	**21,780,000**	**48,610,000**	**258,000**	**48,352,000**	**5**	**0.8**	**20**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core hole. The combination of surface and inherent moisture is modeled at 6.5-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
**Volatile Matter analysis is not available for the Beckley seam reserve areas. The Beckley reserves are priced as a Mid-Vol. product.*
Totals may not add due to rounding.
See Appendix A for a detailed breakdown.

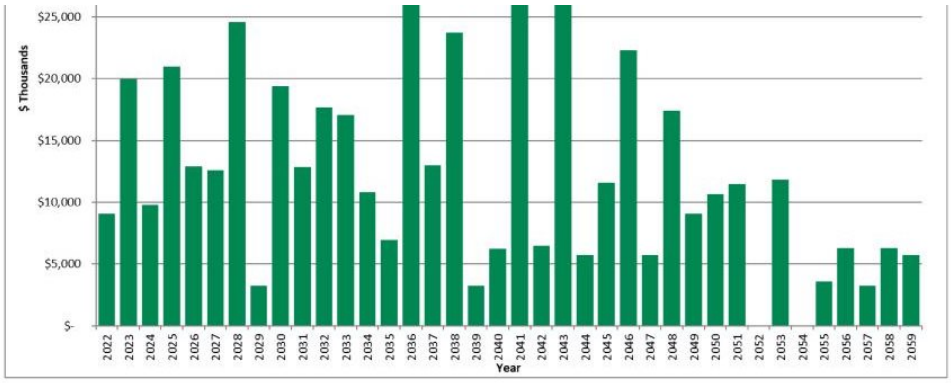
In summary, Alpha controls a total of 48.61 Mt (moist basis) of marketable coal reserves at Kepler as of December 31, 2021. Of that total, 55 percent are proven, and 45 percent are probable. Of the 48.61 Mt tons, 20.10 Mt are permitted coal reserves and 28.51 Mt are not permitted coal reserves. Of the total, 39.29 is classified as metallurgical and 9.32 is classified as steam. The maps included in *Appendix C* reflect mining depletion at the time of the resource/reserve calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

1.8 Capital Summary

Alpha provided MM&A with information related to the number of currently operating production units at Kepler. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated Kepler operations is provided in *Figure 1-2* below.

Figure 1-2: Projected Capital Expenditures – Consolidated Kepler Operations



1.9 Operating Costs

Alpha provided historical costs and budgeted projections of operating costs for its mines that were active in 2019 (Roadfork #51 and Wyoming #2) and 2020 (Roadfork #52) for MM&A's review. MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for the mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

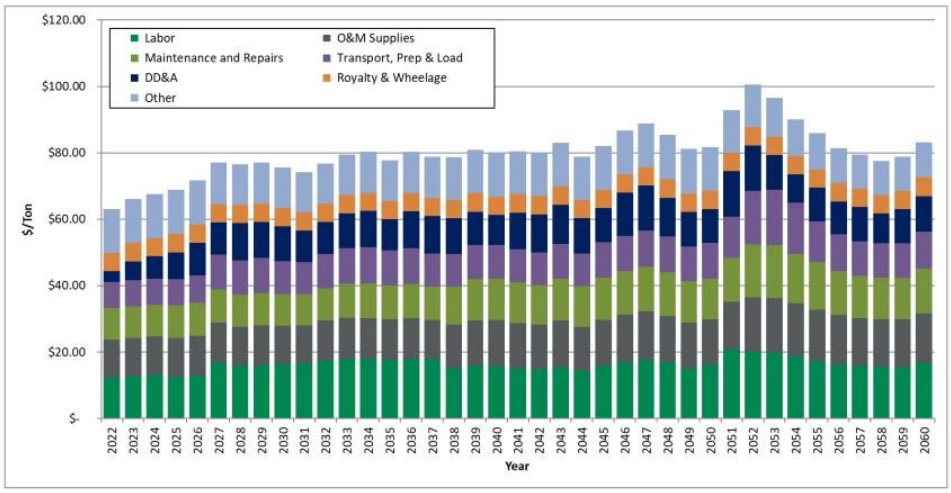
Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long term

realization of $144 per short ton port pricing, with an average $110.20 per ton netback pricing reflective of the low-volatile product currently sold at Kepler. These estimates are based on long-term pricing published by third-party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha and their Kepler business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the Kepler business unit.

A summary of the projected operating costs for the consolidated Kepler operations is provided in *Figure 1-3*.

Figure 1-3: Kepler Operating Costs



1.10 Economic Evaluation

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and

indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation, refuse disposal, coal loading, reclamation and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

Table 1-3 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at Kepler.

Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
P3 North	11,332	$258,761	$22.83	$393,458	$34.72
Road Fork 52	31,763	$1,159,339	$36.50	$1,464,821	$46.12
Sewell #1	584	$1,619	$2.77	$8,742	$14.98
Sewell #2	4,442	$84,306	$18.98	$134,333	$30.24
Beckley East	488	$5,861	$12.02	$6,737	$13.82
Beckley West	429	$1,612	$3.76	$5,820	$13.58
Consolidated Deep Mines	**49,037**	**$1,511,497**	**$30.82**	**$2,013,911**	**$41.07**

Note: (1) LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (426,390 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 1-3,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated Kepler operations show positive LOM P&L and EBITDA of $1.5 billion and $2.0 billion, respectively.

Alpha's consolidated Kepler cash flow summary in constant dollars, excluding debt service, is shown in *Table 1-4* below.

Table 1-4: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	49,037	320	1,182	1,143	1,121	1,181	1,147
Total Revenue	$5,403,712	$35,617	$131,576	$127,254	$124,763	$131,416	$127,621
EBITDA	$2,013,911	$16,632	$60,743	$58,208	$56,528	$59,561	$56,456
Net Income	$1,205,212	$11,585	$44,580	$40,050	$38,352	$39,422	$35,276
Net Cash Provided by Operating Activities	$1,707,626	$10,496	$40,065	$47,412	$46,627	$48,712	$47,356
Purchases of Property, Plant, and Equipment	($472,453)	$0	($9,056)	($19,976)	($9,770)	($20,961)	($12,877)
Net Cash Flow	$1,235,173	$10,496	$31,009	$27,436	$36,857	$27,751	$34,480

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	1,504	1,600	1,579	1,619	1,647	1,564	1,509
Total Revenue	$164,022	$174,067	$172,018	$176,113	$178,913	$169,718	$163,676
EBITDA	$62,674	$69,489	$67,363	$70,702	$72,605	$64,833	$59,665
Net Income	$37,739	$39,730	$39,723	$42,411	$44,889	$39,678	$34,886
Net Cash Provided by Operating Activities	$51,220	$57,184	$57,819	$59,536	$60,321	$56,654	$52,205
Purchases of Property, Plant, and Equipment	($12,570)	($24,604)	($3,240)	($19,383)	($12,821)	($17,689)	($17,080)
Net Cash Flow	$38,650	$32,580	$54,579	$40,153	$47,500	$38,965	$35,125

	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	1,519	1,540	1,525	1,611	1,518	1,487	1,493
Total Revenue	$164,968	$167,004	$165,537	$175,617	$167,981	$165,464	$166,163
EBITDA	$59,521	$61,868	$60,275	$66,860	$64,742	$59,999	$60,277
Net Income	$34,300	$38,080	$33,617	$38,318	$39,035	$36,832	$38,202
Net Cash Provided by Operating Activities	$51,434	$52,819	$51,675	$56,086	$56,362	$53,299	$52,377
Purchases of Property, Plant, and Equipment	($10,784)	($6,935)	($34,195)	($12,988)	($23,709)	($3,240)	($6,240)
Net Cash Flow	$40,650	$45,884	$17,480	$43,098	$32,653	$50,059	$46,137

	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	1,561	1,587	1,516	1,629	1,481	1,387	1,332
Total Revenue	$173,718	$176,659	$168,743	$181,245	$164,783	$154,341	$148,218
EBITDA	$65,244	$67,852	$60,741	$70,016	$58,587	$51,929	$47,731
Net Income	$37,588	$38,974	$34,278	$41,706	$34,800	$26,313	$23,650
Net Cash Provided by Operating Activities	$54,728	$57,603	$54,453	$58,130	$53,206	$46,623	$43,498
Purchases of Property, Plant, and Equipment	($29,374)	($6,494)	($27,423)	($5,744)	($11,574)	($22,315)	($5,744)
Net Cash Flow	$25,354	$51,109	$27,029	$52,386	$41,632	$24,308	$37,754

	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	1,405	1,561	1,440	1,104	657	672	708
Total Revenue	$156,342	$173,766	$159,362	$121,240	$71,427	$72,971	$76,845
EBITDA	$52,601	$63,417	$56,226	$33,709	$14,214	$15,172	$19,151
Net Income	$29,259	$36,829	$33,387	$14,771	$5,267	$8,066	$12,821
Net Cash Provided by Operating Activities	$45,922	$52,564	$50,632	$35,501	$4,839	$10,641	$16,095
Purchases of Property, Plant, and Equipment	($17,424)	($9,091)	($10,678)	($11,495)	$0	($11,839)	$0
Net Cash Flow	$28,498	$43,474	$39,954	$24,006	$4,839	($1,198)	$16,095

	YE 12/31 2055	YE 12/31 2056	YE 12/31 2057	YE 12/31 2058	YE 12/31 2059	YE 12/31 2060	YE 12/31 2061
Production & Sales tons	547	547	567	573	574	380	0
Total Revenue	$60,626	$60,871	$63,113	$63,734	$63,892	$42,308	$0
EBITDA	$19,154	$21,742	$23,847	$24,437	$24,584	$14,758	($117)
Net Income	$13,345	$14,396	$14,467	$15,493	$14,560	$8,948	($233)
Net Cash Provided by Operating Activities	$18,170	$18,250	$20,001	$20,582	$20,567	$18,116	($1,294)
Purchases of Property, Plant, and Equipment	($3,584)	($6,285)	($3,240)	($6,285)	($5,744)	$0	$0
Net Cash Flow	$14,586	$11,965	$16,761	$14,297	$14,823	$18,116	($1,294)

	YE 12/31 2062	YE 12/31 2063	YE 12/31 2064	YE 12/31 2065	YE 12/31 2066	YE 12/31 2067	YE 12/31 2068
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0
EBITDA	($46)	($23)	($12)	($6)	$0	$0	$0
Net Income	($93)	($47)	($24)	($12)	$0	$0	$0
Net Cash Provided by Operating Activities	($431)	($216)	($108)	($108)	$0	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($431)	($216)	($108)	($108)	$0	$0	$0

(1) LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (426,390 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
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Central Appalachian Coal Basin
West Virginia, USA

Consolidated cash flows are driven by annual sales tonnage, which grows from 1.2 million tons in 2022 to a peak of 1.6 million tons in 2031. Between years 2032 and 2051, sales ranges from 1.1 million to 1.6 million tons and between years 2052-2060, sales range from 0.4 million tons to 0.7 million tons. Projected consolidated revenue grows from $131.6 million in 2022 to a peak of $178.9 million in 2031. Revenue totals $5.4 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow

exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $60.3 million in 2031 and totals $1.7 billion over the project life. Capital expenditures total $72.6 million during the first five years and $472.5 million over the project's life.

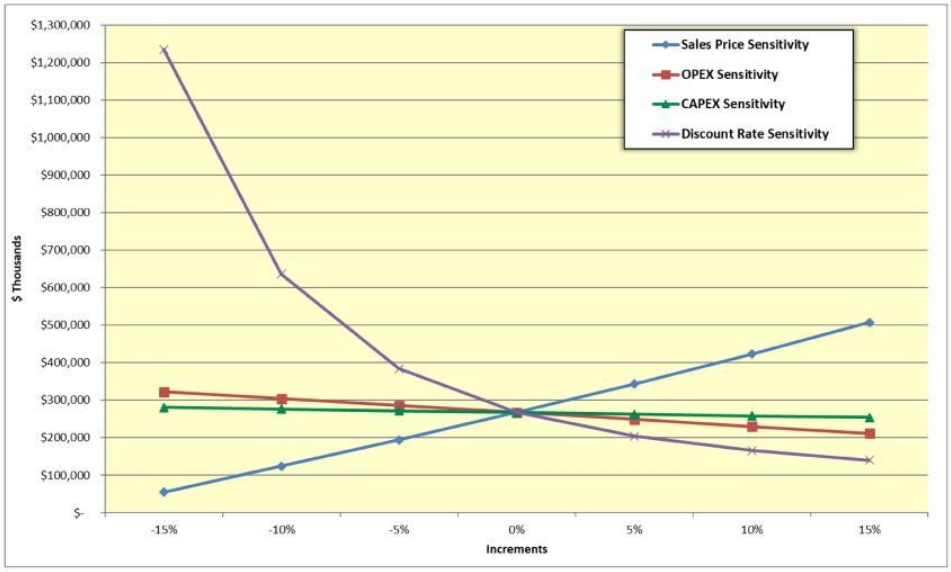
1.10.1 Discounted Cash Flow Analysis

Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $267.3 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the Kepler reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its Kepler assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

1.10.2 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs, and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 1-4: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

1.11 Permitting

Alpha has obtained all mining and discharge permits to operate its active mines and processing, loadout or related support facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Kepler, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

1.12 Conclusion and Recommendations

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Kepler Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study concludes that the 48.61 Mt of marketable underground coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

operation costs, and capital expenditures.

2 Introduction

2.1 Registrant and Terms of Reference

This report was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors.

The report provides a statement of coal reserves for Alpha. Exploration results and Resource calculations were used as the basis for the mine planning and the preliminary feasibility study completed to determine the extent and viability of the reserve.

2.2 Information Sources

The technical report is based on information provided by Alpha and reviewed by MM&A's professionals, including geologists, mining engineers, civil engineers, and environmental scientists. MM&A's professionals hold professional registrations and memberships which qualify them as Qualified Persons in accordance with SEC guidelines.

Alpha engaged MM&A to conduct a coal reserve evaluation of the Alpha coal properties as of December 31, 2021. For the evaluation, the following tasks were to be completed:

> Conduct site visits of the mines and mine infrastructure facilities;

> Process the information supporting the estimation of coal resources and reserves into geological models;

> Develop life-of-reserve mine (*LOM*) plans and financial models;

> Hold discussions with Alpha company management; and

> Prepare and issue a Technical Report Summary providing a statement of coal reserves which would include:

- A description of the mines and facilities.

- A description of the evaluation process.
- An estimation of coal reserves with compliance elements as stated under the new SEC Guidelines which will become effective for the first fiscal year commencing on or after January 1, 2021.

2.3 Personal Inspections

MM&A is very familiar with Kepler, having provided a variety of services in recent years and QP's involved in this TRS have conducted multiple site visits.

3 Property Description

3.1 Location

The Kepler Mine Complex is located in the Central Appalachian Basin in southern West Virginia (see *Figure 1-1*) approximately 2 miles west of Pineville, the county seat of Wyoming County and 25 miles west southwest of Beckley, which is the county seat of Raleigh County. Surface facilities for the operation are located along the Guyandotte River near the Roadfork #52 portal and adjacent to a Norfolk Southern rail line. Numerous small communities are present throughout the property such as Marianna, Slab Fork, and Wyoming.

The nearest major population centers are Charleston, West Virginia (53 miles north), Bristol, Virginia (75 miles south), Roanoke, Virginia (90 miles east), and Morgantown, West Virginia (166 miles north), and Lexington, KY (165 miles west) . The property is located on the following **United States Geological Survey (*USGS*)** Quadrangles: Oceana, Matheny, McGraws, Gilbert, Baileysville, Pineville, Mullens, Rhodell, Odd, Iaeger, Davy, Welch, Keystone, Crumpler, and Matoaka. The coordinate system and datum used for the model of the Greenbrier Mine complex and the subsequent maps were produced in the West Virginia State Plane South system, NAD 27.

3.2 Titles, Claims or Leases

The property is composed of over 140,000 total acres of mineral control, nearly all of which is leased. Alpha's control is comprised of over 30 separate leases with varying expiration dates. Some leases expire over the next several years, but Alpha does not anticipate any challenges related to lease renewal. MM&A has not carried out a separate title verification for the coal properties and has not verified leases, deeds, surveys or other property control instruments pertinent to the subject resources. Alpha has represented to MM&A that it controls the mining rights to the reserves as shown on its property maps, and MM&A has accepted these as being a true and accurate depiction of the mineral rights controlled by Alpha. The TRS assumes the property is developed under responsible and experienced management.

3.3 Mineral Rights

Alpha supplied property control maps to MM&A related to properties for which mineral and/or surface property are controlled by Alpha. While MM&A accepted these representations as being true and accurate, through past knowledge of the Property MM&A has no knowledge of past property boundary disputes or other concerns that could impact future mining operations or development potential.

Property control in Appalachia can be intricate. Coal mining properties are typically composed of

numerous property tracts which are owned and/or leased from both land holding companies and private individuals or companies. It is common to encounter severed ownership, with different entities or individuals controlling the surface and mineral rights. Mineral control in the region is typically characterized by leases or ownership of larger tracts of land, with surface control generally comprised of smaller tracts, particularly in developed areas.

Control of the surface property is necessary to conduct surface mining but is not necessary to conduct underground mining aside from relatively limited areas required for seam access or ventilation infrastructure. Alpha's executive management team has a history of mining in Central Appalachia and has conveyed to MM&A that it has been successful in acquiring surface rights where needed for past operations.

3.4 Encumbrances

No Title Encumbrances are known. By assignment, MM&A did not complete a query related to Title Encumbrances.

3.5 Other Risks

There is always risk involved in property control. As is common practice, Alpha, and its predecessors, have had their legal teams examine the deeds and title control in order to minimize this risk. Historically, property control has not posed any significant challenges related to Kepler's operations.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, elevation and Vegetation

Topography of the area surrounding the Kepler mine complex is typical of the Central Appalachian Plateau's physiographic province, being rugged and deeply dissected by v-shaped river valleys and flanked by steep-sided upland regions. Slopes in the area are mostly steep to very steep with some gently sloping with relatively narrow ridges. Surface elevations near the mine complex range from approximately 1,200 feet above sea level at streams to approximately 2,200 feet at ridge tops. The

area is heavily vegetated and has a significant amount of hardwood forests. The property is not situated near any major urban centers.

4.2 Access and Transport

There is general access to the Kepler property via a well-developed network of primary, secondary, and unimproved roads. Interstates 64 and 77 converge at Beckley, WV, and are the primary roads in the area connecting to Beckley, Charleston, and Huntington, West Virginia, to the West and Lexington, Virginia, to the East. Numerous secondary and unimproved roads provide direct access to the mine property, some being federal-, state-, and town-maintained. These include State Route 97 running east-west and State Route 16 running north-south from Pineville to Welch and east-west from Pineville to Mullens. These roads typically stay open throughout the year. Within the property, unimproved roads are utilized to access gas drainage wells and surface based deep mine infrastructure. An Alpha-owned loadout area and a Norfolk Southern rail line are located approximately 2 miles west of the town of Pineville and serve as the primary transport means of processed coal. Kepler also has access to the CSX rail line through the Feats loadout located near Holden West Virginia along State Route 119.

4.3 Proximity to Population Centers

The Kepler Mine Complex is located near the towns of Pineville and Welch and communities of Marianna, Wyoming, New Richmond and Itmann, primarily in Wyoming County, West Virginia, with small portions falling in Raleigh and McDowell Counties. There are no large population centers within close proximity. The nearest major population centers are Charleston, West Virginia (53 miles north), Bristol, Virginia (75 miles south), Roanoke, Virginia (90 miles east), and Morgantown, West Virginia (166 miles north), and Lexington, KY (165 miles west). As of the 2010 census, Wyoming County had 23,796 residents.

4.4 Climate and Length of Operating Season

The climate of the region is classified as humid continental with four distinct seasons: warm summers, cold winters, and moderate fall and spring seasons. Precipitation in the region is consistent throughout the year, approximately 3 to 5 inches per month, with the most rain falling in spring and the early months of summer. Average yearly precipitation is 45.8 inches. Summer months typically begin in late May and end in early September and range in average temperature from 50 to 83 degrees Fahrenheit. Winters typically begin in mid to late November and run until mid to late March with average temperatures ranging from 23 to 54 degrees Fahrenheit. Precipitation in the winter typically comes in the form of snowfall or as a wintery mix (sleet and snow) with severe snowfall events occurring occasionally. Seasonal variations in climate typically do not affect underground mining in West Virginia. However, weather events could potentially negatively impact efficiency of surface and preparation plant operations on a very limited basis and lasting less than a few days.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

4.5 Infrastructure

The Kepler Mine Complex has sources of water, power, personnel, and supplies readily available for use. Personnel have historically been sourced from the surrounding communities in Wyoming, Raleigh, McDowell Counties, and have proven to be adequate in numbers to conduct mining operations. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners. Water is sourced locally from public water sources or rivers, and electricity is sourced from **Appalachian Power**, a subsidiary of **American Electric Power (*AEP*)**. The

service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc. Alpha's Kepler preparation plant services consumers with washed coal, which is transported via the adjacent Norfolk Southern rail line at the Kepler loadout or through the Feats loadout on the CSX rail line. Haul roads, primary roads, and conveyor belt systems account for transport from the various active and planned mine sites to the preparation plant.

5 History

5.1 Previous Operation

The Kepler property involves a complex combination of previous ownership. Coal mining in the area occurred for nearly a century. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)** and **Massey Energy (*Massey*)** previously held mining rights on the majority of the property. The Alpha based portions of the Kepler property were acquired from the **AMCI Group (*AMCI*)** at Alpha's inception in the mid-2000's. The Massey based assets were combined with the AMCI and Alpha assets during Alpha's acquisition of Massey in 2011. Additionally, reserves and resources associated with the former Pinnacle Mine (commonly referred to as Mine 50) were recently acquired by Alpha as a result of the **Mission Coal** bankruptcy. Mission Coal is the most recent operator of Mine 50 which utilized longwall mining methods in the Pocahontas No. 3 seam to produce low volatile coking coal. The Pinnacle based reserves have undergone multiple ownership changes, with recent controllers including, **Cliffs Natural Resources**, **PinnOak Resources** and **US Steel**.

5.2 Previous Exploration

Extensive exploration in the form of subsurface drill efforts has been carried out on the property by numerous entities, most of which efforts were completed prior to the inception of Alpha. Diamond core and rotary drilling are the primary types of exploration on the property. Data for correlation and mining conditions are derived from core descriptions and geophysical logging (e-logging). Coal-quality analyses were also employed during the core-exploration process. Development of this report included an assessment of over 2,200 coal measurements, largely comprised of exploration drill holes.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recently drilled holes.

6 Geological Setting, Mineralization and Deposit

6.1 Regional, Local and Property Geology

The property lies in the Central Appalachian Coal basin in the Appalachian Plateau physiographic province.

The coal deposits in the eastern US are the oldest and most extensively developed coal deposits in the country. The coal deposits on the Property are Carboniferous in age, being of the Pennsylvanian system. Overall, these Carboniferous coals contain two-fifths of the US's bituminous coal deposits and extend over 900 miles from northern Alabama to Pennsylvania and are part of what is known as the *Appalachian Basin*. The Appalachian Basin is more than 250 miles wide and, in some portions, contains over 60 coal seams of varying economic significance.

Seams and zones of economic significance typically range between 24 and 48 inches in thickness, with relatively little structural deformation. Regional structure is typically characterized by gently dipping strata to the northwest at one to four percent, averaging three percent

Strata on the property are of the Pennsylvanian-age New River and Pocahontas Formations of the Pottsville Series. The rock formations between the coal seams are characterized by large proportions of sandstone interspersed with shale units.

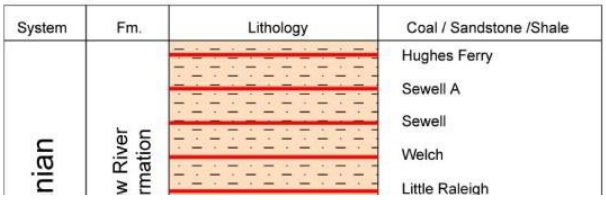
Seams mined or with remaining reserve or resource potential include, in stratigraphically ascending order the: Pocahontas 3, 4 and 6 (in the Pocahontas Formation); and the Fire Creek, Beckley and Sewell (in the New River Formation).

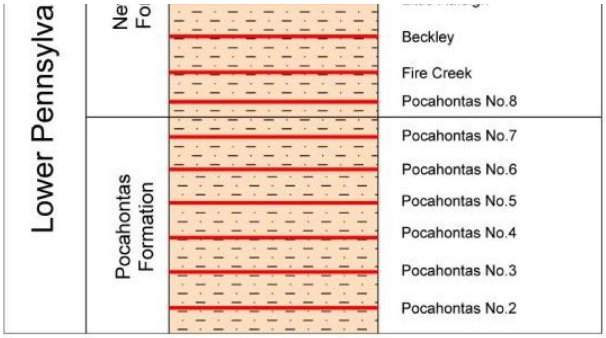
6.2 Mineralization

The generalized stratigraphic columnar section in *Figure 6-1* demonstrates the vertical relationship of the principal coal seams and rock formations on the Property.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 6-1: Kepler Stratigraphic Column





(not to scale)

6.3 Deposits

The coal produced at the Kepler complex is mainly a low-volatile, typically under 21-percent volatile matter bituminous coal. Some coal exhibit localized higher volatile zones of approximately 23-percent.

Due to the high value of these low-volatile coking coals, all of the seams have been extensively mined in the past. The coal seams reach the highest structural elevations along the southeastern margin of the property, generally dipping toward the northwest. The seams of interest are all situated both above and below drainage. The Pocahontas No. 3 reserves are located below drainage. Beckley reserves are located above drainage on the eastern portion of the property and are accessible via outcrop. The Sewell reserves, located on the western portion of the property, are located below drainage. The rock formations between the coal seams are characterized by large portions of sandstone with shale units interspersed throughout.

7 Exploration

7.1 Nature and Extent of Exploration

The Property has been extensively explored by subsurface drilling efforts carried out by numerous entities, most of which were completed prior to ownership by Alpha.

Diamond core and rotary drilling are the primary types of exploration on the Property. Diamond core drilling produces rock core samples from the hole. Data for coal bed correlations and strata mining conditions are derived from core descriptions and geophysical logging (e-logging). Geophysical logs are produced from a probe that surveys the drill hole void. Rock stratum types are interpreted from log signatures produced from the probe which commonly include a hole caliper, rock density and gamma readings. Coal-quality analyses were also employed during the core-exploration process. This study included analyzing over 2,200 measurements of coal thickness, largely composed of exploration drilling holes.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recently drilled holes.

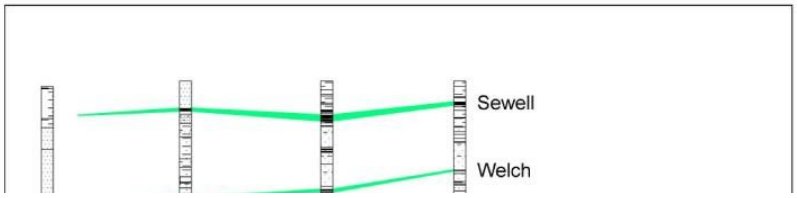
The location of the drilling is shown on the maps included in *Appendix C.*

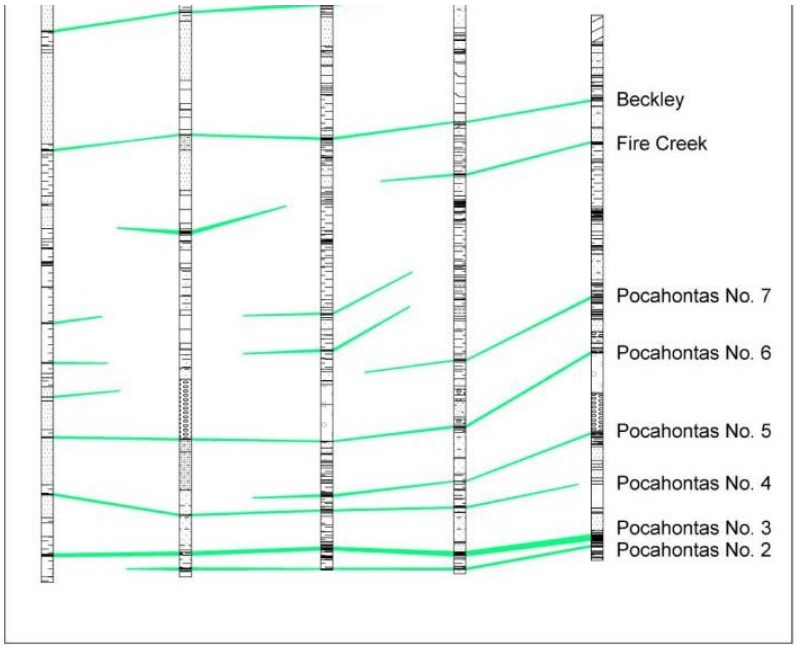
The concentration of exploration varies slightly across the property. Drilling on the property is typically sufficient for delineation of potential surface, highwall miner, and deep mineable benches. Core logging is carried out by professional geologists in cases where roof and floor strata are of particular interest and in cases where greater resolution and geologic detail are needed. However, most drill hole data come from simplified driller's logs, which often lack specific details regarding geotechnical conditions and specific geology, making correlations and floor and roof conditions difficult to determine. Geophysical logging (e-logging) techniques, by contrast, document specific details useful for geologic interpretation and mining conditions. Given the variability of data-gathering methods, *definitive* mapping of future mining conditions may not be possible, but projections and assumptions can be made within a *reasonable* degree of certainty. A significant effort was put into verifying the integrity of the database. Once this was established, stratigraphic columnar sections were generated using cross-sectional analysis to establish or confirm coal seam correlations.

A typical cross-section is shown in *Figure 7-1.*

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 7-1: Kepler Cross-Section





Due to the long history of exploration by various parties on the Property, a wide variety of survey techniques exist for documentation of data point locations. Many of the older exploration drill holes appear to have been located by survey and more recently completed drill holes are often located by high-resolution Global Positioning System (*GPS*) units. However, some holes appear to have been approximately located using USGS topography maps or other methods which are less accurate. Therefore, discretion had to be used regarding the accuracy for the location and ground surface elevation of some of these older drill holes. In instances where a drill hole location (or associated coal seam elevations) appeared to be inconsistent with the overall structural trend (or surface topography for surface-mineable areas), the data point was not honored for geological modeling. Others with apparently minor variances were adjusted or then used by MM&A.

Surveying of the underground and surface mined areas has been performed by the mine operators and/or their consulting surveyors. By assignment, MM&A did not verify the accuracy or completeness of supplied mine maps but accepted this information as being the work of responsible engineers and surveyors, as required by both State and Federal Law.

MM&A compiled comprehensive topographic map files by selecting the best available aerial mapping for each area and filling any gaps with digital USGS topographic mapping.

7.2 Non-Drilling Procedures and Parameters

Some analyses, specifically ultimate ash and sulfur types are not as prevalent as others in the testing done on samples recovered by drilling. To supplement the information database, samples have been provided from train shipments from the Kepler plant.

7.3 Drilling Procedures

Core drilling methods utilize NX-size ($2^1/_8$ inch) or similar-sized core cylinders to recover core samples, which can be used to delineate geologic characteristics, and for coal quality testing and geotechnical logging. For the core holes, the geophysical logs are especially useful in verifying the core recovery of both the coal samples (for assurance that sample is representative of the full seam) and of the roof and floor rock samples (for evaluating ground control characteristics of deep mineable coal seams). In addition to the core holes, rotary drilled holes also exist on most of the Property. Data for the rotary drilled holes is mainly derived from downhole geophysical logs, which are used to interpret coal and rock thickness and depth since logging of the drill cuttings is not reliable.

A wide variety of core-logging techniques exist for the Property. For many of the core holes, the primary data source is a generalized lithology description by the driller, typically supplemented by a more detailed core log completed by a geologist. These drilling logs were provided to MM&A as a geological database. MM&A geologists were not involved in the production of original core logs but did perform a basic check of information within the provided database. Where geophysical logs for such holes are available, they were used by MM&A geologists to verify the coal thickness and core recovery of seams.

7.4 Hydrology

Hydrologic testing and forecasting are necessary parts of the permitting process and as such are routinely considered in the mine planning process.

Kepler has a lengthy history of operation and three currently active mines with no significant hydrologic concerns or material issues experienced in its history. Future mining is projected to occur in areas exhibiting similar hydrogeological conditions as past mining. Based upon the successful history of the operation with regards to hydrogeological features, MM&A assumes that the operation will not be hindered by such issues in the future.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

7.5 Geotechnical Data

Life-of-Mine (LOM) Mining plans for potential underground mines were developed by MM&A through incorporation of budget maps from Alpha. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS*) program that was developed by the **National Institute for Occupational Safety and Health (*NIOSH*)**. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan. Coal and rock strengths from core testing are used to verify the empirical assumptions integral to ACPS.

8 Sample Preparation Analyses and Security

8.1 Prior to Sending to the Lab

Most of the coal samples have been obtained from the Property by subsurface exploration using core drilling techniques. The protocol for preparing and testing the samples has varied over time and is not well documented for the older holes drilled on the Property. Typical US core drilling sampling technique is for the coal core sample, once recovered from the core barrel, to be described then wrapped in a sealed plastic sleeve and placed into a covered core box, which is the length of the sample so that the core can be delivered to a laboratory in relatively intact condition and with original moisture content. The core identification number and the depth are scribed on the sample box lid to identify the sample. This process has been the norm for both historical and ongoing exploration activities at Kepler.

This work is typically performed by the supervising driller, geologist or company personnel. Samples are most often delivered to the company by the driller after each shift or acquired by company personnel or representatives. Most of the coal core samples were obtained by previous operators on the Property. MM&A did not participate in the collection, sampling and analysis of the majority of core samples within the exploration database. However, it is reasonable to assume, given the sophistication level of the previous operators, that these samples were generally collected and processed under industry best-practices. This assumption is based on MM&A's familiarity with the operating companies and the companies used to perform the analysis.

8.2 Lab Procedures

Coal quality testing has been performed over many years by operating companies using different laboratories and testing regimens. Some of the samples have raw analyses and washabilities on the full seam (with coal and rock parting layers co-mingled) and are mainly useful for characterizing the coal quality for projected production from underground and highwall mining. Other samples have coal and rock analyzed separately, the results of which can be manipulated to forecast either surface or underground mining quality. Care has been taken to use only those analyses that are representative of the coal quality parameters for the appropriate mining type for each sample.

Standard procedure upon receipt of core samples by the testing laboratory is to log the depth and thickness of the sample, then perform testing as specified by a representative of the operating company. Each sample is then analyzed in accordance with procedures defined under **American Society for Testing and Materials (*ASTM*)** standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

9 Data Verification

9.1 Procedures of Qualified Person

MM&A reviewed the Alpha-supplied digital geologic database and supplemented the database with its own in-house records which have been maintained for both Alpha and previous operators of the property. The database consists of data records, which include drill hole information for holes that lie within and adjacent to the Property and records for numerous supplemental coal seam thickness measurements. Once the initial integrity of the database was established, stratigraphic columnar sections were generated using cross-sectional analysis to establish or confirm coal seam correlations. Geophysical logs were used wherever available to assist in confirming the seam correlation and to verify proper seam thickness measurements and recovery of coal samples.

After establishing and/or verifying proper seam correlation, seam data control maps and geological cross-sections were generated and again used to verify seam correlations and data integrity. Once the database was fully vetted, seam thickness, base-of-seam elevation, roof and floor lithology, and overburden maps were independently generated for use in the mine planning process.

Coal quality was analyzed and summarized by MM&A's team of geologists and engineers. Quality was provided by Alpha in various database formats, laboratory data sheets, and also obtained directly from MM&A's files. Care was taken to ensure that sampled data was representative of the mineable section. In instances where minimal representative data was noted, geological tonnages were estimated based upon applying assumed densities of coal and non-coal material to thicknesses expressed in geological database files.

9.2 Limitations

As with any exploration program, localized anomalies cannot always be discovered. The greater the density of the samples taken, the less the risk. Once an area is identified as being of interest for inclusion in the mine plan, additional samples are taken to help reduce the risk in those specific areas. In general, provision is made in the mine planning portion of the study to allow for localized anomalies that are typically classed more as a nuisance than a hinderance.

9.3 Opinion of Qualified Person

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Kepler Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

10 Mineral Processing and Metallurgical Testing

10.1 Testing Procedures

Basic chemical analyses (both raw and washed quality), petrographic data, rheological data and ash, ultimate and sulfur analysis are available but not summarized for this filing. Available coal quality data sourced from MM&A's vaults (associated with former projects for Alpha and its predecessors) was tabulated by resource area in a Microsoft® EXCEL workbook. Such data contained laboratory sheets which MM&A utilized to confirm that sampled intervals were representative of geological models and confirm that appropriate laboratory procedures were utilized to derive raw and clean coal parameters. Additionally, Alpha provided MM&A with a database of its own in-house coal quality information which did **not** include backup laboratory information or sampled intervals. MM&A compared wash recovery values from Alpha's dataset to proximal holes with wash recovery data in MM&A's dataset and calculated estimates of wash recovery based upon the relative percentages of coal and rock from lithologic descriptions. In general, MM&A found that Alpha's dataset was representative and appropriate for inclusion in coal quality summaries. Quality tables also provide basic statistical analyses of the coal quality datasets, including average value; maximum and minimum values; and the number of samples available to represent each quality parameter of the seam. Coal samples that were deemed by MM&A geologists to be unrepresentative were not used for statistical analysis of coal quality, as documented in the tabulations.

Specific to the surface mine reserve areas, exploration quality was supplemented with historical pit sampling. Tabulations were completed based upon annual arithmetic averages on in-pit samples for washed quality. The general consistency in quality suggests confidence in the mines' ability to continue to produce a comparable metallurgical product.

The amount and areal extent of coal sampling for geological data is generally sufficient to represent the quality characteristics of the coal horizons and allow for proper market placement of the subject coal seams. For some of the coal deposits there are considerable laboratory data from core samples that are representative of the full extent of the resource area; and for others there are more limited data to represent the resource area. For example, in the active operations with considerable previous mining, there may be limited quality data within some of the remaining resource areas; however, in those cases

the core sampling data can be supplemented with operational data from mining and shipped quality samples representative of the resource area.

10.2 Relationship of Tests to the Whole

The extensive sampling and testing procedures typically followed in the Coal Industry result in an excellent correlation between samples and Marketable product. As shipped analyses of the coal from Kepler were reviewed to verify that the coal quality and characteristics were as expected. The Kepler Property has a long history of saleable production, under various owners, in the mid-volatile metallurgical and thermal markets, confirming exploration results.

10.3 Lab Information

Each sample is analyzed at area Laboratories that operate in accordance with procedures defined under ASTM standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

10.4 Relevant Results

No critical factors have been found that would adversely affect the recovery of the Reserve. Any quality issues that occur, either localized or generally are accounted for in the Marketing Study done for this TRS.

11 Mineral Resource Estimates

MM&A independently created a geologic model to define the coal resources at Kepler. Coal resources were estimated as of December 31, 2021.

11.1 Assumptions, Parameters and Methodology

Geological data was imported into Carlson Mining® (formerly SurvCADD®) geological modelling software in the form of Microsoft® Excel files incorporating, drill hole collars, seam and thickness picks, bottom seam elevations and raw and washed coal quality. These data files were validated prior to importing into the software. Once imported, a geologic model was created, reviewed, and verified- with a key element being a gridded model of coal seam thickness. Resource tons were estimated by using the seam thickness grid based on each valid point of observation and by defining resource confidence arcs around the points of observation. Points of observation for Measured and Indicated confidence arcs were defined for all valid drill holes that intersected the seam using standards deemed acceptable by MM&A based on a detailed geologic evaluation and a statistical analysis of all drill holes within the projected reserve areas as described in *Section 11.1.1*. The geological evaluation incorporated an

analysis of seam thickness related to depositional environments, adjacent roof and floor lithologies, and structural influences.

After validating coal seam data and establishing correlations, the thickness and elevation for seams of economic interest were used to generate a geologic model. Due to the relative structural simplicity of the deposits and the reasonable continuity of the tabular coal beds, the principal geological interpretation necessary to define the geometry of the coal deposits is the proper modeling of their thickness and elevation. Both coal thickness and quality data are deemed by MM&A to be reasonably

thickness and elevation. Both coal thickness and quality data are deemed by MM&A to be reasonably sufficient within the resource areas. Therefore, there is a reasonable level of confidence in the geologic interpretations required for coal resource determination based on the available data and the techniques applied to the data.

Table 11-1 below provides the geological mapping and coal tonnage estimation criteria used for the coal resource and reserve evaluation. These cut-off parameters have been developed by MM&A based on its experience with the Alpha Property and are typical of mining operations in the Central Appalachian coal basin. This experience includes technical and economic evaluations of numerous properties in the region for the purposes of determining the economic viability of the subject coal reserves.

Table 11-1: General Reserve & Resource Criteria

Item	Parameters	Technical Notes & Exceptions*
• **General Reserve Criteria**		
Reserve Classification	Reserve and Resource	Coal resources as reported are inclusive of coal reserves.
Reliability Categories	Reserve (Proven and Probable) Resource (Measured, Indicated & Inferred)	To better reflect geological conditions of the coal deposits, distance between points of observation is determined via statistical analysis
Effective Date of Resource Estimate	December 31, 2021	Coal resources were estimated based upon depletion maps with effective dates of September 31, 2021 with a production depletion adjustment though 12/31/21.
Effective Date of Reserve Estimate	December 31, 2021	Coal reserves were estimated based upon depletion maps with effective dates of September 31, 2021 with a production depletion adjustment though 12/31/21.
Seam Density	With raw seam analysis: SG = 1.25+(Raw Ash% / 100 In the absence of laboratory data, estimated by (1) assuming specific gravity of 1.30 for coal and 2.25 for rock parting	
• **Underground-Mineable Criteria**		
Map Thickness	Total seam thickness	
Minimum Seam Thickness	30 inches	Minor Exceptions for localized zones of thinner coal
Minimum Mining Thickness	54 inches	
Minimum Total Coal Thickness	27 inches	Minor Exceptions for localized zones of thinner coal
Minimum In-Seam Wash Recovery	Determined as function of seam thickness	
Wash Recovery Applied to Coal Reserves	Based on average yield for drill holes within reserve area, or in the absence of laboratory washability data, based on estimated visual recovery using specific gravities noted above and 95 percent yield on "clean" coal	
Out-of-Seam Dilution Thickness for Run-of-Mine Tons Applied to ROM tonnages	2 inches	

Item	Parameters	Technical Notes & Exceptions*
Mine Barrier	200-foot distance from abandoned mines and sealed or pillared areas	
Minimum Reserve Tonnage	400 thousand recoverable tons for individual area (logical mining unit)	
Minimum Overburden Depth	100 feet	
Minimum Interval to Rider Coal	Considered on a case-by-case basis, depending on interval lithology, etc.	
Minimum Interval to Overlying or Underlying Reserves	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Minimum Interval to Overlying or Underlying Mined Areas	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Adjustments Applied to Coal Reserves	6.5 percent moisture increase; 5 percent preparation plant inefficiency	

Note: Exceptions for application of these criteria to reserve estimation are made as warranted and demonstrated by either actual mining experience or detailed data that allows for empirical evaluation of mining conditions. Final classification of coal reserve is made based on the pre-feasibility evaluation.

11.1.1 Statistical Analysis

MM&A completed two statistical analyses on drill holes within the reserve boundaries. The first analysis was performed in order to determine the applicability of the common United States classification system for measured and indicated coal resources. Historically, the United States has assumed that coal within ¼-mile (1,320 feet) of a point of observation represents a measured resource whereas coal between ¼-mile (1,320 feet and ¾-mile (3,960 feet) from a point of observation is classified as indicated. Inferred resources are commonly assumed to be located between ¾-mile (3,960 feet) and 3 miles (15,840 feet) from a point of observation. Per SEC regulations, only measured and indicated resources may be considered for reserve classification, respectively as proven and probable reserves.

A general acceptable thickness variation for measured resources is approximately 20 percent. Thickness variations for indicated resources are assumed to average less than 30 percent, which is also comparable with historical standards.

MM&A extracted drill hole information from within projected reserve areas of the Kepler complex, which included coordinates (northing and easting) and seam thickness. Drill holes included diamond core and rotary holes. Since the Pocahontas No. 3 seam represents the vast majority of the reserve tonnage for the Kepler complex, data for this seam in each mineable area was extracted and processed.

Once the data was extracted, matrices were formed to calculate the distance and percent change in seam thicknesses between each combination of drill holes in the reserve area. Distances were then sorted smallest to largest and the variation in thicknesses was analyzed as a function of distance between drill holes. Ultimately, the average variation in thicknesses between drill holes at ¼-, ¾- and 3-mile intervals were calculated to determine the applicability of common US resource classification systems. The results for the Pocahontas No. 3 seam in each mining area were then compiled to form a summary.

The total number of drill holes used in this study is 216, generating a total 18,016 data points. *Table 11-2* is a breakdown of the statistics used in the study.

Table 11-2: Statistical Breakdown

Classification:	Measured	Indicated	Inferred
Distance Between Drill holes (miles):	0 – ¼	¼ - ¾	¾ - 3
Number of Data Points:	134	1,356	16,526
Average Thickness Variation:	14%	14%	21%

MM&A also performed a geostatistical analysis of the same data set using the **Drill Hole Spacing Analysis (*DHSA*)** method. This method attempts to quantify the uncertainty of applying a measurement from a central location to increasingly larger square blocks and provides recommendations for determining the distances between drill holes for measured, indicated, and inferred resources.

To perform DHSA the data set was processed to remove any erroneous data points, clustered data points, as well as directional trends. This was achieved through the use of histograms, as seen in *Figure 11-1*, color coded scatter plots showing the geospatial positioning of the borings, *Figure 11-2*, and trend analysis.

Figure 11-1: Histogram of the Total Seam Thickness for the Pocahontas No. 3 Seam Present in the Kepler Complex

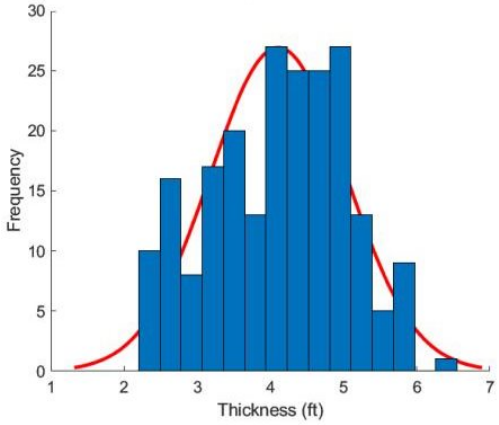
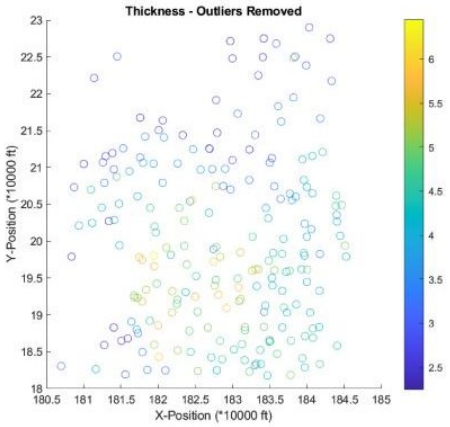


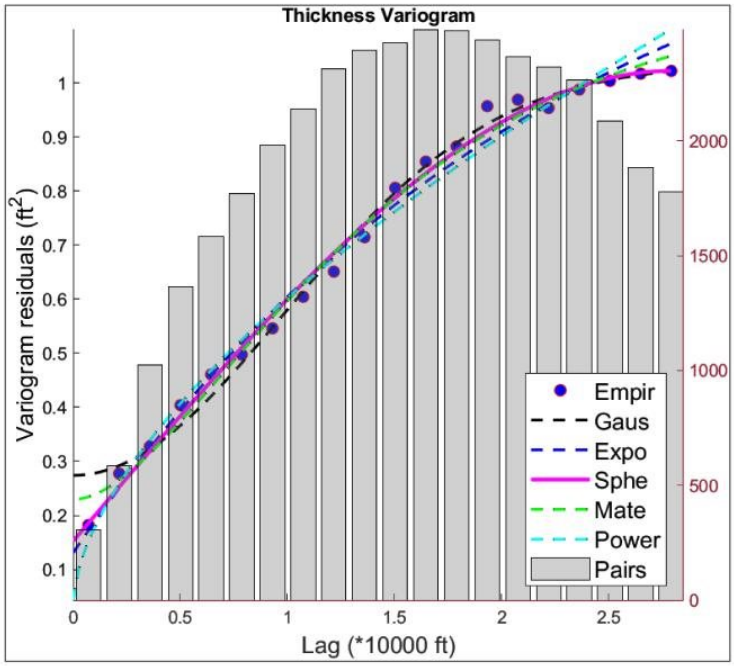
Figure 11-2: Scatter plot of the Total Seam Thickness for the Pocahontas No. 3 Seam Present in the Kepler Complex



Following the completion of data processing, a variogram of the data set was created, *Figure 11-3*. The variogram plots average square difference against the separation distance between the data pairs. The

separation distance is broken up into separate bins defined by a uniform lag distance (e.g., for a lag distance of 500 feet the bins would be 0 – 500 feet, 501 – 1,000 feet, etc.). Each pair of data points that are less than one lag distance apart are reported in the first bin. If the data pair is further apart than one lag distance but less than two lag distances apart, then the variance is reported in the second bin. The numerical average for differences reported for each bin is then plotted on the variogram. Care was taken to define the lag distance in such a way as to not overestimate any nugget effect present in the data set. Lastly, modeled equations, often spherical, gaussian, or exponential, are applied to the variogram in order to represent the data set across a continuous spectrum.

Figure 11-3: Variogram of the Total Seam Thickness for the Pocahontas No. 3 Seam Present in the Kepler Complex



The estimation variance is then calculated using information from the modeled variogram as well as charts published by Journel and Huijbregts (1978). This value estimates the variance from applying a single central measurement to increasingly larger square blocks. Care was taken to ensure any nugget effect present was added back into the data. This process was repeated for each test block size.

The final step of the process is to calculate the global estimation variance. In this step the number square blocks that would fit inside the selected study area is determined for each block size that was investigated in the previous step. The estimation variance is then divided by the number of blocks that would fit inside the study area for each test block size. Following this determination, the data is then transformed back to represent the relative error in the 95th-percentile range.

Figure 11-4 shows the results of the DHSA performed on the Pocahontas No. 3 data for the Kepler Complex. DHSA provides hole to hole spacing values, these distances need to be converted to radius

from a central point in order to compare to the historical standards. A summary of the radius data is shown in *Table 11-3*. DHSA prescribes measured, indicated, and inferred drill hole spacings be determined at the 10-percent, 20-percent, and 50-percent levels of relative error, respectively.

Figure 11-4: Result of DHSA for the Pocahontas No. 3 Seam Present in the Kepler Complex

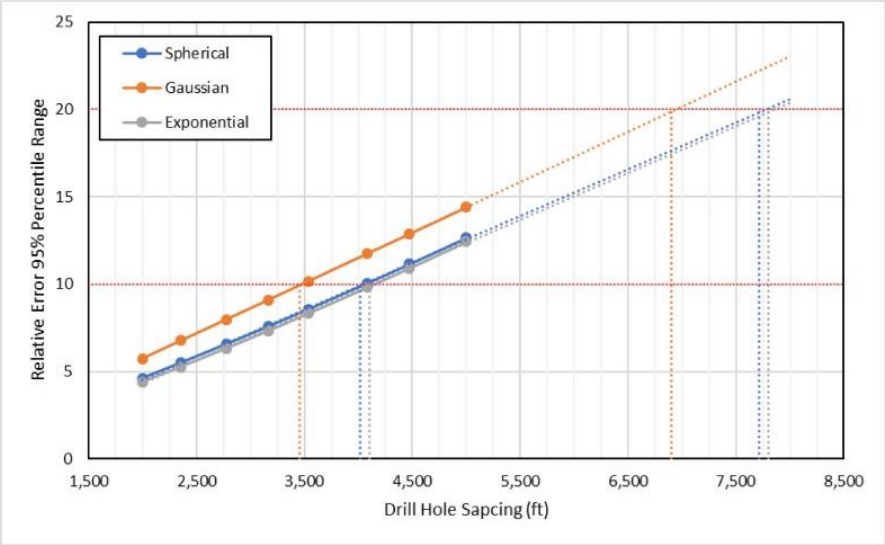


Table 11-3: DHSA Results Summary for Radius from a Central Point

Model:	Measured Radial Distance (10% Relative Error) (Miles)	Indicated Radial Distance (20% Relative Error) (Miles)	Inferred Radial Distance (50% Relative Error) (Miles)
Gaussian:	0.33	0.65	1.63
Spherical:	0.38	0.73	1.78
Exponential:	0.39	0.74	1.79

Comparing the results of the DHSA to the historical standards, it is evident that the historical standards are more conservative than even the most conservative DHSA model with regards to determining measured resources. The Gaussian model recommends using a radius of 0.33 miles for measured resources compared to the historical value of 0.25 miles. With respect to indicated resources the DHSA falls in line closely with the historical standards. The Gaussian model recommends using a radius 0.65 miles, while the spherical and exponential models recommend radiuses of 0.73 and 0.74 miles, respectively. These values line up closely with the historical radius of 0.75 miles. These results have led the QP's to report the data following the historical classification standards, rather than use the results of the DHSA.

As shown earlier, the thickness variation between holes is less than the historically accepted standards. Based on this analysis, it would be possible to extend the measured, indicated and inferred arcs slightly beyond historically accepted practices due to consistent geological settings. The QP's have again elected not to extend arc distances, introducing a level of conservatism in measured and indicated coal classification.

11.2 Resources Exclusive of Reserves

The Kepler property contains multiple resource blocks which were not deemed to exhibit reserve potential at the time of the study. These resources, formally identified as resources exclusive of reserves, are located in the Sewell, Beckley, and Pocahontas No. 4 and Pocahontas No. 6 coal seams. Reasons which may preclude elevation of resources to reserves include, but are not limited to:

1. Limited availability of quality information to document coal seam market characteristics. All Pocahontas No. 6 resources are hindered by limited quality information. It is of important note that abandoned works in the Pocahontas No. 6 seam and operations by proximal producers in the same seam demonstrate that the Pocahontas No. 6 seam has metallurgical properties.
2. Isolation of resource blocks in which seam access costs are cost prohibitive at the time of the study. The Pocahontas No. 4 resources are isolated and cannot be accessed via active or proposed mines. The resources exhibit insufficient tonnage to offset high capital requirements for seam access.
3. Unfavorable economics at the PFS level, yet economics could become attractive in the future under different market conditions.
4. Exclusion from LOM planning by mining operator due to remaining resource blocks which are relatively small, isolated blocks and not currently attractive from an operational perspective. Two resource blocks in the closed Sewell Wyoming #2 mine are not considered a reserve due to relatively small size and access through a closed mine with unknown conditions.
5. Questionable mining conditions due to historical mine maps of proximal operations appearing to cease suddenly adjacent to resource areas, requiring further evaluation to determine mineability

at the PFS level. Resources associated with the Sewell Wyomac (Block I) tonnages are located proximal to abandoned works which abruptly stopped. MM&A suspects that the abandoned works encountered seam splitting or geotechnical problems which could also negatively impact remaining resources.

11.2.1 Initial Economic Assessment

MM&A completed an initial economic assessment to determine the potential economic viability of resources exclusive of reserves. MM&A applied relevant technical factors to estimate potential

resources exclusive of reserves. MM&A applied relevant technical factors to estimate potential saleable tons without the resource blocks, should the resources be extracted via deep, continuous mining methods. MM&A developed cash cost profiles for the resource blocks, including direct cash costs (labor, supplies, roof control, maintenance and repair, power, and other); washing, trucking, materials handling, general and administrative, and environmental costs; and indirect cash costs (royalties, production taxes, property tax, insurance). Costs were developed based off relevant cost drivers (per-ft, per-raw-ton, per-clean-ton). Additionally, MM&A estimated capital costs to access resources. Capital costs associated with mine developed were amortized across the resource's potential saleable tonnages). Additional non-cash items (depreciation of equipment and depletion) and cash costs were compared to an assumed sale price of $125 per ton netback FOB loadout (approximately $162 per ton U.S. East Coast basis) for low-volatile markets. This resource assumed sales value was developed as a premium to the market-based reserve sales value to properly estimate the sales related expenses should these resources be extracted during higher-than-average market conditions. Pricing used for the primary product was selected by the QP and deemed reasonable based on a review of historical average pricing for the Kepler complex coal products over the past 5 years. Results of the analysis are shown below and demonstrate potential profitability on a fully loaded cost basis. Detailed summaries are shown in *Appendix B*.

Table 11-4: Results of Initial Economic Assessment

Seam	Resource Block	Direct Cash	Transportation, Washing, Enviro, G&A	Indirect	Non-Cash	Total Cost	Fully Loaded P&L
Sewell	B, C, D	$60.66	$20.87	$12.42	$6.68	$100.64	$24.36
Sewell	F	$70.26	$30.20	$12.42	$11.25	$124.13	$0.87
Beckley	B	$66.92	$26.12	$12.42	$6.00	$111.46	$13.54
P6	A	$51.34	$22.92	$12.42	$7.74	$94.42	$30.58
P6	B, D	$54.96	$22.41	$12.42	$6.67	$96.46	$28.54
P6	F, G	$61.91	$32.11	$12.42	$10.64	$117.09	$7.91
P3	A	$37.63	$12.56	$12.42	$6.37	$68.99	$56.01
P4	A, B	$51.41	$17.56	$12.42	$13.84	$95.23	$29.77

Figure 11-5: Results of Initial Economic Assessment

11.3 Qualified Person's Estimates

Based on the work described and detailed modelling of the areas considering all the parameters defined, a coal resource estimate, summarized in *Table 11-5*, was prepared as of December 31, 2021, for property controlled by Alpha.

Table 11-5: Coal Resources Summary as of December 31, 2021

Mine/Area	Seam	Coal Resource (Dry Tons, In Situ) Measured	Indicated	Inferred	Total
Inclusive of Reserves					
Sewell #2 West	Sewell	8,030,000	2,928,000	0	10,958,000
Sewell #1 East	Sewell	1,682,000	52,000	0	1,733,000
Proposed Beckley West Mine	Beckley	1,047,000	36,000	0	1,082,000
Proposed Beckley East Mine	Beckley	1,417,000	0	0	1,417,000
Road Fork 52	Pocahontas 3	41,241,000	30,159,000	0	71,401,000
Proposed P3 North	Pocahontas 3	9,330,000	17,842,000	0	27,172,000
Total Inclusive of Reserve		**62,747,000**	**51,016,000**	**0**	**113,763,000**
Exclusive of Reserve					
Wyoming 2	Sewell	3,180,000	254,000	0	3,434,000
Resource Only	Sewell	1,994,000	1,521,000	0	3,514,000
Resource Only	Beckley	386,000	0	0	386,000
Resource Only	Pocahontas 6	0	23,565,000	0	23,565,000
Resource Only	Pocahontas 4	13,276,000	1,474,000	0	14,750,000
Road Fork 52	Pocahontas 3	9,982,000	3,102,000	0	13,084,000
Total Exclusive of Reserve		**28,818,000**	**29,916,000**	**0**	**58,734,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Totals may not add due to rounding.
See Appendix A for a detailed breakdown.

11.4 Qualified Person's Opinion

While there is some stratigraphically controlled seam-thickness variability due to seam splitting, sand channels, etc., MM&A geologists and engineers modeled the deposit and resource areas to reflect realistic mining scenarios, giving special consideration to seam thickness, floor and roof conditions, mining equipment, etc. This statistical study demonstrates that for each configuration of mineable seams, the classification system of **measured** (0 – ¼ mile), **indicated** (¼ to ¾ mile), and **inferred** (¾ to 3 miles) is reasonably adequate to predict seam thickness variation for modeling and mining purposes.

As previously mentioned, generally accepted thickness deviation within a quarter mile is less than 20 percent. With an abundance of data points, this deposit has an average of 14 percent thickness variation between drill holes within a quarter mile and is well within acceptable values. The average thickness variation within the indicated classification from this study is 14 percent, similarly, falling below the historical standard of less than 30% variability between data points.

Based on the data review, the attendant work done to verify the data integrity and the creation of an independent Geologic Model, MM&A believes this is a fair and accurate representation of the Kepler coal resources.

12 Mineral Reserve Estimates

12.1 Assumptions, Parameters and Methodology

Coal Reserves are classified as *proven* or *probable* considering "modifying factors" including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors.

- **Proven Coal Reserves** are the economically mineable part of a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.
- **Probable Coal Reserves** are the economically mineable part of an indicated coal resource, and in some circumstances a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.

Upon completion of delineation and calculation of coal resources, MM&A generated a LOM plan for Kepler. The footprint of each reserve area is shown on the maps in *Appendix C*. The mine plan was generated based on 5-year budget mine plans, where provided by Alpha, and supplemented with

additional projections by MM&A to reflect LOM plans that honor property control limits, geologic mapping, or other factors determined during the evaluation.

Carlson Mining software was used to generate the LOM plan for Kepler. The mine plan was sequenced based on productivity schedules provided by Alpha. MM&A judged the productivity estimates and plans to be reasonable based on experience and current industry practice.

Raw, ROM production data outputs from LOM plan sequencing were processed into Microsoft® EXCEL spreadsheets and summarized on an annual basis for processing into the economic model. Average seam densities were estimated to determine raw coal tons produced from the LOM plan. Average mine recovery and wash recovery factors were applied to determine coal reserve tons.

Coal reserve tons in this evaluation are reported at a 6.50-percent moisture and represent the saleable product from the Property.

Pricing data as provided by Alpha is described in *Table 16-2*. The pricing data assumes a flat-line mine realization of $144 per short ton port pricing, with an average $110.20 per ton netback pricing, reflective of the low/mid-volatile product currently sold at Kepler. This estimate was provided by Alpha.

The coal resource mapping and estimation process, described in the report, was used as a basis for the coal reserve estimate. Proven and probable coal reserves were derived from the defined coal resource considering relevant processing, economic (including technical estimates of capital, revenue, and cost), marketing, legal, environmental, socio-economic, and regulatory factors and are presented on a moist, recoverable basis.

As is customary in the US, the categories for proven and probable coal reserves are based on the distances from valid points of measurement as determined by the QP for the area under consideration. For this evaluation, measured resource, which may convert to a proven reserve, is based on a ¼-mile radius from a valid point of observation.

Points of observation include exploration drill holes, degas holes, and mine measurements which have been fully vetted and processed into a geologic model. The geologic model is based on seam depositional modeling, the interrelationship of overlying and underlying strata on seam mineability, seam thickness trends, the impact of seam structure (i.e., faulting), intra-seam characteristics, etc. Once the geologic model was completed, a statistical analysis, described in *Section 11.1.1* was conducted and a ¼-mile radius from a valid point of observation was selected to define Measured Resources. The ¼-mile radius results in an accuracy of plus or minus 19 percent in this evaluation.

Likewise, the distance between ¼ and ¾ of a mile radius was selected to define Indicated Resources. Indicated Resources may convert to Probable Reserves. The ¼-mile to ¾-mile radius equated to an accuracy of plus or minus 28 percent in this evaluation.

Inferred Resources (greater than a ¾-mile radius from a valid point of observation) have been excluded from Reserve consideration.

12.2 Mineral Reserves

Kepler Property reserve were derived from multiple coal seams of *Figure 7-1* located on the Property. Reserves are all categorized as underground mineable. Underground reserves were derived from three coal seams: the Sewell seam, Beckley seam, and the Pocahontas 3 (P3) seam.

12.2.1 Sewell Seam (*Map 1*)

Sewell seam reserves are included in two proposed mines, the Sewell #1 mine, and the Sewell #2 mine.

The Sewell #1 proposed mine is located south of the Guyandotte River and immediately south and adjacent to the Kepler preparation plant. The reserve block is located adjacent to the refuse impoundment and previously closed mines. Seam thickness is typically 2.5 feet and less than 2.5 feet coal thickness.

The Sewell #2 proposed mine is also located south of the Guyandotte River and west of the proposed Sewell #1 mine. The reserve is located along the west side of the closed Marianna #3 Sewell mine. Seam thickness is typically 2.5 to 3.0 feet and greater than 2.5 feet coal thickness.

12.2.2 Beckley Seam (*Map 2*)

The Beckley reserves are included in two proposed mines, the Beckley East, and West mines. The two proposed mines are in the same coal block that is separate by the closed Sugar Run No. 2 mine. Seam thickness is typically 2.5 to 3.0 feet and typically 2.5 feet coal thickness. The northwest reserve boundary is controlled by the 2.5-foot seam thickness cutoff and the southeast reserve limit is controlled by previous mining, low seam thickness and outcrop.

12.2.3 Pocahontas 3 (P3) Seam (*Map 5*)

The P3 reserve includes the active Road Fork 52 reserve block located south of the Guyandotte River, and a contiguous P3 block north of the river that will require separate access. The reserves have been previously mined by the Pinnacle mine and Alpha's closed Road Fork 51 mine. The P3 is below drainage and is a gassy coal seam. The seam has been degassed though an array of surface, in-seam horizontal de-gas drill holes. Alpha management has a long history of mining the P3 and managing the gas with ventilation. The seam thickness in the Road Fork 52 block is generally 3.5 to 5.0 feet and 2.5 to 3.5 feet in the northern block.

12.3 Qualified Person's Estimates

The coal reserves, as shown in *Table 12-1*, are based on a technical evaluation of the geology and a preliminary feasibility study of the coal deposits. The extent to which the coal reserves may be affected

by any known environmental, permitting, legal, title, socio-economic, marketing, political, or other relevant issues has been reviewed rigorously. Similarly, the extent to which the estimates of coal reserves may be materially affected by mining, metallurgical, infrastructure and other relevant factors has also been considered.

The results of this TRS define an estimated 48.61 Mt of proven and probable marketable coal reserves. The maps included in *Appendix C* reflect mining depletion at the time of the resource/reserve calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

Mine	Seam	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
		By Reliability Category			By Control Type				
		Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%*
Sewell #2 West	Sewell	3,222,000	1,220,000	4,442,000	3,000	4,438,000	3	0.5	24
Sewell #1 East	Sewell	581,000	3,000	584,000	0	584,000	4	0.7	23
Proposed Beckley West Mine	Beckley	419,000	10,000	429,000	0	429,000	4	1.3	-
Proposed Beckley East Mine	Beckley	488,000	0	488,000	0	488,000	4	1.3	-
Road Fork 52	Pocahontas 3	18,275,000	13,061,000	31,337,000	255,000	31,082,000	6	0.9	19
Proposed P3 North	Pocahontas 3	3,846,000	7,486,000	11,332,000	0	11,332,000	6	0.8	20
Grand Total		**26,830,000**	**21,780,000**	**48,610,000**	**258,000**	**48,352,000**	**5**	**0.8**	**20**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core hole. The combination of surface and inherent moisture is modeled at 6.5-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
**Volatile Matter analysis is not available for the Beckley seam reserve areas. The Beckley reserves are priced as a Mid-Vol. product.*
Totals may not add due to rounding.
See Appendix A for a detailed breakdown.

12.4 Qualified Person's Opinion

The estimate of coal reserves was determined in accordance with the new SEC Guidelines which will become effective for the first fiscal year falling on or after January 1, 2021.

The LOM mining plan for Kepler was prepared to the level of preliminary feasibility. Mine projections were prepared, and timing scheduled to match production with coal seam characteristics. Production timing was carried out from current locations to depletion of the coal reserve area. Coal reserve estimates could be materially affected by the risk factors described in *Section 22.2*.

Based on the Preliminary Feasibility Study and the attendant Economic Review, MM&A believes this is a fair and accurate calculation of the Kepler coal reserves.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

13 Mining Methods

Eight underground mining areas were modeled and tested economically. Once the Resources were calculated, mine plans were created to project operating each resource area to depletion, with crews and equipment scheduled to move to subsequent mining areas as depletion occurs. Underground mine operations are projected to be exhausted in 2065. Individual mines lives range from 2 years to 41 years.

13.1 Geotech and Hydrology

Mining plans for potential underground mines were developed by Alpha and MM&A. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS)* program that was developed by the **National Institute for Occupational Safety and Health (*NIOSH*)**. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan.

Hydrology has not been an issue of concern at Kepler. Based on numerous site visits to both the surface and underground portions of the property by the QP's, it has been determined that this is not a significant concern. Mining of future reserves is projected to occur in areas which exhibit similar hydrogeological characteristics as those formerly mined areas.

13.2 Production Rates

Operations at Kepler by Alpha and its predecessors have been on-going for many years. The Mine plan and productivity expectations reflect historical performance and efforts have been made to adjust the plan to reflect future conditions. MM&A is confident that the mine plan is reasonably representative to provide an accurate estimation of coal reserves. Mine development and operation have not been optimized within the TRS.

Carlson Mining software was used by MM&A to generate mine plans for the mineable coal seams. Mine plans were sequenced based on productivity schedules provided by Alpha, which were based on historically achieved productivity levels. All production forecasting ties assumed production rates to geological models as constructed by MM&A's team of geologists and mining engineers.

The Kepler Mining Complex currently operates one underground mine with a total of three (3) operating sections. Three continuous mining units operate in the Pocahontas No. 3 Seam. Road Fork 52 is currently the only active mine and is operating with three continuous mining units. Each Kepler mine is scheduled to operate one or two production sections with the Road Fork 52 mine operating three production sections. All sections are configured with dual continuous miners in a "walk-between" super section operation. In all cases, mines are forecasted to produce coal two shifts each day. Production is scheduled Monday through Friday each week, and every other Saturday.

As shown in *Table 13-1*, the seven areas planned for underground mines produce coal until 2060. Clean coal production varies directly with coal thickness.

Table 13-1: Kepler Complex Underground Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
P3 North	0	0	0	0	0	0	0	0
Road Fork 52	320	1,182	1,143	1,121	1,181	1,147	1,133	1,157
Sewell #1	0	0	0	0	0	0	162	185
Sewell #2	0	0	0	0	0	0	209	259
Beckley East	0	0	0	0	0	0	0	0
Beckley West	0	0	0	0	0	0	0	0
Total	**320**	**1,182**	**1,143**	**1,121**	**1,181**	**1,147**	**1,504**	**1,600**
Mine Name	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
P3 North	0	0	0	0	0	0	0	0
Road Fork 52	1,171	1,172	1,161	1,087	1,032	1,068	1,053	1,058
Sewell #1	185	52	0	0	0	0	0	0
Sewell #2	223	395	486	476	478	451	487	467
Beckley East	0	0	0	0	0	0	0	0
Beckley West	0	0	0	0	0	0	0	0
Total	**1,579**	**1,619**	**1,647**	**1,564**	**1,509**	**1,519**	**1,540**	**1,525**
Mine Name	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
P3 North	66	312	411	439	489	503	500	533
Road Fork 52	1,144	1,095	1,076	1,054	1,072	1,084	1,017	1,095
Sewell #1	0	0	0	0	0	0	0	0
Sewell #2	401	111	0	0	0	0	0	0
Beckley East	0	0	0	0	0	0	0	0
Beckley West	0	0	0	0	0	0	0	0
Total	**1,611**	**1,518**	**1,487**	**1,493**	**1,561**	**1,587**	**1,516**	**1,629**
Mine Name	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
P3 North	532	527	551	501	467	454	460	466
Road Fork 52	949	860	781	904	1,094	888	463	0
Sewell #1	0	0	0	0	0	0	0	0
Sewell #2	0	0	0	0	0	0	0	0
Beckley East	0	0	0	0	0	0	0	41
Beckley West	0	0	0	0	0	98	181	150
Total	**1,481**	**1,387**	**1,332**	**1,405**	**1,561**	**1,440**	**1,104**	**657**
Mine Name	**2053**	**2054**	**2055**	**2056**	**2057**	**2058**	**2059**	**2060**
P3 North	465	491	524	547	567	573	574	380
Road Fork 52	0	0	0	0	0	0	0	0
P2	0	0	0	0	0	0	0	0
Sewell #1	0	0	0	0	0	0	0	0
Sewell #2	0	0	0	0	0	0	0	0
Beckley East	207	217	23	0	0	0	0	0
Beckley West	0	0	0	0	0	0	0	0
Total	**672**	**708**	**547**	**547**	**567**	**573**	**574**	**380**

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

13.3 Mining Related Requirements

13.3.1 Underground

A mine plan with sequenced mining projections was prepared for each logical mining unit. For each mine plan, the appropriate number of production units is selected for the resource area, and a productivity level assigned, expressed in feet of advance per unit-shift of production. The productivity is based on the equipment and personnel configuration, mining height and expected physical conditions.

conditions.

13.4 Required Equipment and Personnel

13.4.1 Underground Mines

13.4.1.1 Road Fork 51

The Road Fork 51 Mine was previously active operating in the Pocahontas No. 3 seam. The reserve block was mined to exhaustion and the mine closed in June 2020. Production was then shifted to the new Road Fork 52 mine.

13.4.1.2 Road Fork 52

Road Fork 52 has started production with a single mining unit in early 2020. Two additional mining units were added during calendar year 2020 from the Road Fork 51 operation. Access to the Pocahontas No. 3 Seam is gained by a newly constructed decline slope that reaches to the west of the historic workings. This mine produces metallurgical coal from leased mineral property.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. On each day, two production sections are scheduled to produce coal on two shifts. Productivity is planned at the rate of 240 feet of advance per shift of operation for the production section. A total of 120 employees are assigned to the mine.

Principal production equipment includes two continuous miners, two roof bolters, three shuttle cars, and one scoop for the single section, and two continuous miners, two roof bolters, four shuttle cars and one scoop for the super section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is transported directly to the preparation plant and load-out via conveyor belt.

The mine is existing with sufficient infrastructure and surface facilities to service the operation. The mine is located in the Appalachian Basin, which has an extensive history (>100 years) of coal mining. The workforce is existing and is considered to be stable. There are no plans to recruit new workers to

staff this operation. Estimated mine access and utility capital expenditures are included in the financial model for the mine.

Mining permits are in place and capital construction is in place. Estimated expenditures for mine closure and site reclamation are included in the financial model for each mine or plant site.

Expected annual production averages approximately 1,100,000 marketable tons at steady state levels.

The mine is scheduled to and deplete in 2051.

13.4.1.3 Wyoming 2

The Wyoming 2 Mine operated in the Sewell Seam and production ceased, and the mine closed in October 2020. Sewell seam production will transfer to the Sewell #1 and #2 mines, located south of the Guyandotte River.

13.4.1.4 Sewell #1

The Sewell #1 mine assignment is found in the Sewell Seam near the Kepler Processing Facility refuse impoundment. The site would use an existing drift mine faceup to access the reserve. Rehabilitation to the existing workings near the portal area and the establishment of mine seals will allow the mining activity to bypass the old works and start operations along the old workings. Production would be scheduled to begin in 2027. This mine will produce metallurgical coal from leased mineral property.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. This will be a single operating section producing during two scheduled production shifts per day. The section is configured with two continuous miners operated on a walk-between schedule. Productivity is planned at the rate of 240 feet of advance per shift of operation. A total of 36 employees are assigned to the mine.

Principal production equipment includes two continuous miners, two roof bolters, three shuttle cars, and one scoop. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stacked on the ground to await truck transport to the preparation plant and load-out.

The workforce is existing and is considered to be stable. There are no plans to recruit new workers to staff this operation. Estimated mine access and utility capital expenditures are included in the financial model for the mine.

Estimated expenditures for mine closure and site reclamation are included in the financial model for each mine or plant site.

Expected annual production averages approximately 185,000 marketable tons at steady state levels.

The mine is scheduled to deplete in 2030.

13.4.1.5 Sewell #2

The proposed Sewell #2 Mine is scheduled to begin production in 2027. Access to the Sewell Seam will be by drift entry along the outcrop. The mine will produce metallurgical coal from leased property.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. On each day, one production section is scheduled to produce coal on two shifts. Production sections are configured as super sections with two continuous miners available for production on each section. Mining will begin with one section and a second unit will be brought on-line after the Sewell #1 mine is completed. Productivity is planned at the rate of 225 feet of advance per shift of operation. A total of 101 employees will be assigned to the mine.

Principal production equipment includes two continuous miners, two roof bolters, three shuttle cars, and one scoop. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stacked on the ground. A transportation advantage for the mine will be a vertical shaft to the Pocahontas No. 3 Seam main conveyor belt. The vertical shaft would be configured as a vertical coal transportation facility where coal from the Sewell Seam can be staged on the Road Fork 52 main belt for haulage to the Kepler Processing Facility without requiring truck haulage.

Due to the projected starting date for the Mine Sewell #2 Mine, no detailed design of infrastructure or surface facilities has been completed to date. The proposed mine is located in the Appalachian Basin, which has an extensive history (>100 years) of coal mining. The workforce is existing and is considered to be stable. There are no plans to recruit new workers to staff this operation. Estimated mine access and utility capital expenditures are included in the financial model for the mine.

Due to the projected start-up date of the Sewell #2 Mine, no permit work has been completed to date. The proposed mine is located in an area with a long history of coal mining, with numerous permitted operations in close proximity. Coal mining permits are routinely obtained. Estimated expenditures for mine closure and site reclamation are included in the financial model for each mine or plant site.

Expected annual production averages approximately 480,000 marketable tons at steady state levels.

The mine is scheduled to deplete in 2038.

13.4.1.6 P3 North

The proposed P3 North Mine is scheduled to begin production in 2037. Mining Units from the Sewell #2 Mine will be used to staff the P3 North mine assignment. Access to the Pocahontas No. 3 seam will be by slope entry to access the coal seam located 300 vertical feet below the surface. This mine will produce metallurgical coal from leased mineral property.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. On each day, two production sections are scheduled to produce coal on two shifts. Each section is configured as walk-between super sections with two continuous miners available for production on each section. Productivity is planned at the rate of 228 feet of advance per shift of operation. A total of 73 employees are assigned to the mine.

Principal production equipment includes two continuous miners, two roof bolters, three shuttle cars, and one scoop. Coal is extracted from the production face with the continuous miner and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stacked on the ground to await truck transport to the preparation plant and load-out.

Due to the projected starting date for the P3 North Mine, no detailed design of infrastructure or surface facilities has been completed to date. The proposed mine is located in the Appalachian Basin, which has an extensive history (>100 years) of coal mining. The workforce is existing and is considered to be stable. There are no plans to recruit new workers to staff this operation. Estimated mine access and utility capital expenditures are included in the financial model for the mine.

Due to the projected start-up date of the P3 North Mine, no permit work has been completed to date. The proposed mine is located in an area with a long history of coal mining, with numerous permitted operations in close proximity. Coal mining permits are routinely obtained. Estimated expenditures for mine closure and site reclamation are included in the financial model for each mine or plant site.

Expected annual production averages approximately 500,000 marketable tons at steady state levels.

The mine is scheduled to deplete in 2060.

13.4.1.7 Beckley West Mine

The proposed Beckley West Mine is scheduled to begin production in 2050. Access to the Beckley seam will be by drift entry along the outcrop. This mine will produce metallurgical coal from leased mineral property. This mine will utilize one existing production unit from the Road Fork 52 Mine as it completes its assignment.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. On each day, one production section is scheduled to produce coal on two shifts. The section is configured as a walk-between super section with two continuous miners available for production. Productivity is planned at the rate of 197 feet of advance (150 feet of retreat) per shift of operation. A total of 36 employees are assigned to the mine.

Principal production equipment includes two continuous miners, two roof bolters, three shuttle cars, and one scoop. Coal is extracted from the production face with the continuous miners and hauled to

and one scoop. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stacked on the ground to await truck transport to the preparation plant and load-out.

Due to the projected starting date for the Beckley West mine, no detailed design of infrastructure or surface facilities has been completed to date. The proposed mine is located in the Appalachian Basin, which has an extensive history (>100 years) of coal mining. The workforce is existing and is considered to be stable. There are no plans to recruit new workers to staff this operation. Estimated mine access and utility capital expenditures are included in the financial model for the mine.

Due to the projected start-up date of the Beckley West mine, no permit work has been completed to date. The proposed mine is located in an area with a long history of coal mining, with numerous permitted operations in close proximity. Coal mining permits are routinely obtained. Estimated expenditures for mine closure and site reclamation are included in the financial model for each mine or plant site.

Expected annual production averages approximately 181,000 marketable tons at steady state levels.

The mine is scheduled to deplete in 2052.

13.4.1.8 Beckley East Mine

The proposed Beckley East Mine is scheduled to begin production in 2052. Access to the Beckley seam will be by drift entry along the outcrop. This mine will produce metallurgical coal from leased mineral property. This mine will utilize one existing production unit from the Beckley West Mine as it completes its assignment.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. On each day, one production section is scheduled to produce coal on two shifts. The section is configured as a walk-between super section with two continuous miners available for production. Productivity is planned at the rate of 233 feet of advance per shift of operation. A total of 36 employees are assigned to the mine.

Principal production equipment includes two continuous miners, two roof bolters, three shuttle cars, and one scoop. Coal is extracted from the production face with the continuous miner and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stacked on the ground to await truck transport to the preparation plant and load-out.

Due to the projected starting date for the Beckley East mine, no detailed design of infrastructure or surface facilities has been completed to date. The proposed mine is located in the Appalachian Basin, which has an extensive history (>100 years) of coal mining. The workforce is existing and is considered to be stable. There are no plans to recruit new workers to staff this operation. Estimated mine access and utility capital expenditures are included in the financial model for the mine.

Due to the projected start-up date of the Beckley East mine, no permit work has been completed to date. The proposed mine is located in an area with a long history of coal mining, with numerous permitted operations in close proximity. Coal mining permits are routinely obtained. Estimated expenditures for mine closure and site reclamation are included in the financial model for each mine or plant site.

Expected annual production averages approximately 212,000 marketable tons at steady state levels.

The mine assignment is scheduled to be depleted in 2055.

14 Processing and Recovery Methods

14.1 Description or Flowsheet

The Kepler Division currently includes the Kepler Preparation Plant in addition to the mines. The preparation plant was constructed in 1967 and first processed coal in 1969. The plant site includes raw coal storage, clean coal storage, a railroad loadout, and refuse disposal area. The plant has a feed rate capacity of 900 raw tons per hour.

Primary separation equipment includes heavy media vessels, heavy media cyclones, spirals, and flotation cells, supported by the requisite screens, centrifuges, disk filters, sumps, pumps, and distribution systems. The plant produces a product with a typical ash content of 5.96%; typical sulfur content of 0.79%, and a typical volatile matter content of 19.51%. Coarse and fine refuse are disposed in an adjacent coarse and slurry refuse areas. During the 2021 reporting year the Kepler Plant had an average utilization of 50.78%. The washed coal product is shipped to customers through the Kepler loadout located on the Norfolk Southern rail line and at the Feats loadout located on the CSX rail line. The Feats loadout was constructed in 1975 and has a capacity of 3500 tons per hour. Processes and

equipment are typical of those used in the coal industry and are in use in nearly all plants in the Central Appalachian Basin.

14.2 Requirements for Energy, Water, Material and Personnel

Personnel have historically been sourced from the surrounding communities in Wyoming, Raleigh, and McDowell Counties, and have proven to be adequate in numbers to conduct mining operations at Kepler. As mining is common in the surrounding areas, the workforce is generally familiar with mining

practices, and many are experienced miners.

Water is sourced locally from public water sources or rivers, and electricity is sourced from AEP. The service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc.

15 Infrastructure

Alpha's Kepler preparation plant services customers with washed coal, which is transported via the Norfolk Southern rail line at the plant's loadout or on the CSX rail line via the Feats loadout. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to the preparation plant. This practice will continue for future reserves.

As an active operation, the necessary support infrastructure for Kepler is in place.

As new areas are developed, the infrastructure requirements will change. These changes have been considered in the LOM plans and financial model.

The underground mining resource areas which are located above drainage will require an access road and mine access development along the outcrop. The Road Fork 52 facility is a long-term below-drainage mine and will require ventilation shafts, access portals and dewatering facilities during the life of the assignment. The P3 North mine assignment is found below drainage and will require an access slope, ventilation shafts and dewatering facilities during its lifespan.

Typical mine facilities include a mine office, a change house, supply facilities, mine fan and a stacker conveyor if truck haulage is required. One major advantage for the operations is that the majority of the raw coal is transported directed to the preparation plant by conveyors which eliminates truck haulage.

A Photo of the existing facilities is shown in *Figure 15-1*.

Figure 15-1: Kepler Surface Facilities

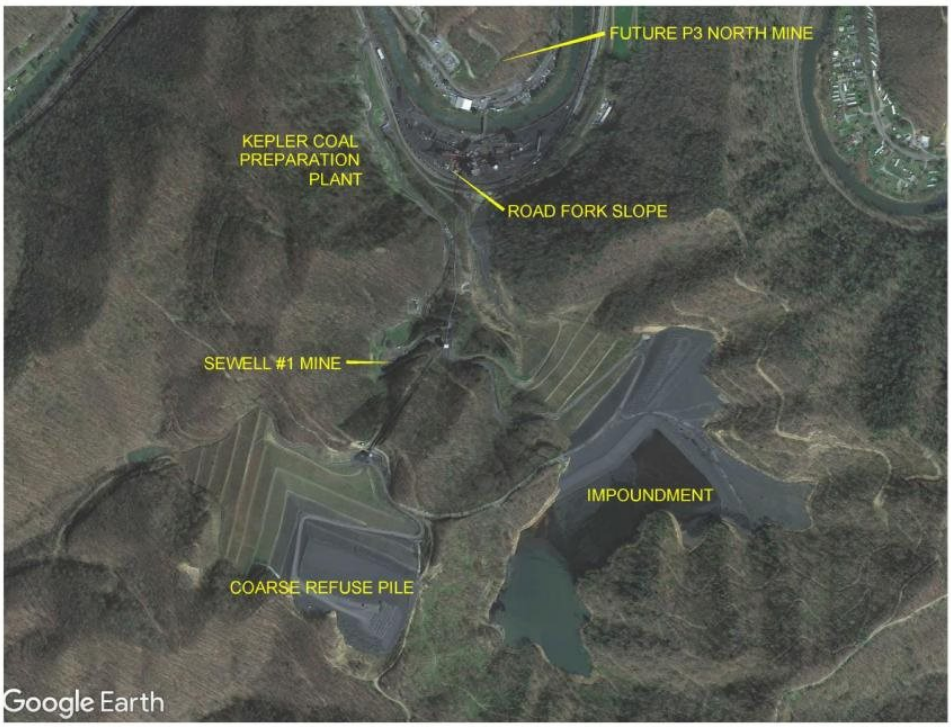


Figure 15-2: Kepler Preparation Plant

Google Earth
N

Figure 15-3: Feats Loadout Facility

16 Market Studies

16.1 Market Description

The quality characteristics for the subject coal resources and coal reserves have been reviewed in detail by MM&A. The drill hole data were utilized to develop average coal quality characteristics for the mining site. These average coal quality characteristics were then utilized as the basis for determining the various markets into which the saleable coal will likely be placed.

Quality Specifications for the Kepler products are as shown in *Table 16-1*.

Table 16-1: Quality Specifications

	Low Volatile
Ash (%)	5.96
Sulfur (%)	0.79
Volatile Matter (%)	19.51

Note: All Specs are dry basis except Moisture and Thermal

The mine production serves the both the low and mid-volatiles metallurgical markets.

16.2 Price Forecasts

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long term realization of $144 per short ton port pricing, with an average $110.20 per ton netback pricing reflective of the low-volatile product currently sold at Kepler. These estimates are based on long term pricing

published by third party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha and their Kepler business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the Kepler business unit.

Table 16-2: Price Forecasts

Coal Quality	Market Pricing Per Ton [1] [2]
High-Vol. A	$138
High- Vol. B	$117
Mid-Vol.	$144
Low-Vol.	$144
Thermal	$76

(1) - Market pricing shown on U.S. East Coast basis.
(2) - Metallurgical and thermal pricing based on 10-year and 3-year average, respectively of forecasted pricing from pricing services.

16.3 Contract Requirements

Some contracts are necessary for successful marketing of the coal. For Kepler, since all mining, preparation and marketing is done in-house, the remaining contracts required are:

> **Transportation** – Alpha contracts with the Norfolk Southern Railroad to transport coal to market

> **Sales** – Sales contracts are a mix of spot and contract sales. With the volatility of the market, long-term contracts are not typically written.

17 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals

17.1 Results of Studies

MM&A completed an environmental review in 2011 for the Massey properties acquired by Alpha, including those operations that were active at Kepler at that time. In addition, MM&A performed a Limited Phase I Environmental Site Assessment (*ESA*) on the Pinnacle property in September 2005 on behalf of **PinnOak Resources, LLC**. Alpha reports not having conducted such a study since the 2005 and 2011 MM&A studies. The environmental review and ESA completed by MM&A included site inspections, reviews of historical records, database searches of State and Federal regulatory records and interviews to identify potential recognized environmental conditions (*RECs*) that may create environmental liability for the sites. While MM&A identified RECs during both studies, MM&A's opinion was that those issues would not preclude the continued or future use of the properties as a coal mining/preparation venture.

Based on this former ESA completed by MM&A, it is MM&A's opinion that Kepler has a generally typical coal industry record of compliance with applicable mining, water quality, and environmental laws. Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models.

17.2 Requirements and Plans for Waste Disposal

Based on a recent engineering review, done by Alpha, approximately 55 years of fine refuse disposal capacity and 21 years of coarse refuse disposal capacity at current rates have been identified, a significant portion of which is permitted and active. Securing additional coarse and fines capacity will be critical to execute the business plan as outlined in this TRS. The table below outlines the current estimated capacities and permits of Kepler's fine and coarse impoundments

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 17-1: Kepler Refuse Disposal Summary

Refuse Facility	State SMCRA Permit Number	MSHA ID	Refuse Disposal Type	Classified as a Dam	Permit Status	Current Planned Maximum Coarse Life (Approved + Planned)	Current Planned Maximum Fines Life (Approved + Planned)	Est. Coarse/ Combined Refuse Life (Approved/ Permitted)	Est. Fine Refuse Life (Approved/ Permitted
Wallace Cabin Branch Impoundment (Kepler)	E004500	1211-WV4-0704-01	Slurry Impoundment - Downstream and Upstream	Yes	Active	5.0	21.3	5.0	41.5

Big Branch Impoundment (Kepler)	O400603	1211-WV4-0704-03	Slurry Impoundment - Downstream	Yes	Not Started	14.0	0.0	14.0	14.0
Kepler Refuse Dump 2	O402496	1211-WV4-0704-02	Coarse Refuse	No	Active	2.3	0.0	2.3	0.0

17.3 Permit Requirements and Status

All mining operations are subject to federal and state laws and must obtain permits to operate mines, coal preparation and related facilities, haul roads, and other incidental surface disturbances necessary for mining to occur. Permits generally require that the permittee post a performance bond in an amount established by the regulatory program to provide assurance that any disturbance or liability created during mining operations is properly restored to an approved post-mining land use and that all regulations and requirements of the permits are fully satisfied before the bond is returned to the permittee. Significant penalties exist for any permittee who fails to meet the obligations of the permits including cessation of mining operations, which can lead to potential forfeiture of the bond. Any company, and its directors, owners and officers, which are subject to bond forfeiture can be denied future permits under the program.[1]

New permits or permit revisions will occasionally be necessary to facilitate the expansion or addition of new mining areas on the Property, such as amendments to existing permits and new permits for mining of reserve areas. Exploration permits also are required. Property under lease includes provisions for exploration among the terms of the lease. New or modified mining permits are subject to a public advertisement process and comment period, and the public is provided an opportunity to raise objections to any proposed mining operation. MM&A is not aware of any specific prohibition of mining on the subject property and given sufficient time and planning, Alpha should be able to secure new permits to maintain its planned mining operations within the context of current regulations. Necessary permits are in place to support current production on the Property, but future permits are required to maintain and expand production. Portions of the Property are located near local communities. Regulations prohibit mining activities within 300 feet of a residential dwelling, school, church, or similar structure unless written consent is first obtained from the owner of the structure. Where required,

[1] Monitored under the Applicant Violator System (AVS) by the Federal Office of Surface Mining.

Alpha reports that such consents have been obtained where mining is proposed beyond the regulatory limits.

Alpha has obtained all mining and discharge permits to operate its mines and processing, loadout or related facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Kepler, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

The Mining permits currently held by Kepler are shown in *Table 17-2.*

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 17-2: Kepler Mining Permits

Permittee	Type	Permit ID	Permit Name	Current Status	Issued Date	Expiration Date	Acres	NPDES No.
Brooks Run South Mining, LLC	Coal Underground	U301512	Marianna Slope Mine	Renewed	7/24/2015	7/24/2025	45.38	WV1026844
Brooks Run South Mining, LLC	Coal Underground	U400498	Still Run Mine No. 7	Inactive	8/20/1998	8/20/2023	10.39	WV1018621
Brooks Run South Mining, LLC	Coal Underground	U401289	Alpine No. 3	Inactive	8/8/1989	8/8/2024	11.51	WV1008706
Road Fork Development Company, LLC	Other	O000684	Preparation Plant	Inactive	2/3/1984	2/3/2024	102.15	WV1006592
Road Fork Development Company, LLC	Other	O004782	Refuse Area No. 2	Renewed	8/24/1982	8/24/2022	50.45	WV1006584

Road Fork Development Company, LLC	Coal Underground	U400105	Guyandotte Slope Mine	Renewed	8/23/2005	8/25/2025	57.41	WV1021273
Road Fork Development Company, LLC	Coal Underground	U400208	Kepler Sewell Mine No. 1	Inactive	8/18/2009	8/18/2024	10.40	WV1021567
Kepler Processing Company, LLC	Coal Underground	E004500	Wallace Cabin Branch Coal Refuse Disposal Facility	Renewed	1/17/1981	7/23/2022	214.17	WV1009877
Kepler Processing Company, LLC	Other - Refuse Disposal	O400603	Big Branch Fine Coal Refuse Di	Renewed	5/26/2004	5/26/2024	138.00	WV1018973
Kepler Processing Company, LLC	Other - Refuse Disposal	O402496	Big Br Coarse Coal Refuse	Renewed	6/2/1997	6/2/2022	59.39	WV1018493
Riverside Energy Company, LLC	Coal Underground	U007584	No. 9 Deep Mine	Inactive	9/7/1984	9/7/2024	220.21	WV0066770
Riverside Energy Company, LLC	Coal Underground	U047100	Westigan Mine No. 6 Seam	Renewed	10/23/1979	12/17/2009	4.02	WV1005596
Riverside Energy Company, LLC	Coal Underground	U400295	Still Run No. 1 Mine	Renewed	3/17/1995	3/17/2010	5.16	WV1016181
Riverside Energy Company, LLC	Coal Underground	U400297	Joe Branch Mine No. 1	Inactive	7/17/1997	7/17/2022	9.42	WV1018523
Riverside Energy Company, LLC	Coal Underground	U400806	Tralee Mine No. 1	Inactive	2/27/2007	2/27/2022	10.97	WV1021401
Riverside Energy Company, LLC	Coal Underground	U401198	Rock Branch Mine No. 1	Inactive	11/19/1998	11/19/2023	11.89	WV1018671
Riverside Energy Company, LLC	Coal Underground	U401207	Horse Creek Mine No. 1	Inactive	12/19/2008	12/19/2023	7.64	WV1021532
Riverside Energy Company, LLC	Coal Underground	U401908	Lower War Eagle Mine	Renewed	10/19/2010	10/19/2025	17.83	WV1023888
Riverside Energy Company, LLC	Coal Underground	U402199	Grave Fork No. 1 Mine	Renewed	9/15/2000	9/15/2025	87.58	WV1018884
Riverside Energy Company, LLC	Coal Underground	U402387	Cherokee Mine	Renewed	12/28/1988	12/28/2018	33.47	WV1018876
Riverside Energy Company, LLC	Coal Underground	U402595	Jims Branch Mine No. 2	Renewed	3/18/1996	3/18/2026	9.81	WV1016385

17.4 Local Plans, Negotiations or Agreements

MM&A found no indication of agreements beyond the scope of Federal or State Regulations.

17.5 Mine Closure Plans

Applicable regulations require that mines be properly closed, and reclamation commenced immediately upon abandonment. In general, site reclamation includes removal of structures, backfilling, regrading, and revegetation of disturbed areas. For surface mines, the majority of the expense for backfilling and regrading is completed as part of ongoing mining operations, with only reclamation of final pits and HWM benches required at end-of-mine life. Sediment control is required during the establishment of vegetation, and bond release generally requires a minimum five-year period of site maintenance, water sampling, and sediment control following mine completion. This requirement is reduced to two years for certain operations involving re-mining. Reclamation of underground mines includes closure and sealing of mine openings such as portals and shafts in addition to the items listed above.

Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models. As with all mining companies, an accretion calculation is performed annually so the necessary Asset Retirement Obligations (*ARO*) can be shown as a Liability on the Balance Sheet.

17.6 Qualified Person's Opinion

The Kepler complex is an operating facility; all necessary permits for current production have been obtained. MM&A knows of no reason that any permits revisions that may be required cannot be obtained.

Estimated expenditures for site closure and reclamation are included in the financial model for this site.

18 Capital and Operating Costs

18.1 Capital Cost Estimate

The production sequence selected for a property must consider the proximity of each reserve area to coal preparation plants, river docks and/or railroad loading points, along with suitability of production equipment to coal seam conditions. The in-place infrastructure was evaluated, and any future needs were planned to a level suitable for a Preliminary Feasibility Study and included in the Capital Forecast.

Alpha provided MM&A with information related to the number of currently operating production units at Kepler. MM&A's capital schedules assume that major equipment rebuilds occur over the course of

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated

Kepler operations is provided in *Figure 18-1* below. Total capital by mine is summarized in *Table 18-1*.

Figure 18-1: Projected Capital Expenditures – Consolidated Kepler Operations

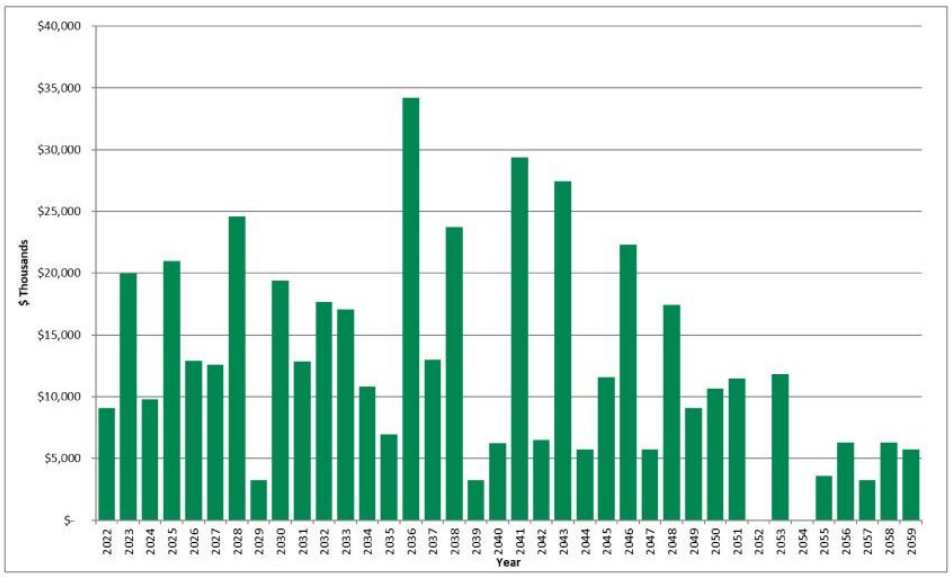


Table 18-1: Summary of Capital Expenditures Schedule by Mine

Item	Total	2021	2022	2023	2024	2025	2026	2027
P3 North	**$135,760**	$0	$0	$0	$0	$0	$0	$0
Road Fork 52	**$257,576**	$0	$9,056	$19,976	$9,770	$14,130	$11,839	$0
Sewell #1	**$10,563**	$0	$0	$0	$0	$0	$1,038	$6,285
Sewell #2	**$59,464**	$0	$0	$0	$0	$6,831	$0	$6,285
Wyoming 2	**$0**	$0	$0	$0	$0	$0	$0	$0
Beckley East	**$486**	$0	$0	$0	$0	$0	$0	$0
Beckley West	**$8,605**	$0	$0	$0	$0	$0	$0	$0
Total	**$472,453**	**$0**	**$9,056**	**$19,976**	**$9,770**	**$20,961**	**$12,877**	**$12,570**

Item	2028	2029	2030	2031	2032	2033	2034	2035
P3 North	$0	$0	$0	$0	$0	$0	$0	$0
Road Fork 52	$17,780	$3,240	$7,544	$12,821	$6,194	$17,080	$3,690	$0
Sewell #1	$3,240	$0	$0	$0	$0	$0	$0	$0
Sewell #2	$3,584	$0	$11,839	$0	$11,495	$0	$7,094	$6,935
Wyoming 2	$0	$0	$0	$0	$0	$0	$0	$0
Beckley East	$0	$0	$0	$0	$0	$0	$0	$0
Beckley West	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$24,604**	**$3,240**	**$19,383**	**$12,821**	**$17,689**	**$17,080**	**$10,784**	**$6,935**

Item	2036	2037	2038	2039	2040	2041	2042	2043
P3 North	$13,062	$7,244	$5,585	$3,240	$0	$14,935	$0	$12,539
Road Fork 52	$15,733	$5,744	$18,124	$0	$6,240	$14,440	$6,494	$14,884
Sewell #1	$0	$0	$0	$0	$0	$0	$0	$0
Sewell #2	$5,400	$0	$0	$0	$0	$0	$0	$0
Wyoming 2	$0	$0	$0	$0	$0	$0	$0	$0
Beckley East	$0	$0	$0	$0	$0	$0	$0	$0
Beckley West	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$34,195**	**$12,988**	**$23,709**	**$3,240**	**$6,240**	**$29,374**	**$6,494**	**$27,423**

Item	2044	2045	2046	2047	2048	2049	2050	2051
P3 North	$0	$3,240	$10,370	$5,744	$5,585	$5,744	$0	$11,495
Road Fork 52	$5,744	$8,334	$11,945	$0	$11,839	$0	$4,934	$0
Sewell #1	$0	$0	$0	$0	$0	$0	$0	$0
Sewell #2	$0	$0	$0	$0	$0	$0	$0	$0
Wyoming 2	$0	$0	$0	$0	$0	$0	$0	$0
Beckley East	$0	$0	$0	$0	$0	$486	$0	$0
Beckley West	$0	$0	$0	$0	$0	$2,861	$5,744	$0
Total	**$5,744**	**$11,574**	**$22,315**	**$5,744**	**$17,424**	**$9,091**	**$10,678**	**$11,495**

Item	2052	2053	2054	2055	2056	2057	2058	2059
P3 North	$0	$11,839	$0	$3,584	$6,285	$3,240	$6,285	$5,744
Road Fork 52	$0	$0	$0	$0	$0	$0	$0	$0
Sewell #1	$0	$0	$0	$0	$0	$0	$0	$0
Sewell #2	$0	$0	$0	$0	$0	$0	$0	$0
Wyoming 2	$0	$0	$0	$0	$0	$0	$0	$0
Beckley East	$0	$0	$0	$0	$0	$0	$0	$0
Beckley West	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$0**	**$11,839**	**$0**	**$3,584**	**$6,285**	**$3,240**	**$6,285**	**$5,744**

18.2 Operating Cost Estimate

Alpha provided historical costs and budgeted projections of operating costs for its active mine (Roadfork #52) and recently closed mines (Roadfork #51 and Wyoming #2 for MM&A's review. MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for the mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Statutory sales related costs are summarized in *Table 18-2*.

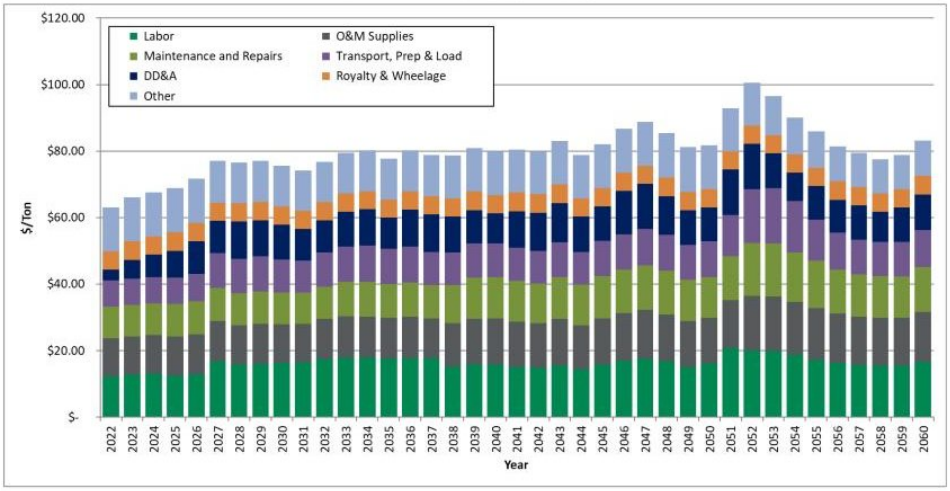
Table 18-2: Estimated Coal Production Taxes and Sales Costs

Description of Tax or Sales Cost	Basis of Assessment	Cost
Federal Black Lung Excise Tax - Underground	Per Ton	$1.10
Federal Reclamation Fees – Underground	Per Ton	$0.12
West Virginia Reclamation Tax - Underground	Per Ton	$0.279
West Virginia Severance Tax	Percentage of Revenue	1 to 5%
Royalties - Underground	Percentage of Revenue	5.0%

Notes: 1. Federal black lung excise tax is paid only on coal sold domestically.

A summary of the projected operating costs for the consolidated Kepler operations is provided in *Figure 18-2*.

Figure 18-2: Kepler Operating Costs



19 Economic Analysis

19.1 Economic Evaluation

19.1.1 Introduction

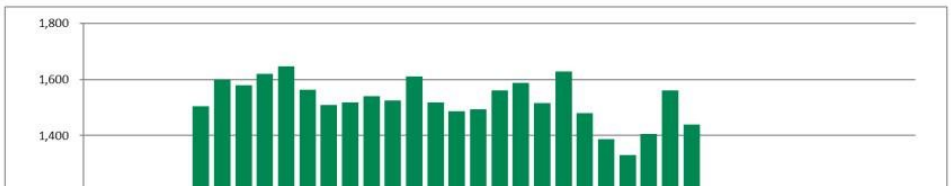
The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

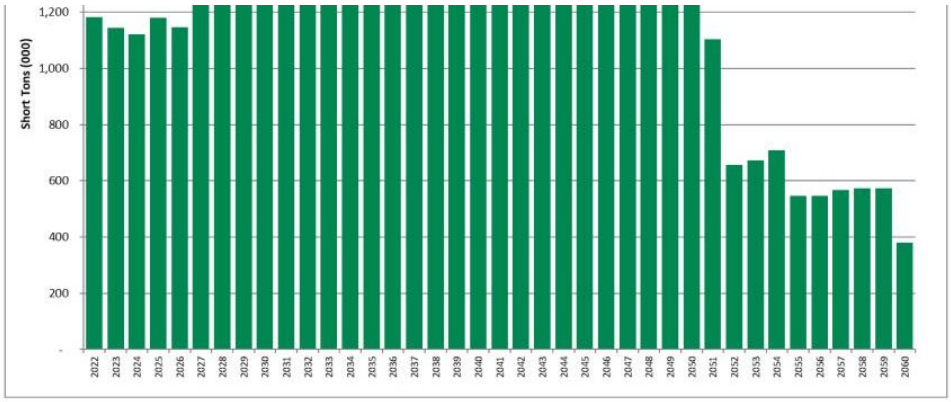
On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation, refuse disposal, coal loading, reclamation and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

The operations are projected on a calendar year basis. MM&A's projection of annual sales tonnage is summarized in the chart below. While all Alpha coal resources properties deemed by MM&A to have potential for classification as coal reserves were evaluated as part of the economic model, some of those resource areas were determined to be uneconomical in the current market and were therefore excluded from coal reserves as discussed below.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 19-1: Projection of Sales Tons





Sales revenue is based on the metallurgical coal price information provided to MM&A by Alpha. Only the revenue from Alpha's captive mining operations is included in the financial model used for this TRS.

The P&L projections of the individual mines of Alpha's Kepler operations are then consolidated into a P&L and cash flow schedule for further testing of the economics. Projected debt service is excluded from the P&L and cash flow model in order to determine Enterprise Value of the aggregated entity.

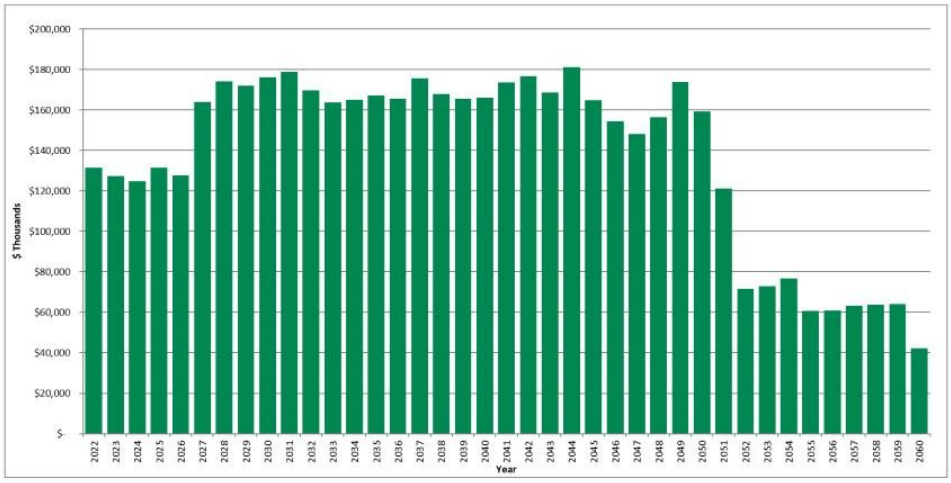
The financial model expresses coal sales prices, operating costs, and capital expenditures in current day dollars without adjustment for inflation. Capital expenditures and reclamation costs are included based on engineering estimates for each mine by year. MM&A also included an estimate of administrative costs in the financial projections.

Alpha will pay royalties for the various current and projected operations. The royalty rates vary by location as provided by Alpha. The royalty rates are 5.0% of the sales revenue.

The projection model also includes consolidated income tax calculations at Alpha's Kepler Division level, incorporating statutory depletion calculations, as well as state income taxes, and a federal tax rate of 21%. To the extent the Alpha mines generate net operating losses for tax purposes, the losses are carried over to offset future taxable income from Alpha mines. The terms "cash flows" and "project cash flows" used in this report refer to after-tax cash flows.

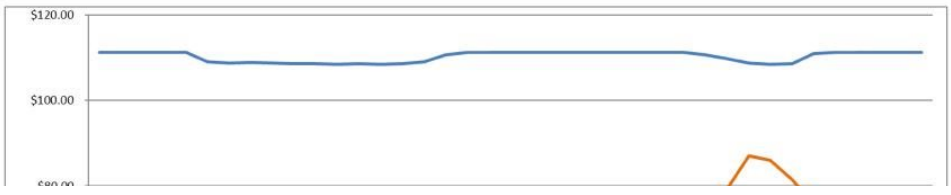
Alpha's projected consolidated annual revenue for the Kepler operations is shown in the chart below:

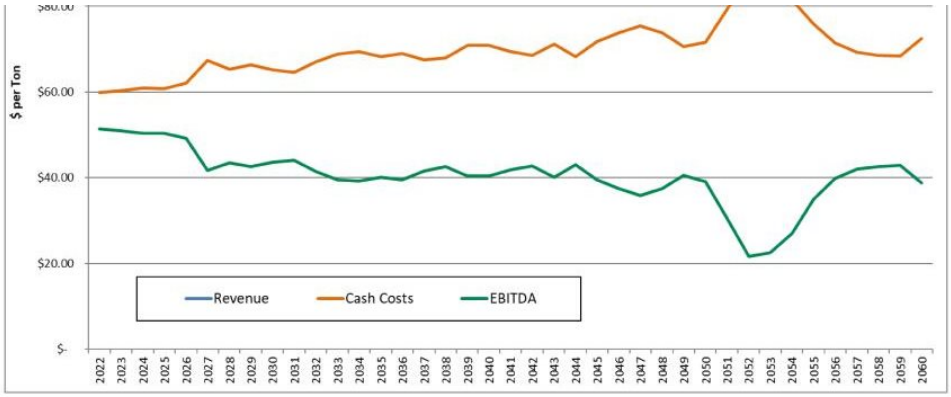
Figure 19-2: Consolidated Annual Revenue



Projected consolidated revenue, cash costs, and EBITDA for the Kepler operations are expressed in dollars per ton in the graph below.

Figure 19-3: Revenue, Cash Costs, and EBITDA





The above chart shows an assumed revenue of $110 per ton, cash costs of $59 to $87 per ton and EBITDA of $22 to $51 per ton. Positive EBITDA per ton averages $41.07 per ton over the life of the operations.

Table 19-1 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at Kepler.

Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

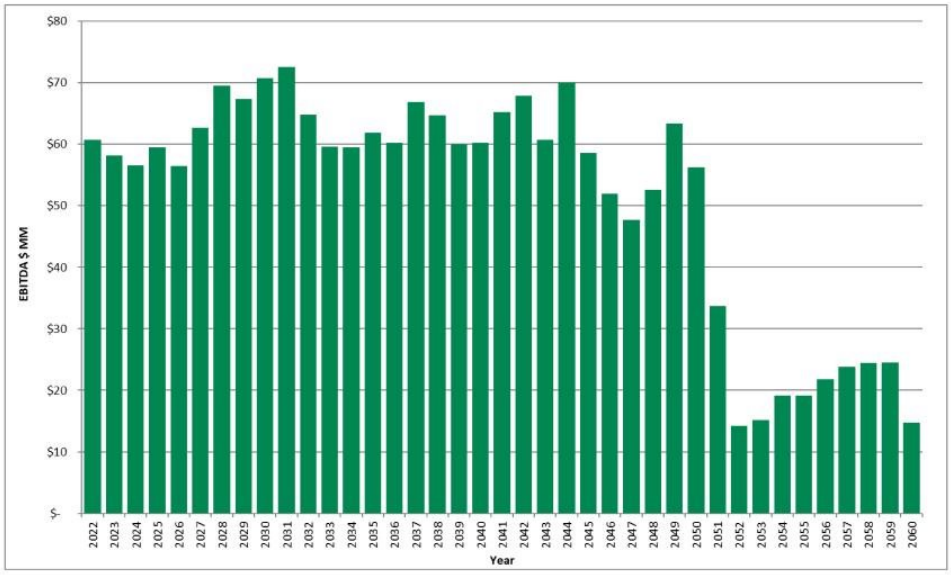
	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
P3 North	11,332	$258,761	$22.83	$393,458	$34.72
Road Fork 52	31,763	$1,159,339	$36.50	$1,464,821	$46.12
Sewell #1	584	$1,619	$2.77	$8,742	$14.98
Sewell #2	4,442	$84,306	$18.98	$134,333	$30.24
Beckley East	488	$5,861	$12.02	$6,737	$13.82
Beckley West	429	$1,612	$3.76	$5,820	$13.58
Consolidated Deep Mines	**49,037**	**$1,511,497**	**$30.82**	**$2,013,911**	**$41.07**

Note: (1) LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (426,390 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 19-1,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated Kepler operations show positive LOM P&L and EBITDA of $1.5 billion and $2.0 billion, respectively.

A breakdown of projected EBITDA for the consolidated Kepler operations is shown in the chart below:

Figure 19-4: Annual EBITDA



19.1.2 Cash Flow Summary

Alpha's consolidated Kepler cash flow summary in constant dollars, excluding debt service, is shown in *Table 19-2* below.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 19-2: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	49,037	320	1,182	1,143	1,121	1,181	1,147
Total Revenue	$5,403,712	$35,617	$131,576	$127,254	$124,763	$131,416	$127,621
EBITDA	$2,013,911	$16,632	$60,743	$58,208	$56,528	$59,561	$56,456
Net Income	$1,205,212	$11,585	$44,580	$40,050	$38,352	$39,422	$35,276
Net Cash Provided by Operating Activities	$1,707,626	$10,496	$40,065	$47,412	$46,627	$48,712	$47,356
Purchases of Property, Plant, and Equipment	($472,453)	$0	($9,056)	($19,976)	($9,770)	($20,961)	($12,877)
Net Cash Flow	$1,235,173	$10,496	$31,009	$27,436	$36,857	$27,751	$34,480

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	1,504	1,600	1,579	1,619	1,647	1,564	1,509
Total Revenue	$164,022	$174,067	$172,018	$176,113	$178,913	$169,718	$163,676
EBITDA	$62,674	$69,489	$67,363	$70,702	$72,605	$64,833	$59,665
Net Income	$37,739	$39,730	$39,723	$42,411	$44,889	$39,678	$34,886
Net Cash Provided by Operating Activities	$51,220	$57,184	$57,819	$59,536	$60,321	$56,654	$52,205
Purchases of Property, Plant, and Equipment	($12,570)	($24,604)	($3,240)	($19,383)	($12,821)	($17,689)	($17,080)
Net Cash Flow	$38,650	$32,580	$54,579	$40,153	$47,500	$38,965	$35,125

	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	1,519	1,540	1,525	1,611	1,518	1,487	1,493
Total Revenue	$164,968	$167,004	$165,537	$175,617	$167,981	$165,464	$166,163
EBITDA	$59,521	$61,868	$60,275	$66,860	$64,742	$59,999	$60,277
Net Income	$34,300	$38,080	$33,617	$38,318	$39,035	$36,832	$38,202
Net Cash Provided by Operating Activities	$51,434	$52,819	$51,675	$56,086	$56,362	$53,299	$52,377
Purchases of Property, Plant, and Equipment	($10,784)	($6,935)	($34,195)	($12,988)	($23,709)	($3,240)	($6,240)
Net Cash Flow	$40,650	$45,884	$17,480	$43,098	$32,653	$50,059	$46,137

	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	1,561	1,587	1,516	1,629	1,481	1,387	1,332
Total Revenue	$173,718	$176,659	$168,743	$181,245	$164,783	$154,341	$148,218
EBITDA	$65,244	$67,852	$60,741	$70,016	$58,587	$51,929	$47,731
Net Income	$37,588	$38,974	$34,278	$41,706	$34,800	$26,313	$23,650
Net Cash Provided by Operating Activities	$54,728	$57,603	$54,453	$58,130	$53,206	$46,623	$43,498
Purchases of Property, Plant, and Equipment	($29,374)	($6,494)	($27,423)	($5,744)	($11,574)	($22,315)	($5,744)
Net Cash Flow	$25,354	$51,109	$27,029	$52,386	$41,632	$24,308	$37,754

	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	1,405	1,561	1,440	1,104	657	672	708
Total Revenue	$156,342	$173,766	$159,362	$121,240	$71,427	$72,971	$76,845
EBITDA	$52,601	$63,417	$56,226	$33,709	$14,214	$15,172	$19,151
Net Income	$29,259	$36,829	$33,387	$14,771	$5,267	$8,066	$12,821
Net Cash Provided by Operating Activities	$45,922	$52,564	$50,632	$35,501	$4,839	$10,641	$16,095
Purchases of Property, Plant, and Equipment	($17,424)	($9,091)	($10,678)	($11,495)	$0	($11,839)	$0
Net Cash Flow	$28,498	$43,474	$39,954	$24,006	$4,839	($1,198)	$16,095

	YE 12/31 2055	YE 12/31 2056	YE 12/31 2057	YE 12/31 2058	YE 12/31 2059	YE 12/31 2060	YE 12/31 2061
Production & Sales tons	547	547	567	573	574	380	0
Total Revenue	$60,626	$60,871	$63,113	$63,734	$63,892	$42,308	$0
EBITDA	$19,154	$21,742	$23,847	$24,437	$24,584	$14,758	($117)
Net Income	$13,345	$14,396	$14,467	$15,493	$14,560	$8,948	($233)
Net Cash Provided by Operating Activities	$18,170	$18,250	$20,001	$20,582	$20,567	$18,116	($1,294)
Purchases of Property, Plant, and Equipment	($3,584)	($6,285)	($3,240)	($6,285)	($5,744)	$0	$0
Net Cash Flow	$14,586	$11,965	$16,761	$14,297	$14,823	$18,116	($1,294)

	YE 12/31 2062	YE 12/31 2063	YE 12/31 2064	YE 12/31 2065	YE 12/31 2066	YE 12/31 2067	YE 12/31 2068
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0
EBITDA	($46)	($23)	($12)	($6)	$0	$0	$0
Net Income	($93)	($47)	($24)	($12)	$0	$0	$0
Net Cash Provided by Operating Activities	($431)	($216)	($108)	($108)	$0	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($431)	($216)	($108)	($108)	$0	$0	$0

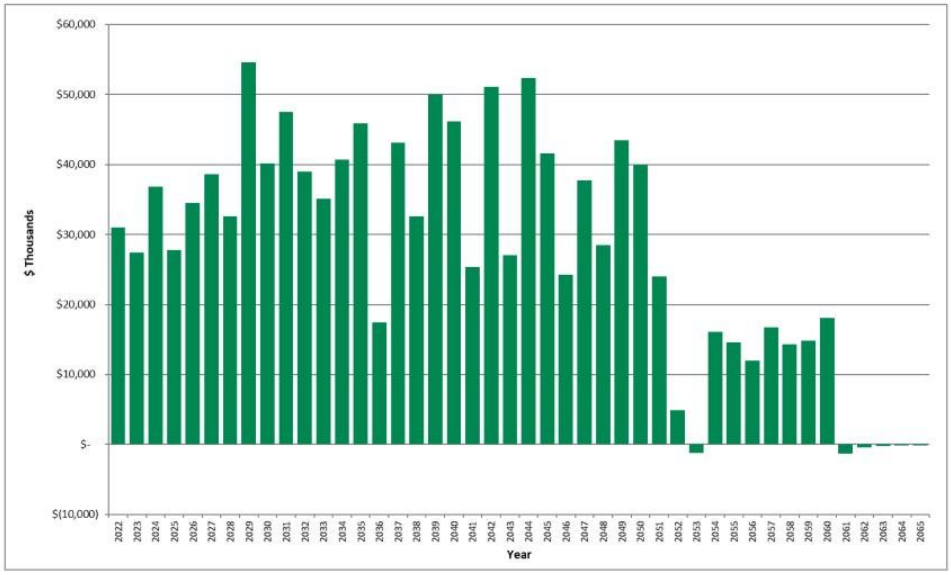
Note: (1) LOM tonnage evaluated in the financial model includes 4th quarter 2021 production (426,390 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

Consolidated cash flows are driven by annual sales tonnage, which grows from 1.2 million tons in 2022 to a peak of 1.6 million tons in 2031. Between years 2032 and 2051, sales ranges from 1.1 million to 1.6 million tons and between years 2052-2060, sales range from 0.4 million tons to 0.7 million tons. Projected consolidated revenue grows from $131.6 million in 2022 to a peak of $178.9 million in 2031. Revenue totals $5.4 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $60.3 million in 2031 and totals $1.7 billion over the project life. Capital expenditures total $72.6 million during the first five years and $472.5 million over the project's life.

Consolidated Kepler net cash flow after tax, but before debt service, is shown by year in the chart below:

Figure 19-5: Net Cash Flow after Tax (Before Debt Service)



Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

LOM Net cash flow is positive for this project. The cash flows after year 2060 are generally related to end of mine reclamation expenditures, which are accrued over the life of the mines.

19.1.3 Discounted Cash Flow Analysis

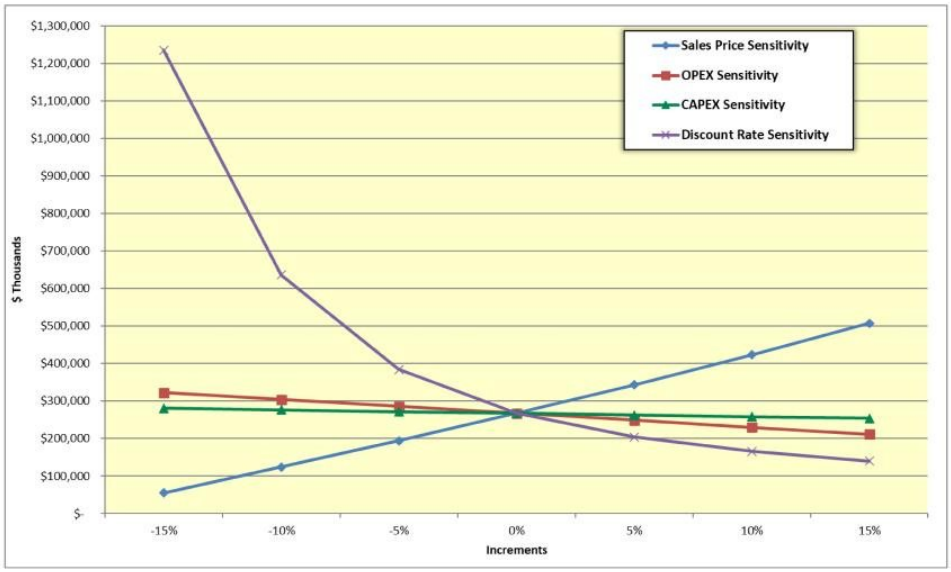
Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted

WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $267.3 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the Kepler reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its Kepler assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

19.1.4 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs, and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 19-6: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

20 Adjacent Properties

20.1 Information Used

No Proprietary information associated with neighboring properties was used as part of this study.

21 Other Relevant Data and Information

MM&A performed a previous audit of all Kepler Property in year 2021 for reserves effective as of December 31, 2020, based on **U.S. Securities and Exchange Commission (*SEC*)** Industry Guide 7 standards. MM&A utilized this former audit study as the basis of an updated study which meets those standards set forth by the SEC for 2021 reserve compliance.

22 Interpretation and Conclusions

22.1 Conclusion

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Kepler Property. The data is of sufficient quantity and reliability to reasonably support

the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study is sufficient to conclude that the 48.61 Mt of marketable coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

22.2 Risk Factors

Risks have been identified for operational, technical and administrative subjects addressed in the Pre-Feasibility Study. A risk matrix has been constructed to present the risk levels for all the risk factors identified and quantified in the risk assessment process. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

The purpose of the characterization of the project risk components is to inform the project stakeholders of key aspects of the Alpha projects that can be impacted by events whose consequences can affect the success of the venture. The significance of an impacted aspect of the operation is directly related to both the probability of occurrence and the severity of the consequences. The initial risk for a risk factor is herein defined as the risk level after the potential impact of the risk factor is addressed by competent and prudent management utilizing control measures readily available. Residual risk for a risk factor is herein defined as the risk level following application of special mitigation measures if management determines that the initial risk level is unacceptable. Initial risk and residual risk can be quantified numerically, derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

The probability and consequence parameters are subjective numerical estimates made by practiced mine engineers and managers. Both are assigned values from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and

greatest consequence. The products, which define the Risk Level, are classified from very low to very high.

Risk Level Table (R = P x C)

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Risk aspects identified and evaluated during this assignment total 13. No residual risks are rated Very High. Three (3) residual risks are rated High. Six (6) of the risk aspects could be associated with Moderate residual risk. Four (4) of the risk aspects were attributed Low or Very Low residual risks.

22.2.1 Governing Assumptions

The listing of the aspects is not presumed to be exhaustive. Instead that listing is presented based on the experiences of the contributors to the TRS.

1. The probability and consequence ratings are subjectively assigned, and it is assumed that this subjectivity reasonably reflects the condition of the active and projected mine operations.
2. The Control Measures shown in the matrices presented in this chapter are not exhaustive. They represent a condensed collection of activities that the author of the risk assessment section has observed to be effective in coal mining scenarios.
3. Mitigation Measures listed for each risk factor of the operation are not exhaustive. The measures listed, however, have been observed by the author to be effective.
4. The monetary values used in ranking the consequences are generally accepted quantities for the coal mining industry.

22.2.2 Limitations

The risk assessment proposed in this report is subject to the limitations of the information currently collected, tested, and interpreted at the time of the writing of the report.

22.2.3 Methodology

The numerical quantities (i.e., risk levels) attributable to either “initial” or “residual” risks are derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

$$R = P \times C$$

Where: R = Risk Level
P = Probability of Occurrence
C = Consequence of Occurrence

The Probability (P) and Consequence (C) parameters recited in the formula are subjective numerical estimates made by practiced mine engineers and managers. Both P and C are assigned integer values ranging from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and

the value 5 represents the highest probability and greatest consequence. The products (R = P x C) which define the Risk Level, are thereafter classified from very low to very high.

Risk Level Table

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Very high initial risks are considered to be unacceptable and require corrective action well in advance of project development. In short, measures must be applied to reduce very high initial risks to a tolerable level.

As shown and discussed above, after taking into account the operational, technical, and administrative actions that have been applied or are available for action when required, the residual risk can be determined. The residual risk provides a basis for the management team to determine if the residual risk level is acceptable or tolerable. If the risk level is determined to be unacceptable, further actions should be considered to reduce the residual risk to acceptable or tolerable levels to provide justification for continuation of the proposed operation.

22.2.4 Development of the Risk Matrix

Risks have been identified for the technical, operational, and administrative subjects addressed in the TRS. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

22.2.4.1 Probability Level Table

Table 22-1: Probability Level Table

Category	Probability Level (P)		
1	Remote	Not likely to occur except in exceptional circumstances.	<10%
2	Unlikely	Not likely to occur; small in degree.	10 - 30%
3	Possible	Capable of occurring.	30 - 60%
4	Likely	High chance of occurring in most circumstances.	60 - 90%
5	Almost Certain	Event is expected under most circumstances; impossible to avoid.	>90%

The lowest rated probability of occurrence is assigned the value of 1 and described as remote, with a likelihood of occurrence of less than 10 percent. Increasing values are assigned to each higher probability of occurrence, culminating with the value of 5 assigned to incidents considered to be almost certain to occur.

22.2.4.2 Consequence Level Table

Table 22-2 lists the consequence levels.

Table 22-2: Consequence Level Table

Correlation of Events in Key Elements of the Project Program to Event Severity Category							
Category	Severity of the Event	Financial Impact of the Event	Unplanned Loss of Production (Impact on Commercial Operations)	Events Impacting on the Environment	Events Affecting the Program's Social and Community Relations	Resultant Regulatory / Sovereign Risk	Events Affecting Occupational Health & Safety
				Insignificant loss of			

1	**Insignificant**	< USD $0.5 million	≤ 12 hours	habitat; no irreversible effects on water, soil and the environment.	Occasional nuisance impact on travel.		Event recurrence avoided by corrective action through established procedures (Engineering, guarding, training).
2	**Minor**	USD $0.5 million to $2.0 million	≤ 1 day	No significant change to species populations; short-term reversible perturbation to ecosystem function.	Persistent nuisance impact on travel. Transient adverse media coverage.		**First aid – lost time.** Event recurrence avoided by corrective action thought established procedures.
3	**Moderate**	USD $2.0 million to $10.0 million	≤ 1 week	Appreciable change to species population; medium-term (≤10 years) detriment to ecosystem function.	Measurable impact on travel and water/air quality. Significant adverse media coverage / transient public outrage.	Uncertainty securing or retaining essential approval / license. Change to regulations (tax; bonds; standards).	**Medical Treatment –** permanent incapacitation Avoiding event recurrence requires modification to established corrective action procedures**.**
4	**Major**	USD $10.0 million to $50.0 million	1 to 2 weeks	Change to species population threatening viability; long-term (>10 years) detriment to ecosystem function.	Long-term, serious impact on travel and use of water resources; degradation of air quality; sustained and effective public opposition.	Suspension / long-delay in securing essential approval / license. Change to laws (tax; bonds; standards).	**Fatality.** Avoiding event recurrence requires modification to established corrective action procedures and staff retraining.
5	**Critical**	>USD $50.0 million	>1 month	Species extinction; irreversible damage to ecosystem function.	Loss of social license.	Withdraw / failure to secure essential approval / license.	**Multiple fatalities.** Avoiding event recurrence requires major overhaul of policies and procedures.

The lowest rated consequence is assigned the value of 1 and is described as Insignificant Consequence parameters include non-reportable safety incidents with zero days lost accidents, no environmental damage, loss of production or systems for less than one week and cost of less than USD $0.5 million. Increasing values are assigned to each higher consequence, culminating with the value of 5 assigned to critical consequences, the parameters of which include multiple-fatality accidents, major environmental damage, and loss of production or systems for longer than one month and cost of greater than USD $50.0 million.

Composite Risk Matrix R = P x C and Color-Code Convention

The risk level, defined as the product of probability of occurrence and consequence, ranges in value from 1 (lowest possible risk) to 25 (maximum risk level). The values are color-coded to facilitate identification of the highest risk aspects.

Table 22-3: Risk Matrix

P x C = R			Consequence (C)				
			Insignificant	Minor	Moderate	Major	Critical
			1	2	3	4	5
Probability Level (P)	Remote	1	1	2	3	4	5
	Unlikely	2	2	4	6	8	10
	Possible	3	3	6	9	**12**	**15**
	Likely	4	4	8	**12**	**16**	**20**
	Almost Certain	5	5	10	**15**	**20**	**25**

22.2.5 Categorization of Risk Levels and Color Code Convention

Very high risks are considered to be unacceptable and require corrective action. Risk reduction measures must be applied to reduce very high risks to a tolerable level.

22.2.6 Description of the Coal Property

The Kepler Mine Complex (*Kepler*) is located in located in Wyoming, Raleigh and McDowell Counties, West Virginia – is an active operation with one underground mine. The active underground operation within the Kepler Mine Complex (Road Fork #52) utilizes continuous mining production sections. The method provides continuity, preserving skilled work groups and enabling effective utilization of

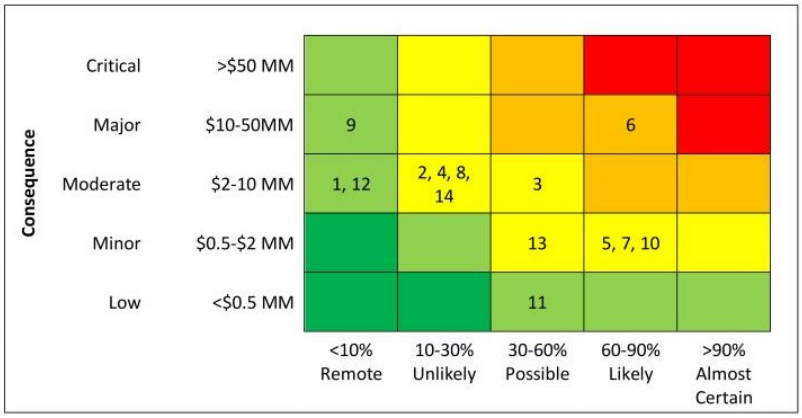
Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

production equipment. The active and projected mines are located above and below drainage and as such are accessed via a combination of drifts, box cuts, shafts and slopes.

22.2.7 Summary of Residual Risk Ratings

Each risk factor is numbered, and a risk level for each is determined by multiplying the assigned probability by the assigned consequence. The risk levels are plotted on a risk matrix to provide a composite view of the Alpha risk profile. The average risk level is 6.6, which is defined as Moderate.

Table 22-4: Risk Assessment Matrix



22.2.8 Risk Factors

A high-level approach is utilized to characterize risk factors that are generally similar across a number of the active and proposed mining operations. Risk factors that are unique to a specific operation or are particularly noteworthy are addressed individually.

22.2.8.1 Geological and Coal Resource

Coal mining is accompanied by risk that, despite exploration efforts, mining areas will be encountered where geological conditions render extraction of the resource to be uneconomic, or that coal quality characteristics disqualify the product for sale into target markets.

Offsetting the geological and coal resource risk are the size of the controlled property which allows flexibility in the selection of mine areas away from areas where coal quality and mineability are less favorable. In addition, many of the underground mines are designed to operate with multiple production sections each, which lessens the immediate impact when one section encounters difficulties. The large reserve areas also provide a mitigation strategy of varying the timing of development of mines to offset expected or encountered adverse conditions, thereby maintaining

consistent production and quality. This flexibility requires additional extension or development cost but increases performance consistency.

The larger reserve areas will be developed with multiple production sections and the small, replacement production reserve areas provide ready access to alternative locations if geological and coal resource characteristics require abandonment of an active production area.

Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Recoverable coal tons recognized to be significantly less than previously estimated.	Reserve base is adequate to serve market commitments and respond to opportunities for many years. Local adverse conditions may increase frequency and cost of production unit relocations.	Previous and ongoing exploration and extensive regional mining history provide a high level of confidence of coal seam correlation, continuity of the coal seams, and coal resource tons.	1	4	4	Optimize mine plan to increase resource recovery; develop mine plan to provide readily available alternate mining locations to sustain expected production level.	1	3	3
Coal quality locally proves to be lower than initially projected.	If uncontrolled, production and sale of coal that is out of specification can result in rejection of deliveries, cancellation of coal sales agreements and damage to reputation.	Exploration and vast experience and history in local coal seams provide confidence in coal quality; limited excursions can be managed with careful product segregation and blending.	2	5	10	Develop mine plan to provide readily available alternate mining locations to sustain expected production level; modify coal sales agreements to reflect coal quality.	2	3	6

22.2.8.2 Environmental

Water quality and other permit requirements are subject to modification and such changes could have a material impact on the capability of the operator to meet modified standards or to receive new permits and modifications to existing permits. Permit protests may result in delays or denials to permit applications.

Environmental standards and permit requirements have evolved significantly over the past 50 years and to-date, mining operators and regulatory bodies have been able to adapt successfully to evolving environmental requirements.

Table 22-6: Environmental (Risks 3 and 4)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Environmental performance standards are modified in the future.	Delays in receiving new permits and modifications to existing permits; cost of testing and treatment of water and soils	Work with regulatory agencies to understand and influence final standards; implement testing, treatment and other actions to comply	3	4	12	Modify mining and reclamation plans to improve compliance with new standards while reducing cost of	3	3	9

		with new standards.				compliance.			
New permits and permit modifications are increasingly delayed or denied.	Interruption of production and delayed implementation of replacement production from new mines.	Comply quickly with testing, treatment and other actions required; continue excellent compliance performance within existing permits.	2	4	8	Establish and maintain close and constructive working relationships with regulatory agencies, local communities and community action groups.	2	3	6

22.2.8.3 Regulatory Requirements

Federal and state health and safety regulatory agencies occasionally amend mine laws and regulations. The impact is industry wide. Mining operators and regulatory agencies have been able to adapt successfully to evolving health and safety requirements.

Table 22-7: Regulatory Requirements (Risk 5)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Federal and state mine safety and health regulatory agencies amend mine laws and regulations.	Cost of training, materials, supplies and equipment; modification of mine examination and production procedures; modification of mining plans.	Participate in hearings and workshops when possible to facilitate understanding and implementation; work cooperatively with agencies and employees to facilitate implementation of new laws and regulations.	4	3	12	Familiarity and experience with new laws and regulations results in reduced impact to operations and productivity and improved supplies and equipment options.	4	2	8

22.2.8.4 Market and Transportation

Most of the current and future production is expected to be directed to domestic and international metallurgical markets. Historically the metallurgical markets have been cyclical and highly volatile.

Table 22-8: Market and Transportation (Risk 6)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Volatile coal prices drop precipitously.	Loss of revenue adversely affects profitability; reduced cash flow may disrupt capital expenditures plan.	Cost control measures implemented; capital spending deferred.	4	5	20	High-cost operations closed, and employees temporarily furloughed.	4	4	16

Occasional delay or interruption of rail, river and terminals service may be expected. The operator can possibly minimize the impact of delays by being a preferred customer by fulfilling shipment obligations promptly and maintaining close working relationships.

Table 22-9: Market and Transportation (Risk 7)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Rail or river transport is delayed; storage and shipping access at river and ocean terminals is not available.	Fulfillment of coal sales agreements delayed; limited coal storage at mines may increase cost of rehandling; production may be temporarily idled.	Provide adequate storage capacity at mines; coordinate continuously with railroad and shipping companies to respond quickly and effectively to changing circumstances.	4	3	12	Provide back-up storage facility along with personnel, equipment and rehandle plan to sustain production and fulfill sales obligations timely.	4	2	8

22.2.8.5 Mining Plan

Occupational health and safety risks are inherent in mining operations. Comprehensive training and retraining programs, internal safety audits and examinations, regular mine inspections, safety meetings, along with support of trained fire brigades and mine rescue teams are among activities that greatly reduce accident risks. Employee health monitoring programs coupled with dust and noise monitoring and abatement reduce health risks to miners.

As underground mines are developed and extended, observation of geological, hydrogeological and geotechnical conditions lead to modification of mine plans and procedures to enable safe work within the mine environments.

Highlighted below are selected examples of safety and external factors relevant to Alpha's operations.

22.2.8.5.1 Methane Management

Coalbed methane is present in coal operations below drainage. Often the methane concentration in shallow coal seams is at such low levels that it can be readily managed with frequent testing and monitoring, vigilance and routine mine ventilation. Very high methane concentrations may be present at greater depths. High methane concentrations may require degasification of the coal seam to assure safe mining. Methane is not expected to be present in above drainage mines of the Kepler property.

Table 22-10: Methane Management (Risk 8)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Methane hazard is present in mines operating below drainage.	Injury or loss of life; possible ignition of gas and mine explosion; potential loss of mine and equipment temporarily or	Low to moderate levels can be managed with frequent examinations, testing and monitoring within the mine ventilation system.	2	5	10	Very high-level methane concentrations may require coal seam degasification and gob degasification where pillar extraction	2	3	6

	permanently; additional mine fan, mine power, ventilation, monitoring and examination requirements.	Excellent rock dust maintenance minimizes explosion propagation risk should an ignition occur.				methods are employed.			

22.2.8.5.2 Mine Fires

Mine fires, once common at mine operations, are rare today. Most active coal miners have not encountered a mine fire. Vastly improved mine power and equipment electrical systems, along with safe mine practices reduce mine fire risks. Crew training and fire brigade support and training improve response for containment and control if a fire occurs. Spontaneous combustion within coal mines, which is the source of most fires that occur today, is not expected to commonly occur at the Alpha property. When spontaneous combustion conditions are present, monitoring systems are employed for early detection and mine plans are designed to facilitate isolation, containment and rapid extinguishment.

Table 22-11: Mine Fires (Risk 9)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Mine fire at underground operation or plant stockpile fire.	Injury or loss of life; potential loss of mine temporarily or permanently; damage to equipment and mine infrastructure.	Inspection and maintenance of mine power, equipment and mine infrastructure; good housekeeping; frequent examination of conveyor belt entries; prompt removal of accumulations of combustible materials.	1	5	5	If spontaneous combustion conditions are present, enhanced monitoring and examination procedures will be implemented; mine design will incorporate features to facilitate isolation, containment and extinguishment of spontaneous combustion locations.	1	4	4

22.2.8.5.3 Ground Control

Underground mining exposes miners to the risks of roof falls and rib rolls. Ground control-based risks can be mitigated through effective roof control plans which are supplemented with a strong understanding of future geotechnical conditions. Foremen and crews should be trained to examine the

roof, rib and floor conditions and identify pending and immediate hazards. Multiple publicly available software programs can be used to assess pillar sizing and stability.

Table 22-12: Ground Control (Risk 10)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Ground control issues cause roof failures, rib rolls, floor heave, etc.	Injury or loss of life; catastrophic damage to equipment; production interruption.	Regular inspection for change and signs of failure. Dynamic design of roof control plan and safety measures to honor observed conditions and exploration-based information; conservative pillar design.	4	3	12	Multiple operating sections to mitigate any lost production; availability of new working areas in case abandonment of section is required; availability of alternative roof control technologies in case of abrupt changes in mining conditions.	4	2	8

22.2.8.5.4 Availability of Supplies and Equipment

The industry has periodically experienced difficulty receiving timely delivery of mine supplies and equipment. Availability issues often accompanied boom periods for coal demand. Any future delivery of supplies and equipment delays are expected to be temporary with limited impact on production.

Table 22-13: Availability of Supplies and Equipment (Risk 11)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Disruption of availability for supplies and equipment.	Temporary interruption of production.	Force majeure provision in coal sales agreements to limit liability for delayed or lost sales.	3	2	6	Work closely with customers to assure delayed coal delivery rather than cancelled sales; monitory external conditions and increase inventory of critical supplies; accelerate delivery of equipment when possible.	3	1	3

22.2.8.5.5 Labor

Work stoppage due to labor protests are considered to be unlikely and accompanied by limited impact should it occur. Excellent employee relations and communications limit the exposure to outside protesters. Loss of supervisors and skilled employees to retirement is inevitable; the impact can be lessened with succession planning and training and training and mentorship of new employees.

Table 22-14: Labor – Work Stoppage (Risk 12)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Work stoppage due to slowdowns or secondary boycott activity.	Loss of production and coal sales; damaged customer and employee relations; reputation loss.	Maintain excellent employee relations and communications; maintain frequent customer communications.	2	3	6	Develop plan for employee communications and legal support to minimize impact of secondary boycott activities.	1	3	3

Table 22-15: Labor – Retirement (Risk 13)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Retirement of supervisors and skilled employees.	Loss of leadership and critical skills to sustain high levels of safety, maintenance and productivity.	Monitor demographics closely and maintain communications with employees who are approaching retirement age; maintain employee selection and training programs.	3	3	9	Maintain selection of candidates and implementation of in-house or third-party training for electricians and mechanics; develop employee mentoring program.	3	2	6

22.2.8.6 Comprehensive Health and Safety

While largely incorporated in mine plan-based risk factors, effective health and safety programs reduce the risk of accidents, associated loss of production and fines. Currently, coal mining and processing requires a robust health and safety team, consisting of executive level health and safety roles, regional health and safety managers, and multiple operational level health and safety coordinators.

Table 22-16: Health and Safety (Risk 14)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Failure to attain operations safety standards and associated occurrence of accidents	Injuries and possible loss of life; damage to morale and workforce confidence; loss of production and diminished productivity; regulatory issues, closures and fines; reputation loss	Safety and loss control awareness training to help employees recognize hazardous conditions and actions; frequent job observations and feedback; periodic employee performance reviews	2	5	10	Senior management's active participation in safety process; utilization of motivational methods to reinforce company's values and commitment to safety; regular comprehensive safety audits to assure safety standards are maintained.	2	3	6

23 Recommendations

Alpha is continuing to work both internally and with outside assistance to continue to further define their Resource Base and to Optimize the LOM Plan.

24 References

Publicly available information from various State and Federal agencies was used where relevant.

JOURNEL, A.G., & HUIJBREGTS, CH, J., 1978: Mining Geostatistics, The Blackburn Press Caldwell, New Jersey.

25 Reliance on Information Provided by Registrant

For the purpose of this TRS, MM&A utilized the Geological and Coal Quality data provided by Alpha. This information was subjected to verification of its integrity and completeness.

Historical productivity and operating costs were also supplied by Alpha. This information was combined with the experience and knowledge of the QP's to forecast the LOM plan.

Alpha supplied a long-term price forecast based on published benchmark pricing. This benchmark pricing was adjusted by Alpha to reflect the effects of quality and transportation borne after FOB plant costs were calculated.

A summary of the information provided by Alpha relied upon by MM&A for the purposes of this TRS is provided in *Table 25-1*.

Table 25-1: Information from Registrant Relied Upon by MM&A

Category	Information Provided by Alpha	Report Section
Legal	Mineral control and surface control rights as shown on maps	3.2, 3.3
Geological	Geologic data including digital databases and original source data including geologist logs, driller's logs, geophysical logs	9.1
Coal Quality	Database of coal quality information supplemented with original source laboratory sheets where available	10.1
Mining	Historical productivities and manpower from operating and future Alpha mines	13.2, 13.4
Coal Preparation	Flow sheet and other information representing current and future methods of coal processing	14.1
Marketing	Long-term price forecast used in financial projections	16.2

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Kepler Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Category	Information Provided by Alpha	Report Section
Waste Disposal	Engineering data and estimates representing remaining capacities for coarse and fine coal waste disposal	17.2
Environmental	Permit and bonding information	17.3
Costs	Historical and budgetary operating cost information used to derive cost drivers for reserve financial modeling	18.2

APPENDIX

A

SUMMARY TABLES

Alpha Metallurgical Resources

2021 SEC Filing - Kepler Properties

Summary of Coal Resource (Short Tons) • Effective December 31, 2021

Appendix A Table 1

Mine/Area	Seam	Coal Resource (Dry Tonnes, In Situ)									Quality (Dry Basis)		
		By Reliability Category					By Control Type		By Permit Status				
		Measured	Indicated	Total	Inferred	Grand Total	Owned	Leased	Permitted	Not Permitted	Ash%	Sulfur%	VM%
Sewell #2 West	Sewell	0	0	0	0	0	0	0	0	0	-	-	-
Sewell #1 East	Sewell	0	0	0	0	0	0	0	0	0	-	-	-
Proposed Beckley West Mine	Beckley	0	0	0	0	0	0	0	0	0	-	-	-
Proposed Beckley East Mine	Beckley	0	0	0	0	0	0	0	0	0	-	-	-
Proposed P3 North	Pocahontas 3	0	0	0	0	0	0	0	0	0	-	-	-
Wyomine 2	Sewell	3.180.000	254.000	3.434.000	0	3.434.000	0	3.434.000	2.505.000	929.000	5	0.5	23

Resource Only	Sewell	1,994,000	1,521,000	3,514,000	0	3,514,000	115,000	3,399,000	0	3,514,000	4	0.9	24
Resource Only	Beckley	386,000	0	386,000	0	386,000	0	386,000	0	386,000	-	-	-
Resource Only	Pocahontas 6	0	23,565,000	23,565,000	0	23,565,000	481,000	23,085,000	0	23,565,000	-	-	-
Resource Only	Pocahontas 4	13,276,000	1,474,000	14,750,000	0	14,750,000	0	14,750,000	0	14,750,000	19	0.5	-
Road Fork 52	Pocahontas 3	9,982,000	3,102,000	13,084,000	0	13,084,000	0	13,084,000	7,049,000	6,035,000	10	1.1	20
Total		**28,818,000**	**29,916,000**	**58,734,000**	**0**	**58,734,000**	**596,000**	**58,138,000**	**9,555,000**	**49,179,000**	**12**	**0.9**	**21**

*Note(1): Resource tons are **exclusive** of reserve tons.*

Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.

All resources exclusive of reserves are considered on a met market.

Totals may not add due to rounding.

Alpha Metallurgical Resources

2021 SEC Filing - Kepler Properties

Summary of Coal Reserves (Short Tons) • Effective December 31, 2021

Appendix A Table 2

		Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)											Quality (Dry Basis)		
		By Reliability Category			By Mining Type		By Control Type		By Permit Status		By Market				
Mine	Seam	Proven	Probable	Total	Surface	UG	Owned	Leased	Permitted	Not Permitted	Thermal	Met	Ash%	Sulfur%	VM%
Sewell #2	Sewell	3,222,000	1,220,000	4,442,000	0	4,442,000	3,000	4,438,000	0	4,442,000	0	4,442,000	3	0.5	24
Sewell #1	Sewell	581,000	3,000	584,000	0	584,000	0	584,000	549,000	34,000	0	584,000	4	0.7	23
Proposed Beckley West Mine	Beckley	419,000	10,000	429,000	0	429,000	0	429,000	0	429,000	0	429,000	4	1.3	-
Proposed Beckley East Mine	Beckley	488,000	0	488,000	0	488,000	0	488,000	0	488,000	0	488,000	4	1.3	-
Road Fork 52 (Pocahontas 3)	Pocahontas 3	18,275,000	13,061,000	31,337,000	0	31,337,000	255,000	31,082,000	19,547,000	11,789,000	0	31,337,000	6	0.9	19
Proposed P3 North	Pocahontas 3	3,846,000	7,486,000	11,332,000	0	11,332,000	0	11,332,000	0	11,332,000	0	11,332,000	6	0.8	20
Grand Total		**26,830,000**	**21,780,000**	**48,610,000**	**0**	**48,610,000**	**258,000**	**48,352,000**	**20,097,000**	**28,514,000**	**0**	**48,610,000**	**5**	**0.8**	**20**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core hole. The combination of surface and inherent moisture is modeled at 6.5-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.

**Volatile Matter analysis is not available for the Beckley seam reserve areas. The Beckley reserves are priced as a Mid-Vol. product.*

Totals may not add due to rounding.

APPENDIX

B

INITIAL ECONOMIC ASSESSMENT, KEPLER RESOURCES
EXCLUSIVE OF RESERVES

MARSHALL MILLER
& ASSOCIATES

Kepler Area
Initial Economic Assessment, Kepler Resources Exclusive of Reserves
Appendix B

	Sewell Wyoming 2 Blocks A,B,D	Sewell Block F	Beckley Block B	P6 Block A	P6 Blocks B,C,D	P6 Blocks F,G	P6 Block H	P4 Blocks A & B
In-Place Resource Tons	5,700,000	1,250,000	390,000	6,300,000	15,070,000	2,200,000	13,080,000	14,750,000
Potentially Recoverable Tons*	2,930,000	570,000	140,000	2,870,000	7,430,000	1,080,000	5,340,000	3,830,000
Mining Method	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM
Assumed Sales Realization at Plant**	$ 125	$ 125	$ 125	$ 125	$ 125	$ 125	$ 125	$ 125
Iniital Capex Estimate to Access Resources***	$ 2,000,000	$ 3,000,000	$ -	$ 5,000,000	$ 5,000,000	$ 5,000,000	$ 2,000,000	$ 30,000,000
Direct Mining Costs:								
Labor****	$ 34.37	$ 40.51	$ 37.50	$ 29.16	$ 31.20	$ 34.74	$ 19.21	$ 32.52
Supplies, Excluding Roof Control	$ 5.73	$ 6.75	$ 6.25	$ 4.86	$ 5.20	$ 5.79	$ 3.20	$ 3.87
Roof Control	$ 6.87	$ 8.10	$ 7.50	$ 5.83	$ 6.24	$ 6.95	$ 3.84	$ 6.97
M&R	$ 8.71	$ 9.48	$ 9.97	$ 7.31	$ 7.84	$ 9.18	$ 7.24	$ 5.12
Power	$ 2.49	$ 2.71	$ 2.85	$ 2.09	$ 2.24	$ 2.62	$ 2.07	$ 1.46
Other	$ 2.49	$ 2.71	$ 2.85	$ 2.09	$ 2.24	$ 2.62	$ 2.07	$ 1.46
Total Direct Cash Costs	$ 60.66	$ 70.26	$ 66.92	$ 51.34	$ 54.96	$ 61.91	$ 37.63	$ 51.41
Transporation, Washing, Environmental & G&A Costs:								
Coal Prep*****	$ 8.71	$ 9.48	$ 9.97	$ 7.31	$ 7.84	$ 9.18	$ 7.24	$ 5.12
Materials Handling	$ 2.49	$ 2.71	$ 2.85	$ 2.09	$ 2.24	$ 2.62	$ 2.07	$ 1.46
Raw Coal Trucking*****	$ 6.42	$ 14.76	$ 10.04	$ 10.28	$ 9.08	$ 17.05	$ -	$ 7.72
Clean Coal Trucking	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25
Enviro******	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
G&A	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Total Transporation, Washing, Environmental & G&A Costs:	$ 20.87	$ 30.20	$ 26.12	$ 22.92	$ 22.41	$ 32.11	$ 12.56	$ 17.56
Indirect Cash Costs								
Royalty	$ 8.75	$ 8.75	$ 8.75	$ 8.75	$ 8.75	$ 8.75	$ 8.75	$ 8.75
Black Lung Excise Tax	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55
SMCRA	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12
State Severance	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50
Property Tax & Insurance	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Total Indirect Cash Costs	$ 12.42	$ 12.42	$ 12.42	$ 12.42	$ 12.42	$ 12.42	$ 12.42	$ 12.42
Non Cash Costs								
Amoritiztion of Development Capital	$ 0.68	$ 5.25	$ -	$ 1.74	$ 0.67	$ 4.64	$ 0.37	$ 7.84
Depreciation of Initial Equipment and Sustaining Capital	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00
Depletion	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Total Non Cash	$ 6.68	$ 11.25	$ 6.00	$ 7.74	$ 6.67	$ 10.64	$ 6.37	$ 13.84
Total Cash Cost	$ 93.96	$ 112.87	$ 105.46	$ 86.68	$ 89.79	$ 106.45	$ 62.61	$ 81.39
EBITDA	$ 31.04	$ 12.13	$ 19.54	$ 38.32	$ 35.21	$ 18.55	$ 62.39	$ 43.61
Fully Loaded Cost	$ 100.64	$ 124.13	$ 111.46	$ 94.42	$ 96.46	$ 117.09	$ 68.99	$ 95.23
Fully Loaded P&L	$ 24.36	$ 0.87	$ 13.54	$ 30.58	$ 28.54	$ 7.91	$ 56.01	$ 29.77
Passes Resource Iniital Economic Assessment?	YES	YES	YES	YES	YES	YES	YES	YES

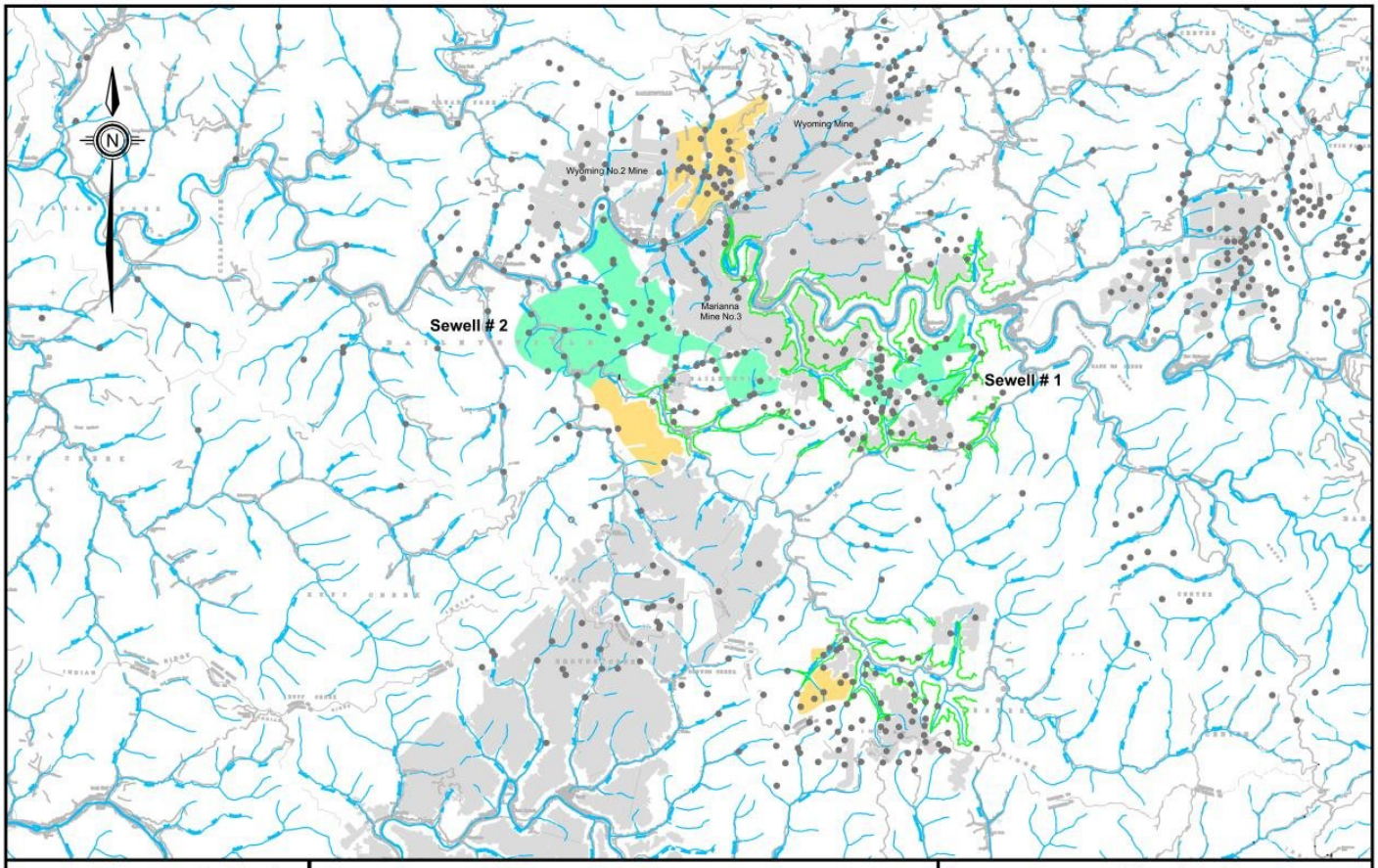
*Potentially recoverable tons are calculated by applying appropriate modifying factors to in-place resource tonnages
**Sales relization represents approximate 2-year historicals for Kepler product
***Capex estimate inclusive of site development and seam access, including water, power, etc.
****Labor rates are driven based off of super section productivities assuming 300 to 400 feet per unit shift per section.
*****Processing assumed to occur at Kepler plant, requiring haulage to plant.
******Environmental costs assumed to include permiting, outfall maintenance, etc.

APPENDIX

C

MAPS

MARSHALL MILLER
&ASSOCIATES®



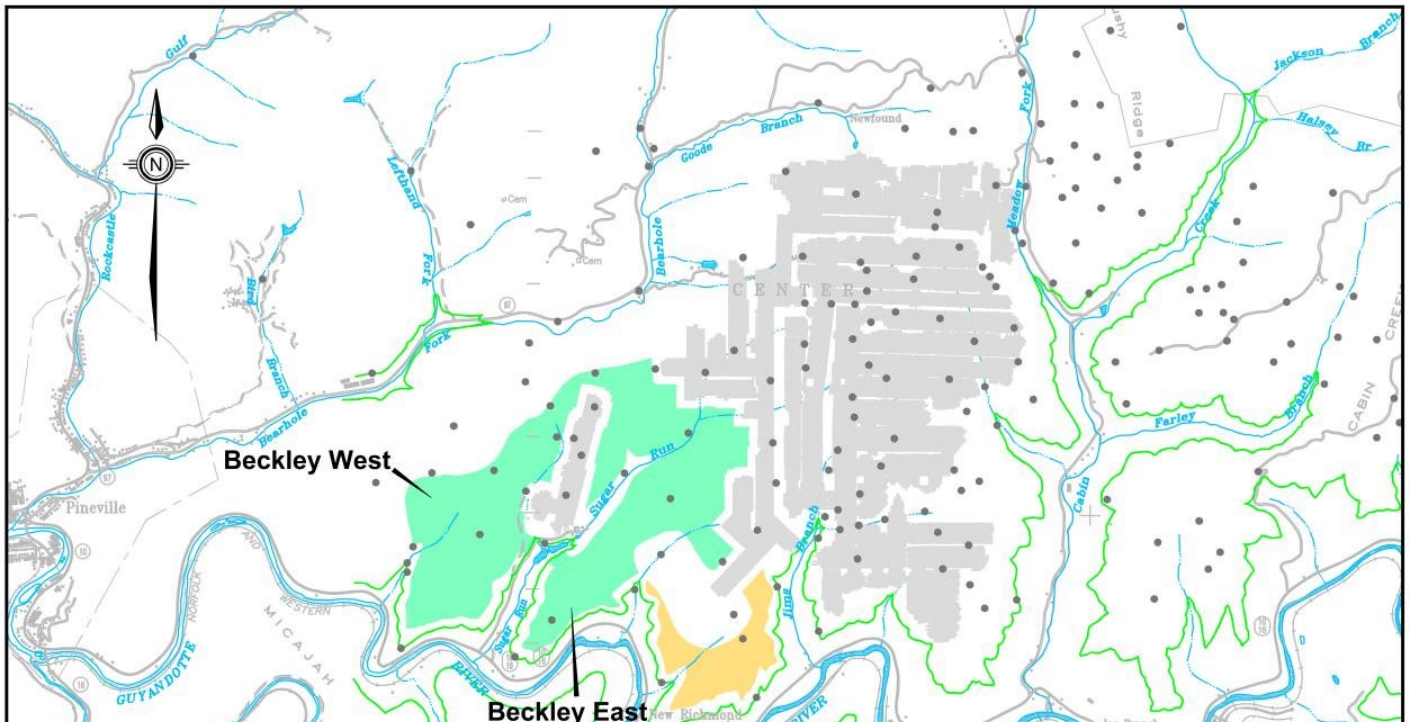
MARSHALL MILLER & ASSOCIATES®

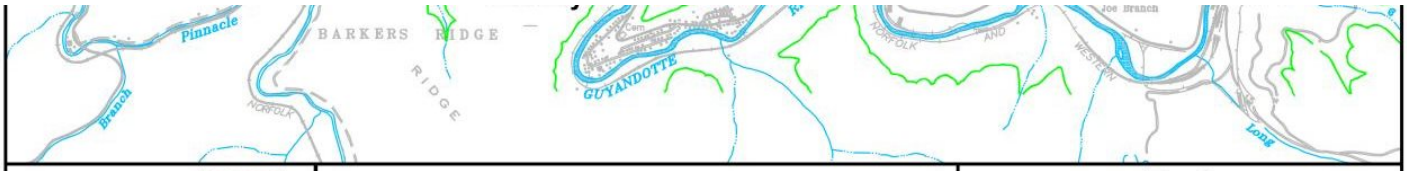
CES129 Bluefield, VA 2/22
Kepler–Sewell mh

Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0 2
Scale In Miles

Map 1
Kepler Area
Sewell Seam

Alpha Metallurgical Resource, LLC
Wyoming County, West Virginia
Coordinate System: West Virginia South State Plane NAD 27





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CES129 Bluefield, VA 2/22
Kepler—Beckley mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 3000'
Scale In Feet

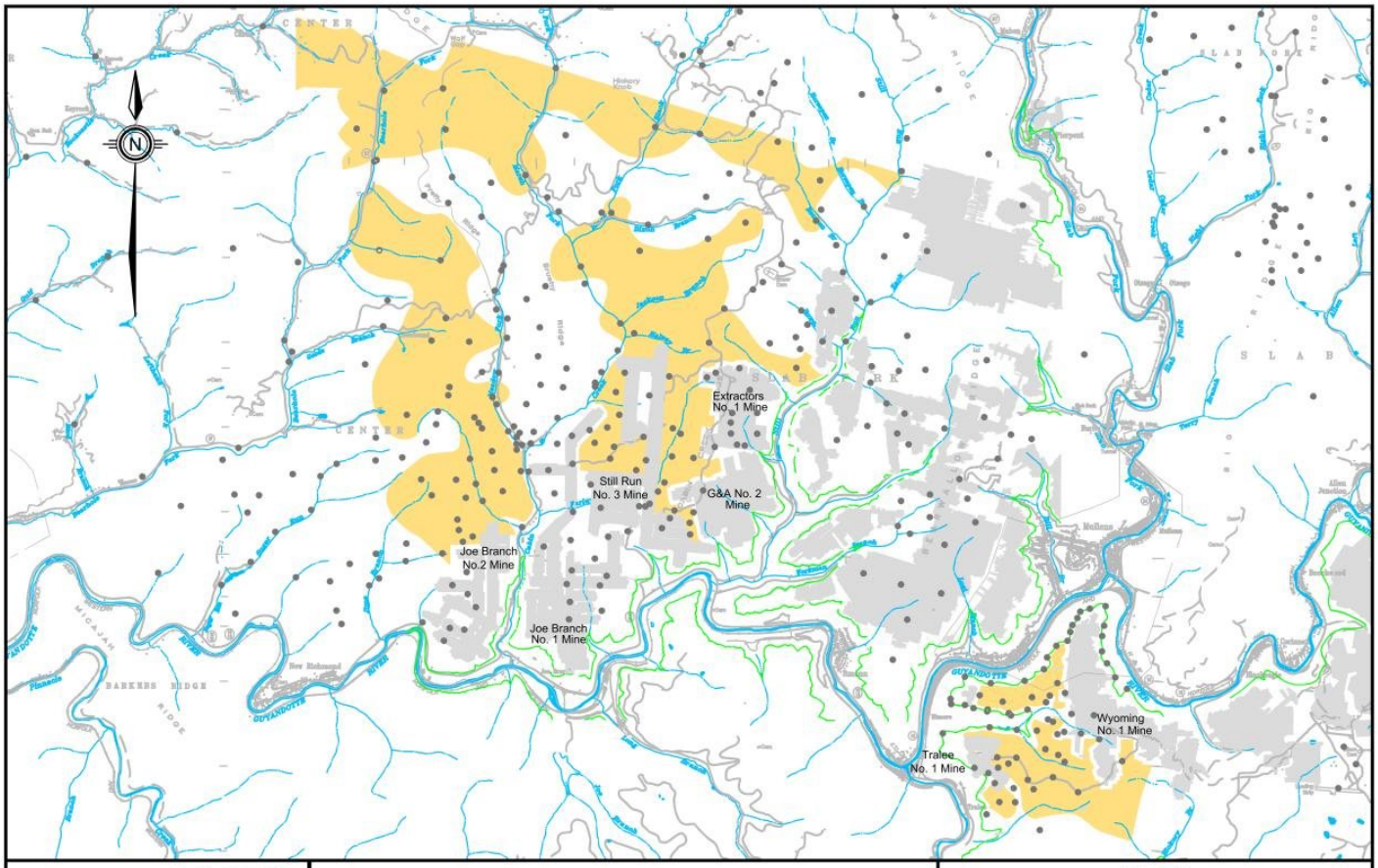
Map 2

Kepler Area
Beckley Seam

Alpha Metallurgical Resource, LLC

Wyoming County, West Virginia

Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
Kepler–P6 mh

Data Point Location

Previous Underground Mining

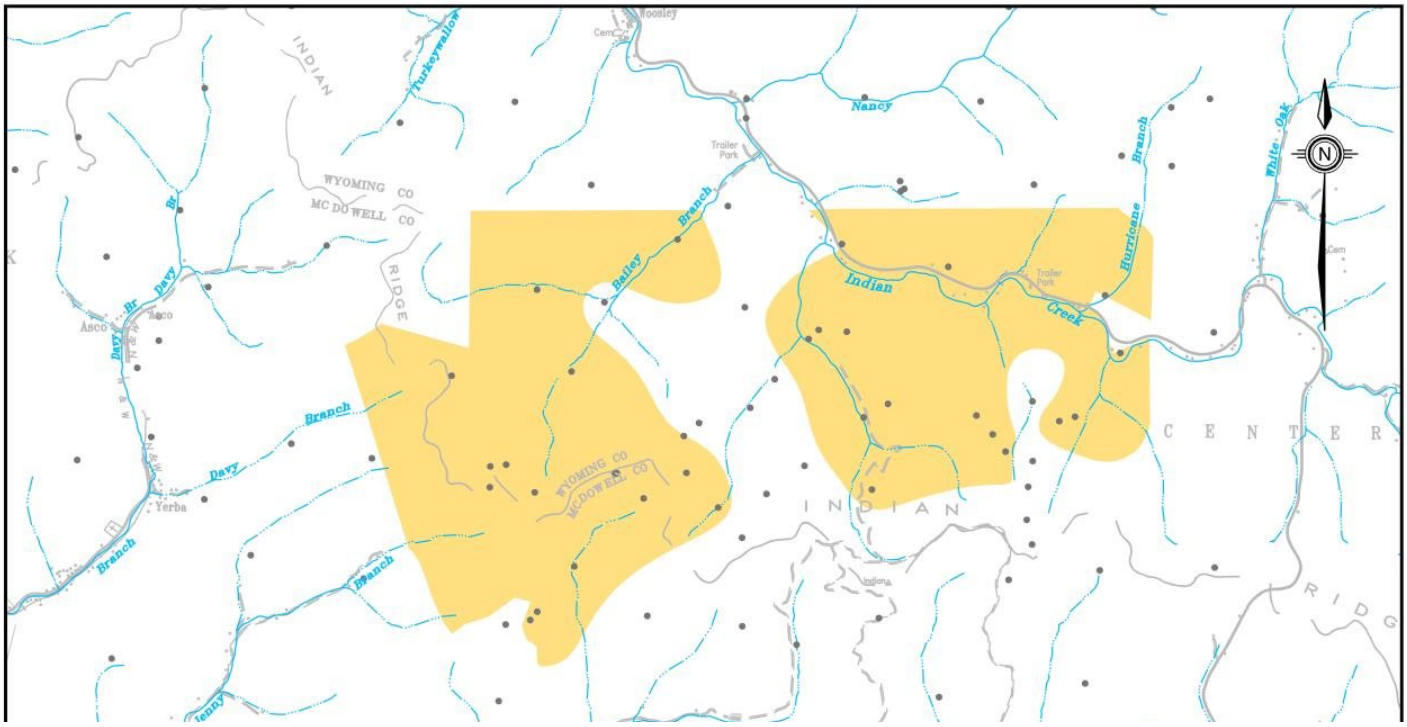
Controlled Underground Reserve / Resource as of 12/31/21

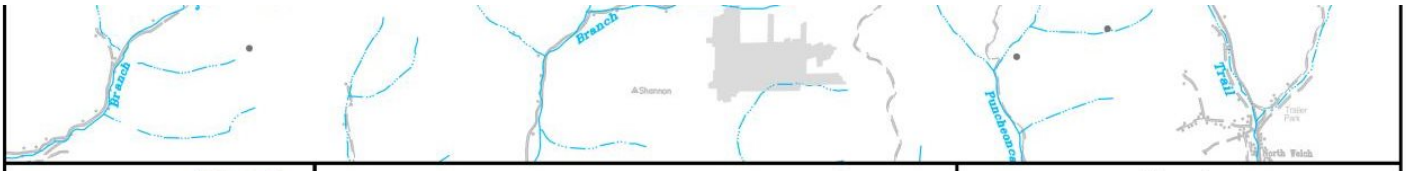
Resource Exclusive of Reserve

0 1
Scale In Miles

Map 3
Kepler Area
Pocahontas No. 6 Seam

Alpha Metallurgical Resource, LLC
Wyoming County, West Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
Kepler–P4 mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Resource Exclusive of Reserve

0 3000'
Scale In Feet

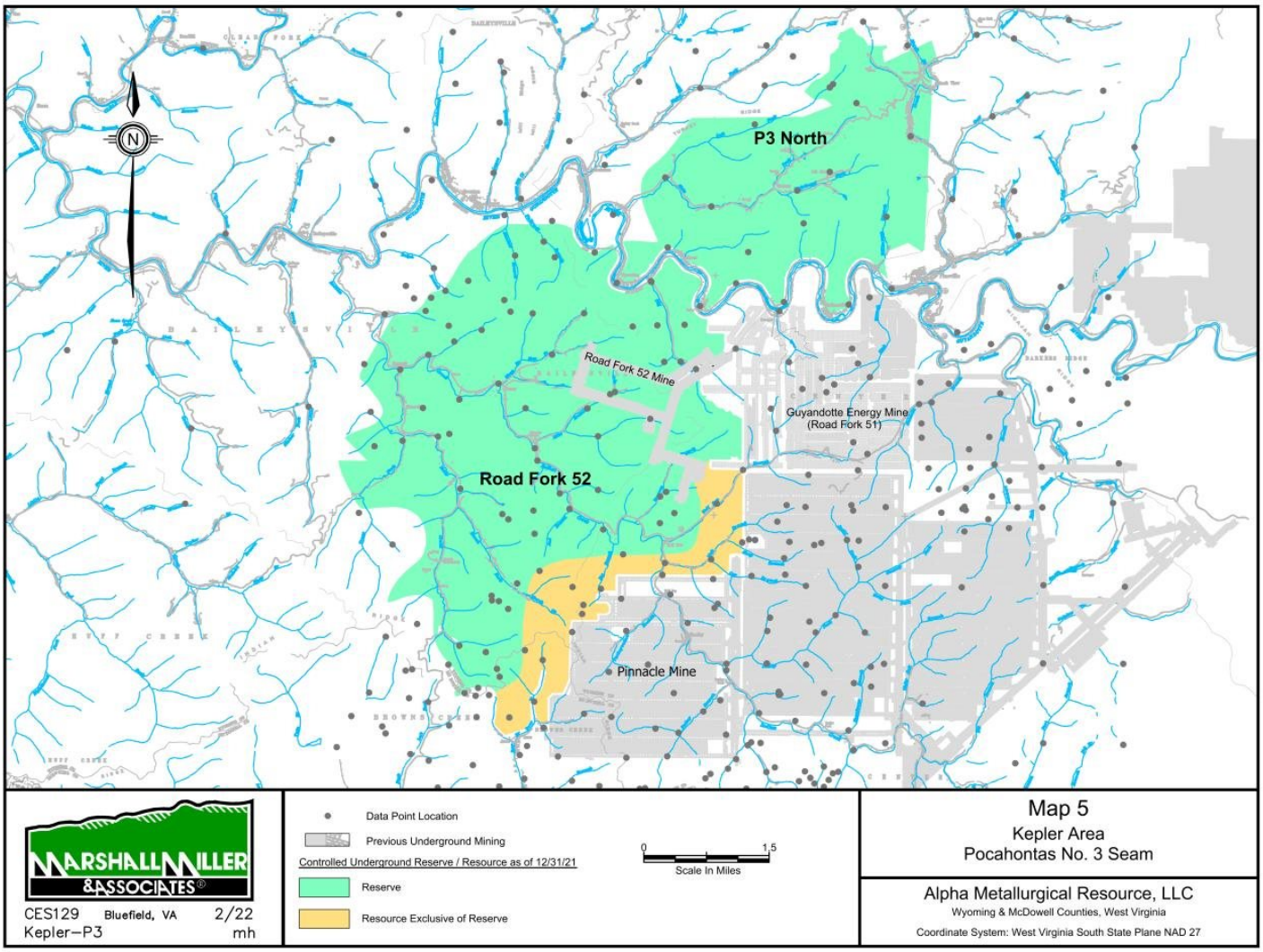
Map 4

Kepler Area
Pocahontas No. 4 Seam

Alpha Metallurgical Resource, LLC

Wyoming & McDowell Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27


N
P3 North
Road Fork 52 Mine
Guyandotte Energy Mine
(Road Fork 51)
Road Fork 52
Pinnacle Mine
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0
1.5
Scale In Miles
MARSHALL MILLER & ASSOCIATES
CES129 Bluefield, VA 2/22
Kepler–P3 mh
Map 5
Kepler Area
Pocahontas No. 3 Seam
Alpha Metallurgical Resource, LLC
Wyoming & McDowell Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

February 2022

Prepared for:
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582 Industrial Park Road
Bluefield, Virginia 24605
www.mma1.com

Statement of Use and Preparation

This Technical Report Summary (*TRS*) was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors. Copies or references to information in this report may not be used without the written permission of Alpha.

The report provides a statement of coal resources and coal reserves for Alpha, as defined under the **United States Securities and Exchange Commission (*SEC*)**.

The statement is based on information provided by Alpha and reviewed by various professionals within **Marshall Miller & Associates, Inc. (*MM&A*)**.

MM&A professionals who contributed to the drafting of this report meet the definition of *Qualified Persons* (*QPs*), consistent with the requirements of the SEC.

The information in this TRS related to coal resources and reserves is based on, and fairly represents, information compiled by the QPs. At the time of reporting, MM&A's QPs have sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity they are undertaking to qualify as a QP as defined by the SEC. Each QP consents to the inclusion in this report of the matters based on their information in the form and context in which it appears.

Certain information set forth in this report contains "forward-looking information", including production, productivity, operating costs, capital costs, sales prices, and other assumptions. These statements are not guarantees of future performance and undue reliance should not be placed on them. The assumptions used to develop the forward-looking and the risks that could cause the actual results to differ materially are detailed in the body of this report.

Marshall Miller & Associates, Inc. (*MM&A*) hereby consents (i) to the use of the information contained in this report dated December 31, 2021, relating to estimates of coal resources and coal reserves controlled by Alpha, (ii) to the use of MM&A's name, any quotations from or summarizations of this TRS in Alpha's SEC filings, and (iii) to the filing of this TRS as an exhibit to Alpha's SEC filings.

Qualified Person:	**/s/ Marshall Miller & Associates, Inc.**
Date:	February 15, 2022

Table of Contents

1 **Executive Summary 1**
1.1 Property Description 1
1.2 Ownership 2
1.3 Ownership 2
1.4 Geology 2
1.5 Exploration Status 3
1.6 Operations and Development 3
1.7 Mineral Resource 4
1.8 Mineral Reserve 5
1.9 Capital Summary 6
1.10 Operating Costs 7
1.11 Economic Evaluation 9
1.11.1 Discounted Cash Flow Analysis 11
1.11.2 Sensitivity Analysis 11
1.12 Permitting 12
1.13 Conclusion and Recommendations 12
2 **Introduction 13**
2.1 Registrant and Terms of Reference 13
2.2 Information Sources 13
2.3 Personal Inspections 14
3 **Property Description 14**
3.1 Location 14
3.2 Titles, Claims or Leases 14
3.3 Mineral Rights 15
3.4 Encumbrances 15
3.5 Other Risks 15
4 **Accessibility, Climate, Local Resources, Infrastructure and Physiography 15**
4.1 Topography, elevation, and Vegetation 15
4.2 Access and Transport 16
4.3 Proximity to Population Centers 16
4.4 Climate and Length of Operating Season 16
4.5 Infrastructure 17

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

5 **History 17**
5.1 Previous Operation 17
5.2 Previous Exploration 17
6 **Geological Setting, Mineralization and Deposit 18**
6.1 Regional, Local and Property Geology 18
6.2 Mineralization 18
6.3 Deposits 20

6.3 Deposits 20
7 **Exploration 21**
7.1 Nature and Extent of Exploration 21
7.2 Drilling Procedures 23
7.3 Hydrology 23
7.4 Geotechnical Data 24
8 **Sample Preparation Analyses and Security 24**
8.1 Prior to Sending to the Lab 24
8.2 Lab Procedures 25
9 **Data Verification 25**
9.1 Procedures of Qualified Person 25
9.2 Limitations 26
9.3 Opinion of Qualified Person 26
10 **Mineral Processing and Metallurgical Testing 26**
10.1 Testing Procedures 26
10.2 Relationship of Tests to the Whole 27
10.3 Lab Information 27
10.4 Relevant Results 27
11 **Mineral Resource Estimates 28**
11.1 Assumptions, Parameters and Methodology 28
11.1.1 Geostatistical Analysis 30
11.2 Resources Exclusive of Reserves 33
11.2.1 Initial Economic Assessment 34
11.3 Qualified Person's Estimates 35
11.4 Qualified Person's Opinion 36
12 **Mineral Reserve Estimates 37**
12.1 Assumptions, Parameters and Methodology 37
12.2 Mineral Reserves 38
12.2.1 Surface Reserves 39

12.2.2 Underground Reserves 41
12.3 Qualified Person's Estimates 42
12.4 Qualified Person's Opinion 43
13 **Mining Methods 43**
13.1 Geotech and Hydrology 43
13.2 Production Rates 43
13.3 Mining Related Requirements 45
13.3.1 Underground 45
13.4 Required Equipment and Personnel 45
13.4.1 Underground Mines 45
13.4.2 Surface Mines 48
14 **Processing and Recovery Methods 51**
14.1 Description or Flowsheet 51
14.2 Requirements for Energy, Water, Material and Personnel 53
15 **Infrastructure 53**
16 **Market Studies 56**
16.1 Market Description 56
16.2 Price Forecasts 57
16.3 Contract Requirements 57
17 **Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals 58**
17.1 Results of Studies 58
17.2 Requirements and Plans for Waste Disposal 58
17.3 Permit Requirements and Status 59
17.4 Local Plans, Negotiations or Agreements 62
17.5 Mine Closure Plans 62
17.6 Qualified Person's Opinion 62
18 **Capital and Operating Costs 62**
18.1 Capital Cost Estimate 62
18.2 Operating Cost Estimate 64
19 **Economic Analysis 66**
19.1 Economic Evaluation 66
19.1.1 Introduction 66
19.1.2 Cash Flow Summary 71
19.1.3 Discounted Cash Flow Analysis 72

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

19.1.4 Sensitivity Analysis 73
20 **Adjacent Properties 74**
20.1 Information used 74
21 **Other Relevant Data and Information 74**
22 **Interpretation and Conclusions 74**
22.1 Conclusion 74

22.2 Risk Factors 74
22.2.1 Governing Assumptions 75
22.2.2 Limitations 76
22.2.3 Methodology 76
22.2.4 Development of the Risk Matrix 77
22.2.5 Categorization of Risk Levels and Color Code Convention 79
22.2.6 Description of the Coal Property 79
22.2.7 Summary of Residual Risk Ratings 80
22.2.8 Risk Factors 80
23 **Recommendations 87**
24 **References 87**
25 **Reliance on Information Provided by Registrant 88**

FIGURES (IN REPORT)

Figure 1-1: Alpha's MWVS Business Unit Property Location Map 2
Figure 1-2: Projected Capital Expenditures – Consolidated MWVS Business Unit 7
Figure 1-3: MWVS Business Unit Operating Costs 8
Figure 1-4: Sensitivity of NPV 12
Figure 6-1: MWVS- Workman Creek Stratigraphic Column 19
Figure 6-2: MWVS-Kingston Stratigraphic Column 20
Figure 7-1: MWVS Cross-Section 22
Figure 11-1: Histogram of the Total Seam Thickness for the Little Eagle Seam Present in the MWVS Business Unit 31
Figure 11-2: Scatter plot of the Total Seam Thickness for the Little Eagle Seam Present in the MWVS Business Unit 31
Figure 11-3: Variogram of the Total Seam Thickness for the Little Eagle Seam Present in the MWVS Business Unit 32
Figure 11-4: Result of DHSA for the Little Eagle Seam Present in the MWVS Business Unit 33
Figure 11-5: Results of Initial Economic Assessment 35
Figure 13-1: Workman Creek Surface Mine and Permit Areas Aerial View 48
Figure 13-2: Kingston Surface Mine Permit Areas Aerial View 50
Figure 14-1: MWVS Kingston Preparation Plant and Refuse Area 52

Figure 14-2: MWVS Kingston Preparation Plant and Refuse Area (Zoomed-In View) 53
Figure 15-1: MWVS Kingston Preparation Plant & Surface Facilities 54
Figure 15-2: MWVS Pax Loadout Surface Facilities 55
Figure 15-3: MWVS Workman Creek Surface Facilities 55
Figure 15-4: Workman Creek Coal Handling Facility 56
Figure 18-1: Projected Capital Expenditures – Consolidated MWVS Operations 63
Figure 18-2: MWVS Business Unit Operating Costs 65
Figure 19-1: Projection of Sales Tons 67
Figure 19-2: Consolidated Annual Revenue 68
Figure 19-3: Revenue, Cash Costs, and EBITDA 69
Figure 19-4: Annual EBITDA 70
Figure 19-5: Net Cash Flow after Tax (Before Debt Service) 72
Figure 19-6: Sensitivity of NPV 73

TABLES (IN REPORT)

Table 1-1: Coal Resources Summary as of December 31, 2021 4
Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 5
Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 9
Table 1-4: Project Cash Flow Summary (000) 10
Table 11-1: General Reserve & Resource Criteria 29
Table 11-2: DHSA Results Summary for Radius from a Central Point 33
Table 11-3: Results of Initial Economic Assessment 35
Table 11-4: Coal Resources Summary as of December 31, 2021 36
Table 12-1: Workman Creek Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 39
Table 12-2: Kingston Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 40
Table 12-3: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 42
Table 13-1: MWVS Business Unit Underground Mine Production Schedule (x 1,000 Saleable Tons) .. 44
Table 13-2: MWVS Business Unit Surface Mine Production Schedule (x 1,000 Saleable Tons) 44
Table 13-3: MWVS Business Unit Highwall Mine Production Schedule (x 1,000 Saleable Tons) 45
Table 16-1: Quality Specifications 56
Table 16-2: Price Forecasts 57
Table 17-1: MWVS Refuse Disposal Summary* 59
Table 17-2: MWVS Mining Permits 61
Table 18-1: Summary of Capital Expenditures Schedule by Mine 64
Table 18-2: Estimated Coal Production Taxes and Sales Costs 65
Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 69
Table 19-2: Project Cash Flow Summary (000) 71
Table 22-1: Probability Level Table 77
Table 22-2: Consequence Level Table 78
Table 22-3: Risk Matrix 79
Table 22-4: Risk Assessment Matrix 80
Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2) 81

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 22-6: Environmental (Risks 3 and 4) 82
Table 22-7: Regulatory Requirements (Risk 5) 82
Table 22-8: Market and Transportation (Risk 6) 83
Table 22-9: Market and Transportation (Risk 7) 83
Table 22-10: Methane Management (Risk 8) 84
Table 22-11: Mine Fires (Risk 9) 84
Table 22-12: Ground Control (Risk 10) 85
Table 22-13: Availability of Supplies and Equipment (Risk 11) 85

Table 22-14: Labor – Work Stoppage (Risk 12) 86
Table 22-15: Labor – Retirement (Risk 13) 86
Table 22-16: Health and Safety (Risk 14) 87
Table 22-17: Refuse Disposal (Risk 15) 87
Table 25-1: Information from Registrant Relied Upon by MM&A 88

Appendices

A ..... Summary Tables
B ..... Financial Details – Resources Exclusive of Reserves
C ..... Maps

1 Executive Summary

1.1 Property Description

Alpha Metallurgical Resources, Inc. (*Alpha*) authorized **Marshall Miller & Associates, Inc. (*MM&A*)** to prepare this Technical Report Summary (*TRS*) of its controlled coal reserves located at the **Mid-West Virginia Surface Business Unit (*MWVS* or the *Property*)** in Raleigh and Fayette counties, West Virginia.

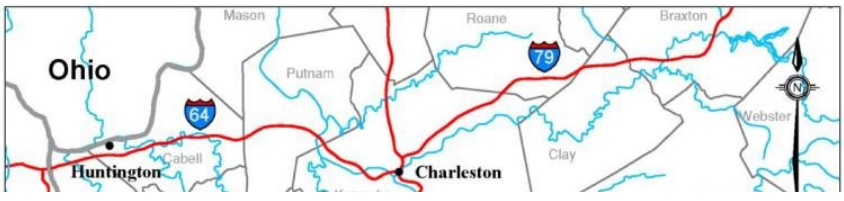
Coal resources and coal reserves are herein reported in imperial units of measurement.

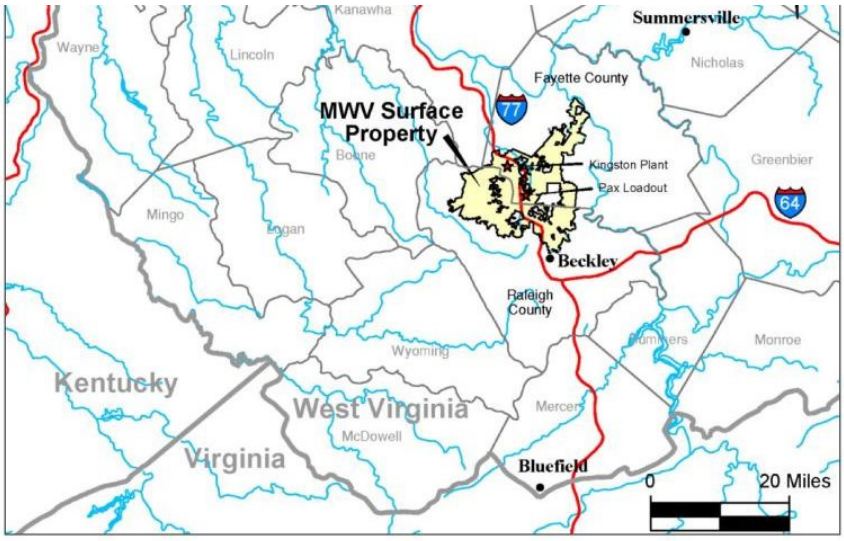
The MWVS Operations is comprised of the Kingston surface and underground operations and the Workman Creek surface mines that are part of Mid-West Virginia Underground Operations. Active surface facilities for the met operations include the Workman Creek surface facilities in Raleigh County West Virginia, located along Workman Creek, a tributary to Clear Fork along State Route 1. Workman Creek surface facility are 24 miles northwest of the Beckley, West Virginia, the county seat of Raleigh County; the Kingston surface facilities and preparation plant are near the community of Mossy, along Paint Creek in Fayette County. Kingston is located approximately 25 mile north of Beckley, West Virginia; The Pax loadout is located in the community of Pax, located along Interstate Highway 64/77 and has access to the CSX railroad line. The Pax Loadout is 20 miles north of Beckley, West Virginia (see *Figure 1-1*).

The Property is composed of approximately 119,000 total acres of mineral control, of which nearly all are contained within 10 separate leases and 8 owned properties. The mentioned leases are all subject to Alpha renewing the rights to extend the term of all leases which have various expiration dates, some of which expire in the next several years but are anticipated to be renewed by Alpha.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 1-1: Alpha's MWVS Business Unit Property Location Map





1.2 Ownership

1.3 Ownership

The MWVS property involves a complex combination of previous ownership. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)**, and **Massey Energy (Massey)** previously held mining rights on most of the Property.

1.4 Geology

Coal seams with reserves of currently active operations at the MWVS Business Unit include the Upper, Middle and Lower Clarion; Stockton, Upper Coalburg, Coalburg, Lower Coalburg, Upper Winifrede Rider, Upper Winifrede, Winifrede, Lower Winifrede, Upper Chilton A, Middle Chilton A , Chilton A Upper Split, Chilton A Lower Split, Chilton A, Chilton Rider, Upper Chilton, Lower Chilton, Chilton, Upper Hernshaw, Lower Hernshaw, Upper Cedar Grove Upper Split, Upper Cedar Grove Lower Split, Middle Cedar Grove, Lower Cedar Grove Upper Split, Lower Cedar Grove, Peerless Upper Split, Peerless Lower

Split, Peerless C, Upper No. 2 Gas, Lower No. 2 Gas, Powellton, Lower Powellton, Powellton Lower Split, Powellton Lower Split Upper, Upper Eagle Rider 2, Powellton Lower Split Lower, Upper Eagle Rider, Upper Eagle, Eagle A, Eagle Upper Split, Eagle Lower Split, Eagle, Little Eagle, Little Eagle Lower Split, War Eagle, Glen Alum Tunnel Upper Split, Glen Alum Tunnel Douglas and Sewell seams. Coal seams below the Coalburg seam are all historically utilized as coking coal. Strata on the Property, among the active sites, are mostly of the Pennsylvanian-aged (approximately 290 to 330 million years ago) Kanawha Formation. The lower most Sewell coal seam is part of the New River Formation of the Pottsville Series. The rock formations between the coal seams are characterized by proportions of sandstone and shale units. In general, the coal seams reach the highest structural elevations along the southeastern margin of the Property, generally dipping toward the northwest. The area is generally stable with no major faulting and gentle dips.

1.5 Exploration Status

The Property has been extensively explored, largely by drilling using continuous coring and rotary drilling methods but also by obtaining coal measurements at mine exposures, and by downhole geophysical methods. Most of the data was acquired or generated by previous owners of the Property. These sources comprise the primary data used in the evaluation of the coal resources and coal reserves on the Property. MM&A examined the data available for the evaluation and incorporated all pertinent information into this TRS. Where data appeared to be anomalous or not representative, that data was excluded from the digital databases and subsequent processing by MM&A.

Ongoing exploration has been carried out by Alpha since acquiring the MWVS Business Unit. The Alpha acquired exploration data has been consistent with past drilling activities.

1.6 Operations and Development

As of December 31, 2021, MWVS Business Unit is comprised of two surface operations, Kingston and Workman Creek. Active surface mine operations at Workman Creek, include the Long Ridge, Center Contour, Collins Fork and Middle Ridge permits. Active Surface mines and Kingston included the Kingston permit. The surface mines production is approximately 75% metallurgical coal product consisting of Mid-Vol, High-Vol A and Alt Met Coal product and 25% steam coal as a by-product from stripping. These surface mines are traditional contour strip mines that include supplemental highwall mining activity in major seams.

MWVS underground mine operations were active at the Kingston 2 Mine, part of the Kingston unit. Kingston 2 produces Mid-Vol product from the Douglas coal seam.

Based on the mine plans developed as part of this TRS, annual deep mine production peaks at 1.7 million tons in 2032. Underground reserves will be depleted in 2035. Annual surface production peaks at 3.4 million tons in 2023 and highwall mine production peaks at 0.6 million tons in 2024. Surface and highwall reserves are both depleted in 2042.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

In addition to the mines, the MWVS Business Unit includes the Kingston Preparation Plant and the Pax loadout facilities.

The Kingston Preparation Plant has a design feed rate capacity of 700 raw tons per hour. Primary separation equipment includes heavy media vessels, heavy media cyclones, spirals, and flotation cells, supported by the requisite screens, centrifuges, sumps, pumps, and distribution systems. Coarse and fine refuse are disposed in an adjacent combined fill refuse area and impoundment. Coal Production is also conveyed from Workman Creek, through underground mine works to the Marfork preparation

is also conveyed from Workman Creek, through underground mine works to the Marfork preparation for processing and shipment on the CSX railway. Coal production can be trucked to Mammoth Preparation plant for processing and shipping on the Kanawha River. Shortline railroad connections to the CSX and Norfolk Southern railroads as well as on-site barge loading on the Kanawha River are also available.

1.7 Mineral Resource

A coal resource estimate, summarized in *Table 1-1* was prepared as of December 31, 2021, for property controlled by Alpha.

Table 1-1: Coal Resources Summary as of December 31, 2021

Area or Seam	Coal Resource (Dry Tons, In Situ)			
	Measured	Indicated	Inferred	Total
Inclusive of Reserve				
Workman Creek Surface	28,864,000	965,000	118,000	29,947,000
Workman Creek HWM	10,445,000	178,000	0	10,623,000
Kingston Surface	20,273,000	4,386,000	1,051,000	25,710,000
Kingston HWM	7,011,000	262,000	0	7,273,000
Sewell (UG)	33,662,000	6,908,000	0	40,569,000
Douglas (UG)	2,460,000	1,108,000	0	3,568,000
Total	**102,715,000**	**13,807,000**	**1,169,000**	**117,690,000**
Exclusive of Reserve				
Workman Creek Surface	2,489,000	4,594,000	45,000	7,128,000
Workman Creek HWM	0	0	0	0
Kingston Surface	0	0	0	0
Kingston HWM	0	0	0	0
Sewell (UG)	0	21,254,000	0	21,254,000
Douglas (UG)	0	0	0	0
Total	**2,489,000**	**25,848,000**	**45,000**	**28,382,000**
Grand Total				
Total	**105,204,000**	**39,655,000**	**1,214,000**	**146,073,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Note (3): The Property contains 28.3 million tons (Mt) of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

1.8 Mineral Reserve

The Resource estimate outlined in *Table 1-1* **inclusive** of reserves has been used as the basis for this Reserve calculation, which utilizes a reasonable Preliminary Feasibility Study, a Life-of Mine (*LOM*) Mine Plan and practical recovery factors. Production modeling was completed with an effective start date of January 1, 2021.

Factors that would typically preclude conversion of a coal resource to coal reserve, include the following: inferred resource classification; absence of coal quality; poor mine recovery; lack of access to the deposit; geological encumbrances associated with overlying and underlying strata; thin seam trends; complex structures; and insufficient exploration data. The listed factors have all been considered. Reserve consideration excludes those portions of the resource area, which exhibit the afore mentioned geologic and/ or operational encumbrances.

Proven and probable coal reserves were derived from the defined in-situ coal resource considering relevant processing, economic (including technical estimates of capital, revenue and cost), marketing, legal, environmental, socioeconomic, and regulatory factors. The proven and probable coal reserves on the Property are summarized below in *Table 1-2*.

Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)							Quality (Dry Basis)		
	By Reliability Category			By Permit Status		By Control Type				
Area or Seam	Proven	Probable	Total	Permitted	Not Permitted	Owned	Leased	Ash%	Sulfur%	VM%
Workman Creek Surface	0	24,528,000	24,528,000	24,528,000	0	57,000	24,471,000	-	-	-
Workman Creek HWM	3,661,000	61,000	3,722,000	3,722,000	0	0	3,722,000	9	0.9	-
Kingston Surface	16,048,000	3,440,000	19,487,000	12,298,000	7,189,000	0	19,487,000	10	1.0	32
Kingston HWM	2,401,000	92,000	2,493,000	1,774,000	719,000	0	2,493,000	6	1.0	33
Sewell (UG)	0	9,091,000	9,091,000	0	9,091,000	526,000	8,564,000	5	0.8	22
Douglas (UG)	1,028,000	390,000	1,418,000	1,009,000	408,000	82,000	1,336,000	6	1.0	-
Grand Total	**23,138,000**	**37,601,000**	**60,740,000**	**43,332,000**	**17,407,000**	**664,000**	**60,075,000**	-	-	-

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Raw quality and some volatile matter analysis not available for Workman Creek . Workman Creek surface reserves were priced at 60% High-Vol. A and 40% thermal product. Douglas seam volatile matter analysis not available. Douglas seam priced as a Mid-Vol. product, consistent with Kingston 2 production. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
Totals may not add due to rounding.
Workman Creek Surface is modeled as 55% direct-ship and 45% washed to mimic what Alpha is doing, however without any raw quality data for the surface seams a quality composite could not be prepared.
See Appendix A for detailed breakdown.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

In summary, Alpha controls a total of 60.7 Mt (moist basis) of marketable coal reserves at MWVS as of December 31, 2021. Of that total, 38 percent are proven, and 62 percent are probable. Due to the lack of raw coal quality information, all Workman Creek surface reserves have been classified as Probable even though it is an active operation with sales into the thermal and metallurgical markets. Of the 60.7 Mt, 0.7 Mt are owned, and 60.1 Mt are leased coal reserves. Of the total, 44.0 Mt are surface mineable, 6.2 Mt are highwall mineable, and 10.5 Mt are underground mineable. Marketable coal reserves are 13.7 Mt are thermal and 47.1 Mt are metallurgical. Of the total, 51.0 Mt are assigned, and the

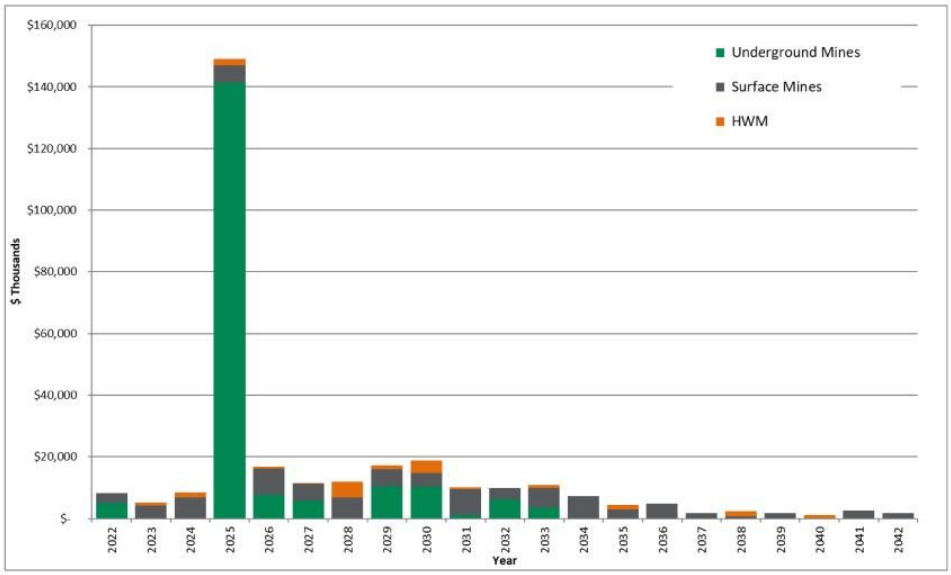
remaining 9.8 Mt are unassigned.

1.9 Capital Summary

Alpha provided MM&A with information related to the number of currently operating production units at the MWVS Business Unit. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement mine.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated MWVS operations is provided in *Figure 1-2* below.

Figure 1-2: Projected Capital Expenditures – Consolidated MWVS Business Unit



1.10 Operating Costs

Alpha provided historical costs and budgeted projections of operating costs for its active mines including:

> Underground operations at Kingston 2 and Kingston 10.

> Surface mines at Pax Surface, Workman Creek North, Workman Creek South, Republic, Kingston Surface.

> Highwall miner operations at Pax HWM, WC North HWM, WC South HWM, Republic HWM and Kingston HWM.

MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for each mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

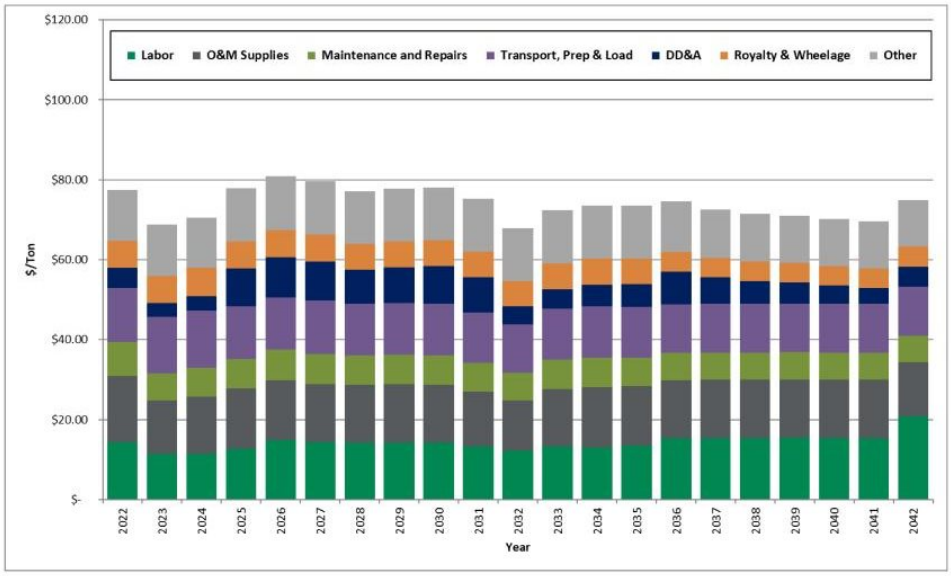
Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Pricing data as provided by Alpha is described in *Table 16-2*. The pricing data assumes a flat-line long term realization average of $144 per short ton port loading, with an average of $102.26 netback pricing reflective of the mid-volatile product, $144 per short ton port loading with an average of $111.29 per short ton netback pricing reflective of the low-volatile product, and $138 per short ton port loading

short ton netback pricing reflective of the low-volatile product, and $138 per short ton port loading, with an average of $108.08 netback pricing reflective of the high-volatile product currently sold at MWVS. A portion of the surface mine production is also thermal product which assumes a flat-line long term realization of $76 per short ton with an average of $66.68 per ton netback pricing. The LOM blended average netback pricing for the MWVS reserves is $95.97 per ton. These estimates are based on long term pricing published by third party sources and adjusted for quality and transportation. A large majority of the coal sold by Alpha and their MWVS business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the MWVS business unit.

A summary of the projected operating costs for the consolidated MWVS operations is provided in *Figure 1-3*.

Figure 1-3: MWVS Business Unit Operating Costs



1.11 Economic Evaluation

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities cost for materials handling, coal preparation, refuse disposal, coal loading, reclamation, and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

Table 1-3 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at MWVS.

Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

-	LOM Tonnage[1]	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Underground Mines					
Kingston Mine #10 (Douglas)	697	$298	$0.43	$5,020	$7.21
Sewell	9,091	$45,070	$4.96	$264,345	$29.08
Kingston #2 (Douglas)	835	$12,518	$14.99	$16,560	$19.83
Consolidated Deep Mines	**10,622**	**$57,886**	**$5.45**	**$285,925**	**$26.92**
Surface Mines					
Workman	30,828	$581,850	$18.87	$703,133	$22.81
Kingston	19,644	$444,329	$22.62	$534,053	$27.19
Consolidated Surface Mines	**50,472**	**$1,026,179**	**$20.33**	**$1,237,186**	**$24.51**
HWM Operations					
Workman HWM	3,792	$215,908	$56.94	$234,873	$61.94
Kingston HWM	2,544	$131,771	$51.81	$144,563	$56.84
Consolidated HWMs	**6,336**	**$347,680**	**$54.88**	**$379,436**	**$59.89**
Grand Total	**67,429**	**$1,431,745**	**$21.23**	**$1,902,547**	**$28.22**

Note: 1) LOM tonnage evaluated in the financial model includes October 2021 through December 2021 production (913,003 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021. In addition, the financial model includes 5.8 Mt clean tons of resources.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

As shown in *Table 1-3,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated MWVS operations show positive LOM P&L and EBITDA of $1.4 billion and $1.9 billion, respectively.

Alpha's consolidated MWVS cash flow summary in constant dollars, excluding debt service, is shown in *Table 1-4* below.

Table 1-4: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons[1]	67,429	806	3,306	4,142	3,650	3,725	3,698
Total Revenue	$6,471,321	$76,916	$315,487	$390,938	$349,204	$354,737	$354,585
EBITDA	$1,902,547	$17,706	$75,845	$120,622	$104,818	$99,557	$92,318
Net Income	$1,146,410	$989	$49,167	$85,262	$74,715	$46,469	$43,561
Net Cash Provided by Operating Activities	$1,617,212	$14,075	$53,790	$93,210	$90,104	$84,150	$83,298
Purchases of Property, Plant, and Equipment	($312,247)	($7,020)	($8,195)	($5,270)	($8,370)	($148,942)	($16,688)
Net Cash Flow	$1,304,965	$7,055	$45,595	$87,940	$81,734	($64,793)	$66,610

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	3,915	4,580	4,553	4,581	4,880	5,334	4,497
Total Revenue	$376,067	$440,318	$437,420	$440,275	$470,853	$517,175	$431,768
EBITDA	$102,276	$125,806	$123,862	$125,485	$147,134	$179,469	$128,665
Net Income	$53,290	$70,267	$65,830	$65,272	$81,751	$125,882	$83,944
Net Cash Provided by Operating Activities	$91,678	$106,436	$109,408	$110,284	$123,849	$146,922	$118,462
Purchases of Property, Plant, and Equipment	($11,577)	($11,940)	($17,120)	($18,872)	($9,992)	($9,769)	($10,870)
Net Cash Flow	$80,101	$94,496	$92,288	$91,412	$113,857	$137,153	$107,592

	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	3,960	3,405	1,270	1,265	1,265	1,261	1,265
Total Revenue	$376,920	$323,799	$123,139	$122,710	$122,710	$122,282	$122,710
EBITDA	$107,002	$92,743	$38,778	$39,324	$39,566	$39,492	$39,747
Net Income	$67,840	$57,867	$26,428	$26,520	$26,717	$26,407	$27,294
Net Cash Provided by Operating Activities	$96,106	$83,327	$33,645	$30,267	$31,840	$32,496	$32,323
Purchases of Property, Plant, and Equipment	($7,130)	($4,450)	($4,780)	($1,800)	($2,290)	($1,800)	($1,070)
Net Cash Flow	$88,976	$78,877	$28,865	$28,467	$29,550	$30,696	$31,253

	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	1,265	804	0	0	0	0	0
Total Revenue	$122,710	$78,599	$0	$0	$0	$0	$0
EBITDA	$39,811	$22,521	$0	$0	$0	$0	$0
Net Income	$27,380	$14,531	($557)	($221)	($111)	($56)	($29)
Net Cash Provided by Operating Activities	$33,109	$27,755	($5,622)	($1,839)	($919)	($459)	($486)
Purchases of Property, Plant, and Equipment	($2,500)	($1,800)	$0	$0	$0	$0	$0
Net Cash Flow	$30,609	$25,955	($5,622)	($1,839)	($919)	($459)	($486)

Note: 1) LOM tonnage evaluated in the financial model includes October 2021 through December 2021 production (913,003 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021. In addition, the financial model includes 5.8 Mt clean tons of resources.

Consolidated cash flows are driven by annual sales tonnage, which grows from 3.3 million tons in 2022 to a peak of 5.3 million tons in 2032. Between years 2033 and 2035, sales ranges from 3.4 million to

4.5 million tons and between years 2036-2042, sales range from 0.8 million tons to 1.3 million tons. Projected consolidated revenue grows from $77 million in 2022 to a peak of $517 million in 2032. Revenue totals $6.5 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $146.9 million in 2032 and totals $1.6 billion over the project life. Capital expenditures total $177.8 million during the first five years and $312.2 million over the project's life.

1.11.1 Discounted Cash Flow Analysis

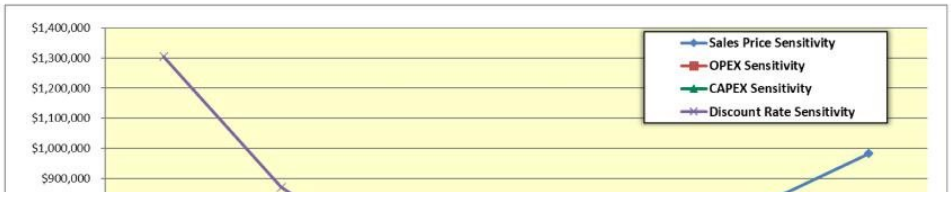
Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $447.2 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the MWVS reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its MWVS assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

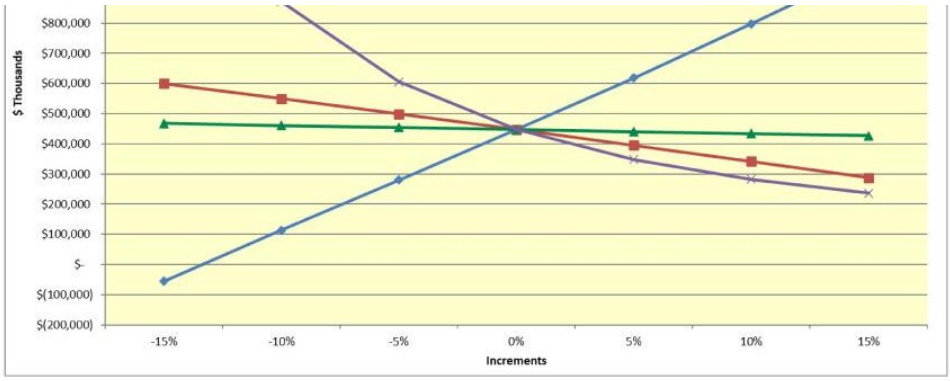
1.11.2 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 1-4: Sensitivity of NPV





As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

1.12 Permitting

Alpha has obtained all mining and discharge permits to operate its active mines and processing, loadout, or related support facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Alpha, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

1.13 Conclusion and Recommendations

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the MWVS properties. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study concludes that the 60.7 Mt of marketable underground and surface coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

2 Introduction

2.1 Registrant and Terms of Reference

This report was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors.

The report provides a statement of coal reserves for Alpha located at the Mid-West Virginia Surface Business Unit (*MWVS*) in Raleigh and Fayette Counties, West Virginia. Exploration results and Resource calculations were used as the basis for the mine planning and the preliminary feasibility study completed to determine the extent and viability of the reserve.

Coal resources and coal reserves are herein reported in imperial units of measurement.

2.2 Information Sources

The technical report is based on information provided by Alpha and reviewed by MM&A's professionals, including geologists, mining engineers, civil engineers, and environmental scientists. MM&A's professionals hold professional registrations and memberships which qualify them as Qualified Persons in accordance with SEC guidelines.

Alpha engaged MM&A to conduct a coal reserve evaluation of the Alpha coal properties as of December 31, 2021. For the evaluation, the following tasks were to be completed:

> Conduct site visits of the mines and mine infrastructure facilities.

> Process the information supporting the estimation of coal resources and reserves into geological models.

> Develop life-of-reserve mine (*LOM*) plans and financial models.

> Hold discussions with Alpha company management; and

> Prepare and issue a Technical Report Summary providing a statement of coal reserves which would include:

- A description of the mines and facilities.
- A description of the evaluation process.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

- An estimation of coal reserves with compliance elements as stated under the new SEC Guidelines which will become effective for the first fiscal year commencing on or after January 1, 2022.

2.3 Personal Inspections

MM&A is very familiar with the MWVS properties, having provided a variety of services in recent years and QP's involved in this TRS have conducted multiple site visits most recently November 2021.

3 Property Description

3.1 Location

The MWV Surface Business Unit is in the Central Appalachian Basin in West Virginia (see *Figure 1-1*) north of Beckley, West Virginia, and south of Charleston, West Virginia. The Business Unit includes Workman Creek with six surface permits, Kingston with two issued and one pending surface permits and one deep mine located is in Raleigh and Fayette Counties. Surface facilities for the Workman Creek operation are located on Workman Creek, a tributary to Clear Fork along State Route 1 in Raleigh County. Kingston surface facilities are near the community of Mossy , along Paint Creek in Fayette County. The Pax loadout is located in the community of Pax, located along Interstate Highway 64/77 These facilities are all approximately 20 to 27 miles north of Beckley, WV, the county seat of Raleigh County. Numerous small communities are present throughout the Property.

The nearest major population centers are Charleston, West Virginia (45 miles north), Bristol, Virginia (160 miles south), Roanoke, Virginia (140 miles east), and Morgantown, West Virginia (170 miles north), and Lexington, KY (220 miles west). The Property is located on the following **United States Geological Survey (*USGS*)** Quadrangles: Dorothy, Pax, Arnett, and Eccles. The coordinate system and datum used for the model of the MWV Surface Business Unit, and the subsequent maps were produced in the West Virginia State Plane South system, NAD 27.

3.2 Titles, Claims or Leases

The Property is composed of over 119,000 total acres of mineral control, nearly all of which is owned and leased. Alpha's control is comprised of over 10 separate leases with varying expiration dates and 8 owned properties. Some leases expire over the next several years, but Alpha does not anticipate any challenges related to lease renewal. MM&A has not carried out a separate title verification for the coal properties and has not verified leases, deeds, surveys, or other property control instruments pertinent to the subject resources. Alpha has represented to MM&A that it controls the mining rights to the reserves as shown on its property maps, and MM&A has accepted these as being a true and accurate depiction of the mineral rights controlled by Alpha. The TRS assumes the Property is developed under responsible and experienced management.

3.3 Mineral Rights

Alpha supplied property control maps to MM&A related to properties for which mineral and/or surface property are controlled by Alpha. While MM&A accepted these representations as being true and accurate, MM&A has no knowledge of past property boundary disputes or other concerns, through past knowledge of the Property, that would signal concern over future mining operations or development potential.

Property control in Appalachia can be intricate. Coal mining properties are typically composed of numerous property tracts which are owned and/or leased from both land holding companies and private individuals or companies. It is common to encounter severed ownership, with different entities or individuals controlling the surface and mineral rights. Mineral control in the region is typically characterized by leases or ownership of larger tracts of land, with surface control generally comprised of smaller tracts, particularly in developed areas.

Control of the surface property is necessary to conduct surface mining but is not necessary to conduct underground mining aside from relatively limited areas required for seam access or ventilation infrastructure. Alpha's executive management team has a history of mining in Central Appalachia and has conveyed to MM&A that it has been successful in acquiring surface rights where needed for past operations.

3.4 Encumbrances

No Title Encumbrances are known. By assignment, MM&A did not complete a query related to Title Encumbrances.

3.5 Other Risks

There is always risk involved in property control. As is common practice, Alpha, and its predecessors, have had their legal teams examine the deeds and title control to minimize this risk. Historically, property control has not posed any significant challenges related to MWVS's operations.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, elevation, and Vegetation

Much of topography of the area encompassed by the MWVS Business Unit is typical of the Central Appalachian Plateau's physiographic province, being rugged deeply dissected by V-shaped river valleys, flanked by steep-sided upland regions. Terrain slopes in the area are mostly steep to very steep with some gently sloping with relatively narrow ridges. Surface elevations near the mine operations range

from approximately 1,200 feet above sea level at streams to approximately 3,000 feet at ridge tops. The area is heavily vegetated and has a significant amount of hardwood forests. The Property is not situated near any major urban centers.

4.2 Access and Transport

There is general access to the MWV Surface property via a well-developed network of primary, secondary, and unimproved roads from U.S. interstates highways. Interstate 81 to the south and 77 to

the east are the primary roads coming into the business unit region. Interstate 81 connects with Bristol, Virginia to the southwest and Roanoke, Virginia to the east. Interstate 77 connects with Charleston, West Virginia to the north and via interstate 64 with Lexington, Kentucky, to the northwest.

Numerous secondary and unimproved roads provide direct access to the mine property, some being federal, state, and town maintained. Interstate 64/77 is located near the eastern side of the Property and is the primary throughfare in the area connecting the Property to Beckley, Charleston, and Huntington, West Virginia, to the West and Lexington, Virginia, to the East. Numerous secondary and unimproved roads provide direct access to the mine property, some being federal-, state-, and town-maintained. These include State Route 1 that runs through the Property holdings and provides direct access to Workman Creek surface office. These roads typically stay open throughout the year. Within the Property, unimproved roads are utilized to access surface based deep mine infrastructure. The primary transport means of processed coal is CSX Railroad which services the Marfork preparation plant and the Pax Loadout. Additionally, coal is transported by over-the-road-truck to the Kanawha River for barge transportation at the Marmet dock and also for processing at the Mammoth preparation plant with access to barge and the Kanawha River Railroad shortline that connects to the Norfolk Southern and CSX Transportation railroads.

4.3 Proximity to Population Centers

The MWV Surface Business Unit is located near the City of Beckley and is primarily in Raleigh and Fayette Counties, West Virginia, with small portions falling in Kanawha County. There are no large population centers in close proximity to mine operations. The nearest major population centers are Charleston, West Virginia (45 miles north), Bristol, Virginia (160 miles south), Roanoke, Virginia (140 miles east), and Morgantown, West Virginia (170 miles north), and Lexington, KY (220 miles west). As of the 2020 census, Raleigh County had just over 73,300 residents and Fayette County had 40,488 residents.

4.4 Climate and Length of Operating Season

The climate of the region is classified as humid continental with four distinct seasons: warm summers, cold winters, and moderate fall and spring seasons. Precipitation in the region is consistent throughout the year, approximately 3 to 5 inches per month, with the most rain falling in spring and the early months of summer. Average yearly precipitation is 40 inches. Summer months typically begin in late

May and end in early September and range in average temperature from 46 to 78 degrees Fahrenheit. Winters typically begin in mid to late November and run until mid to late March with average temperatures ranging from 19 to 52 degrees Fahrenheit. Precipitation in the winter typically comes in the form of snowfall or as a wintery mix (sleet and snow) with severe snowfall events occurring occasionally. Seasonal variations in climate typically do not affect underground mining in West Virginia. However, weather events could potentially negatively impact efficiency of surface and preparation plant operations on a very limited basis and lasting less than a few days.

4.5 Infrastructure

The MWV Surface Business Unit has sources of water, power, personnel, and supplies readily available for use. Personnel have historically been sourced from the surrounding communities in Raleigh, Fayette and surrounding Counties, and have proven to be adequate in number to conduct mining operations. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners. Water is sourced locally from public water sources or rivers, and electricity is sourced from **Appalachian Power**, a subsidiary of **American Electric Power (*AEP*)**. The service industry in the areas surrounding the mine operations has historically provided supplies, equipment repairs and fabrication, etc. The Kingston Preparation Plant processes MWVS coal and is capable to shipping through the Pax Loadout or by barge on the Kanawha River. Pax Loadout services consumers with raw and washed coal via the CSX railroad. Alpha's Marfork Preparation Plant processes some MWVS coal and services consumers with washed coal, which is transported via the adjacent CSX rail line at the loadout. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to both surface plant facilities.

5 History

5.1 Previous Operation

The MWV Surface property involves a complex combination of previous ownership. Coal mining in the area occurred for nearly a century. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)** and **Massey Energy (*Massey*)** previously held mining rights on much of the Property.

5.2 Previous Exploration

Extensive exploration in the form of subsurface drill efforts has been carried out on the property by numerous entities, most of which efforts were completed prior to the inception of Alpha. Diamond core and rotary drilling are the primary types of exploration on the Property. Data for correlation and mining conditions are derived from core descriptions and geophysical logs (e-logging). Coal sample, quality analyses were also employed during the core-exploration process. Development of this report included an assessment of over 1,500 locations of coal measurements, largely comprised of exploration drill holes which often include several coal intercepts. In mine data measurements are included also.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recent drilled holes.

6 Geological Setting, Mineralization and Deposit

6.1 Regional, Local and Property Geology

The Property lies in the Central Appalachian Coal basin in the Appalachian Plateau physiographic province.

The coal deposits in the eastern U.S. are the oldest and most extensively developed coal deposits in the country. The coal deposits on the Property are Carboniferous in age, being of the Pennsylvanian system. Overall, these Carboniferous coals contain two-fifths of the US's bituminous coal deposits and extend over 900 miles from northern Alabama to Pennsylvania and are part of what is known as the *Appalachian Basin*. The Appalachian Basin is more than 250 miles wide and, in some portions, contains over 60 coal seams of varying economic significance.

Strata on the Property are mostly of the Pennsylvanian-age Kanawha Formation and the older, lower Sewell seam is part of the New River Formation of the Pottsville Series. The rock formations between the coal seams are characterized by large proportions of sandstone interspersed with shale units.

Coal seams with remaining reserve or resource potential evaluated within this TRS include, in descending stratigraphic order the: Upper, Middle and Lower Clarion; Stockton, Upper Coalburg, Coalburg, Lower Coalburg, Upper Winifrede Rider, Upper Winifrede, Winifrede, Lower Winifrede, Upper Chilton A, Middle Chilton A , Chilton A Upper Split, Chilton A Lower Split, Chilton A, Chilton Rider, Upper Chilton, Lower Chilton, Chilton, Upper Hernshaw, Lower Hernshaw, Upper Cedar Grove Upper Split, Upper Cedar Grove Lower Split, Middle Cedar Grove, Lower Cedar Grove Upper Split, Lower Cedar Grove, Peerless Upper Split, Peerless Lower Split, Peerless C, Upper No. 2 Gas, Lower No. 2 Gas, Powellton, Lower Powellton, Powellton Lower Split, Powellton Lower Split Upper, Upper Eagle Rider 2, Powellton Lower Split Lower, Upper Eagle Rider, Upper Eagle, Eagle A, Eagle Upper Split, Eagle Lower Split, Eagle, Little Eagle, Little Eagle Lower Split, War Eagle, Glen Alum Tunnel Upper Split, Glen Alum Tunnel Douglas and Sewell seams.

6.2 Mineralization

The generalized stratigraphic columnar section in *Figure 6-1* and *Figure 6-2* demonstrates the vertical relationship of the principal coal seams and rock formations on the Workman Creek and Kingston Properties.

Figure 6-1: MWVS- Workman Creek Stratigraphic Column

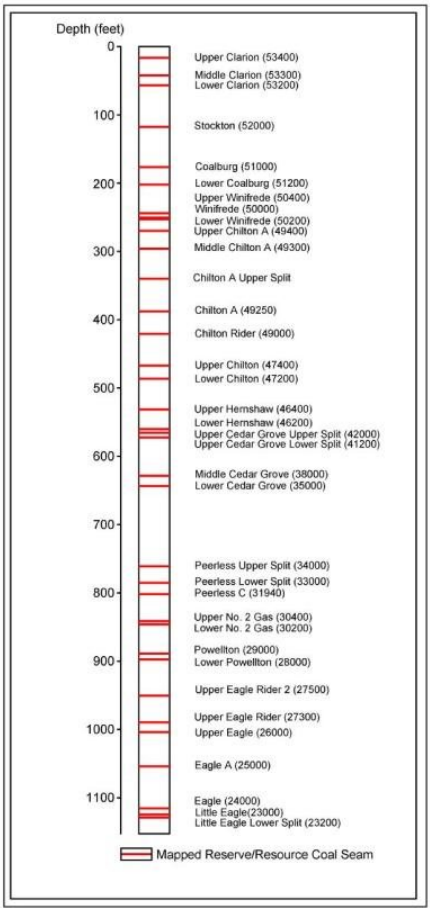
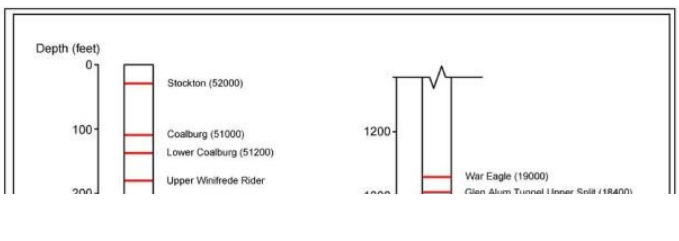
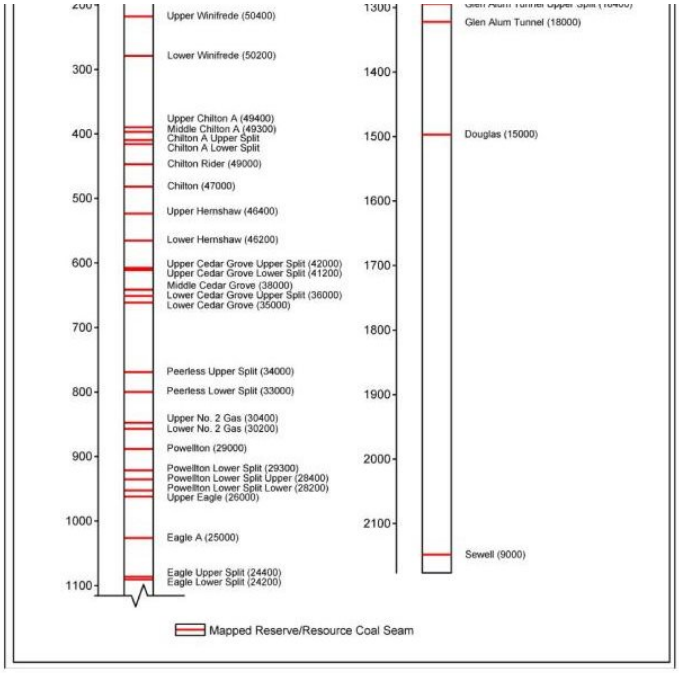


Figure 6-2: MWVS-Kingston Stratigraphic Column





6.3 Deposits

The MWVS Business Unit currently produces dominantly a High-Volatile-A product, an Alt-Met and Mid-Volatile product (with by-product thermal coal).

Due to the long history of mining in the region high value of these coking coals, all the seams have been extensively mined in the past. The coal seams reach the highest structural elevations along the southeastern margin of the Property, generally dipping toward the northwest. The surface mine seams and the Douglas seam are all situated above drainage or near and are therefore accessible via outcrop. The Sewell seam is below drainage and has not been developed. The rock formations between the coal seams are characterized mainly by sandstone and shale units interspersed throughout.

7 Exploration

7.1 Nature and Extent of Exploration

The Property has been extensively explored by subsurface drilling efforts carried out by numerous entities, most of which were completed prior to ownership by Alpha.

Diamond core and rotary drilling are the primary types of exploration on the Property. Diamond core drilling produces rock core samples from the hole. Data for coal bed correlations and strata mining conditions are derived from core descriptions and geophysical logging (e-logging). Geophysical logs are produced from a probe that surveys the drill hole void. Rock stratum types are interpreted from log signatures produces from the probe which commonly include a hole caliper, rock density and gamma readings. Coal-quality analyses were also employed during the core-exploration process.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recently drilled holes.

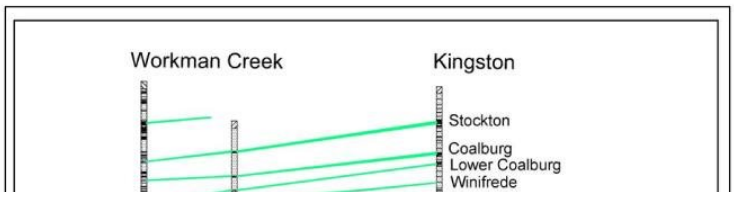
The Location of the drilling is shown on the maps included in *Appendix C.*

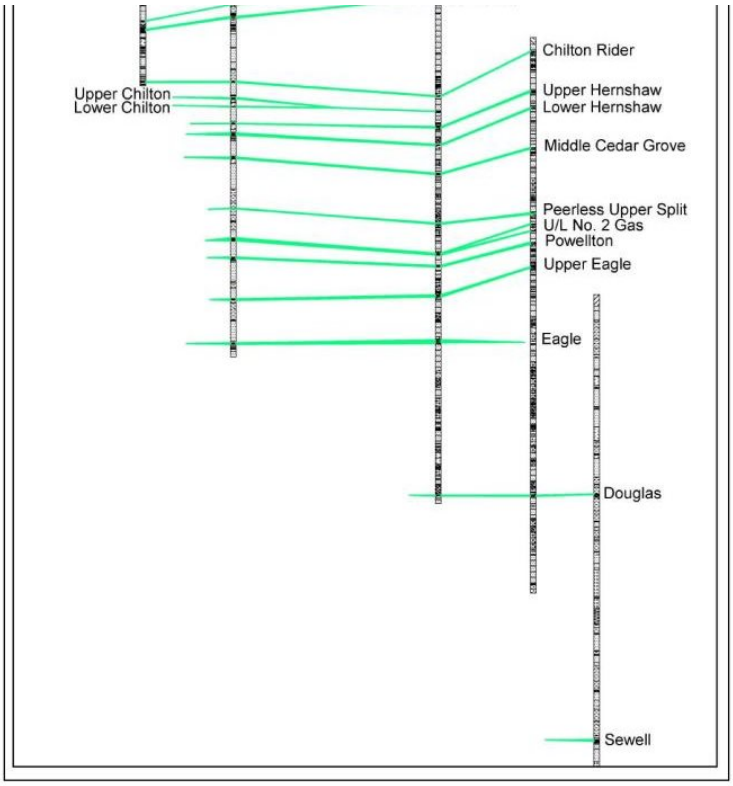
The concentration of exploration varies slightly across the Property. Drilling on the Property is typically sufficient for delineation of potential surface and highwall miner benches, and deep mineable seams. Core logging is carried out by professional geologists in cases where roof and floor strata are of particular interest and in cases where greater resolution and geologic detail are needed. However, most drill hole data comes from simplified driller's logs, which lack details regarding geotechnical conditions and specific geology, making correlations and floor and roof conditions difficult to determine. Geophysical logging (e-logging) techniques, by contrast, document specific details useful for geologic interpretation and mining conditions. Given the variability of data-gathering methods employed, *definitive* mapping of future mining conditions may not be possible, but projections and assumptions can be made within a *reasonable* degree of certainty. A significant effort was put into verifying the integrity of the database. Once this was established, stratigraphic columnar sections were generated using cross-sectional analysis to establish or confirm coal seam correlations. Forty-two individual coal seams or splits were identified, correlated, and modelled for resource/reserve potential in the MWV Surface Business Unit.

A typical cross-section is shown in *Figure 7-1.*

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 7-1: MWVS Cross-Section





Due to the long history of exploration by various parties on the Property, a wide variety of survey techniques exist for documentation of data point locations. Many of the older exploration drill holes appear to have been located by survey and more recently completed drill holes are often located by high-resolution Global Positioning System (*GPS*) units. However, some holes appear to have been approximately located using USGS topography maps or other methods which are less accurate. Therefore, discretion had to be used regarding the accuracy for the location and ground surface

elevation of some of these older drill holes. In instances where a drill hole location (or associated coal seam elevations) appeared to be inconsistent with the overall structural trend (or surface topography for surface-mineable areas), the data point was not honored for geological modeling. Others with apparently minor variances were adjusted or then used by MM&A.

Surveying of the underground and surface mined areas has been performed by the mine operators and/or their consulting surveyors. By assignment, MM&A did not verify the accuracy or completeness of supplied mine maps but accepted this information as being the work of responsible engineers and surveyors, as required by both State and Federal Law.

MM&A compiled comprehensive topographic map files by selecting the best available aerial mapping for each area. In the case of active surface mines, digital flown topography was utilized to reference original seam outcrop positions.

7.2 Drilling Procedures

Core drilling methods utilize NX-size ($2^1/_8$ inch) or similar-sized core cylinders to recover core samples, which can be used to delineate geologic characteristics, and for coal quality testing and geotechnical logging. For the cored holes, the geophysical logs are especially useful in verifying the percent of core recovery of both the coal samples (for assurance that sample is representative of the full seam) and of the roof and floor rock samples (for evaluating ground control characteristics of deep mineable coal seams). In addition to the core holes, rotary drilled holes also exist on the Property. Data for the rotary drilled holes is mainly derived from downhole geophysical logs, which are used to interpret coal and rock thickness and depth since logging of the drill cuttings is not reliable in this application.

A wide variety of core-logging techniques exist for the Property. For many of the core holes, the primary data source is a generalized lithology description by the driller, typically supplemented by a more detailed core log completed by a geologist. These drill logs were provided to MM&A collectively as a geological database. MM&A geologists were not involved in the production of original core logs but did perform a basic check of drill records and information within the provided database. Where geophysical logs for such holes are available, they were used by MM&A geologists to verify the coal thickness and core recovery of relevant seams.

7.3 Hydrology

Hydrologic testing and forecasting are necessary parts of the permitting process and as such are routinely considered in the mine planning process.

MM&A is not aware of any significant hydrologic impacts being experienced at any currently active deep mines or active surface mines. Future mining is projected to occur in areas exhibiting similar hydrogeological conditions as past mining. Based upon the successful history of the operation with

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

regards to hydrogeological features, MM&A assumes that the operation will not be hindered by such issues in the future.

7.4 Geotechnical Data

Life-of-Mine (*LOM*) Mining plans for potential underground mines were developed by MM&A through incorporation of budget maps from Alpha. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS*) program that was developed by the **National Institute for Occupational**

Safety and Health (*NIOSH*). MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan. Coal and rock strengths from core testing are used to verify the empirical assumptions integral to ACPS.

8 Sample Preparation Analyses and Security

8.1 Prior to Sending to the Lab

Most of the coal samples related to exploration drilling activities have been obtained from the Property by subsurface exploration using core drilling techniques. The protocol for preparing and testing the samples has varied over time and is not well documented for the older holes drilled on the Property. Typical US coal sampling technique from core drilling is for the coal core sample, once recovered from the core barrel, to be measured and described into a log, then wrapped in a sealed plastic sleeve and placed into a covered wooden core box, which is the length of the sample so that the core can be delivered to a laboratory in relatively intact condition and with original moisture content. The core identification number and the depth are scribed on the sample box lid to identify the sample. This process has been the norm for both historical and ongoing exploration activities at MWVS.

This work is typically performed by the supervising driller, geologist, or company personnel. Samples are most often delivered to the company by the driller after each shift or acquired by company personnel or representatives. Most of the coal core samples were obtained by previous operators on the Property. MM&A did not participate in the collection, sampling, and analysis of the majority of core samples within the exploration database. However, it is reasonable to assume, given the professional level of the previous operators, that these samples were generally collected and processed under industry best-practices. This assumption is based on MM&A's familiarity with the operating companies and the companies used to perform the analysis.

Additionally, specific to Alpha's MWVS surface operations, a significant dataset was made available related to in-pit quality measurements used during the mining process as a predictive measure prior to mining. This robust dataset is generally based upon bulk or grab samples obtained by employees of Alpha prior to the extraction of coal in surface mined pits or in stockpiles. The information contained

in the dataset does not include a surveyed location point, as the information is generally only relied upon in the short term for assistance in coal blending procedures.

8.2 Lab Procedures

Coal quality testing related to exploration drilling has been performed over many years by operating companies using different laboratories and testing regimens. Some of the samples have raw analyses and washability analysis on the full seam (with coal and rock parting layers co-mingled) and are mainly useful for characterizing the coal quality for projected production from underground and highwall mining. Other samples have coal and rock analyzed separately, the results of which can be manipulated to forecast either surface or underground mining quality. Care has been taken to use only those analyses that are representative of the coal quality parameters for the appropriate mining type for each sample.

Standard procedure upon receipt of core samples by the testing laboratory is to log the depth and thickness of the sample, then perform testing as specified by a representative of the operating company. Each sample is then analyzed in accordance with procedures defined under **American Society for Testing and Materials (*ASTM*)** standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

Specific to the aforementioned pit-quality sampling and associated datasets, laboratory analysis includes both short proximate analysis and at times, detailed metallurgical characteristics. The dataset contains a combination of raw and washed samples.

9 Data Verification

9.1 Procedures of Qualified Person

MM&A reviewed the Alpha-supplied digital geologic database which consists of data records including drill hole information for holes that lie within and adjacent to the Property along with records for numerous supplemental coal seam thickness measurements, mainly in mine measurements from underground mine maps. Once the initial integrity of the database was established, stratigraphic columnar sections were generated to use cross-sectional analysis to establish or confirm coal seam correlations. The stratigraphic column correlation method provides a view of seam depths, lithologic strata and thickness intervals to over and underlying seams. Geophysical logs were used wherever available to assist in confirming the seam correlation and to verify proper seam depths, thickness measurements and recovery of coal samples.

After establishing and/or verifying proper seam correlation for all seam the database was used in the geologic model process. Seam thickness, base-of-seam elevation, roof and floor lithology data control,

and overburden maps were independently generated for use in the mine planning process. Maps with seam control data plus geological cross-sections were generated to represent the seam correlations and data integrity. Forty-two individual coal seams or splits were identified, correlated, and modelled for resource/reserve potential in the MWV Surface Business Unit. Coal quality data was analyzed and summarized by MM&A's team of geologists and engineers. Quality was provided by Alpha in various database formats, laboratory data sheets, and also obtained directly from MM&A's files. Care was taken to ensure that sampled data was representative of the mineable section. In instances where

minimal representative data was noted, geological tonnages were estimated based upon applying assumed densities of coal and non-coal material to thicknesses expressed in geological database files.

9.2 Limitations

As with any exploration program, localized anomalies, such as a thin coal area or poor mining conditions, cannot always be discovered. The greater the density of the samples taken, the less the risk. Once an area is identified for inclusion in the mine plan, additional samples are taken to help reduce the risk in specific areas. In general, provision is made in the mine planning portion of the study to allow for localized anomalies that are typically classed more as a nuisance than a hinderance.

9.3 Opinion of Qualified Person

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the MWVS Property. The Property data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

10 Mineral Processing and Metallurgical Testing

10.1 Testing Procedures

Basic chemical analyses (both raw and washed quality), petrographic data, rheological data and ash, ultimate and sulfur analysis are available but not summarized for this filing. Available coal quality data sourced from MM&A's vaults (associated with former projects for Alpha and its predecessors) was tabulated by resource area in a Microsoft® EXCEL workbook. Such data contained laboratory sheets which MM&A utilized to confirm that sampled intervals were representative of geological models and confirm that appropriate laboratory procedures were utilized to derive raw and clean coal parameters. Additionally, Alpha provided MM&A with a database of its own in-house coal quality information which did not include backup laboratory information or sampled intervals. MM&A compared wash recovery values from Alpha's dataset to proximal holes with wash recovery data in MM&A's dataset and calculated estimates of wash recovery based upon the relative percentages of coal and rock from lithologic descriptions. In general, MM&A found that Alpha's dataset was representative and appropriate for inclusion in coal quality summaries. Quality tables also provide

basic statistical analyses of the coal quality datasets, including average value; maximum and minimum values; and the number of samples available to represent each quality parameter of the seam. Coal samples that were deemed by MM&A geologists to be unrepresentative were not used for statistical analysis of coal quality, as documented in the tabulations.

The amount and areal extent of coal sampling for geological data is generally sufficient to represent the quality characteristics of the coal horizons and allow for proper market placement of the subject coal seams. For some of the coal deposits there are considerable laboratory data from core samples that are representative of the full extent of the resource area; and for others there are more limited data to represent the resource area. For example, in the active operations with considerable previous mining, there may be limited quality data within some of the remaining resource areas; however, in those cases the core sampling data can be supplemented with operational data from mining and shipped quality samples representative of the resource area.

10.2 Relationship of Tests to the Whole

The extensive sampling and testing procedures typically followed in the Coal Industry result in an excellent correlation between samples and Marketable product. Pit analyses of the coal from MWVS were reviewed to verify that the coal quality and characteristics were as expected. The MWVS Property has a long history of saleable production, under various owners, in the Mid-Volatile and High-volatile metallurgical and thermal markets, confirming exploration results.

In select instances, those areas which did not contain exploration information inclusive of coal quality analysis but were located relatively adjacent to active producing areas and/or areas which contained coal quality information were downgraded to a “probable” classification. Based upon the extensive production history locally and regionally, the report authors deemed this process acceptable.

10.3 Lab Information

Each sample is analyzed at area Laboratories that operate in accordance with procedures defined under ASTM standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

10.4 Relevant Results

No critical factors have been found that would adversely affect the recovery of the Reserve. Any quality issues that occur, either localized or generally are accounted for in the Marketing Study done for this TRS.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

11 Mineral Resource Estimates

MM&A independently created geologic models to define the coal resources at MWVS. Coal resources were estimated as of December 31, 2021.

11.1 Assumptions, Parameters and Methodology

Geological data was imported into Carlson Mining™ (formerly SurvCADD™) geological modelling software in the form of Microsoft® Excel files incorporating, drill hole collars, seam and thickness picks, bottom seam elevations and raw and washed coal quality. These data files were validated prior to importing into the software. Once imported, a geologic model was created, reviewed, and verified- with a key element being a gridded model of coal seam thickness. Resource tons were estimated by using the seam thickness grid based on each valid point of observation and by defining resource confidence arcs around the points of observation. Points of observation for Measured and Indicated confidence arcs were defined for all valid drill holes that intersected the seam using standards deemed acceptable by MM&A based on a detailed geologic evaluation and a statistical analysis of drill holes within the projected reserve areas as described in *Section 11.1.1*. The geological evaluation incorporated an analysis of seam thickness related to depositional environments, adjacent roof and floor lithologies, and structural influences.

After validating coal seam data and establishing correlations, the seam thickness, coal thickness and elevation for seams of economic interest were used to generate a geologic model. Local geologic and physical conditions were incorporated into the model where mineability and or mining costs could be affected by the conditions. Both coal thickness and quality data are deemed by MM&A to be reasonably sufficient within the resource areas. Therefore, there is a reasonable level of confidence in the geologic interpretations required for coal resource determination based on the available data and the techniques applied to the data.

Table 11-1 below provides the geological mapping and coal tonnage estimation criteria used for the coal resource and reserve evaluation. These cut-off parameters have been developed by MM&A based on its experience with the Alpha Property and are typical of mining operations in the Central Appalachian coal basin. This experience includes technical and economic evaluations of numerous properties in the region for the purposes of determining the economic viability of the subject coal reserves.

Table 11-1: General Reserve & Resource Criteria

Item	Parameters	Technical Notes & Exceptions*
• **General Reserve Criteria**		
Reserve Classification	Reserve and Resource	Coal resources as reported are inclusive of coal reserves.
Reliability Categories	Reserve (Proven and Probable) Resource (Measured, Indicated & Inferred)	To better reflect geological conditions of the coal deposits, distance between points of observation is determined via statistical analysis. For surface-mineable reserves, the QPs responsible for the delineation of coal reserves have opted to classify tons in areas lacking exploration drillhole quality as 100-percent probable as opposed to basing proven and probable classifications upon relative distance from drillholes. Resource classification as stated in the tables is directly derived from drillhole spacing. The QPs have relied upon consistency in historical pit sampling as a justification for reserve delineation in such areas.
Proven and Measured Classification	0.25 Mile, (1320') Projection form Measurement Point	Based on 11.1.1 Analysis
Probable and Indicated Classification	0.25 to 0.75 Mile, (1320' to 3960') Projection form Measurement Point	Based on 11.1.1 Analysis; Required for Reserve Classification
Inferred Classification	0.75 to 3.0 Mile, (3960' to 15,840) Projection form Measurement Point	Based on 11.1.1 Analysis
Effective Date of Resource Estimate	December 31, 2021	Coal reserves were estimated based upon depletion maps as of September 30, 2021, and a fourth quarter 2021 production depletion adjustment
Effective Date of Reserve Estimate	December 31, 2021	Coal reserves were estimated based upon depletion maps as of September 30, 2021, and a fourth quarter 2021 production depletion adjustment
Seam Density	With Analysis: SG = 1.25 + Raw Ash/100 In the absence of laboratory data, estimated by (1) assuming specific gravity of 1.30 for coal and 2.25 for rock parting	
• **Underground-Mineable Criteria**		
Map Thickness	Total seam thickness	
Minimum Seam Thickness	27 inches (Douglas) 30 inches (Sewell)	Minor Exceptions for localized zones of thinner coal.
Minimum Mining Thickness	54 inches	
Minimum Total Coal Thickness	27 inches (Douglas) 30 inches (Sewell)	Minor Exceptions for localized zones of thinner coal.
Minimum In-Seam Wash Recovery	Determined as function of seam thickness	
Wash Recovery Applied to Coal Reserves	Based on average yield for drill holes within reserve area, or in the absence of laboratory washability data, based on estimated visual recovery using specific gravities noted above and 95 percent yield on "clean" coal	
Out-of-Seam Dilution Thickness for Run-of-Mine Tons Applied to ROM tonnages	2 inches	
Mine Barrier	200-foot distance from abandoned mines and 50-foot from sealed or pillared areas of active Alpha mines	
Minimum Reserve Tonnage	400 thousand recoverable tons for individual area (logical mining unit)	
Minimum Overburden Depth	100 feet	
Minimum Interval to Rider Coal	Considered on a case-by-case basis, depending on interval lithology, etc.	
Minimum Interval to Overlying or Underlying Reserves	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Minimum Interval to Overlying or Underlying Mined Areas	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	

Item	Parameters	Technical Notes & Exceptions*
Adjustments Applied to Coal Reserves	6.0 percent moisture increase; 5 percent preparation plant inefficiency	
• Surface-mineable Criteria		
Mining Type	Surface mining	
	Highwall mining (HWM)	
Coal Density	Used laboratory apparent specific gravity data where available. Otherwise use raw ash formula: Sp. Gr. = (% Raw Ash/100) + 1.25	
	Used estimated specific gravity based on 1.30 specific gravity for coal and 2.25 specific gravity for rock	This is also referred to as EVR or Estimated Visual Recovery method.

	where no lab data was available.	
		EXCEPTION: Used 1800 tons per acre foot for seams with no quality data on surface reserve calculation
Surface Property Control	Controlled	Surface-mineable coal resource estimated where mineral and surface rights are controlled. No resource estimated if mineral rights are not controlled.
	Uncontrolled	Surface-mineable coal resource estimated where surface is uncontrolled if mineral rights are controlled.
Basis for Coal Tonnage	Thickness of recoverable coal less removable partings	Minimum thickness of removable parting for surface-mineable seam is 0.25-foot generally.
Minimum Total seam thickness for Single Cut Contour	2.0 feet (*)	
Minimum Thickness of Principal Seam in Multi-Seam Areas	1.0 foot (*)	
Minimum Thickness of Secondary Seam	0.5 foot	Secondary seam is within 2.5 feet of principal seam
Mine Strip Ratio	18:1 BCY /ton ratio for metallurgical coal & 15:1 BCY/ton for thermal coal	surface mine strip ratios are targets and can vary some by cut or job.
Minimum Total seam thickness for High Wall Miner	2.0 feet (*)	Seam thickness can vary within a panel.
Areas Considered for Surface-mineable Coal Resource	Permitted and potential permit areas provided by Alpha	

Note: Exceptions for application of these criteria to reserve estimation are made as warranted and demonstrated by either actual mining experience or detailed data that allows for empirical evaluation of mining conditions. Final classification of coal reserve is made based on the pre-feasibility evaluation.

11.1.1 Geostatistical Analysis

MM&A completed a geostatistical analysis on drill holes within the reserve boundaries to determine the applicability of the common United States classification system for measured and indicated coal resources. Historically, the United States has assumed that coal within ¼-mile (1,320 feet) of a point of observation represents a measured resource whereas coal between ¼-mile (1,320 feet) and ¾-mile (3,960 feet) from a point of observation is classified as indicated. Inferred resources are commonly assumed to be located between ¾-mile (3,960 feet) and 3 miles (15,840 feet) from a point of observation. Per SEC regulations, only measured and indicated resources may be considered for reserve classification, respectively as proven and probable reserves.

MM&A performed a geostatistical analysis test of the MWVS, Workman Creek Little Eagle Seam data set using the Drill Hole Spacing Analysis (*DHSA*) method. This method attempts to quantify the uncertainty of applying a measurement from a central location to increasingly larger square blocks and provides recommendations for determining the distances between drill holes for measured, indicated, and inferred resources.

To perform DHSA the data set was processed to remove any erroneous data points, clustered data points, as well as directional trends. This was achieved through the use of histograms, as seen in *Figure 11-1*, color coded scatter plots showing the geospatial positioning of the borings, *Figure 11-2*, and trend analysis.

Figure 11-1: Histogram of the Total Seam Thickness for the Little Eagle Seam Present in the MWVS Business Unit

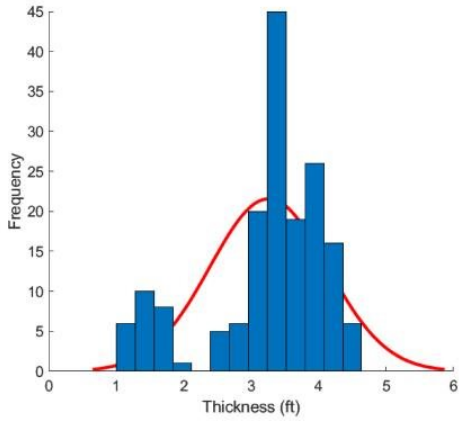
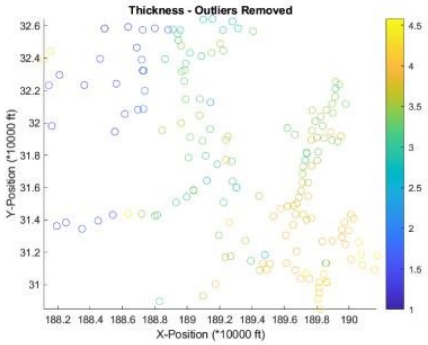


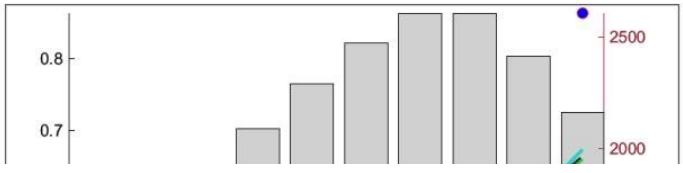
Figure 11-2: Scatter plot of the Total Seam Thickness for the Little Eagle Seam Present in the MWVS Business Unit

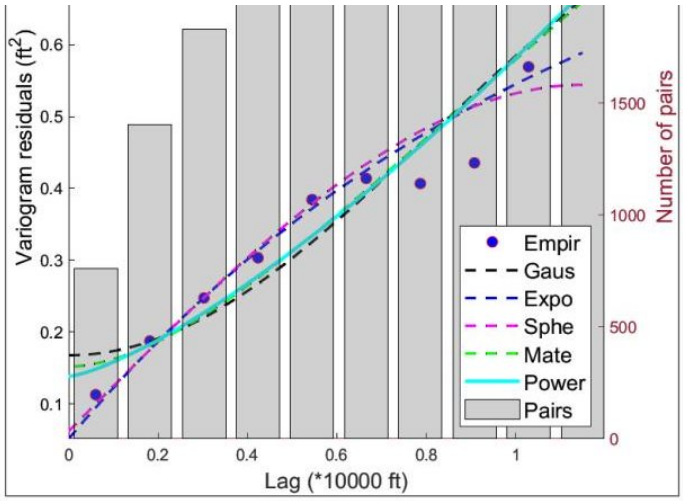


Following the completion of data processing, a variogram of the data set was created, *Figure 11-3*. The variogram plots average square difference against the separation distance between the data pairs. The separation distance is broken up into separate bins defined by a uniform lag distance (e.g., for a lag distance of 500 feet the bins would be 0 – 500 feet, 501 – 1,000 feet, etc.). Each pair of data points that are less than one lag distance apart are reported in the first bin. If the data pair is further apart than one lag distance but less than two lag distances apart, then the variance is reported in the second bin. The numerical average for differences reported for each bin is then plotted on the variogram. Care was taken to define the lag distance in such a way as to not overestimate any nugget effect present in the data set. Lastly, modeled equations, often spherical, gaussian, or exponential, are applied to the variogram in order to represent the data set across a continuous spectrum.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 11-3: Variogram of the Total Seam Thickness for the Little Eagle Seam Present in the MWVS Business Unit





The estimation variance is then calculated using information from the modeled variogram as well as charts published by Journel and Huijbregts (1978). This value estimates the variance from applying a single central measurement to increasingly larger square blocks. Care was taken to ensure any nugget effect present was added back into the data. This process was repeated for each test block size.

The final step of the process is to calculate the global estimation variance. In this step the number square blocks that would fit inside the selected study area is determined for each block size that was investigated in the previous step. The estimation variance is then divided by the number of blocks that would fit inside the study area for each test block size. Following this determination, the data is then transformed back to represent the relative error in the 95th-percentile range.

Figure 11-4 shows the results of the DHSA performed on the Little Eagle seam data for the MWV Surface Business Unit. DHSA provides hole to hole spacing values, these distances need to be converted to radius from a central point in order to compare to the historical standards. A summary of the radius data is shown in *Table 11-3*. DHSA prescribes measured, indicated, and inferred drill hole spacings be determined at the 10-percent, 20-percent, and 50-percent levels of relative error, respectively.

Figure 11-4: Result of DHSA for the Little Eagle Seam Present in the MWVS Business Unit

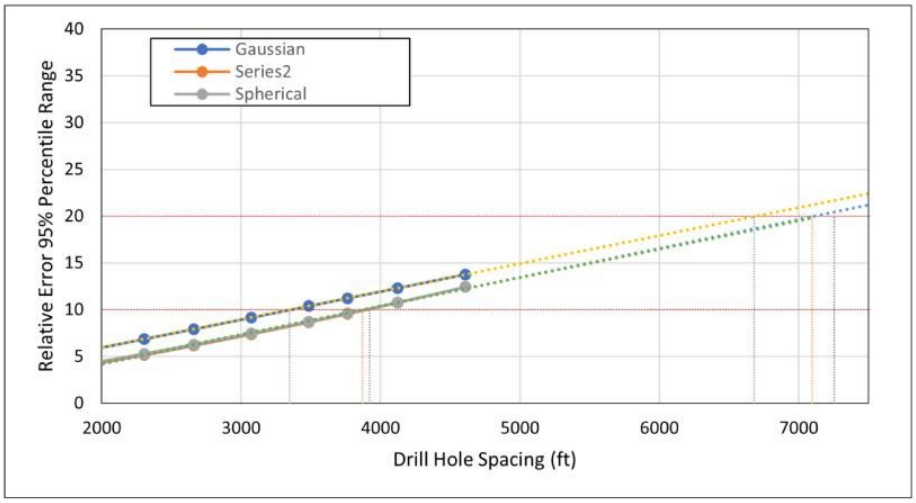


Table 11-2: DHSA Results Summary for Radius from a Central Point

Model:	Measured Radial Distance (10% Relative Error) (Miles)	Indicated Radial Distance (20% Relative Error) (Miles)	Inferred Radial Distance (50% Relative Error) (Miles)
Gaussian:	0.32	0.63	1.58
Spherical:	0.37	0.69	163
Exponential:	0.37	.0.67	1.59

Comparing the results of the DHSA to the historical standards, it is evident that the historical standards are more conservative than even the most conservative DHSA model with regards to determining measured resources. The Exponential model recommends using a radius of 0.37 miles for measured resources compared to the historical value of 0.25 miles. With respect to indicated resources the DHSA-recommended drill hole spacing is slight less than the historical standards although within the margin of precision. The Exponential model recommends using a radius 0.69 miles, while the Gaussian and Spherical models recommend a radius of 0.63 and 0.69 miles, respectively compared against the historical radius of 0.75 miles. These results have led the QP's to report the data following the historical classification standards as outlined in USGS Circular 891, rather than use the results of the DHSA.

11.2 Resources Exclusive of Reserves

The MWVS Properties contain resource blocks of surface seams which were not deemed to exhibit reserve potential at the time of the study. These resources, identified as resources *exclusive* of reserves, exist in the Eagle 2 permit in the Lower Winifrede bench. Reasons which may preclude elevation of resources to reserves include, but are not limited to:

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

1. Limited availability of quality information to document coal seam market characteristics.
   > The Lower Winifrede and above coal seams in the Eagle 2 Permit lack coal quality information and are deemed a resource.
2. Limited a drillhole density and/or coal seam definition.
3. Drill hole spacing is relatively wide spaced in the Sewell resource area. Due to the lack of seam definition, the resource is classified as indicated. Mineability constraints due to over/under

mining, underground conditions, and physical locations that would have negative influence on the mineability of the coal.

> The Sewell resources area is bound on the east side by existing close Sewell mines. Based on the mine maps, it appears entries were driven toward and into the resource block and then stopped. It is likely coal thickness and/or other geologic conditions were encountered that limited the advance into the resource area.

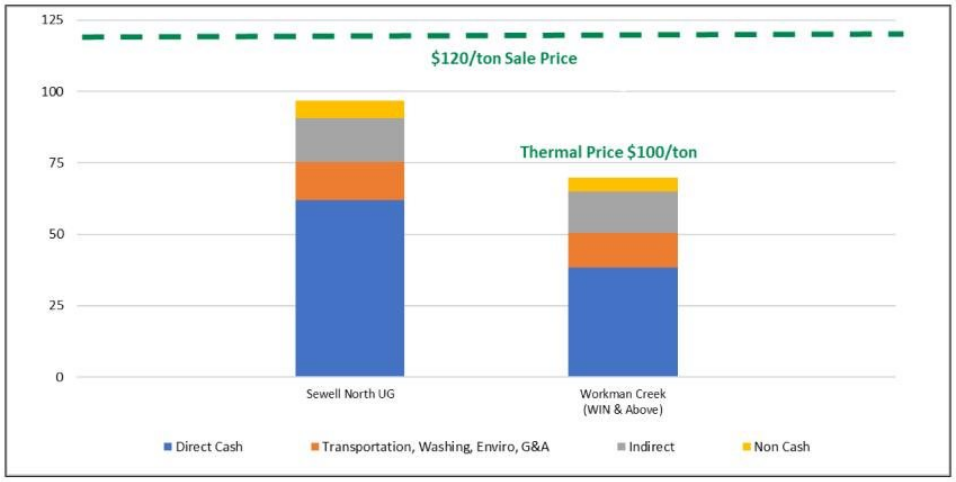
11.2.1 Initial Economic Assessment

MM&A completed an initial economic assessment to determine the potential economic viability of resources exclusive of reserves. MM&A applied relevant technical factors to estimate potential saleable tons without the resource blocks, should the resources be extracted via deep, continuous mining methods. MM&A developed cash cost profiles for the resource blocks, including direct cash costs (labor, supplies, roof control, maintenance and repair, power, and other); washing, trucking, materials handling, general and administrative, and environmental costs; and indirect cash costs (royalties, production taxes, property tax, insurance). Costs were developed based off relevant cost drivers (per-ft, per-raw-ton, per-clean-ton). Additionally, MM&A estimated capital costs to access resources. Capital costs associated with mine developed were amortized across the resource's potential saleable tonnages). Additional non-cash items (depreciation of equipment and depletion) and cash costs were compared to an assumed sale price of $120 per ton netback FOB loadout (approximately $169 per ton U.S. East Coast basis) for Mid Vol markets and $100 per ton netback FOB loadout (approximately $141 per ton U.S. East Coast basis) for thermal markets. This resource assumed sales value was developed as a premium to the market-based reserve sales value to properly estimate the sales related expenses should these resources be extracted during higher-than-average market conditions. Pricing used for the primary product was selected by the QP and deemed reasonable based on a review of historical average pricing for the MWVS Business Unit coal products over the past 5 years. Results of the analysis are shown below and demonstrate potential profitability on a fully loaded cost basis. Detailed summaries are shown in *Appendix B*.

Table 11-3: Results of Initial Economic Assessment

Mine/Resource Block	Resource Block	Direct Cash	Transportation, Washing, Enviro, G&A	Indirect	Non-Cash	Total Cost	Fully Loaded P&L
Sewell North UG	Sewell North UG	$61.85	$13.37	$15.57	$6.00	$96.79	$23.21
Workman Creek (WIN & Above)	Surface	$38.30	$12.02	$14.50	$5.10	$69.92	$30.08

Figure 11-5: Results of Initial Economic Assessment



11.3 Qualified Person's Estimates

Based on the work previously described and detailed modelling of those areas along with consideration of modifying factors, a coal resource estimate, summarized in *Table 11-5*, was prepared as of December 31, 2021, for property controlled by Alpha.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 11-4: Coal Resources Summary as of December 31, 2021

Area or Seam	Coal Resource (Dry Tons, In Situ) Measured	Indicated	Inferred	Total
Inclusive of Reserve				
Workman Creek Surface	28,864,000	965,000	118,000	29,947,000
Workman Creek HWM	10,445,000	178,000	0	10,623,000
Kingston Surface	20,273,000	4,386,000	1,051,000	25,710,000
Kingston HWM	7,011,000	262,000	0	7,273,000
Sewell (UG)	33,662,000	6,908,000	0	40,569,000
Douglas (UG)	2,460,000	1,108,000	0	3,568,000

Total	**102,715,000**	**13,807,000**	**1,169,000**	**117,690,000**
Exclusive of Reserve				
Workman Creek Surface	2,489,000	4,594,000	45,000	7,128,000
Workman Creek HWM	0	0	0	0
Kingston Surface	0	0	0	0
Kingston HWM	0	0	0	0
Sewell (UG)	0	21,254,000	0	21,254,000
Douglas (UG)	0	0	0	0
Total	**2,489,000**	**25,848,000**	**45,000**	**28,382,000**
Grand Total				
Total	**105,204,000**	**39,655,000**	**1,214,000**	**146,073,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Note (3): The Property contains 28.3 million tons (Mt) of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

11.4 Qualified Person's Opinion

While there is some stratigraphically controlled seam-thickness variability due to seam splitting, sand channels, etc., MM&A geologists and engineers modeled the deposit and resource areas to reflect realistic mining scenarios, giving special consideration to seam thickness, floor and roof conditions, mining equipment, etc. This statistical study demonstrates that for each configuration of mineable seams, the classification system of **measured** (0 – ¼ mile), **indicated** (¼ to ¾ mile), and **inferred** (¾ to 3 miles) is reasonably adequate to predict seam thickness variation for modeling and mining purposes. Based on MM&A's geostatistical analysis, it would be possible to extend the measured arcs slightly beyond historically accepted practices due to consistent geological settings. The QP's have again elected not to extend arc distances, introducing a level of conservatism in the measured coal classification.

Based on the data review, the attendant work done to verify the data integrity and the creation of an independent Geologic Model, MM&A believes this is a fair and accurate representation of the MWVS coal resources.

12 Mineral Reserve Estimates

12.1 Assumptions, Parameters and Methodology

Coal Reserves are classified as *proven* or *probable* considering "modifying factors" including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors.

- **Proven Coal Reserves** are the economically mineable part of a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.
- **Probable Coal Reserves** are the economically mineable part of an indicated coal resource, and in some circumstances a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.

Upon completion of delineation and calculation of coal resources, MM&A generated a LOM plan for MWV Surface. The footprint of each reserve area is shown on the maps in *Appendix C*. The Mine plan was generated based on 5-year budget mine plans provided by Alpha and supplemented with additional projections by MM&A to reflect LOM plans that honor property control limits, geologic mapping, or other factors determined during the evaluation.

Carlson Mining software was used to generate the LOM plan for MWVS. The mine plan was sequenced based on productivity schedules provided by Alpha. MM&A judged the productivity estimates and plans to be reasonable based on experience and current industry practice.

Raw, ROM production data outputs from LOM plan sequencing were processed into Microsoft® EXCEL spreadsheets and summarized on an annual basis for processing into the economic model. Average seam densities were estimated to determine raw coal tons produced from the LOM plan. Average mine recovery and wash recovery factors were applied to determine coal reserve tons.

Coal reserve tons in this evaluation are reported on a moist, saleable product basis with 4.5% moisture for surface mined reserves and 6.0% for deep mine reserves.

Pricing data as provided by Alpha is described in *Table 16-2*. The pricing data assumes a flat-line long term realization average of $144 per short ton port loading, with an average of $102.26 netback pricing reflective of the mid-volatile product, $144 per short ton port loading with an average of $111.29 per short ton netback pricing reflective of the low-volatile product, and $138 per short ton port loading, with an average of $108.08 netback pricing reflective of the high-volatile product currently sold at

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

MWVS. A portion of the surface mine production is also thermal product which assumes a flat-line long term realization of $76 per short ton with an average of $66.68 per ton netback pricing. The LOM blended average netback pricing for the MWVS reserves is $95.97 per ton. These estimates are based on long term pricing published by third party sources and adjusted for quality and transportation. A large majority of the coal sold by Alpha and their MWVS business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the MWVS

business unit.

The coal resource mapping and estimation process, described in the report, was used as a basis for the coal reserve estimate. Proven and probable coal reserves were derived from the defined coal resource considering relevant processing, economic (including technical estimates of capital, revenue, and cost), marketing, legal, environmental, socio-economic, and regulatory factors and are presented on a moist, recoverable basis.

As is customary in the US, the categories for proven and probable coal reserves are based on the distances from valid points of measurement as determined by the QP for the area under consideration. For this evaluation, measured resource, which may convert to a proven reserve, is based on a ¼-mile radius from a valid point of observation.

Points of observation include exploration drill holes, and mine measurements which have been fully vetted and processed into a geologic model. The geologic model is based on seam depositional modeling, the interrelationship of overlying and underlying strata on seam mineability, seam thickness trends, the impact of seam structure, intra-seam characteristics, etc. Once the geologic model was completed, a statistical analysis, described in *Section 11.1.1* was conducted and a ¼-mile radius from a valid point of observation was selected to define Measured Resources.

Likewise, the distance between ¼ and ¾ of a mile radius was selected to define Indicated Resources. Indicated Resources may convert to Probable Reserves.

Inferred Resources (greater than a ¾-mile radius from a valid point of observation) have been excluded from Reserve consideration.

12.2 Mineral Reserves

MWVS Business Unit reserves were derived from multiple coal seams of *Figure 7-1* located on the Property. Reserves are estimated for both surface and underground mining. Surface reserves were derived for two units Workman Creek, and Kingston. Each account for coal reserves from multiple seams. Underground reserves were derived from two seams. The underground accessed seams include the Douglas seam at the active Kingston 2 mine; the Sewell seam located below drainage east

of the surface mines. Demonstrated reserve tons are listed in the discussion below. *Table 12-3* shows the demonstrated tonnage by Proven and Probable status.

12.2.1 Surface Reserves

The two surface units of the MWVS, Kingston and Workman Creek operations are both active mines with contour and highwall miner reserve. Estimated LOM average mine ratios bank cubic yards per ton (*BCY/Ton*) do not exceed 20 to 1 for the reserve estimates. Cross sections through drill holes with lithologic records and seam correlation tie lines have been prepared for each surface reserve and are available upon request.

12.2.1.1 Workman Creek Surface

Demonstrated reserve at Workman Creek is comprised of 27.6 million surface mine tons and 3.8 million highwall miner tons from 25 different coal seams. An additional 8 seams are considered resource due to a lack of quality data. Workman Creek reserves consists of six permit areas that are adjacent to each other and are centered around the Workman Creek office and surface facility area. *Table 12-1* shows the demonstrated tonnage by Proven and Probable status.

Table 12-1: Workman Creek Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

Area	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped) By Reliability Category		
	Proven	Probable	Total
Surface			
Center Contour	0	6,880,000	6,880,000
Collins Fork	0	99,000	99,000
Eagle No. 2	0	3,238,000	3,238,000
Long Ridge #1	0	4,005,000	4,005,000
Middle Ridge	0	2,249,000	2,249,000
Turkeyfoot	0	8,057,000	8,057,000
Workman Creek Surface	**0**	**24,528,000**	**24,528,000**
Highwall			
Center Contour	1,509,000	61,000	1,571,000
Collins Fork	0	0	0
Eagle No. 2	437,000	0	437,000
Long Ridge #1	524,000	0	524,000
Middle Ridge	150,000	0	150,000
Turkeyfoot	1,041,000	0	1,041,000
Workman Creek Highwall	**3,661,000**	**61,000**	**3,722,000**
Total			
Center Contour	1,509,000	6,942,000	8,451,000
Collins Fork	0	99,000	99,000
Eagle No. 2	437,000	3,238,000	3,675,000
Long Ridge #1	524,000	4,005,000	4,529,000
Middle Ridge	150,000	2,249,000	2,399,000
Turkeyfoot	1,041,000	8,057,000	9,098,000
Workman Creek Total	**3,661,000**	**24,589,000**	**28,250,000**

Workman Creek mine six permits include: Long Ridge with demonstrated reserves of 4.5 Mt to be extracted from the Upper Chilton through the Little Eagle seams; Turkey Foot with demonstrated reserves of 9.1 Mt to be extracted from the Upper Chilton through the Little Eagle seams; Center

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Contour with demonstrated reserves of 8.5 Mt to be extracted from the Upper Chilton A through the Little Eagle seams; Eagle 2 with demonstrated reserves of 3.7 Mt to be extracted from the Upper Clarion through the Middle Cedar Grove seams; Middle Ridge with demonstrated reserves of 2.4 Mt to be extracted from the Upper Clarion A through the Middle Cedar Grove seams; and Collins Fork with Demonstrated reserves of 0.1 Mt to be extracted from the Little Eagle seam. All of the permits are active to varying degrees with the exception of the Eagle 2 permit. The reserves within Eagle 2 permit may increase if the permit's proposed hollow fills within Sycamore branch receive the necessary **US**

Army Corps of Engineers' (*USACE*) 404 permit. Lower elevation seams within the permit require the hollow fills for excess spoil storage. The reserves of the Eagle 2 permit are presently limited to upper seams that can be backfilled and can obtain excess spoil storage room from adjacent permits.

12.2.1.2 Kingston Surface

Demonstrated reserve at Kinston surface is comprised of 19.5 million surface mine tons and 2.5 million highwall miner tons from 30 different coal seams for permitted and non-permitted reserve. Kingston surface consists of two permitted areas and one pending permit area. The mine permit areas are adjacent to one another with mine permits. One Kingston permit has an active surface mine. *Table 12-2* shows the demonstrated tonnage by Proven and Probable status.

Table 12-2: Kingston Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

Area	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped) By Reliability Category		
	Proven	Probable	Total
Surface			
Kingston Surface	3,137,000	544,000	3,682,000
Paint Mountain (S300520)	7,263,000	1,354,000	8,617,000
Paint Mountain (S300821) (White Oak)	5,647,000	1,542,000	7,189,000
Kingston Surface	**16,048,000**	**3,440,000**	**19,487,000**
Highwall			
Kingston Surface			
Paint Mountain (S300520)			
Paint Mountain (S300821) (White Oak)			
Kingston HWM	**2,401,000**	**92,000**	**2,493,000**
Total			
Kingston Surface	4,108,000	544,000	4,652,000
Paint Mountain (S300520)	8,024,000	1,359,000	9,383,000
Paint Mountain (S300821) (White Oak)	6,317,000	1,628,000	7,946,000
Kingston Total	**18,449,000**	**3,532,000**	**21,981,000**

Kingston Surface mine operations includes two permits and one pending permit. These areas include the Kingston permit with demonstrated reserves of 4.7 Mt from to be extracted from the Powellton through the Stockton seams; Paint Mountain Permit S-3005-20 with demonstrated reserves of 9.4 Mt to be extracted from the Eagle Lower Split through the Stockton seams; and the White Oak pending permit with demonstrated reserves of 7.9 Mt to be extracted from the Powellton through the Stockton seams. Reserve tonnage may increase with permit expansion to include contouring in the lower Glen

Allum Tunnel and Douglas seams. These contours will likely be associated with future hollow fills and/or in close proximity to them.

12.2.2 Underground Reserves

Underground reserves of the MWVS are associated with Kingston operation. There are three underground reserve areas. The Kingston 2 and 10 mines and associated reserves that extract mid-volatile coal from the Douglas seam. The Sewell seam reserve is below drainage and located east of the surface mines.

12.2.2.1 Kingston 2 - Douglas Seam

Douglas reserves include 0.7 M clean recoverable tons remaining in the active Kingston 2 Mine. The Douglas seam is commonly one coal bench with localized area of thin shale partings. Seam thickness average 2.5 feet in the Kingston 2 Mine reserve. Roof and floor rock is generally shale that makes the mine horizon a cuttable unit.

The run-of-mine (*ROM*) coal is belted to the Kingston Preparation Plant prior to shipping to the customer.

12.2.2.2 Kingston 10 – Douglas Seam

Douglas reserves include 0.7 M clean recoverable tons in the future Kingston 10 Mine, which will require a new face-up and portals. Seam thickness average 2.6 feet in the Kingston 10 Mine reserve. The Douglas seam appears to begin to split on the west side of the reserve area. The split thickness may define the reserve limit.

12.2.2.3 Sewell Seam

The Sewell seam reserve is located near the community of Pax in Fayette County, West Virginia. The Sewell seam demonstrated reserves are 9.1 M clean recoverable tons. The reserve is classified as a Probable reserve due to the lack of metallurgical quality. The seam is below drainage and the overburden ranges from 200 feet in the lowest valley bottoms to over 900 feet under the highest ridge tops. The Paint Creek Lineament is a north-south trending zone generally following the western reserve boundary with most tons found east of the lineament. The Sewell seam is known to be gassy and influenced by horizontal stress that would be managed by ventilation and mine design. In addition, multiple combinations of mineable Sewell seam benches A, B, C and D exist throughout the reserve.

The seam consists of multiple coal benches (1 to 4 benches) and seam thickness ranges from 3 feet to 11 feet. The benches are generally depositional with limited lateral continuity where the coal thins at the margin of the deposition basin. The raised depositional areas trend north-south through the center part of the reserve and contain the most coal benches and thickest seam. Roof and floor rock is mostly shale that makes the mine horizon a cuttable unit.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

12.3 Qualified Person's Estimates

The coal reserves, as shown in *Table 12-1*, are based on a technical evaluation of the geology and a preliminary feasibility study of the coal deposits. The extent to which the coal reserves may be affected by any known environmental, permitting, legal, title, socio-economic, marketing, political, or other relevant issues has been reviewed rigorously. Similarly, the extent to which the estimates of coal reserves may be materially affected by mining, metallurgical, infrastructure and other relevant factors has also been considered.

The results of this TRS define an estimated 60.7 Mt of proven and probable marketable coal reserves.

Table 12-3: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)							Quality (Dry Basis)		
	By Reliability Category			By Permit Status		By Control Type				
Area or Seam	Proven	Probable	Total	Permitted	Not Permitted	Owned	Leased	Ash%	Sulfur%	VM%
Workman Creek Surface	0	24,528,000	24,528,000	24,528,000	0	57,000	24,471,000	-	-	-
Workman Creek HWM	3,661,000	61,000	3,722,000	3,722,000	0	0	3,722,000	9	0.9	-
Kingston Surface	16,048,000	3,440,000	19,487,000	12,298,000	7,189,000	0	19,487,000	10	1.0	32
Kingston HWM	2,401,000	92,000	2,493,000	1,774,000	719,000	0	2,493,000	6	1.0	33
Sewell (UG)	0	9,091,000	9,091,000	0	9,091,000	526,000	8,564,000	5	0.8	22
Douglas (UG)	1,028,000	390,000	1,418,000	1,009,000	408,000	82,000	1,336,000	6	1.0	-
Grand Total	**23,138,000**	**37,601,000**	**60,740,000**	**43,332,000**	**17,407,000**	**664,000**	**60,075,000**	-	-	-

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Raw quality and some volatile matter analysis not available for Workman Creek . Workman Creek surface reserves were priced at 60% High-Vol. A and 40% thermal product. Douglas seam volatile matter analysis not available. Douglas seam priced as a Mid-Vol. product, consistent with Kingston 2 production. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
Totals may not add due to rounding.
Workman Creek Surface is modeled as 55% direct-ship and 45% washed to mimic what Alpha is doing, however without any raw quality data for the surface seams a quality composite could not be prepared.
See Appendix A for detailed breakdown.

In summary, Alpha controls a total of 60.7 Mt (moist basis) of marketable coal reserves at MWVS as of December 31, 2021. Of that total, 38 percent are proven, and 62 percent are probable. Due to the lack of raw coal quality information, all Workman Creek surface reserves have been classified as Probable even though it is an active operation with sales into the thermal and metallurgical markets. Of the 60.7 Mt, 0.7 Mt are owned, and 60.1 Mt are leased coal reserves. Of the total, 44.0 Mt are surface mineable, 6.2 Mt are highwall mineable, and 10.5 Mt are underground mineable. Marketable coal reserves are 13.7 Mt are thermal and 47.1 Mt are metallurgical. Of the total, 51.0 Mt are assigned, and the remaining 9.8 Mt are unassigned.

12.4 Qualified Person's Opinion

The estimate of coal reserves was determined in accordance with the new SEC Guidelines which will become effective for the first fiscal year falling on or after January 1, 2021.

The LOM mining plan for MWV Surface was prepared to the level of preliminary feasibility. Mine projections were prepared, and timing scheduled to match production with coal seam characteristics. Production timing was carried out from current locations to depletion of the coal reserve area. Coal reserve estimates could be materially affected by the risk factors described in *Section 22.2*.

Based on the Preliminary Feasibility Study and the attendant Economic Review, MM&A believes this is a fair and accurate calculation of the MWV Surface coal reserves.

13 Mining Methods

Three underground mining areas along with eight surface and highwall miner areas were modeled and tested economically. Once the Resources were calculated, mine plans were created to project operating each resource area to depletion, with crews and equipment scheduled to move to subsequent mining areas as depletion occurs. Underground mine operations are projected to be exhausted in 2035, while surface and highwall mining operations are projected to be completed in 2042. Individual mine lives range from 3 to 22 years.

13.1 Geotech and Hydrology

Mining plans for potential underground mines were developed by Alpha and MM&A. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS)* program that was developed by the **National Institute for Occupational Safety and Health (*NIOSH*)**. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan.

Hydrology has not been an issue of concern at Alpha's MWVS operations. Based on numerous site visits to the underground operations of the Property by the QP's, it has been determined that this is not a significant concern. Mining of future reserves is projected to occur in areas which exhibit similar hydrogeological characteristics as those formerly mined areas.

13.2 Production Rates

Operations at the MWVS operations by Alpha and its predecessors are in various stages of maturity. The mine plan and productivity expectations reflect historical performance and efforts have been made to adjust the plan to reflect future conditions. MM&A is confident that the mine plan is reasonably representative to provide an accurate estimation of coal reserves. Mine development and operation have not been optimized within the TRS.

Carlson Mining software was used by MM&A to generate mine plans for the mineable coal seams. Mine plans were sequenced based on productivity schedules provided by Alpha, which were based on historically achieved productivity levels. All production forecasting ties assumed production rates to geological models as constructed by MM&A's team of geologists and mining engineers.

As shown in *Table 13-1*, the areas planned for underground mines produce coal until 2035. Clean coal production varies directly with coal thickness and anticipated mining conditions.

Table 13-1: MWVS Business Unit Underground Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
Kingston Mine #10 (Douglas)	0	53	280	286	78	0	0	0
Sewell	0	0	0	0	437	947	844	930
Kingston #2 (Douglas)	152	455	228	0	0	0	0	0
Total	**152**	**508**	**508**	**286**	**515**	**947**	**844**	**930**
Mine Name	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Kingston Mine #10 (Douglas)	0	0	0	0	0	0	0	0
Sewell	890	917	1,217	1,658	846	310	96	0
Kingston #2 (Douglas)	0	0	0	0	0	0	0	0
Total	**890**	**917**	**1,217**	**1,658**	**846**	**310**	**96**	**0**

As shown in *Tables 13-2* and *13-3*, the areas planned for surface and highwall mines produce coal until 2042. Clean coal production varies directly with surface mining ratios along with availability of open highwall for the highwall miner units.

Table 13-2: MWVS Business Unit Surface Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
Workman	494	2,000	2,776	2,288	2,216	2,120	2,164	2,134
Kingston	90	464	631	463	655	363	509	1,125
Total	**584**	**2,464**	**3,408**	**2,751**	**2,870**	**2,483**	**2,673**	**3,259**
Mine Name	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Workman	2,143	2,143	2,143	2,151	2,134	2,134	1,788	0
Kingston	1,129	1,129	1,129	1,134	1,125	1,125	1,129	1,134
Total	**3,272**	**3,272**	**3,272**	**3,285**	**3,259**	**3,259**	**2,917**	**1,134**
Mine Name	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
Workman	0	0	0	0	0	0	0	0
Kingston	1,129	1,129	1,125	1,129	1,129	668	0	0
Total	**1,129**	**1,129**	**1,125**	**1,129**	**1,129**	**668**	**0**	**0**

Table 13-3: MWVS Business Unit Highwall Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
Workman HWM	45	236	106	515	312	268	262	256
Kingston HWM	25	99	121	98	28	0	136	136
Total	**70**	**335**	**227**	**613**	**340**	**268**	**398**	**392**
Mine Name	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Workman HWM	256	256	256	256	256	256	256	0
Kingston HWM	136	136	136	136	136	136	136	136
Total	**392**	**392**	**392**	**392**	**392**	**392**	**392**	**136**
Mine Name	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
Workman HWM	0	0	0	0	0	0	0	0
Kingston HWM	136	136	136	136	136	136	0	0
Total	**136**	**136**	**136**	**136**	**136**	**136**	**0**	**0**

13.3 Mining Related Requirements

13.3.1 Underground

A mine plan with sequenced mining projections was prepared for each logical mining unit. For each mine plan, the appropriate number of production units is selected for the resource area, and a productivity level assigned, expressed in feet of advance per unit-shift of production. The productivity is based on the equipment and personnel configuration, mining height and expected physical conditions.

13.4 Required Equipment and Personnel

13.4.1 Underground Mines

13.4.1.1 Kingston 2 Mine – Douglas Seam (Maps UG-1)

Kingston 2 is an active mine and has been in production over 20 years. Two operating sections are found within the mine plan. Each production unit is supplied with two (2) continuous miners, two (2) roof bolters, four (4) shuttle cars, two (2) scoops and one (1) section feeder breaker.

Four distinct portal area access the reserve boundary from coal seam contour benches.

> The main portal and surface facilities are located on the east side of the valley, immediately upstream of the Kingston Preparation Plant. This facility includes the mine office, warehousing and change house facilities.

> Portals are located on the west side of the valley, immediately across from the main portals.

> A set of portals northeast of the preparation plant deliver run of mine coal into a stockpile that feeds the Kingston Preparation Plant.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

> A new set of portals at Shotgun Hollow above the community of Pax have been developed. These portals provide a shorter travel distance to the working areas than the original portal locations.

The basis mining concept has the continuous miner cutting coal and rock from the mine face. The continuous miner loads the run of mine material into shuttle cars which transports the material to the section feeder breaker. The feeder breaker loads the run of mine product onto the section conveyor belt and consecutive conveyor belts for haulage to the surface stockpile.

Once the continuous miner has reached its maximum distance in a working face, it is trammed to another available working face to begin mining. The roof bolter machine is moved into the recently completed working face to support the roof and ribs with steel bolts and plates.

The run of mine coal stockpile is located adjacent to the Kingston Preparation Plant where a reclaim conveyor transports the run of mine product for processing.

The mine is nearing its end of life with one unit ending its assignment in mid-2022 and the remaining unit finishing in late 2023. Remaining reserves are found at the edges of the mineral body.

13.4.1.2 Kingston 10 Mine – Douglas Seam (Map UG-1)

A small boundary area accessible from outcrop near White Oak Branch of Clear Creek has been included within the report. The Kingston 10 Mine would use one continuous miner unit from the Kingston 2 Mine as the unit becomes available. The run of mine coal would be placed into a stockpile and trucked to a processing facility before shipping to a customer.

The nearest access to a preparation plant facility would be by trucking the run-of-mine coal 4.9 miles to the Workman Creek Coal Handling Facility which uses an underground mine conveyor system to transport run of mine material to the Marfork Preparation Plant. From there, the product will be processed and shipped to the market via the CSX Transportation railroad system.

The operation is projected to start in the third quarter of 2022 and complete its assignment in the first quarter of 2025.

13.4.1.3 Sewell Seam Mine Sewell Mine (Map UG-2)

The Sewell Seam reserve boundary will be reached by constructing a slope and two ventilation shafts for access. The slope has a grade of 15 percent and will be constructed at a width capable of supporting the mine conveyor as well as an adjacent haulage road.

Projected plans include the construction of a raw coal stockpile near the slope portal which would ship the raw product to a proposed railcar loading facility. From there the coal would be transported to Alpha's Mammoth Preparation Plant near Montgomery, West Virginia. The Mammoth Preparation Plant is serviced by the **Kanawha River Railroad (*KNWA*)**, a shortline railroad owned by **WATCO**. Capital

construction costs include the mine construction, the railcar loading facility and a railcar unloading facility at the Mammoth Preparation Plant. The rail haul from the Pax Loadout to the Mammoth Preparation Plant would operate entirely on KNWA rail for a one-way distance of 33 miles.

The proposed mine has been timed with three operating continuous miner production units. Each production unit is equipped with two (2) continuous miners, two (2) roof bolting machines, four (4) shuttle cars, two (2) mine scoops and one (1) section feeder breaker.

The normal production cycle involves the continuous miner cutting coal and rock from the mine face. The continuous miner loads the run of mine material into shuttle cars which transports the material to the section feeder breaker. The feeder breaker loads the run of mine product onto the section conveyor belt and consecutive conveyor belts for haulage to the surface stockpile.

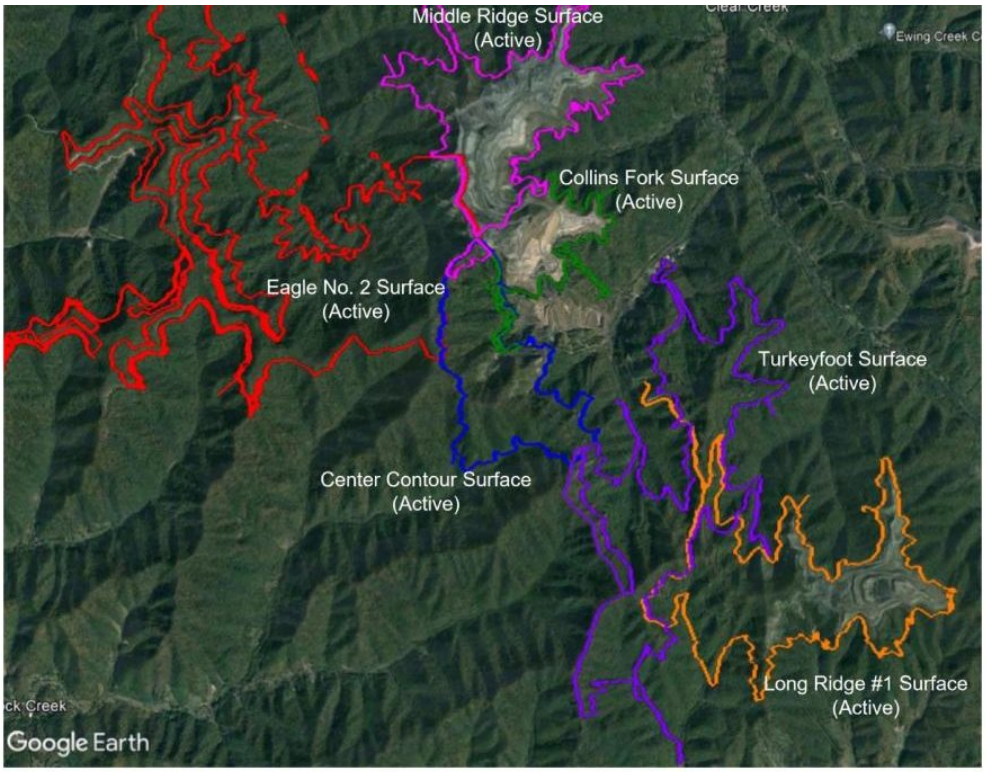
Operating life of the Sewell seam mine is projected at 10 years.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

13.4.2 Surface Mines

13.4.2.1 Workman Creek Surface (Map W-2 through W-14)

Figure 13-1: Workman Creek Surface Mine and Permit Areas Aerial View



The Workman Surface reserve area consists of mountain-top, contour and highwall mining of 25 seams: from the Upper Clarian to the Little Eagle - a difference of over 1,000 vertical feet. Deep mining has taken place in the Lower Hernshaw, Middle Cedar Grove, Lower Cedar Grove, Lower 2 Gas, Powellton, Upper Eagle, Eagle Rider/Eagle A, Eagle, and Little Eagle. Previous contour and augering mining have also been documented. The present mine plan consists of six permits: Middle Fork, Collins Fork, Turkey Foot, Center Contour, Long Ridge, and Eagle #2.

Mining activity consists of hydraulic shovels/ front-end loaders with rock trucks contour mining the lower seams; generating highwalls that are subsequently reclaimed by track bulldozers pushing material off upper seams. Prior to their reclamation highwall miners selectively borrow long holes in the thicker seams exposed in the highwall. Where vertical elevation differences exceed 500 ft, burden will have to be initially trucked off the mountain ridge(s).

Presently excess spoil room is provided by hollow fills on the eastern and southern portion of the Workman permits. Potential for additional hollow fill space exists in Sycamore Creek, but these hollow fills have yet to be approved by the **United States Army Corps of Engineers (*USACE*)**. Backfilling of mined benches is a major component of burden placement according to the mine permits. Careful operational planning will be required to ensure burden placement does not interfere with the full extraction of lower seam reserves.

MM&A did not attempt to confirm burden storage capacity as presented in Workman's permits.

The active Workman Creek Coal Handling Facility (*CHF*) presently used to convey coals through the mountain in the No. 2 Gas seam to the Marfork preparation plant does not allow for the full contour cuts as depicted in the Center Contour permit and will likely reduce burden storage capacity along the eastern ridge line as depicted in the permit.

Contour mining of the lower seams is very efficient with two or three cuts typically required until excavation limits are reached. Burden is trucked to hollow fills and/or back fill areas previously mined. Seams generally exposed during contour activity include the Upper Eagle, Eagle Rider, Eagle and Little Eagle.

Track bulldozers expose the seams above the contour highwall. These seams generally include the upper and lower Powellton, upper and lower No. 2 Gas and Peerless seams. Dozers provide a very cheap, fast, and safe means of reclaiming the lower contour highwalls.

Excavation and haulage of upper seam burden is actively taking place in the Middle Ridge, Collins Fork and Eagle #2 permits. It will also have to take place in the Center Contour, Turkey Foot and Long Ridge permits.

To shorten haul distances, a "cut-thru" is proposed in the Long Ridge permit. The cut-thru will improve mining accessibility to the Turkey Foot western extension area.

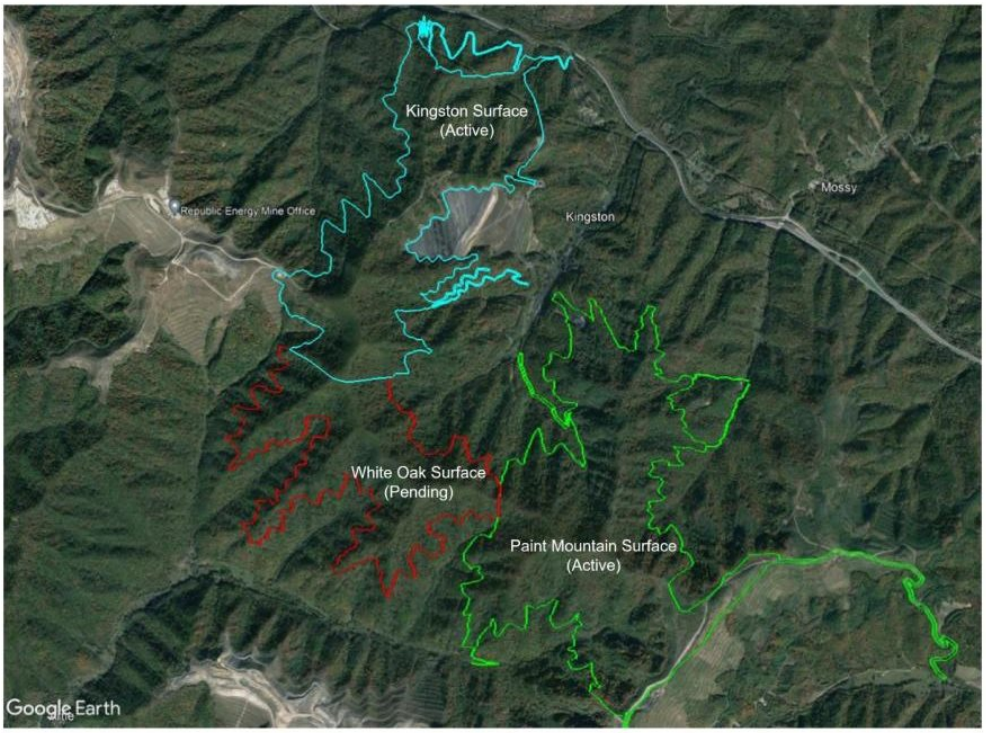
Workman operates three large hydraulic excavators, two **Caterpillar Inc. (*Cat*®)** 993 loaders and nine D11 track bulldozers. Two additional D11 track dozers will be added from Pax to achieve its surface production goals of 39 million bcy per year. Two highwall miners provide additional production tonnage when the final highwalls are exposed. Production from the highwall miners is expected to be sporadic due to highwall exposure of the surface mine and presence of deep-mine works.

The mine is expected to employ 191 operators in the surface mining phase of the operation and 20 operators in the highwall mining phase. Workman's CHF employ an additional 7 employees to operate this facility. When they highwall miner is idled, its operators are expected to perform other supplemental tasks such as reclamation.

At the above production level exhaustion of the reserves is expected to be in year 2035.

13.4.2.2 Kinaston Surface (Map K2-K11)

Figure 13-2: Kingston Surface Mine Permit Areas Aerial View



The Kingston surface reserve area consists of mountain-top, contour and highwall mining of 30+ seams: from the Stockton to the Eagle - a difference of over 1,000 vertical feet. Deep mining has taken place in the Lower Cedar Grove, Upper and Lower No. 2 Gas, Powellton and Powellton lower split, Upper Eagle, and Eagle upper and lower splits. Previous contour and augering mining have also been documented. The present mine plan consists of three permits: Kingston Surface, Paint Mountain, and White Oak. The White Oak permit (S-3008-21) is currently pending.

MM&A did not attempt to confirm burden storage capacity as presented in Kingston's permits.

The Kingston surface operation has not reached the level of maturity of the Workman operation. Fewer working areas have been established with present disturbance being limited to the Kingston Surface permit. Mining activity is expected to be similar to Workman: hydraulic shovels / front-end loaders mining lower seam contours. Dozers will help mine intermediate seams in help reclaim the lower seams. However due to strip ratio constraints, contour mining instead of mountain-top excavation is expected to complete excavation of the upper seams. Less push volume availability is expected to require more haulage contribution to reclaiming highwalls.

Hollow fills of substantial storage volume are primarily limited to the Kingston and Paint Mountain permits. Excess spoil capacity needs for the White Oak permit will be primarily provided by the backfilling of the other two permits. The reserves of the White Oak permit will be the last to be exhausted.

Kingston operates one large hydraulic excavator, one 993 loader and two D11 track bulldozers. As excavation provides room for more active areas, equipment from exhausted thermal coal operations is expected to be added to Kingston's fleet. An additional large excavator, two additional 993 loaders, and four additional track bulldozers will double the overburden production to about 19 million bcy per year within five years. One highwall miner will provide additional production tonnage as highwalls are exposed.

The mine employs 87 operators presently in the surface mining phase of the operation and 10 operators in the highwall mining phase. After five years the number of operators is expected to increase to 154 for the surface mining phase and 20 operators for highwall mining phase.

At the above production level exhaustion of the reserves is expected to be in year 2042.

14 Processing and Recovery Methods

14.1 Description or Flowsheet

The Alpha MWVS Operations includes the Kingston Preparation Plant. Washed coal product is transported from the preparation plant by truck haulage to the Pax loadout with access to the CSX Railroad. The Pax loadout was constructed in 2006 and can load railroad car at a rate of 3,500 tons per hour. Coal can also be transported by truck to Alpha's Marmet dock barge loading facilities. The docks are located on the Kanawha River near Marmet, West Virginia and provider barge transportation to the customer. Barges can be loaded at the rate of 1,600 tons per hour and the facility was built in 1986. Coal Production is also conveyed from Workman Creek, through underground mine works to the Marfork Preparation Plant for processing and shipment on the CSX railroad system. Coal can also be

trucked to MWVUG Mammoth Preparation plant for processing. The Mammoth Plant provides rail loading on the Kanawha River Railroad shortline that connects to the Norfolk Southern and CSX Transportation railroad systems as well as on-site barge loading on the Kanawha River.

Each of the plant sites include raw coal storage, clean coal storage and refuse disposal areas.

The Kingston preparation plant was constructed in 1974 and has a raw feed rate capacity of 700 raw tons per hour. Primary separation equipment includes Peters heavy media vessels, Krebs heavy media

tons per hour. Primary separation equipment includes Pistol heavy media vessels, three heavy media cyclones, Multitech spirals, and Denver froth cells, supported by the requisite screens, centrifuges, sumps, pumps, and distribution systems. Coarse and fine refuse are disposed in an adjacent slurry cell impoundment. During the 2021 reporting year, the Kingston plant produced a product with a typical ash content of 7.90%, and a typical sulfur content 0.66% at a utilization rate of 58.12%.

Product transportation from the preparation plant is by highway truck to either the Pax Railroad Loadout or to barge loading facilities along the Kanawha River near Marmet, West Virginia.

An aerial image of the Kingston Preparation Plant and refuse area is shown in *Figure 14-1*.

Figure 14-1: MWVS Kingston Preparation Plant and Refuse Area

Figure 14-2: MWVS Kingston Preparation Plant and Refuse Area (Zoomed-In View)

Processes and equipment are typical of those used in the coal industry and are in use in nearly all plants in the Central Appalachian Basin.

14.2 Requirements for Energy, Water, Material and Personnel

Personnel have historically been sourced from the surrounding communities in Fayette, Raleigh, Kanawha and Boone Counties, and have proven to be adequate in numbers to conduct mining operations. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners.

Water is sourced locally from public water sources or rivers, and electricity is sourced from **Appalachian Electric Power (*AEP*)**. The service industry in the areas surrounding the mine operations has historically provided supplies, equipment repairs and fabrication, etc.

15 Infrastructure

The Kingston Preparation Plant services the area with washed coal, which is transported via highway trucks to the Pax Loadout located on WATCO's Kanawha River Railroad shortline railroad or to barge loading facilities along the Kanawha River near Marmet, West Virginia. Haul roads, primary roads, and

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

conveyor belt systems account for transport from the various mine sites to the preparation plant. This practice will continue for future reserves.

As an active operation, the necessary support infrastructure for MWVS is in place.

As new areas are developed, the infrastructure requirements will change. These changes have been considered in the LOM plans and financial model.

The underground mining resource areas which are located below drainage will require surface facilities, mine access slope development to the coal seam and ventilation facilities. Typical surface facilities include a mine office, a change house, supply facilities, mine fan and a stacker conveyor for run of mine coal storage.

Photographs of the existing facilities are shown in *Figures 15-1, 15-2, 15-3 and 15-4*.

Figure 15-1: MWVS Kingston Preparation Plant & Surface Facilities

Figure 15-2: MWVS Pax Loadout Surface Facilities

Figure 15-3: MWVS Workman Creek Surface Facilities

Figure 15-4: Workman Creek Coal Handling Facility

16 Market Studies

16.1 Market Description

The quality characteristics for the subject coal resources and coal reserves have been reviewed in detail by MM&A. The drill hole data were utilized to develop average coal quality characteristics for the mining site. These average coal quality characteristics were then utilized as the basis for determining the various markets into which the saleable coal will likely be placed.

Quality Specifications for the MWVS products as produced in 2021 are as shown in *Table 16-1*.

Table 16-1: Quality Specifications

	Kingston MV	Workman CK HVA
Ash (%)	7.74	7.48
Sulfur (%)	0.77	0.97
Volatile Matter (%)	26.5	30.9

Note: All Specs are dry basis except Moisture and Thermal

The mine production serves the both the mid- and high-volatiles metallurgical markets.

16.2 Price Forecasts

Pricing data as provided by Alpha is described in *Table 16-2*. The pricing data assumes a flat-line long term realization average of $144 per short ton port loading, with an average of $102.26 netback pricing reflective of the mid-volatile product, $144 per short ton port loading with an average of $111.29 per short ton netback pricing reflective of the low-volatile product, and $138 per short ton port loading, with an average of $108.08 netback pricing reflective of the high-volatile product currently sold at MWVS. A portion of the surface mine production is also thermal product which assumes a flat-line long term realization of $76 per short ton with an average of $66.68 per ton netback pricing. The LOM blended average netback pricing for the MWVS reserves is $95.97 per ton. These estimates are based on long term pricing published by third party sources and adjusted for quality and transportation. A large majority of the coal sold by Alpha and their MWVS business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the MWVS business unit.

Table 16-2: Price Forecasts

Coal quality	Market Pricing Per Ton (1) (2)
High-Vol. A	$138
High- Vol. B	$117
Mid-Vol.	$144
Low-Vol.	$144
Thermal	$76

(1) - Market pricing shown on U.S. East Coast basis.
(2) - Metallurgical and thermal pricing based on 10-year and 3-year average, respectively of forecasted pricing from pricing services.

16.3 Contract Requirements

Some contracts are necessary for successful marketing of the coal. For MWVS, since all mining, preparation and marketing is done in-house, the remaining contracts required are:

- **Transportation** – Alpha contracts with the Norfolk Southern Railroad and CSX Transportation to transport coal to market. Barge transportation on the Kanawha River is contracted through various parties.
- **Sales** – Sales contracts are a mix of spot and contract sales. With the volatility of the market, long-term contracts are not typically written.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

17 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals

17.1 Results of Studies

MM&A completed an environmental review in 2011 for the Massey properties acquired by Alpha, including those operations that were active at MWV Surface at that time. The environmental review

including those operations that were active at MWV Surface at that time. The environmental review completed by MM&A included site inspections, reviews of historical records, database searches of State and Federal regulatory records and interviews to identify potential recognized environmental conditions (*RECs*) that may create environmental liability for the sites. While MM&A identified RECs during both studies, MM&A's opinion was that those issues would not preclude the continued or future use of the properties as a coal mining/preparation venture.

Based on this former ESA completed by MM&A, it is MM&A's opinion that MWV Surface has a generally typical coal industry record of compliance with applicable mining, water quality, and environmental laws. Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models.

17.2 Requirements and Plans for Waste Disposal

Based on a recent engineering review, done by Alpha, the Kingston Preparation Plant has approximately 14 years of fine refuse disposal capacity and 14 years of coarse refuse disposal capacity at projected rates have been identified for the Kingston refuse area, 3 years of which is permitted and active. In addition, some of the MWVS reserves are processed through the Marfork Preparation Plant. Those remaining capacities are also provided in *Table 17-1*. Securing additional coarse and fines capacity will be critical to execute the business plan as outlined in this TRS. The refused expansion has MSHA approval and awaiting Article III, DEP approval. The table below outlines the current estimated capacities and permits of MWVS Kingston's fine and coarse impoundments.

Table 17-1: MWVS Refuse Disposal Summary*

Refuse Facility	State SMCRA Permit Number	MSHA ID	Refuse Disposal Type	Classified as a Dam	Permit Status	Current Planned Maximum Coarse Life (Approved + Planned)	Current Planned Maximum Fines Life (Approved + Planned)	Est. Coarse/ Combined Refuse Life (Yrs.)	Est. Fine Refuse Life (Yrs.)
Kingston Coal Refuse Disposal Facility MWVS	O-3019-93	1211-WV-40107-04	Slurry Cell Impoundment - Downstream and Upstream	Yes	Active	14	14	3.0	3.0
Brushy Fork Refuse Impoundment	O-3010-95	1211-WV40234-02	Slurry Impoundment - Downstream and Upstream	Yes	Active	48.1	78.5	0.6	21.6
Low Gap Refuse Disposal Area	O-3005-94	1211-WV40234-01	Coarse Refuse Fill	No	Active	18.5	0.0	18.5	0.0

*Since part of reserves are currently being processed through Marfork Preparation Plant, refuse capacities for both Kingston and Marfork areas are included.

17.3 Permit Requirements and Status

All mining operations are subject to federal and state laws and must obtain permits to operate mines, coal preparation and related facilities, haul roads, and other incidental surface disturbances necessary for mining to occur. Permits generally require that the permittee post a performance bond in an amount established by the regulatory program to provide assurance that any disturbance or liability created during mining operations is properly restored to an approved post-mining land use and that all regulations and requirements of the permits are fully satisfied before the bond is returned to the permittee. Significant penalties exist for any permittee who fails to meet the obligations of the permits including cessation of mining operations, which can lead to potential forfeiture of the bond. Any company, and its directors, owners and officers, which are subject to bond forfeiture can be denied future permits under the program.[1]

New permits or permit revisions will occasionally be necessary to facilitate the expansion or addition of new mining areas on the Property, such as amendments to existing permits and new permits for mining of reserve areas. Exploration permits also are required. Property under lease includes provisions for exploration among the terms of the lease. New or modified mining permits are subject to a public advertisement process and comment period, and the public is provided an opportunity to raise objections to any proposed mining operation. MM&A is not aware of any specific prohibition of mining on the subject property and given sufficient time and planning, Alpha should be able to secure new permits to maintain its planned mining operations within the context of current regulations. Necessary permits are in place to support current production on the Property, but future permits are required to maintain and expand production. Portions of the Property are located near local communities. Regulations prohibit mining activities within 300 feet of a residential dwelling, school,

[1] Monitored under the Applicant Violator System (AVS) by the Federal Office of Surface Mining.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

church, or similar structure unless written consent is first obtained from the owner of the structure. Where required, Alpha reports that such consents have been obtained where mining is proposed beyond the regulatory limits.

Alpha has obtained all mining and discharge permits to operate its mines and processing, loadout or related facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. MWVS, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental**

a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

The Mining permits currently held by Alpha MWVS are shown in *Table 17-2.*

Table 17-2: MWVS Mining Permits

Mine Name	Seam	Permit	Expires	Status	Acres Disturbed	Acres Reclaimed	Acres Bonded
Republic Energy, LLC							
Skitter Creek No. 1 Mine	-	S302794	9/22/2025	Active, No Coal Removed	55.9	497.68	616.58
Kingston Surface Mine	Chilton A, No. 2 Gas - Lwr, Coalburg - Ltl, Winifrede - Lwr, Chilton, Chilton RDR, Hernshaw, Coalburg, No. 2 Gas, Chilton - Ltl, Stockton, Winifrede - U, Peerless, Powellton, Clarion, Cedar Grove	S300215	11/5/2024	Active, Moving Coal	-	-	762.26
Paint Mountain Surface Mine	Chilton A, Chilton, Chilton RDR, Coalburg, No. 2 Gas, Stockton, Winifrede - U, Winifrede, Eagle, Eagle A, Eagle - Ltl, Peerless, Powellton, Cedar Grove	S300520	10/19/2026	Not Started	-	-	1112.75
White Oak Surface Mine	Coalburg, Cedar Grove, Chilton A, Chilton, Chilton RDR, Eagle, Eagle A, Eagle - Ltl, Winifrede - Lwr, No. 2 Gas, Powellton, Peerless, Stockton, Winifrede - U	S300821	-	Pending Application	-	-	-
Middle Ridge Surface Mine	Chilton A, Winifrede - Lwr, Chilton, Chilton RDR, Hernshaw, Coalburg, No. 2 Gas, Stockton, Winifrede - U, Winifrede, Eagle, Eagle A, Eagle - Ltl, Peerless, Powellton, Cedar Grove	S301712	3/24/2024	Active, Moving Coal	272.5	145.8	799.05
Collins Fk Remediation Project	No. 2 Gas - Lwr, Chilton, Chilton RDR, Hernshaw, No. 2 Gas, Eagle, Eagle A, Eagle - Ltl, Peerless, Powellton, Cedar Grove, Cedar	S300208	10/14/2026	Active, Reclamation only	159.88	125.95	262.88
Eagle No. 2 Surface Mine	Chilton A, No. 2 Gas - Lwr, Winifrede - Lwr, Chilton, Chilton RDR, Coalburg, No. 2 Gas, Stockton RDR, Winifrede- U, Winifrede, Eagle, Eagle A, Eagle - Ltl, Peerless, Powellton, Cedar Grove	S302805	6/6/2023	Active, Moving Coal	24.54	0	2039.89
Turkeyfoot Surface Mine	Glenalum Tunnel, Hernshaw, Douglas, No. 2 Gas, Eagle, Eagle A, Eagle - Ltl, Peerless, Powellton, Cedar Grove	S301419	4/16/2026	Not Started	-	-	1085.7
Center Contour Surface Mine	Chilton A, Chilton, Chilton RDR, Hernshaw, No. 2 Gas, Eagle, Eagle A , Eagle - Ltl, Peerless, Powellton, Cedar Grove, Powellton - Lwr	S300316	11/13/2024	Active, Moving Coal	-	-	561.43
Long Ridge #1 Surface Mine	Chilton A, Winifrede - Lwr, Chilton, Hernshaw, Coalburg, No. 2 Gas, Winifrede, Eagle, Eagle A , Eagle -Ltl, Peerless, Powellton, Cedar Grove, Powellton - Lwr	S300115	12/21/2026	Active, Moving Coal	330.24	115.58	864.05
Eagle South							

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

17.4 Local Plans, Negotiations or Agreements

MM&A found no indication of agreements beyond the scope of Federal or State Regulations.

17.5 Mine Closure Plans

Applicable regulations require that mines be properly closed, and reclamation commenced immediately upon abandonment. In general, site reclamation includes removal of structures, backfilling, regrading, and revegetation of disturbed areas. For surface mines, the majority of the expense for backfilling and regrading is completed as part of ongoing mining operations, with only reclamation of final pits and HWM benches required at end-of-mine life. Sediment control is required during the establishment of vegetation, and bond release generally requires a minimum five-year period of site maintenance, water sampling, and sediment control following mine completion. This requirement is reduced to two years for certain operations involving re-mining. Reclamation of underground mines includes closure and sealing of mine openings such as portals and shafts in addition to the items listed above.

Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models. As with all mining companies, an accretion calculation is performed

annually so the necessary Asset Retirement Obligations (*ARO*) can be shown as a Liability on the Balance Sheet.

17.6 Qualified Person's Opinion

The MWVS Business Unit is an operating facility; all necessary permits for current production have been obtained. MM&A knows of no reason that any permits revisions that may be required cannot be obtained.

Estimated expenditures for site closure and reclamation are included in the financial model for this site.

18 Capital and Operating Costs

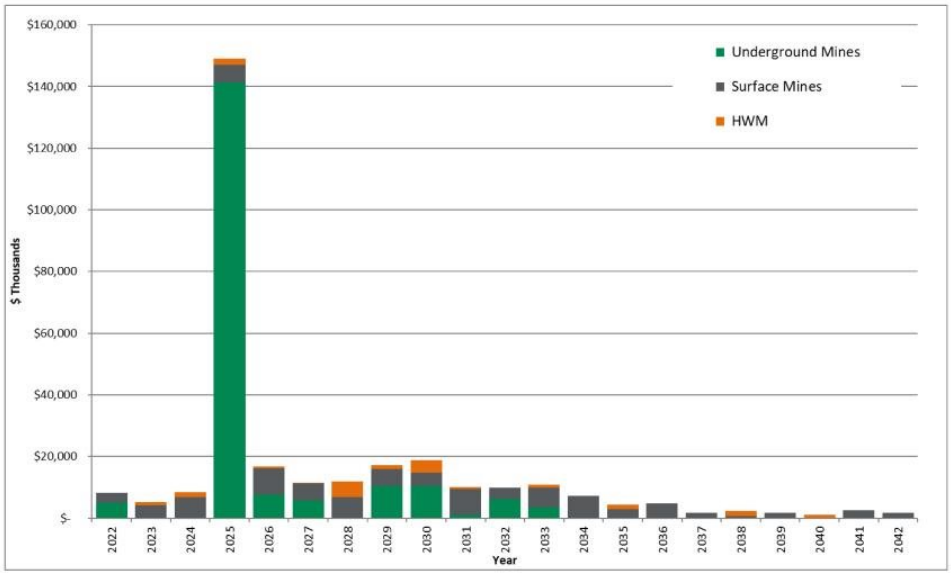
18.1 Capital Cost Estimate

The production sequence selected for a property must consider the proximity of each reserve area to coal preparation plants, river docks and/or railroad loading points, along with suitability of production equipment to coal seam conditions. The in-place infrastructure was evaluated, and any future needs were planned to a level suitable for a Preliminary Feasibility Study and included in the Capital Forecast.

Alpha provided MM&A with information related to the number of currently operating production units at MWVS. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated MWVS operations is provided in *Figure 18-1* below. Total capital by mine is summarized in *Table 18-1*.

Figure 18-1: Projected Capital Expenditures – Consolidated MWVS Operations



Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 18-1: Summary of Capital Expenditures Schedule by Mine

Item	Total	2021	2022	2023	2024	2025	2026	2027
Kingston #2 (Douglas)	**$0**	$0	$0	$0	$0	$0	$0	$0
Sewell	**$186,751**	$0	$0	$0	$0	$141,372	$7,728	$5,877
Kingston Mine #10 (Douglas)	**$4,955**	$0	$4,955	$0	$0	$0	$0	$0
Workman Surface	**$49,530**	$4,520	$1,800	$2,400	$3,810	$3,900	$4,520	$3,600
Kingston Surface	**$49,730**	$2,500	$1,440	$1,800	$2,990	$1,800	$3,940	$1,800
Workman HWM	**$5,880**	$0	$0	$1,070	$1,070	$800	$500	$300
Kingston HWM	**$15,400**	$0	$0	$0	$500	$1,070	$0	$0

Total	$312,247	$7,020	$8,195	$5,270	$8,370	$148,942	$16,688	$11,577
Item	2028	2029	2030	2031	2032	2033	2034	2035
Kingston #2 (Douglas)	$0	$0	$0	$0	$0	$0	$0	$0
Sewell	$0	$10,500	$10,572	$1,032	$6,169	$3,500	$0	$0
Kingston Mine #10 (Douglas)	$0	$0	$0	$0	$0	$0	$0	$0
Workman Surface	$2,400	$3,750	$2,820	$5,960	$1,800	$4,500	$3,750	$0
Kingston Surface	$4,460	$1,800	$1,440	$2,500	$1,800	$1,800	$3,380	$2,880
Workman HWM	$1,070	$1,070	$0	$0	$0	$0	$0	$0
Kingston HWM	$4,010	$0	$4,040	$500	$0	$1,070	$0	$1,570
Total	**$11,940**	**$17,120**	**$18,872**	**$9,992**	**$9,769**	**$10,870**	**$7,130**	**$4,450**
Item	2036	2037	2038	2039	2040	2041	2042	2043
Kingston #2 (Douglas)	$0	$0	$0	$0	$0	$0	$0	$0
Sewell	$0	$0	$0	$0	$0	$0	$0	$0
Kingston Mine #10 (Douglas)	$0	$0	$0	$0	$0	$0	$0	$0
Workman Surface	$0	$0	$0	$0	$0	$0	$0	$0
Kingston Surface	$4,780	$1,800	$720	$1,800	$0	$2,500	$1,800	$0
Workman HWM	$0	$0	$0	$0	$0	$0	$0	$0
Kingston HWM	$0	$0	$1,570	$0	$1,070	$0	$0	$0
Total	**$4,780**	**$1,800**	**$2,290**	**$1,800**	**$1,070**	**$2,500**	**$1,800**	**$0**

18.2 Operating Cost Estimate

Alpha provided historical costs and budgeted projections of operating costs for its active underground mines (Kingston #2) for MM&A's review, along with its active surface and highwall mines (Workman Creek and Kingston). MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for the mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, drilling & blasting, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Statutory sales related costs are summarized in *Table 18-2*.

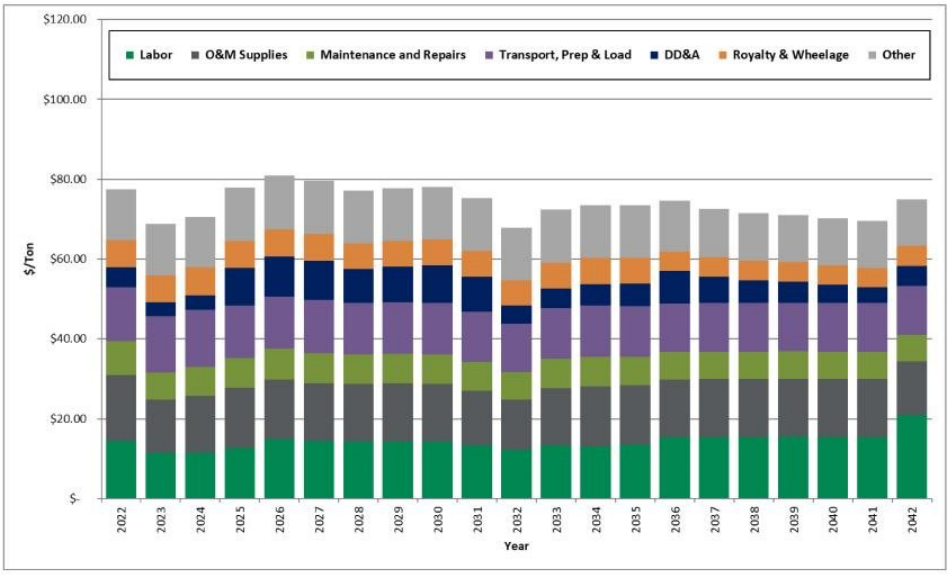
Table 18-2: Estimated Coal Production Taxes and Sales Costs

Description of Tax or Sales Cost	Basis of Assessment	Cost
Federal Black Lung Excise Tax – Underground	Per Ton	$1.10
Federal Black Lung Excise Tax – Surface/Highwall	Per Ton	$0.55
Federal Reclamation Fees – Underground	Per Ton	$0.12
Federal Reclamation Fees – Surface/Highwall	Per Ton	$0.28
West Virginia Reclamation Tax - Underground	Per Ton	$0.279
West Virginia Severance Tax	Percentage of Revenue	1 to 5%
Royalties – Underground, Surface and Highwall	Percentage of Revenue	5.0 to 8.25%

Notes: 1. Federal black lung excise tax is paid only on coal sold domestically.

A summary of the projected operating costs for the consolidated MWVS operations is provided in *Figure 18-2*.

Figure 18-2: MWVS Business Unit Operating Costs



Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

19 Economic Analysis

19.1 Economic Evaluation

19.1.1 Introduction

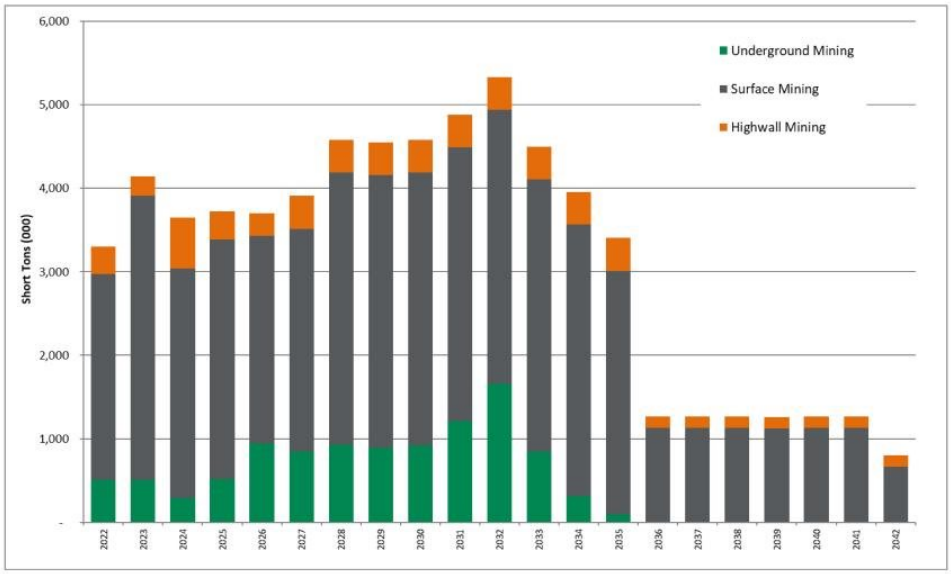
The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable

of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2021.

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation, refuse disposal, coal loading, reclamation and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

The operations are projected on a calendar year basis. MM&A's projection of annual sales tonnage is summarized in the chart below. While all Alpha coal resources properties deemed by MM&A to have potential for classification as coal reserves were evaluated as part of the economic model, some of those resource areas were determined to be uneconomical in the current market and were therefore excluded from coal reserves as discussed below.

Figure 19-1: Projection of Sales Tons



Sales revenue is based on the metallurgical coal price information provided to MM&A by Alpha. Only the revenue from Alpha's captive mining operations is included in the financial model used for this TRS.

The P&L projections of the individual mines of Alpha's MWVS operations are then consolidated into a P&L and cash flow schedule for further testing of the economics. Projected debt service is excluded from the P&L and cash flow model in order to determine Enterprise Value of the aggregated entity.

The financial model expresses coal sales prices, operating costs, and capital expenditures in current day dollars without adjustment for inflation. Capital expenditures and reclamation costs are included based on engineering estimates for each mine by year. MM&A also included an estimate of administrative costs in the financial projections.

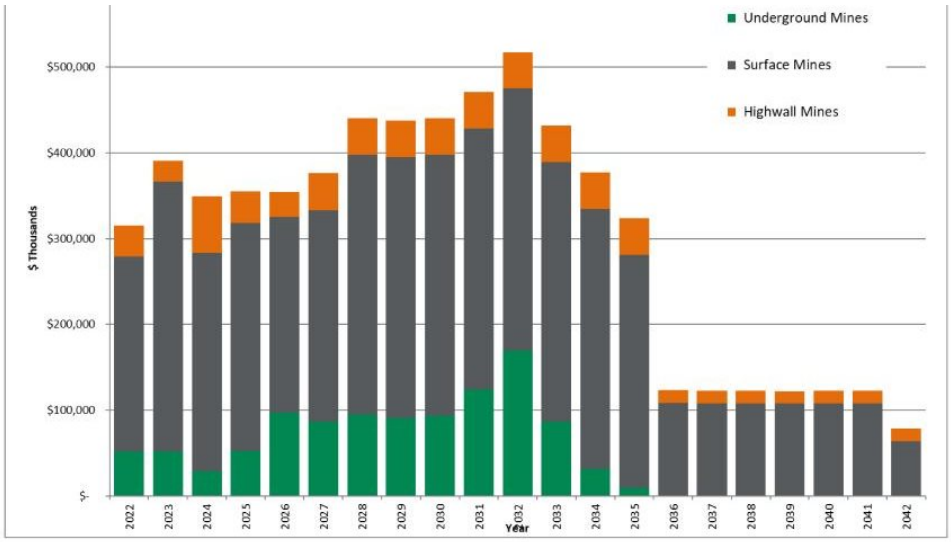
Alpha will pay royalties for the various current and projected operations. The royalty rates vary by location as provided by Alpha. The royalty rates were assumed to be 5.0% to 8.25% of the sales revenue.

The projection model also includes consolidated income tax calculations at Alpha's MWVS Division level, incorporating statutory depletion calculations, as well as state income taxes, and a federal tax rate of 21%. To the extent the Alpha mines generate net operating losses for tax purposes, the losses

are carried over to offset future taxable income from Alpha mines. The terms "cash flows" and "project cash flows" used in this report refer to after-tax cash flows.

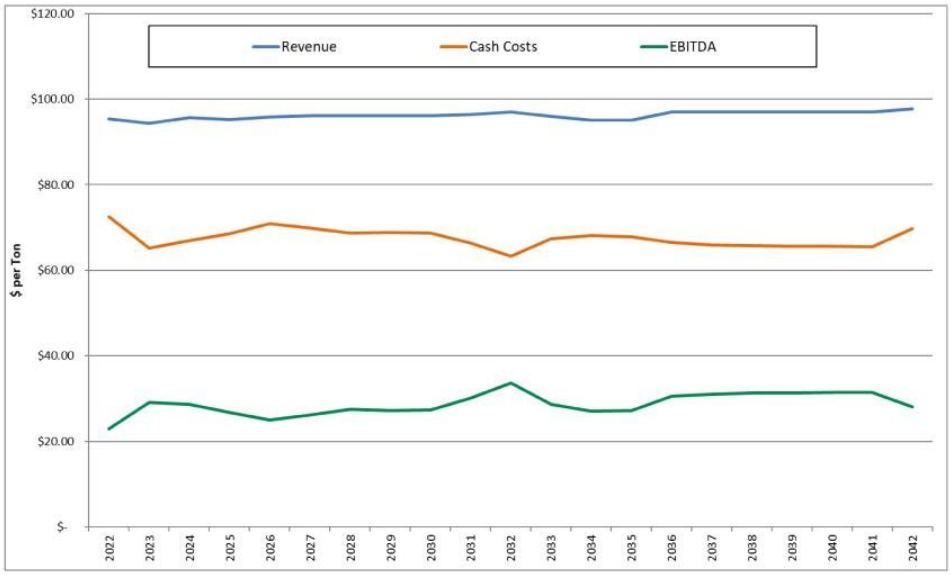
Alpha's projected consolidated annual revenue for the MWVS operations is shown in the chart below:

Figure 19-2: Consolidated Annual Revenue



Projected consolidated revenue, cash costs, and EBITDA for the MWVS operations are expressed in dollars per ton in the graph below.

Figure 19-3: Revenue, Cash Costs, and EBITDA



The above chart shows an average LOM revenue of $96 per ton, cash costs of $63 to $72 per ton and EBITDA of $23 to $34 per ton. Positive EBITDA per ton averages $28.22 per ton over the life of the operations.

Table 19-1 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at MWVS.

Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

-	LOM Tonnage[1]	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Underground Mines					
Kingston Mine #10 (Douglas)	697	$298	$0.43	$5,020	$7.21
Sewell	9,091	$45,070	$4.96	$264,345	$29.08
Kingston #2 (Douglas)	835	$12,518	$14.99	$16,560	$19.83
Consolidated Deep Mines	**10,622**	**$57,886**	**$5.45**	**$285,925**	**$26.92**
Surface Mines					
Workman	30,828	$581,850	$18.87	$703,133	$22.81
Kingston	19,644	$444,329	$22.62	$534,053	$27.19
Consolidated Surface Mines	**50,472**	**$1,026,179**	**$20.33**	**$1,237,186**	**$24.51**

-	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
HWM Operations					
Workman HWM	3,792	$215,908	$56.94	$234,873	$61.94
Kingston HWM	2,544	$131,771	$51.81	$144,563	$56.84
Consolidated HWMs	**6,336**	**$347,680**	**$54.88**	**$379,436**	**$59.89**
Grand Total	**67,429**	**$1,431,745**	**$21.23**	**$1,902,547**	**$28.22**

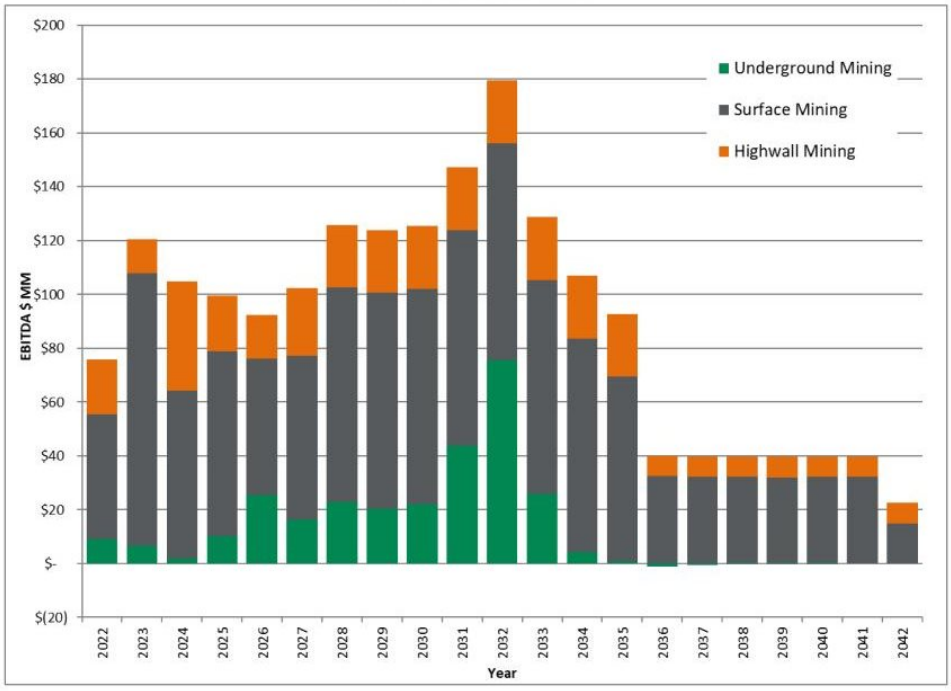
Note: 1) LOM tonnage evaluated in the financial model includes October 2021 through December 2021 production (913,003 clean tons) which was subtracted from coal reserves in order to make the effective date of the

reserves December 31, 2021. In addition, the financial model includes 5.8 Mt clean tons of resources.

As shown in *Table 19-1,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated MWVS operations show positive LOM P&L and EBITDA of $1.4 billion and $1.9 billion, respectively.

A breakdown of projected EBITDA for the consolidated MWVS operations is shown in the chart below:

Figure 19-4: Annual EBITDA



19.1.2 Cash Flow Summary

Alpha's consolidated MWVS cash flow summary in constant dollars, excluding debt service, is shown in *Table 19-2* below.

Table 19-2: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons[1]	67,429	806	3,306	4,142	3,650	3,725	3,698
Total Revenue	$6,471,321	$76,916	$315,487	$390,938	$349,204	$354,737	$354,585
EBITDA	$1,902,547	$17,706	$75,845	$120,622	$104,818	$99,557	$92,318
Net Income	$1,146,410	$989	$49,167	$85,262	$74,715	$46,469	$43,561
Net Cash Provided by Operating Activities	$1,617,212	$14,075	$53,790	$93,210	$90,104	$84,150	$83,298
Purchases of Property, Plant, and Equipment	($312,247)	($7,020)	($8,195)	($5,270)	($8,370)	($148,942)	($16,688)
Net Cash Flow	$1,304,965	$7,055	$45,595	$87,940	$81,734	($64,793)	$66,610

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	3,915	4,580	4,553	4,581	4,880	5,334	4,497
Total Revenue	$376,067	$440,318	$437,420	$440,275	$470,853	$517,175	$431,768
EBITDA	$102,276	$125,806	$123,862	$125,485	$147,134	$179,469	$128,665
Net Income	$53,290	$70,267	$65,830	$65,272	$81,751	$125,882	$83,944
Net Cash Provided by Operating Activities	$91,678	$106,436	$109,408	$110,284	$123,849	$146,922	$118,462
Purchases of Property, Plant, and Equipment	($11,577)	($11,940)	($17,120)	($18,872)	($9,992)	($9,769)	($10,870)
Net Cash Flow	$80,101	$94,496	$92,288	$91,412	$113,857	$137,153	$107,592

	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	3,960	3,405	1,270	1,265	1,265	1,261	1,265
Total Revenue	$376,920	$323,799	$123,139	$122,710	$122,710	$122,282	$122,710
EBITDA	$107,002	$92,743	$38,778	$39,324	$39,566	$39,492	$39,747
Net Income	$67,840	$57,867	$26,428	$26,520	$26,717	$26,407	$27,294
Net Cash Provided by Operating Activities	$96,106	$83,327	$33,645	$30,267	$31,840	$32,496	$32,323
Purchases of Property, Plant, and Equipment	($7,130)	($4,450)	($4,780)	($1,800)	($2,290)	($1,800)	($1,070)
Net Cash Flow	$88,976	$78,877	$28,865	$28,467	$29,550	$30,696	$31,253

	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	1,265	804	0	0	0	0	0
Total Revenue	$122,710	$78,599	$0	$0	$0	$0	$0
EBITDA	$39,811	$22,521	$0	$0	$0	$0	$0
Net Income	$27,380	$14,531	($557)	($221)	($111)	($56)	($29)
Net Cash Provided by Operating Activities	$33,109	$27,755	($5,622)	($1,839)	($919)	($459)	($486)
Purchases of Property, Plant, and Equipment	($2,500)	($1,800)	$0	$0	$0	$0	$0
Net Cash Flow	$30,609	$25,955	($5,622)	($1,839)	($919)	($459)	($486)

Note: 1) LOM tonnage evaluated in the financial model includes October 2021 through December 2021 production (913,003 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021. In addition, the financial model includes 5.8 Mt clean tons of resources.

Consolidated cash flows are driven by annual sales tonnage, which grows from 3.3 million tons in 2022 to a peak of 5.3 million tons in 2032. Between years 2033 and 2035, sales ranges from 3.4 million to

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

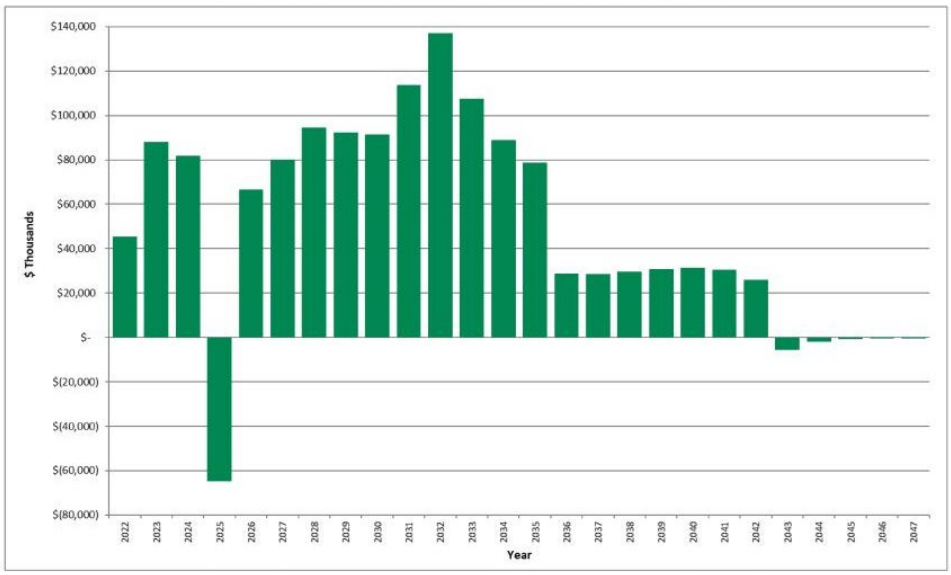
4.5 million tons and between years 2036-2042, sales range from 0.8 million tons to 1.3 million tons. Projected consolidated revenue grows from $77 million in 2022 to a peak of $517 million in 2032. Revenue totals $6.5 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $146.9 million in 2032 and totals $1.6 billion over the project life. Capital expenditures total $177.8 million during the first five years and $312.2 million over the project's life

expenditures total $177.8 million during the first five years and $312.2 million over the project's life.

Consolidated MWVS net cash flow after tax, but before debt service, is shown by year in the chart below:

Figure 19-5: Net Cash Flow after Tax (Before Debt Service)



LOM Net cash flow is positive for this project. The cash flows after year 2042 are generally related to end of mine reclamation expenditures, which are accrued over the life of the mines.

19.1.3 Discounted Cash Flow Analysis

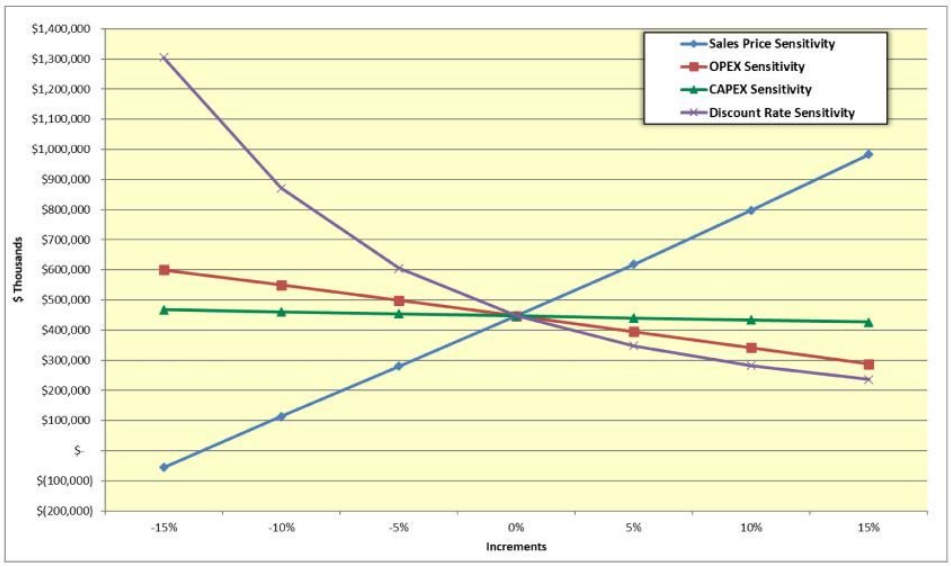
Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered

basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $447.2 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the MWVS reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its MWVS assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

19.1.4 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 19-6: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

20 Adjacent Properties

20.1 Information used

No Proprietary information associated with neighboring properties was used as part of this study.

21 Other Relevant Data and Information

MM&A performed a previous audit of all the Property in year 2021 for reserves effective as of December 31, 2020, for Alpha based on **U.S. Securities and Exchange Commission (*SEC*)** Industry Guide 7 standards. MM&A utilized this former audit study as the basis of an updated study which meets those standards set forth by the SEC for 2021 reserve compliance.

22 Interpretation and Conclusions

22.1 Conclusion

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the MWVS Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study is sufficient to conclude that the 60.7 Mt of marketable coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

22.2 Risk Factors

Risks have been identified for operational, technical and administrative subjects addressed in the Pre-Feasibility Study. A risk matrix has been constructed to present the risk levels for all the risk factors identified and quantified in the risk assessment process. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

The purpose of the characterization of the project risk components is to inform the project stakeholders of key aspects of the Alpha projects that can be impacted by events whose consequences can affect the success of the venture. The significance of an impacted aspect of the operation is directly related to both the probability of occurrence and the severity of the consequences. The initial risk for a risk factor is herein defined as the risk level after the potential impact of the risk factor is addressed by competent and prudent management utilizing control measures readily available. Residual risk for a risk factor is herein defined as the risk level following application of special mitigation measures if management determines that the initial risk level is unacceptable. Initial risk and residual risk can be quantified numerically, derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

The probability and consequence parameters are subjective numerical estimates made by practiced mine engineers and managers. Both are assigned values from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and greatest consequence. The products, which define the Risk Level, are classified from very low to very high.

Risk Level Table (R = P x C)

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Risk aspects identified and evaluated during this assignment total 15. No residual risks are rated Very High. Three (3) residual risks are rated High. Six (6) of the risk aspects could be associated with Moderate residual risk. Four (4) of the risk aspects were attributed Low or Very Low residual risks.

22.2.1 Governing Assumptions

The listing of the aspects is not presumed to be exhaustive. Instead that listing is presented based on the experiences of the contributors to the TRS.

1. The probability and consequence ratings are subjectively assigned, and it is assumed that this subjectivity reasonably reflects the condition of the active and projected mine operations.
2. The Control Measures shown in the matrices presented in this chapter are not exhaustive. They represent a condensed collection of activities that the author of the risk assessment section has observed to be effective in coal mining scenarios.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

3. Mitigation Measures listed for each risk factor of the operation are not exhaustive. The measures listed, however, have been observed by the author to be effective.
4. The monetary values used in ranking the consequences are generally-accepted quantities for the coal mining industry.

22.2.2 Limitations

The risk assessment proposed in this report is subject to the limitations of the information currently

collected, tested, and interpreted at the time of the writing of the report.

22.2.3 Methodology

The numerical quantities (i.e., risk levels) attributable to either "initial" or "residual" risks are derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

$$R = P \times C$$

Where: R = Risk Level
P = Probability of Occurrence
C = Consequence of Occurrence

The Probability (P) and Consequence (C) parameters recited in the formula are subjective numerical estimates made by practiced mine engineers and managers. Both P and C are assigned integer values ranging from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and greatest consequence. The products (R = P x C) which define the Risk Level, are thereafter classified from very low to very high.

Risk Level Table

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Very high initial risks are considered to be unacceptable and require corrective action well in advance of project development. In short, measures must be applied to reduce very high initial risks to a tolerable level.

As shown and discussed above, after taking into account the operational, technical, and administrative actions that have been applied or are available for action when required, the residual risk can be determined. The residual risk provides a basis for the management team to determine if the residual

risk level is acceptable or tolerable. If the risk level is determined to be unacceptable, further actions should be considered to reduce the residual risk to acceptable or tolerable levels to provide justification for continuation of the proposed operation.

22.2.4 Development of the Risk Matrix

Risks have been identified for the technical, operational, and administrative subjects addressed in the TRS. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

22.2.4.1 Probability Level Table

Table 22-1: Probability Level Table

Category	Probability Level (P)		
1	Remote	Not likely to occur except in exceptional circumstances.	<10%
2	Unlikely	Not likely to occur; small in degree.	10 - 30%
3	Possible	Capable of occurring.	30 - 60%
4	Likely	High chance of occurring in most circumstances.	60 - 90%
5	Almost Certain	Event is expected under most circumstances; impossible to avoid.	>90%

The lowest rated probability of occurrence is assigned the value of 1 and described as remote, with a likelihood of occurrence of less than 10 percent. Increasing values are assigned to each higher probability of occurrence, culminating with the value of 5 assigned to incidents considered to be almost certain to occur.

22.2.4.2 Consequence Level Table

Table 22-2 lists the consequence levels.

Table 22-2: Consequence Level Table

Correlation of Events in Key Elements of the Project Program to Event Severity Category							
Category	Severity of the Event	Financial Impact of the Event	Unplanned Loss of Production (Impact on Commercial Operations)	Events Impacting on the Environment	Events Affecting the Program's Social and Community Relations	Resultant Regulatory / Sovereign Risk	Events Affecting Occupational Health & Safety
				Insignificant loss of habitat; no			Event recurrence avoided by corrective

1	**Insignificant**	< USD $0.5 million	≤ 12 hours	habitat; no irreversible effects on water, soil and the environment.	Occasional nuisance impact on travel.		Event recurrence avoided by corrective action through established procedures (Engineering, guarding, training).
2	**Minor**	USD $0.5 million to $2.0 million	≤ 1 day	No significant change to species populations; short-term reversible perturbation to ecosystem function.	Persistent nuisance impact on travel. Transient adverse media coverage.		**First aid – lost time.** Event recurrence avoided by corrective action thought established procedures.
3	**Moderate**	USD $2.0 million to $10.0 million	≤ 1 week	Appreciable change to species population; medium-term (≤10 years) detriment to ecosystem function.	Measurable impact on travel and water/air quality. Significant adverse media coverage / transient public outrage.	Uncertainty securing or retaining essential approval / license. Change to regulations (tax; bonds; standards).	**Medical Treatment –** permanent incapacitation Avoiding event recurrence requires modification to established corrective action procedures**.**
4	**Major**	USD $10.0 million to $50.0 million	1 to 2 weeks	Change to species population threatening viability; long-term (>10 years) detriment to ecosystem function.	Long-term, serious impact on travel and use of water resources; degradation of air quality; sustained and effective public opposition.	Suspension / long-delay in securing essential approval / license. Change to laws (tax; bonds; standards).	**Fatality.** Avoiding event recurrence requires modification to established corrective action procedures and staff retraining.
5	**Critical**	>USD $50.0 million	>1 month	Species extinction; irreversible damage to ecosystem function.	Loss of social license.	Withdraw / failure to secure essential approval / license.	**Multiple fatalities.** Avoiding event recurrence requires major overhaul of policies and procedures.

The lowest rated consequence is assigned the value of 1 and is described as Insignificant Consequence parameters include non-reportable safety incidents with zero days lost accidents, no environmental damage, loss of production or systems for less than one week and cost of less than USD $0.5 million. Increasing values are assigned to each higher consequence, culminating with the value of 5 assigned to critical consequences, the parameters of which include multiple-fatality accidents, major environmental damage, and loss of production or systems for longer than one month and cost of greater than USD $50.0 million.

Composite Risk Matrix R = P x C and Color-Code Convention

The risk level, defined as the product of probability of occurrence and consequence, ranges in value from 1 (lowest possible risk) to 25 (maximum risk level). The values are color-coded to facilitate identification of the highest risk aspects.

Table 22-3: Risk Matrix

P x C = R			Consequence (C)				
			Insignificant	Minor	Moderate	Major	Critical
			1	2	3	4	5
Probability Level (P)	Remote	1	1	2	3	4	5
	Unlikely	2	2	4	6	8	10
	Possible	3	3	6	9	**12**	**15**
	Likely	4	4	8	**12**	**16**	**20**
	Almost Certain	5	5	10	**15**	**20**	**25**

22.2.5 Categorization of Risk Levels and Color Code Convention

Very high risks are considered to be unacceptable and require corrective action. Risk reduction measures must be applied to reduce very high risks to a tolerable level.

22.2.6 Description of the Coal Property

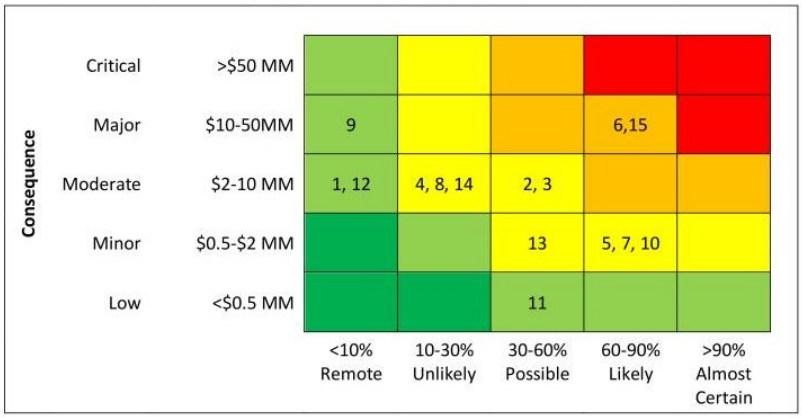
The MWVS Business Unit is located in located in Raleigh , and Fayette Counties, West Virginia – is an active operation with one underground mine and four surface mines. The active underground operation within the MWVS Business Unit (Kingston 2 Mine) utilizes two continuous mining production sections. The method provides continuity, preserving skilled work groups and enabling effective

utilization of production equipment. The active surface mining operations include the Workman Creek and Kingston Mines. The surface mines employ contour, area and highwall mining methods.

22.2.7 Summary of Residual Risk Ratings

Each risk factor is numbered, and a risk level for each is determined by multiplying the assigned probability by the assigned consequence. The risk levels are plotted on a risk matrix to provide a composite view of the Alpha risk profile. The average risk level is 7.2, which is defined as Moderate.

Table 22-4: Risk Assessment Matrix



22.2.8 Risk Factors

A high-level approach is utilized to characterize risk factors that are generally similar across a number of the active and proposed mining operations. Risk factors that are unique to a specific operation or are particularly noteworthy are addressed individually.

22.2.8.1 Geological and Coal Resource

Coal mining is accompanied by risk that, despite exploration efforts, mining areas will be encountered where geological conditions render extraction of the resource to be uneconomic, or that coal quality characteristics disqualify the product for sale into target markets.

Offsetting the geological and coal resource risk are the size of the controlled property which allows flexibility in the selection of mine areas away from areas where coal quality and mineability are less favorable. In addition, many of the underground mines are designed to operate with multiple production sections each, which lessens the immediate impact when one section encounters difficulties. The large reserve areas also provide a mitigation strategy of varying the timing of

development of mines to offset expected or encountered adverse conditions, thereby maintaining consistent production and quality. This flexibility requires additional extension or development cost but increases performance consistency.

The larger reserve areas will be developed with multiple production sections and the small, replacement production reserve areas provide ready access to alternative locations if geological and coal resource characteristics require abandonment of an active production area.

Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Recoverable coal tons recognized to be significantly less than previously estimated.	Reserve base is adequate to serve market commitments and respond to opportunities for many years. Local adverse conditions may increase frequency and cost of production unit relocations.	Previous and ongoing exploration and extensive regional mining history provide a high level of confidence of coal seam correlation, continuity of the coal seams, and coal resource tons.	1	4	4	Optimize mine plan to increase resource recovery; develop mine plan to provide readily available alternate mining locations to sustain expected production level.	1	3	3
Coal quality locally proves to be lower than initially projected.	If uncontrolled, production and sale of coal that is out of specification can result in rejection of deliveries, cancellation of coal sales agreements and damage to reputation. Clean coal quality related to surface mines is largely justified by historical trends as opposed to exploration data.	Exploration and vast experience and history in local coal seams provide confidence in coal quality; limited excursions can be managed with careful product segregation and blending.	3	5	15	Develop mine plan to provide readily available alternate mining locations to sustain expected production level; modify coal sales agreements to reflect coal quality.	3	3	9

22.2.8.2 Environmental

Water quality and other permit requirements are subject to modification and such changes could have a material impact on the capability of the operator to meet modified standards or to receive new permits and modifications to existing permits. Permit protests may result in delays or denials to permit applications.

Environmental standards and permit requirements have evolved significantly over the past 50 years and to-date, mining operators and regulatory bodies have been able to adapt successfully to evolving environmental requirements.

Table 22-6: Environmental (Risks 3 and 4)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Environmental performance standards are modified in the future.	Delays in receiving new permits and modifications to existing permits; cost of testing and treatment of water and soils	Work with regulatory agencies to understand and influence final standards; implement testing, treatment and other actions to comply	3	4	12	Modify mining and reclamation plans to improve compliance with new standards while reducing cost of	3	3	9

		with new standards.				compliance.			
New permits and permit modifications are increasingly delayed or denied.	Interruption of production and delayed implementation of replacement production from new mines.	Comply quickly with testing, treatment and other actions required; continue excellent compliance performance within existing permits.	2	4	8	Establish and maintain close and constructive working relationships with regulatory agencies, local communities and community action groups.	2	3	6

22.2.8.3 Regulatory Requirements

Federal and state health and safety regulatory agencies occasionally amend mine laws and regulations. The impact is industry wide. Mining operators and regulatory agencies have been able to adapt successfully to evolving health and safety requirements.

Table 22-7: Regulatory Requirements (Risk 5)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Federal and state mine safety and health regulatory agencies amend mine laws and regulations.	Cost of training, materials, supplies and equipment; modification of mine examination and production procedures; modification of mining plans.	Participate in hearings and workshops when possible to facilitate understanding and implementation; work cooperatively with agencies and employees to facilitate implementation of new laws and regulations.	4	3	12	Familiarity and experience with new laws and regulations results in reduced impact to operations and productivity and improved supplies and equipment options.	4	2	8

22.2.8.4 Market and Transportation

Most of the current and future production is expected to be directed to domestic and international metallurgical markets. Historically the metallurgical markets have been cyclical and highly volatile.

Table 22-8: Market and Transportation (Risk 6)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Volatile coal prices drop precipitously.	Loss of revenue adversely affects profitability; reduced cash flow may disrupt capital expenditures plan.	Cost control measures implemented; capital spending deferred.	4	5	20	High-cost operations closed, and employees temporarily furloughed.	4	4	16

Occasional delay or interruption of rail, river and terminals service may be expected. The operator can possibly minimize the impact of delays by being a preferred customer by fulfilling shipment obligations promptly and maintaining close working relationships.

Table 22-9: Market and Transportation (Risk 7)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Rail or river transport is delayed; storage and shipping access at river and ocean terminals is not available.	Fulfillment of coal sales agreements delayed; limited coal storage at mines may increase cost of rehandling; production may be temporarily idled.	Provide adequate storage capacity at mines; coordinate continuously with railroad and shipping companies to respond quickly and effectively to changing circumstances.	4	3	12	Provide back-up storage facility along with personnel, equipment and rehandle plan to sustain production and fulfill sales obligations timely.	4	2	8

22.2.8.5 Mining Plan

Occupational health and safety risks are inherent in mining operations. Comprehensive training and retraining programs, internal safety audits and examinations, regular mine inspections, safety meetings, along with support of trained fire brigades and mine rescue teams are among activities that greatly reduce accident risks. Employee health monitoring programs coupled with dust and noise monitoring and abatement reduce health risks to miners.

As underground mines are developed and extended, observation of geological, hydrogeological and geotechnical conditions lead to modification of mine plans and procedures to enable safe work within the mine environments.

Highlighted below are selected examples of safety and external factors relevant to Alpha's operations.

22.2.8.5.1 Methane Management

Coalbed methane is potentially present in coal operations however, the methane concentration in shallow coal seams is at such low levels that it can be readily managed with frequent testing and

monitoring, vigilance, and routine mine ventilation. Methane is not expected to be present in most of the MWVS property.

Table 22-10: Methane Management (Risk 8)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R

Methane hazard is present in mines operating below drainage.	Injury or loss of life; possible ignition of gas and mine explosion; potential loss of mine and equipment temporarily or permanently; additional mine fan, mine power, ventilation, monitoring and examination requirements.	Low to moderate levels can be managed with frequent examinations, testing and monitoring within the mine ventilation system. Excellent rock dust maintenance minimizes explosion propagation risk should an ignition occur.	2	5	10	Very high-level methane concentrations may require coal seam degasification and gob degasification where pillar extraction methods are employed.	2	3	6

22.2.8.5.2 Mine Fires

Mine fires, once common at mine operations, are rare today. Most active coal miners have not encountered a mine fire. Vastly improved mine power and equipment electrical systems, along with safe mine practices reduce mine fire risks. Crew training and fire brigade support and training improve response for containment and control if a fire occurs. Spontaneous combustion within coal mines, which is the source of most fires that occur today, is not expected to commonly occur at the Alpha property. When spontaneous combustion conditions are present, monitoring systems are employed for early detection and mine plans are designed to facilitate isolation, containment and rapid extinguishment.

Table 22-11: Mine Fires (Risk 9)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Mine fire at underground operation or plant stockpile fire.	Injury or loss of life; potential loss of mine temporarily or permanently; damage to equipment and mine infrastructure.	Inspection and maintenance of mine power, equipment and mine infrastructure; good housekeeping; frequent examination of conveyor belt entries; prompt removal of accumulations of combustible materials.	1	5	5	If spontaneous combustion conditions are present, enhanced monitoring and examination procedures will be implemented; mine design will incorporate features to facilitate isolation, containment and extinguishment of spontaneous combustion locations.	1	4	4

22.2.8.5.3 Ground Control

Underground mining exposes miners to the risks of roof falls and rib rolls. Ground control-based risks can be mitigated through effective roof control plans which are supplemented with a strong understanding of future geotechnical conditions. Foremen and crews should be trained to examine the roof, rib and floor conditions and identify pending and immediate hazards. Multiple publicly available software programs can be used to assess pillar sizing and stability.

Table 22-12: Ground Control (Risk 10)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Ground control issues cause roof failures, rib rolls, floor heave, etc.	Injury or loss of life; catastrophic damage to equipment; production interruption.	Regular inspection for change and signs of failure. Dynamic design of roof control plan and safety measures to honor observed conditions and exploration-based information; conservative pillar design.	4	3	12	Multiple operating sections to mitigate any lost production; availability of new working areas in case abandonment of section is required; availability of alternative roof control technologies in case of abrupt changes in mining conditions.	4	2	8

22.2.8.5.4 Availability of Supplies and Equipment

The industry has periodically experienced difficulty receiving timely delivery of mine supplies and equipment. Availability issues often accompanied increased periods for coal demand. Any future delivery of supplies and equipment delays are expected to be temporary with limited impact on production.

Table 22-13: Availability of Supplies and Equipment (Risk 11)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Disruption of availability for supplies and equipment.	Temporary interruption of production.	Force majeure provision in coal sales agreements to limit liability for delayed or lost sales.	3	2	6	Work closely with customers to assure delayed coal delivery rather than cancelled sales; monitory external conditions and increase inventory of critical supplies; accelerate delivery of equipment when possible.	3	1	3

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Surface Business Unit
in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

22.2.8.5.5 Labor

Work stoppage due to labor protests are considered to be unlikely and accompanied by limited impact should it occur. Excellent employee relations and communications limit the exposure to outside protesters. Loss of supervisors and skilled employees to retirement is inevitable; the impact can be lessened with succession planning and training and training and mentorship of new employees.

Table 22-14: Labor – Work Stoppage (Risk 12)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Work stoppage due to slowdowns or secondary boycott activity.	Loss of production and coal sales; damaged customer and employee relations; reputation loss.	Maintain excellent employee relations and communications; maintain frequent customer communications.	2	3	6	Develop plan for employee communications and legal support to minimize impact of secondary boycott activities.	1	3	3

Table 22-15: Labor – Retirement (Risk 13)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Retirement of supervisors and skilled employees.	Loss of leadership and critical skills to sustain high levels of safety, maintenance and productivity.	Monitor demographics closely and maintain communications with employees who are approaching retirement age; maintain employee selection and training programs.	3	3	9	Maintain selection of candidates and implementation of in-house or third-party training for electricians and mechanics; develop employee mentoring program.	3	2	6

22.2.8.6 Comprehensive Health and Safety

While largely incorporated in mine plan-based risk factors, effective health and safety programs reduce the risk of accidents, associated loss of production and fines. Currently, coal mining and processing requires a robust health and safety team, consisting of executive level health and safety roles, regional health and safety managers, and multiple operational level health and safety coordinators.

Table 22-16: Health and Safety (Risk 14)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Failure to attain operations safety standards and associated occurrence of accidents.	Injuries and possible loss of life; damage to morale and workforce confidence; loss of production and diminished productivity; regulatory issues, closures and fines; reputation loss.	Safety and loss control awareness training to help employees recognize hazardous conditions and actions; frequent job observations and feedback; periodic employee performance reviews.	2	5	10	Senior management's active participation in safety process; utilization of motivational methods to reinforce company's values and commitment to safety; regular comprehensive safety audits to assure safety standards are maintained.	2	3	6

22.2.8.7 Refuse Disposal

Having sufficient refuse disposal capacity is critical to strategic long-term mine development. Production delays can be caused by the lengthy process associated with identifying, designing and permitting future waste disposal areas.

Alpha's MWVS Business Unit is actively pursuing additional refuse storage areas to acquire and/or permit in order to support the LOM reserves for the Property.

Table 22-17: Refuse Disposal (Risk 15)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Failure to acquire and/or permit refuse storage areas to support reserves	Interruption of coal preparation plant operations and increased pressure on mine/plant raw coal storage capacities.	Plant design modifications to reduce refuse volumes produced; strategic property acquisition and design of future refuse storage areas.	4	5	20	Addition of plate frame filters in plant; identify, design and permit additional refuse facilities.	4	4	16

23 Recommendations

Alpha is continuing to work both internally and with outside assistance to continue to further define their Resource Base and to Optimize the LOM Plan.

24 References

Publicly available information from various State and Federal agencies was used where relevant.

JOURNEL, A.G., & HUIJBREGTS, CH, J., 1978: Mining Geostatistics, The Blackburn Press Caldwell, New Jersey.

25 Reliance on Information Provided by Registrant

For the purpose of this TRS, MM&A utilized the Geological and Coal Quality data provided by Alpha.

This information was subjected to verification of its integrity and completeness.

Historical productivity and operating costs were also supplied by Alpha. This information was combined with the experience and knowledge of the QP's to forecast the LOM plan.

Alpha supplied a long-term price forecast based on published benchmark pricing. This benchmark pricing was adjusted by Alpha to reflect the effects of quality and transportation borne after FOB plant costs were calculated.

A summary of the information provided by Alpha relied upon by MM&A for the purposes of this TRS is provided in *Table 25-1*.

Table 25-1: Information from Registrant Relied Upon by MM&A

Category	Information Provided by Alpha	Report Section
Legal	Mineral control and surface control rights as shown on maps	3.2, 3.3
Geological	Geologic data including digital databases and original source data including geologist logs, driller's logs, geophysical logs	9.1
Coal Quality	Database of coal quality information supplemented with original source laboratory sheets where available	10.1
Mining	Historical productivities and manpower from operating and future Alpha mines	13.2, 13.4
Coal Preparation	Flow sheet and other information representing current and future methods of coal processing	14.1
Marketing	Long-term price forecast and market placement by seam used in financial projections	16.2
Waste Disposal	Engineering data and estimates representing remaining capacities for coarse and fine coal waste disposal	17.2
Environmental	Permit and bonding information	17.3
Costs	Historical and budgetary operating cost information used to derive cost drivers for reserve financial modeling	18.2

APPENDIX

A

SUMMARY TABLES

Alpha Metallurgical Resources

2021 SEC Update - MWVS Business Unit

Summary of Coal Resource (Short Tons) • Effective December 31, 2021

Appendix A Table 1

		Coal Resource (Dry Tonnes, In Situ)											Quality (Dry Basis)		
		By Reliability Category					By Control Type		By Permit Status		By Market Type				
Mine/Area	Seam	Measured	Indicated	Total	Inferred	Grand Total	Owned	Leased	Permitted	Not Permitted	Thermal	Met	Ash%	Sulfur%	VM%
Workman Creek Surface	Winifrede & Above	2,489,000	4,594,000	7,083,000	45,000	7,128,000	0	7,083,000	7,083,000	0	2,125,000	4,958,000	-	-	-
Sewell Mine	Sewell	0	21,254,000	21,254,000	0	21,254,000	13,652,000	7,603,000	0	21,254,000	0	21,254,000	-	-	-
Total		**2,489,000**	**25,848,000**	**28,337,000**	**45,000**	**28,382,000**	**13,652,000**	**14,686,000**	**7,083,000**	**21,254,000**	**2,125,000**	**26,213,000**	**-**	**-**	**-**

*Note(1): Resource tons are **exclusive** of reserve tons.*

Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.

Note (3): The Property contains 28.3 million tons (Mt) of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.

Totals may not add due to rounding.

Workman Creek Surface is modeled as 55% direct-ship and 45% washed to mimic what Alpha is doing, however without any raw quality data for the surface seams a quality composite could not be prepared.

Sewell is classified as a indicated due to the lack of drilling and lack of quality.

Alpha Metallurgical Resources

2021 SEC Update - MWVS Business Unit

Summary of Coal Reserve (Short Tons) • Effective December 31, 2021

Appendix A Table 2

Mine	Seam	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)											Quality (Dry Basis)		
		By Reliability Category			By Mining Type		By Control Type		By Permit Status		By Market				
		Proven	Probable	Total	Surface	UG	Owned	Leased	Permitted	Not Permitted	Thermal	Met	Ash%	Sulfur%	VM%
Workman Creek Surface		0	24,528,000	24,528,000	24,528,000	0	57,000	24,471,000	24,528,000	0	7,358,000	17,170,000	-	-	-
Workman Creek HWM		3,661,000	61,000	3,722,000	3,722,000	0	0	3,722,000	3,722,000	0	0	3,722,000	9	0.9	-
Kingston Surface		16,048,000	3,440,000	19,487,000	19,487,000	0	0	19,487,000	12,298,000	7,189,000	6,305,000	13,183,000	10	1.0	32
Kingston HWM		2,401,000	92,000	2,493,000	2,493,000	0	0	2,493,000	1,774,000	719,000	0	2,493,000	6	1.0	33
Sewell Mine	Sewell	0	9,091,000	9,091,000	0	9,091,000	526,000	8,564,000	0	9,091,000	0	9,091,000	5	0.8	22
Kingston 2	Douglas	488,000	233,000	721,000	0	721,000	82,000	640,000	642,000	79,000	0	721,000	6	1.0	-
Kingston 10	Douglas	540,000	156,000	697,000	0	697,000	0	697,000	367,000	330,000	0	697,000	6	1.0	-
Grand Total		**23,138,000**	**37,601,000**	**60,740,000**	**50,231,000**	**10,509,000**	**664,000**	**60,075,000**	**43,332,000**	**17,407,000**	**13,663,000**	**47,077,000**	-	-	-

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Raw quality and some volatile matter analysis not available for Workman Creek . Workman Creek surface reserves were priced at 60% High-Vol. A and 40% thermal product. Douglas seam volatile matter analysis not available. Douglas seam priced as a Mid-Vol. product, consistent with Kingston 2 production. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.

Totals may not add due to rounding.

Workman Creek Surface is modeled as 55% direct-ship and 45% washed to mimic what Alpha is doing, however without any raw quality data for the surface seams a quality composite could not be prepared.

APPENDIX

B

MWVS SURFACE RESOURCES EXCLUSIVE OF RESERVES (PER TON)

MARSHALL MILLER
&ASSOCIATES®

Alpha Metallurgical Resources, Inc.

Initial Economic Assessment

MWVS Surface Resources Exclusive of Reserves (per Ton)

Appendix B

	Workman Creek (WIN & Above)	Sewell North UG
In-Place Resource Tons	7,127,590	21,254,462
Potentially Recoverable Tons*	5,763,738	5,883,873
Mining Method	Area	Deep - CM
Assumed Sales Realization at Plant**	$ 100	$ 120
Inital Capex Estimate to Access Resources***	$ 700,000	$ -
Total Direct Cash Costs******	$ 38.30	$ 61.85
Transporation, Washing, Environmental & G&A Costs:		
Materials Handling	$ 1.50	$ 5.21
Coal Prep******	$ 2.92	$ 1.50
Raw Coal Trucking******	$ 3.75	$ 3.26
Clean Coal Trucking	$ 0.50	$ 1.25
Enviro*******	$ 0.35	$ 0.35
G&A	$ 3.00	$ 1.80
Total Transporation, Washing, Environmental & G&A Costs:	**$ 12.02**	**$ 13.37**
Indirect Cash Costs		
Royalty	$ 8.25	$ 8.40
Black Lung Excise Tax	$ 0.25	$ 0.55
SMCRA	$ 0.28	$ 0.12
State Severance	$ 5.02	$ 6.00
Property Tax & Insurance	$ 0.70	$ 0.50
Total Indirect Cash Costs	**$ 14.50**	**$ 15.57**
Non Cash Costs		
Amoritiztion of Development Capital	$ 0.10	$ -
Depreciation of Initial Equipment and Sustaining Capital	$ 4.00	$ 5.00
Depletion	$ 1.00	$ 1.00
Total Non Cash	$ 5.10	$ 6.00
Total Cash Cost	**$ 64.82**	**$ 90.79**
EBITDA	**$ 35.18**	**$ 29.21**
Fully Loaded Cost	**$ 69.92**	**$ 96.79**
Fully Loaded P&L	**$ 30.08**	**$ 23.21**
Passes Resource Iniital Economic Assessment?	**YES**	**YES**

*Potentially recoverable tons are calculated by applying appropriate modifying factors to in-place resource tonnages

**Sales relization represents recent historical thermal price.

***Initial development has already occurred.

****Labor rates, M&R, other operating supplies are driven based off of $2.25 per cubic yard.

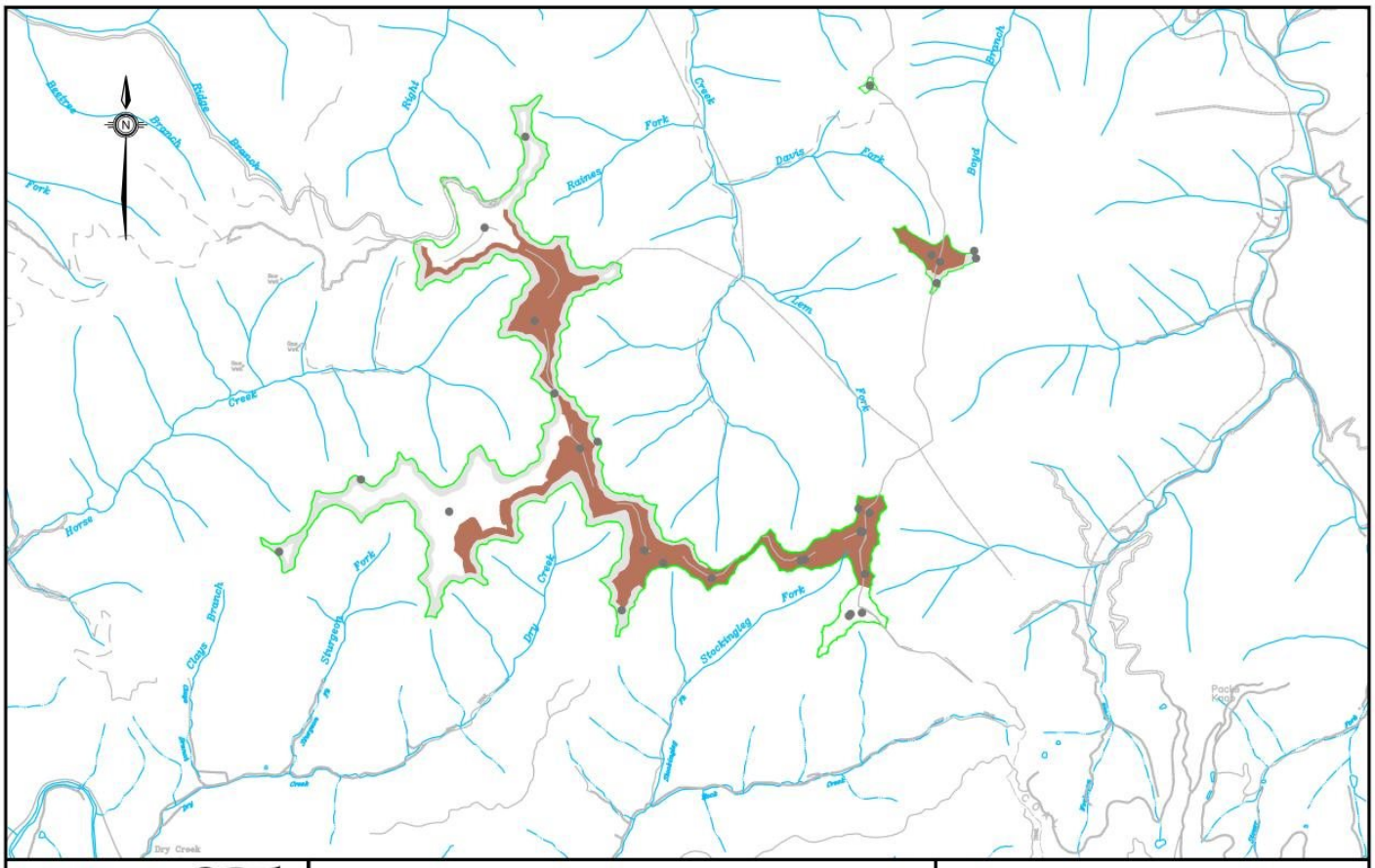
*****Processing assumed to occur at Marfork Plant for Workman Creek tons and Mammoth Plant for Sewell tons.

******Environmental costs assumed to include permiting, outfall maintenance, etc.

APPENDIX

C

MAPS



MARSHALL MILLER & ASSOCIATES

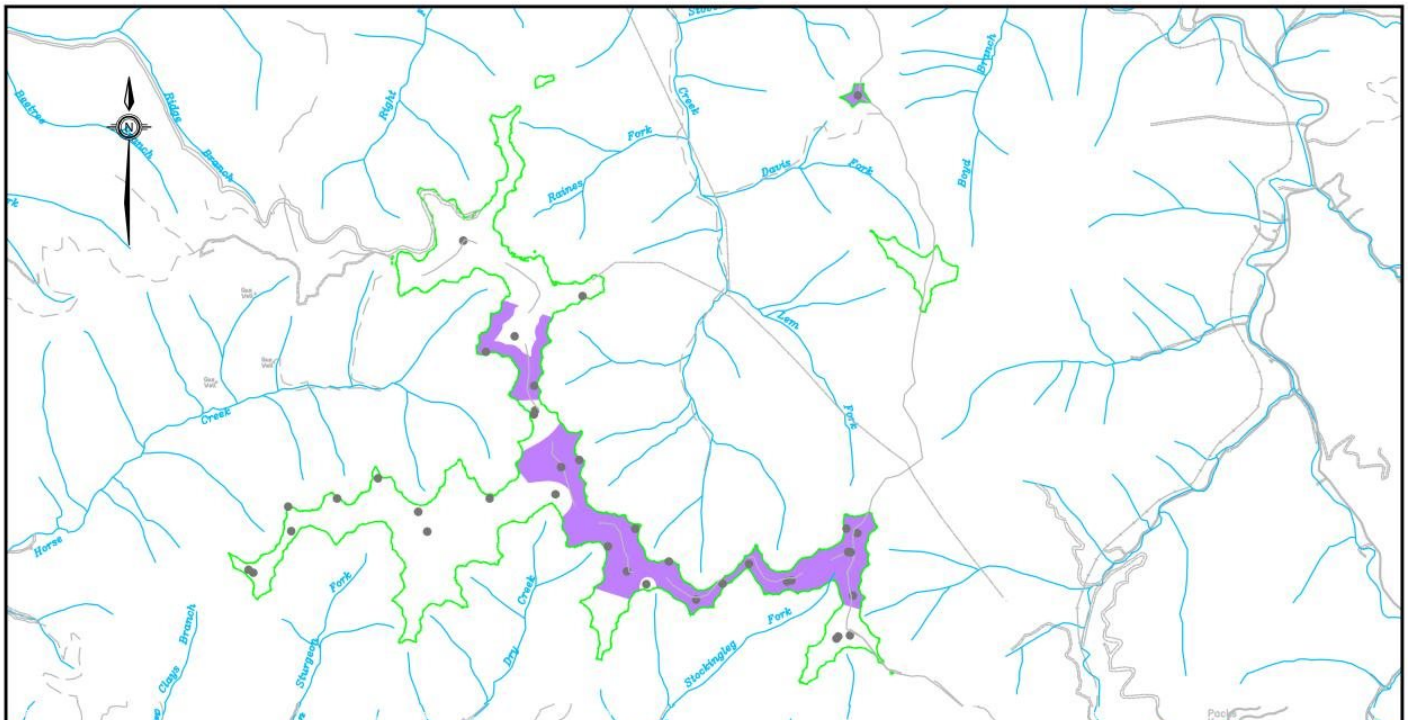
CES129 Bluefield, VA 2/22
MWV–W–LWIN above.dwg ko

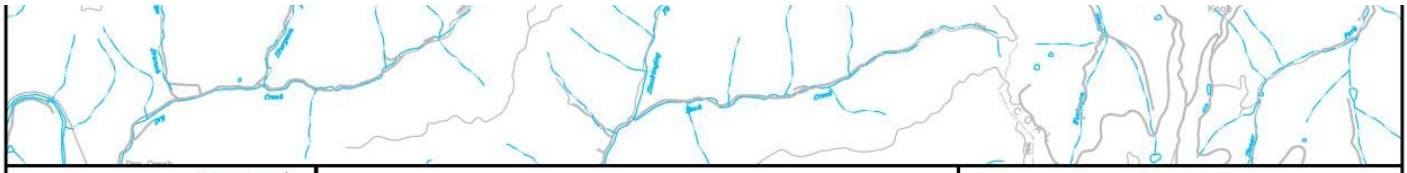
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Resource Exclusive of Reserve

0 4000
Scale In Feet

Map W-2
Mid-West Virginia - Workman
Lower Winifrede and Above

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–W–UCHILA.dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

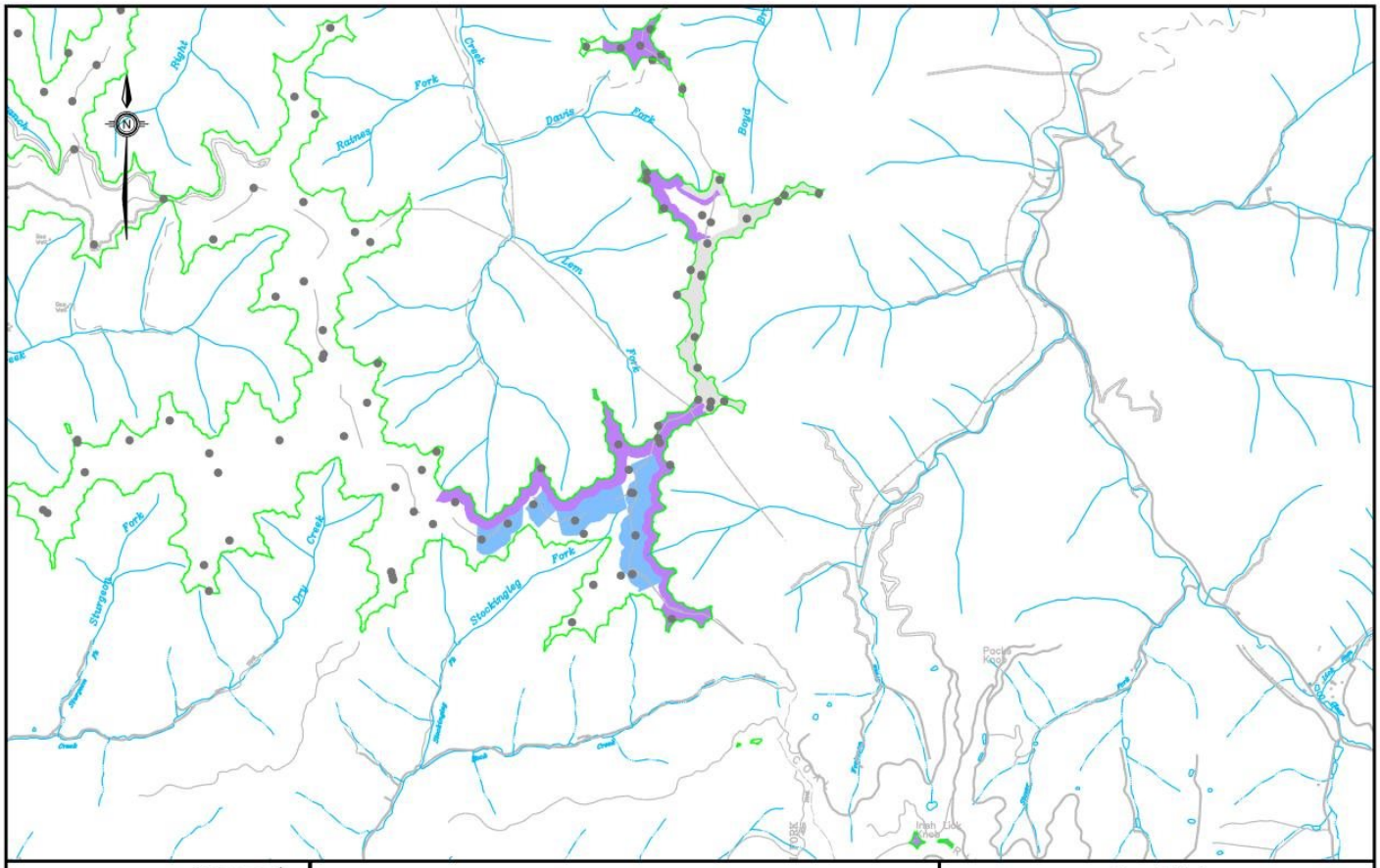
0 4000
Scale In Feet

Map W-3

Mid-West Virginia - Workman
Upper Cilton A

Alpha Metallurgical Resources, LLC

Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
MWV-W-UCHIL-MCHILA.dwg ko

Data Point Location

Previous Surface / Underground Mining

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

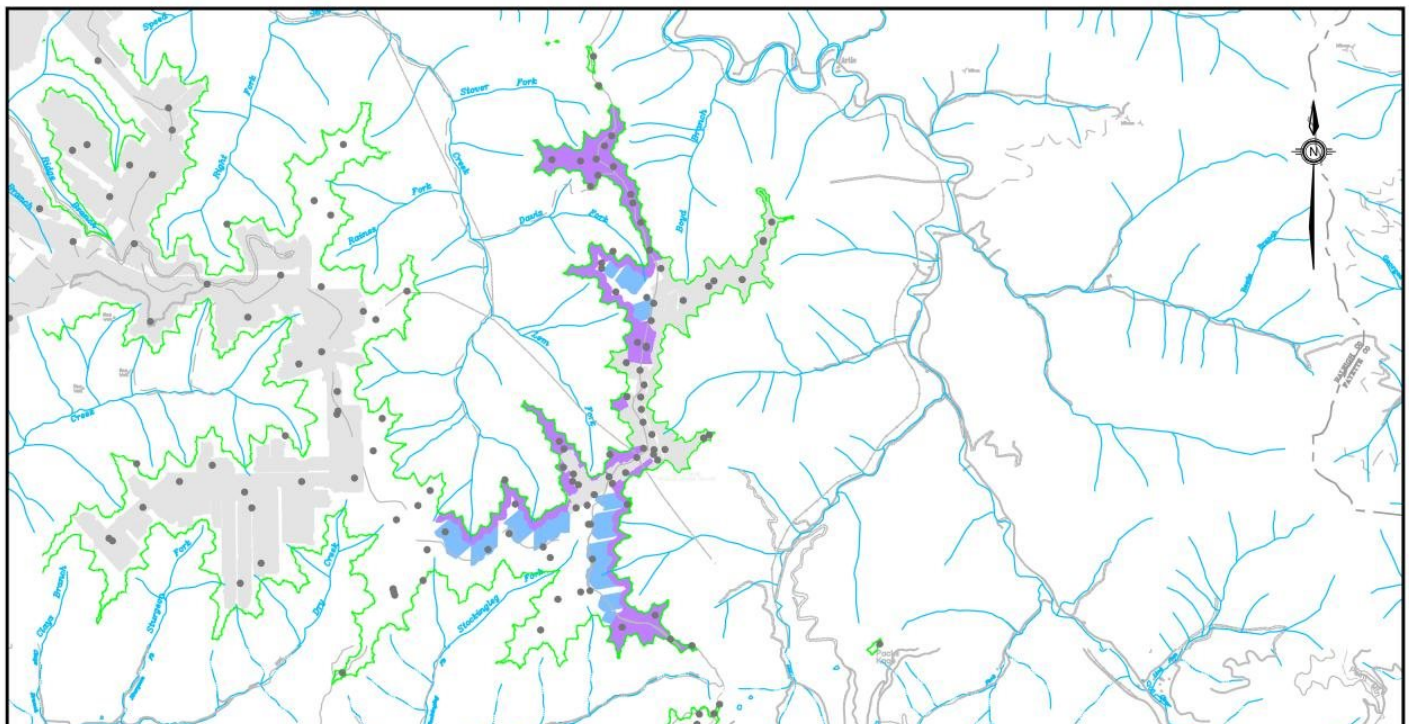
HWM Reserve - Chilton Rider Highwall Miner Not Shown

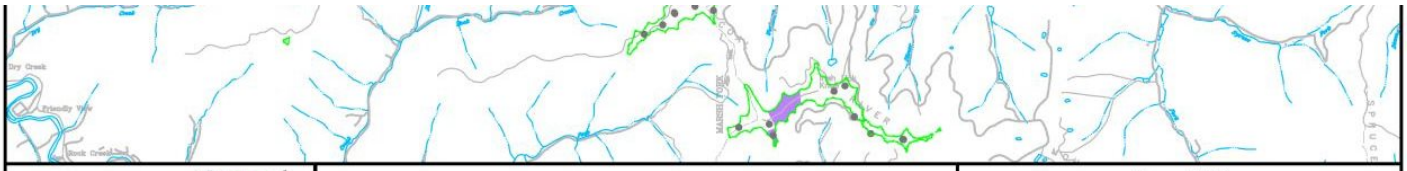
0 4000
Scale In Feet

Map W-4

Mid-West Virginia - Workman
Upper Chilton Through Middle Chilton A

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
MWV–W–MCG–LCHIL.dwg ko

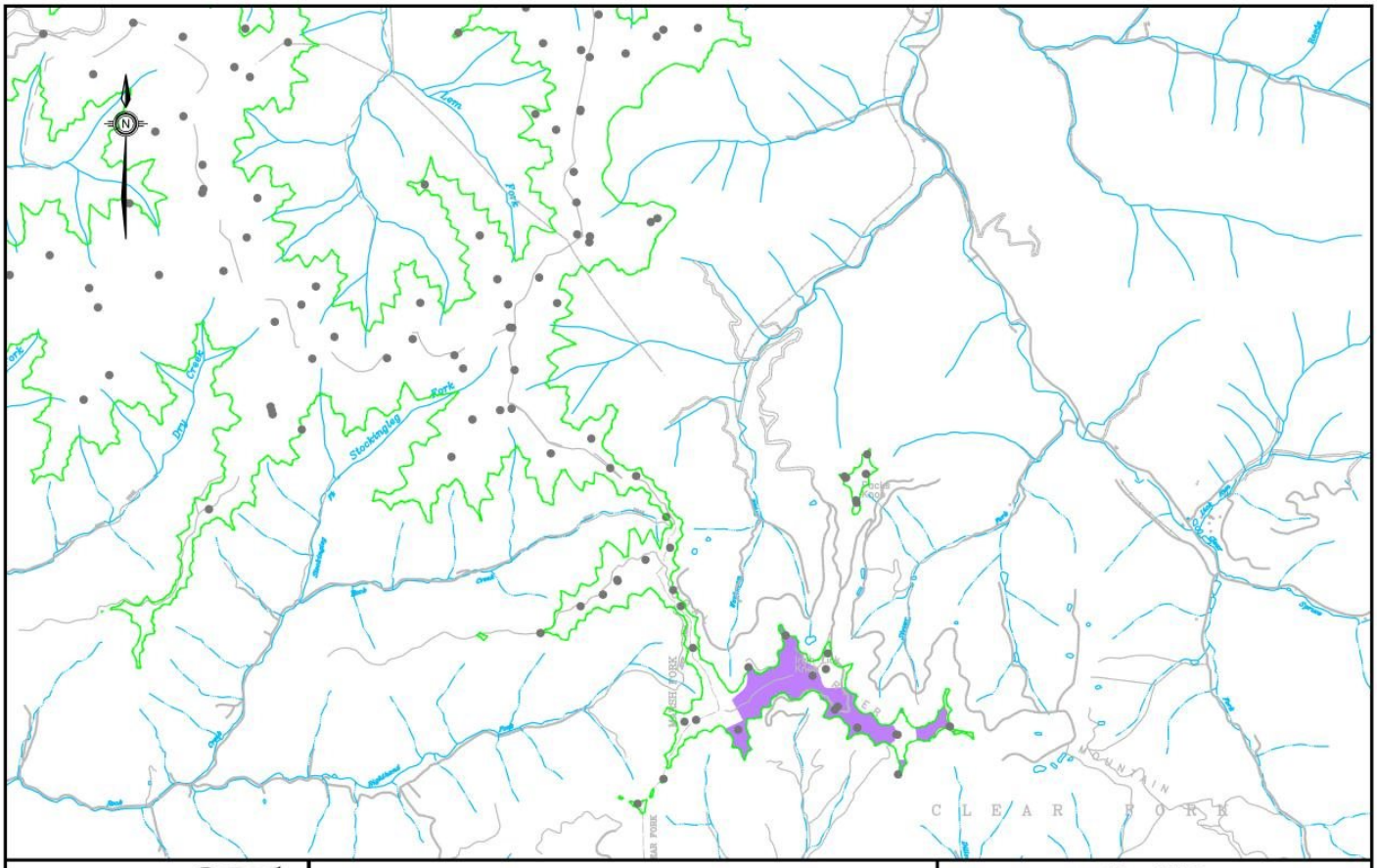
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve - Lower Hernshaw Highwall Miner Not Shown

0 5000
Scale In Feet

Map W-5

Mid-West Virginia - Workman
Middle Cedar Grove Through Lower Chilton

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES®

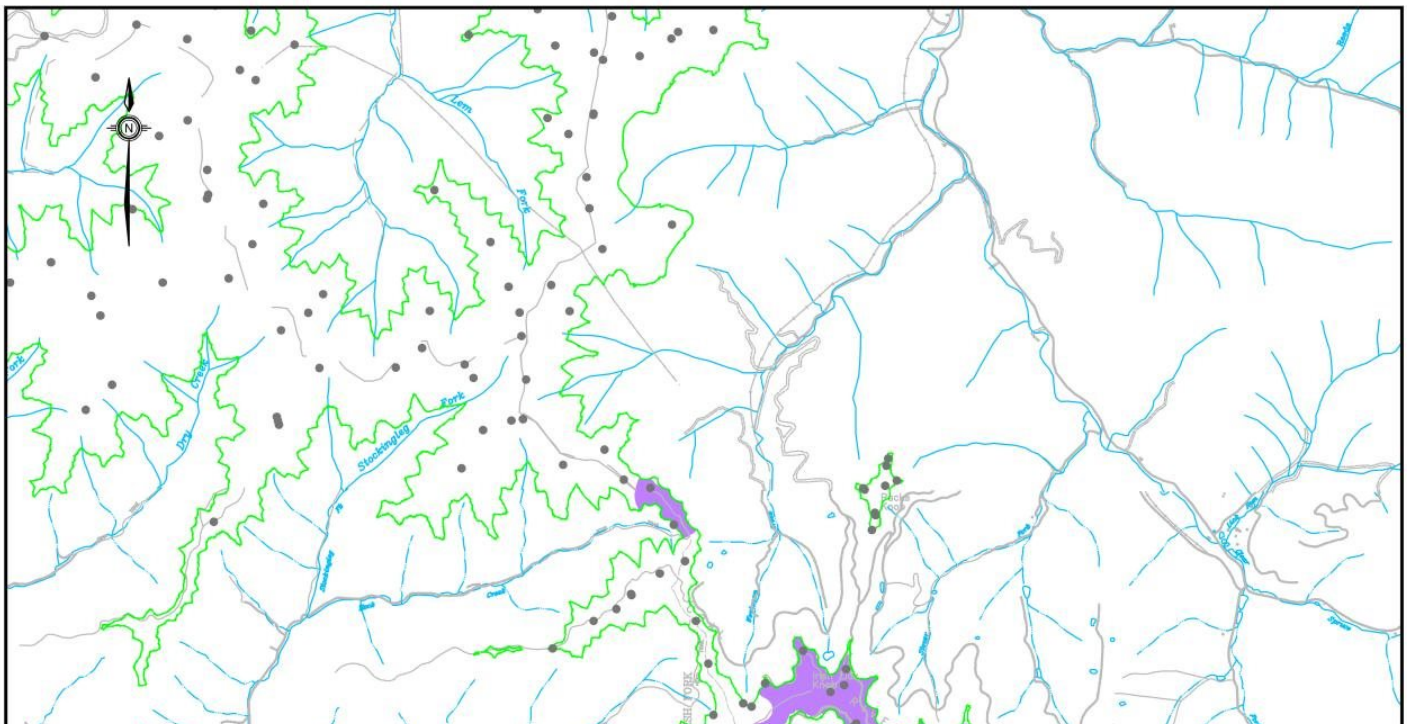
CES129 Bluefield, VA 2/22
MWV-W-PEERUS-LCG.dwg ko

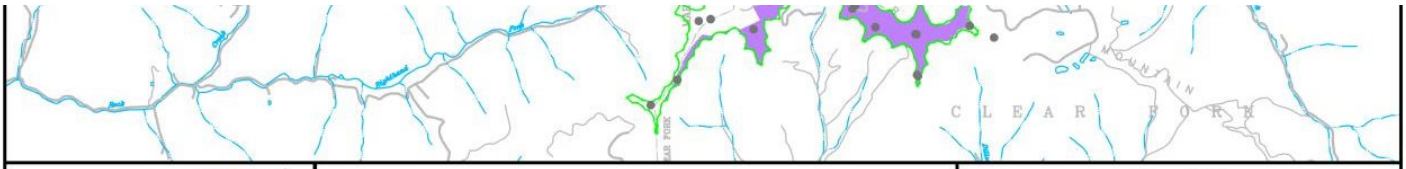
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve

0 4000
Scale In Feet

Map W-6
Mid-West Virginia - Workman
Peerless Upper Split and Lower Cedar Grove

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–W–PEERLS.dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

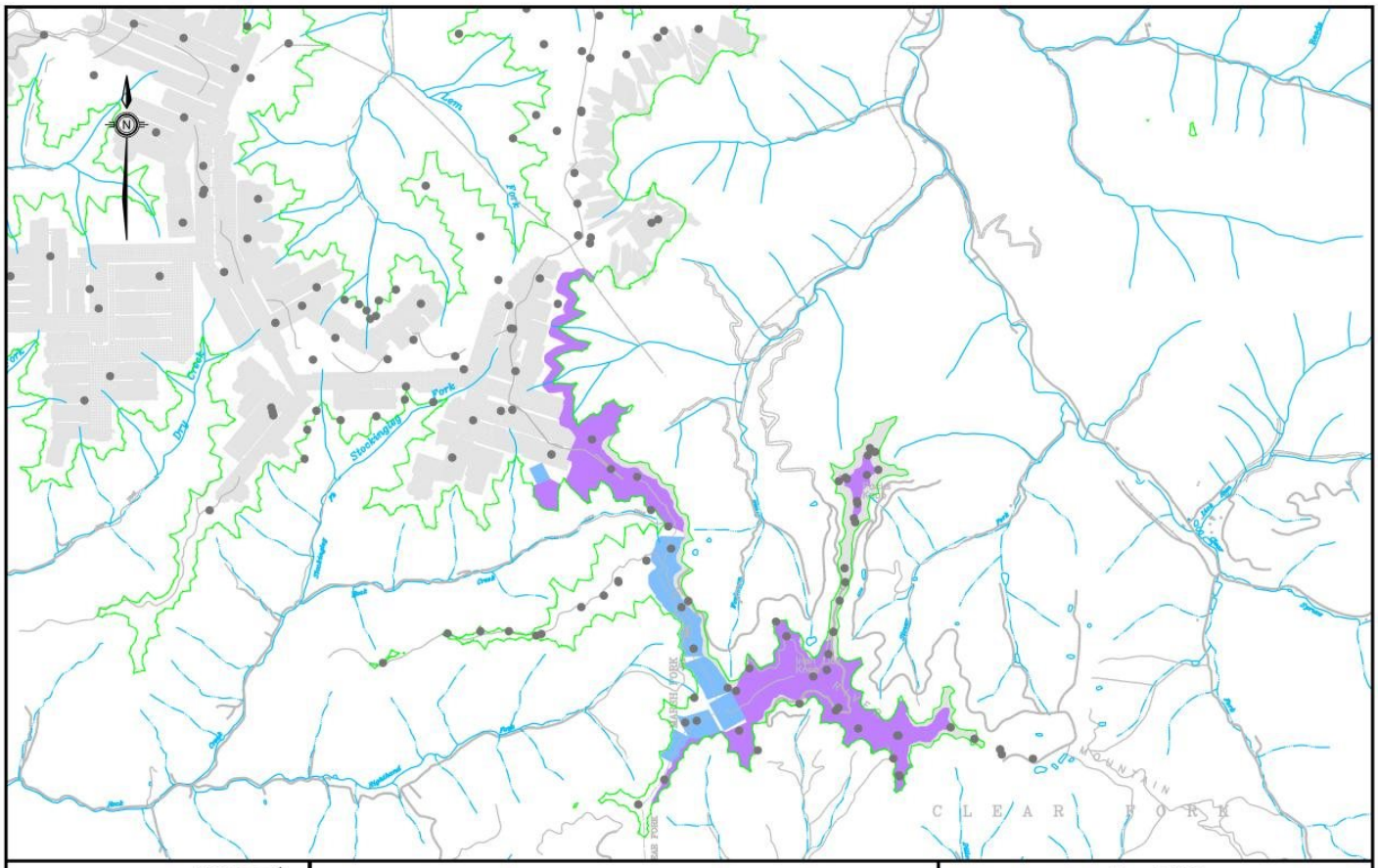
0 4000
Scale In Feet

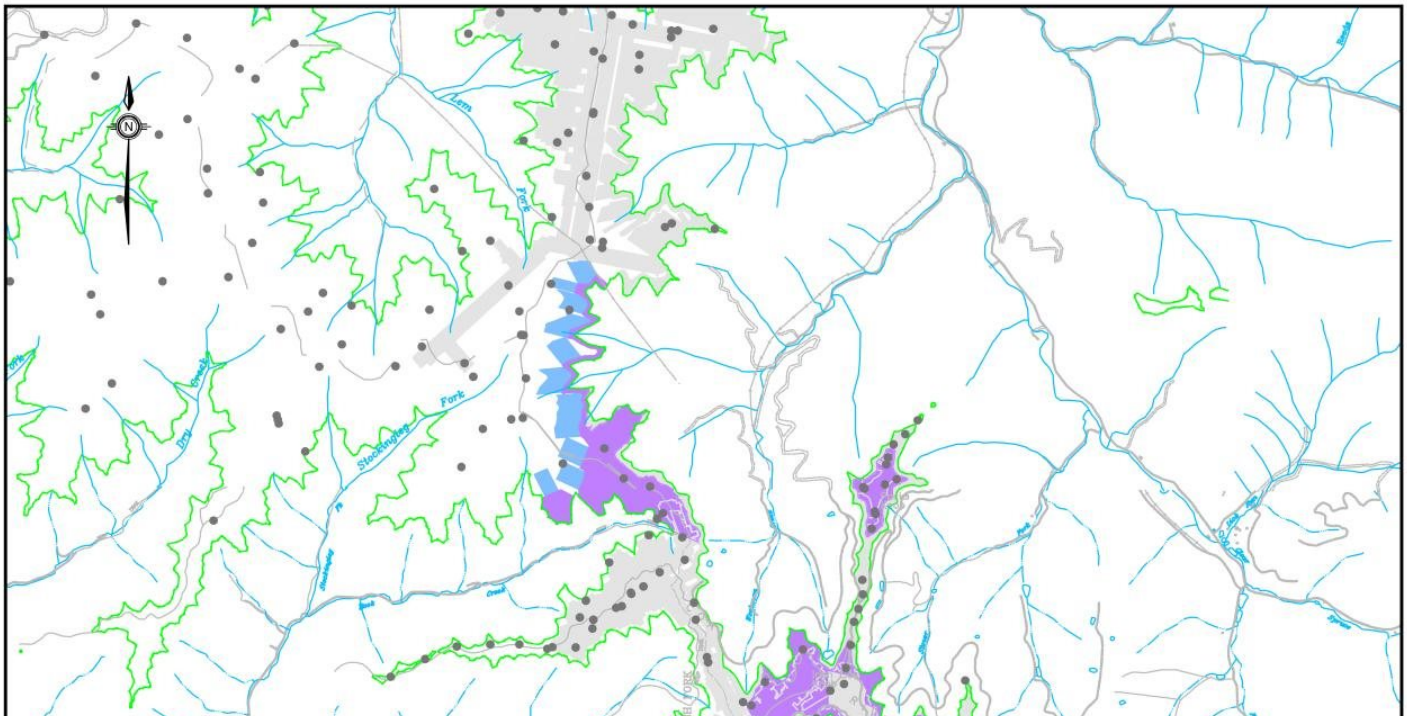
Map W-7
Mid-West Virginia - Workman
Peerless Lower Split

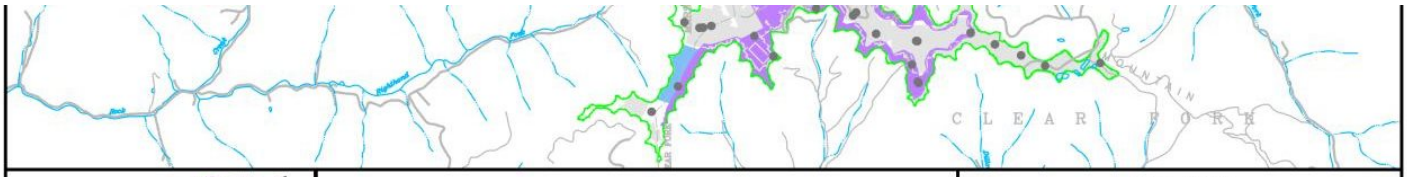
Alpha Metallurgical Resources, LLC

Raleigh County, Virginia

Coordinate System: West Virginia South State Plane NAD 27


Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve
0
4000
Scale In Feet
MARSHALL MILLER & ASSOCIATES
CES129 Bluefield, VA 2/22
MWV-W-L2GAS-PEERC.dwg ko
Map W-8
Mid-West Virginia - Workman
Lower 2 Gas through Peerless C
Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES

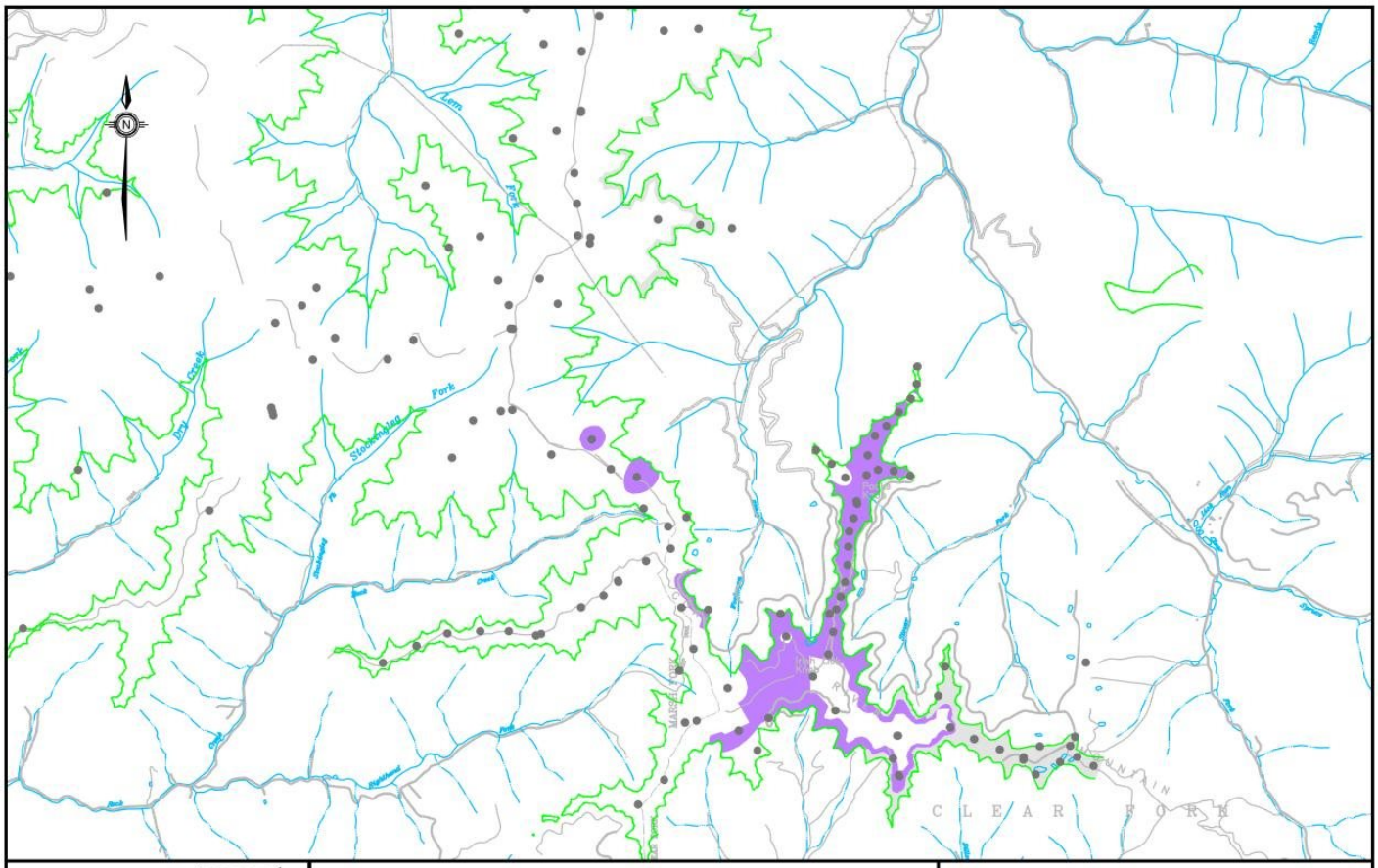
CES129 Bluefield, VA 2/22
MWV–W–K–POW.dwg ko

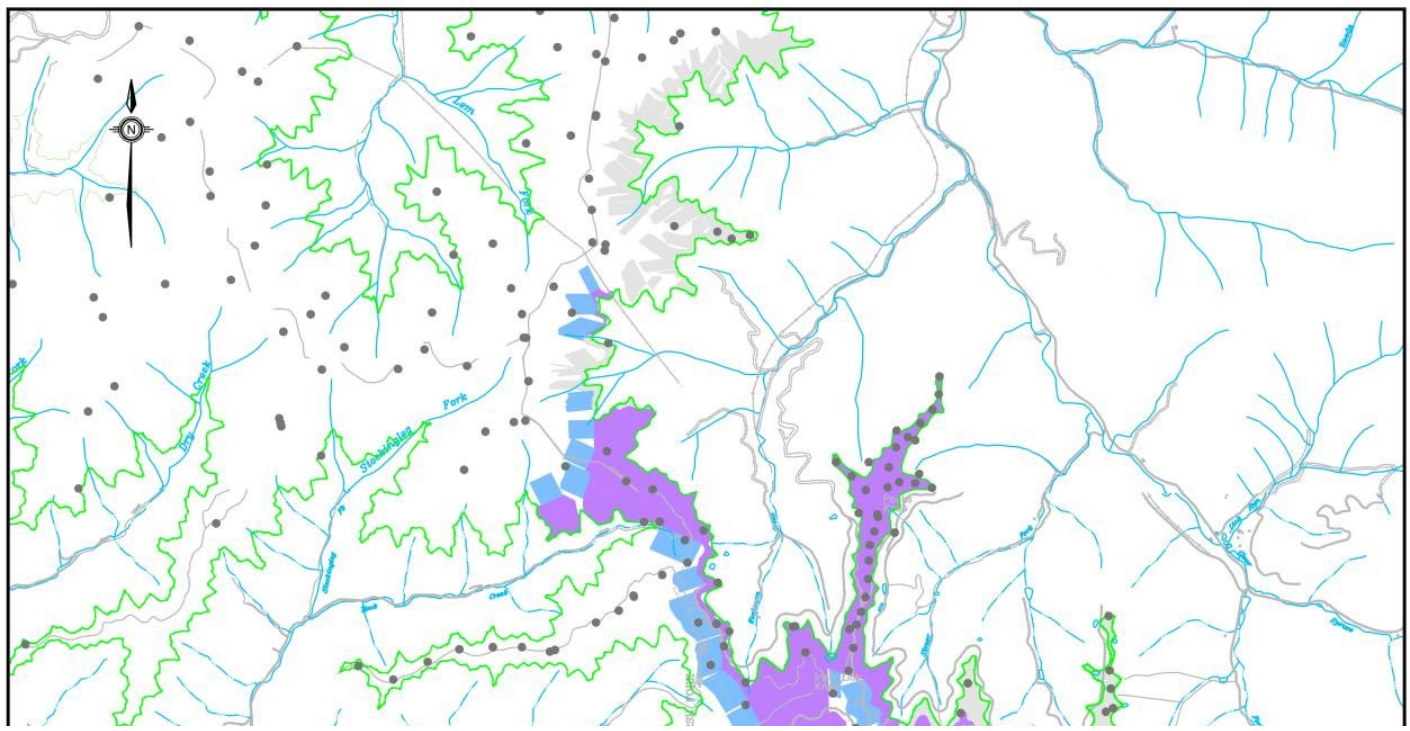
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

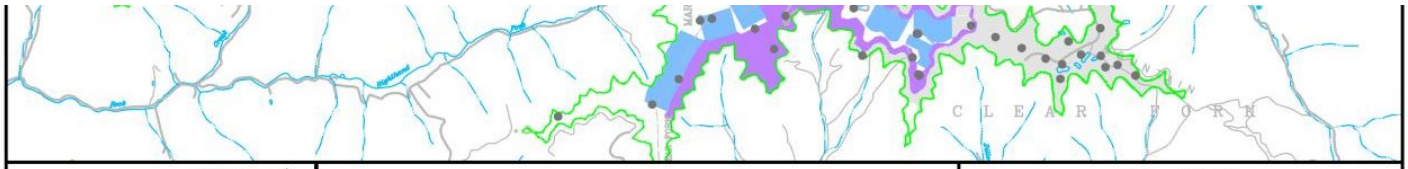
0 4000
Scale In Feet

Map W-9
Mid-West Virginia - Workman Powellton

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27


N
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
0
4000
Scale In Feet
MARSHALL MILLER &ASSOCIATES
CES129 Bluefield, VA 2/22
MWV-W-UEAGR2.dwg ko
Map W-10
Mid-West Virginia - Workman
Upper Eagle Rider 2 and Lower Powellton
Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27


N



MARSHALL MILLER & ASSOCIATES

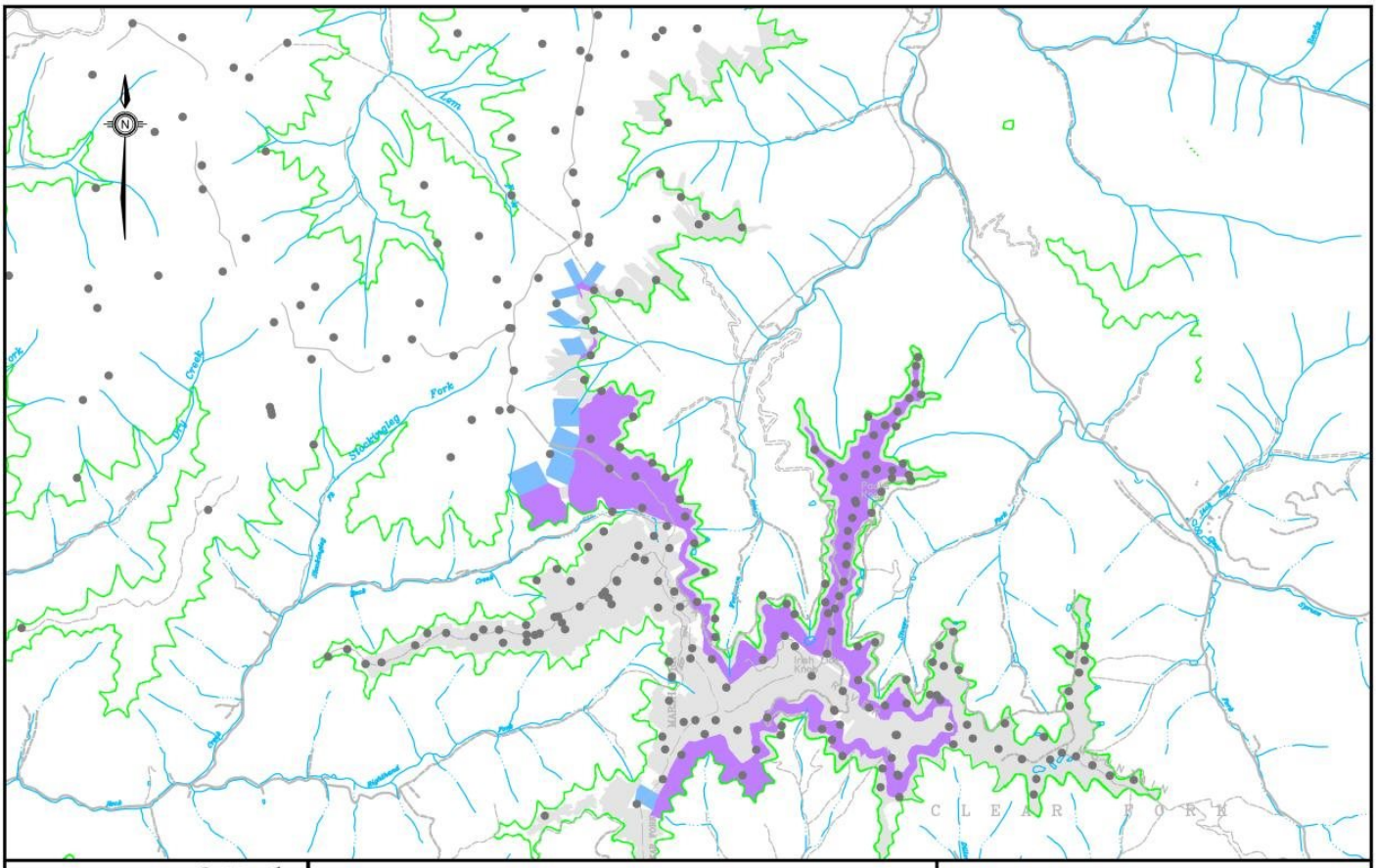
CES129 Bluefield, VA 2/22
MWV–W–K–UEAG.dwg ko

Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

0 4000
Scale In Feet

Map W-11
Mid-West Virginia - Workman
Upper Eagle and Upper Eagle Rider

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES®

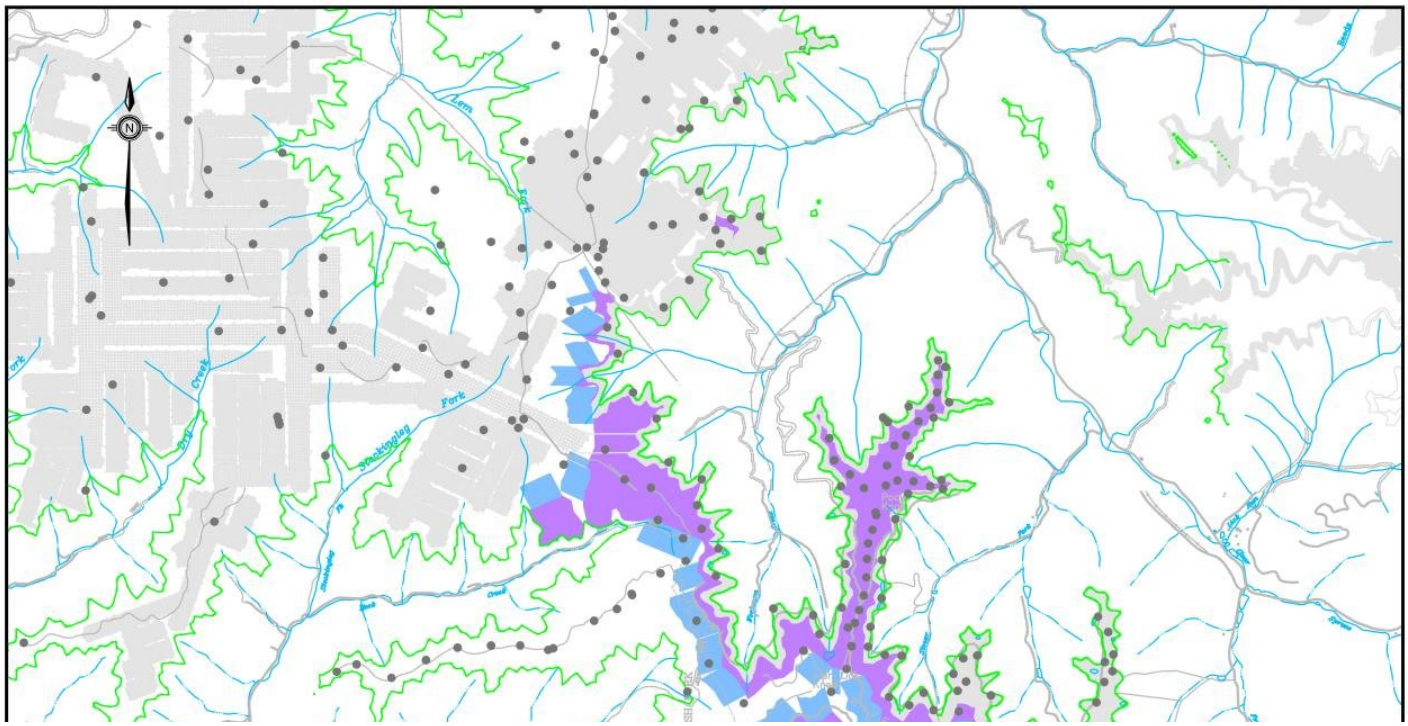
CES129 Bluefield, VA 2/22
MWV–W–EGREGA.dwg ko

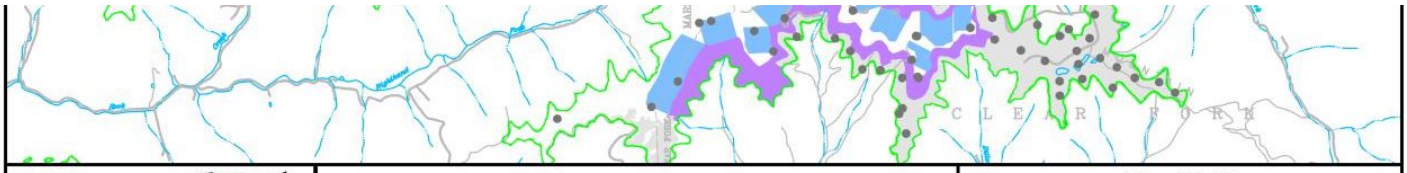
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

0 4000
Scale In Feet

Map W-12
Mid-West Virginia - Workman
Eagle Rider Eagle A

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES

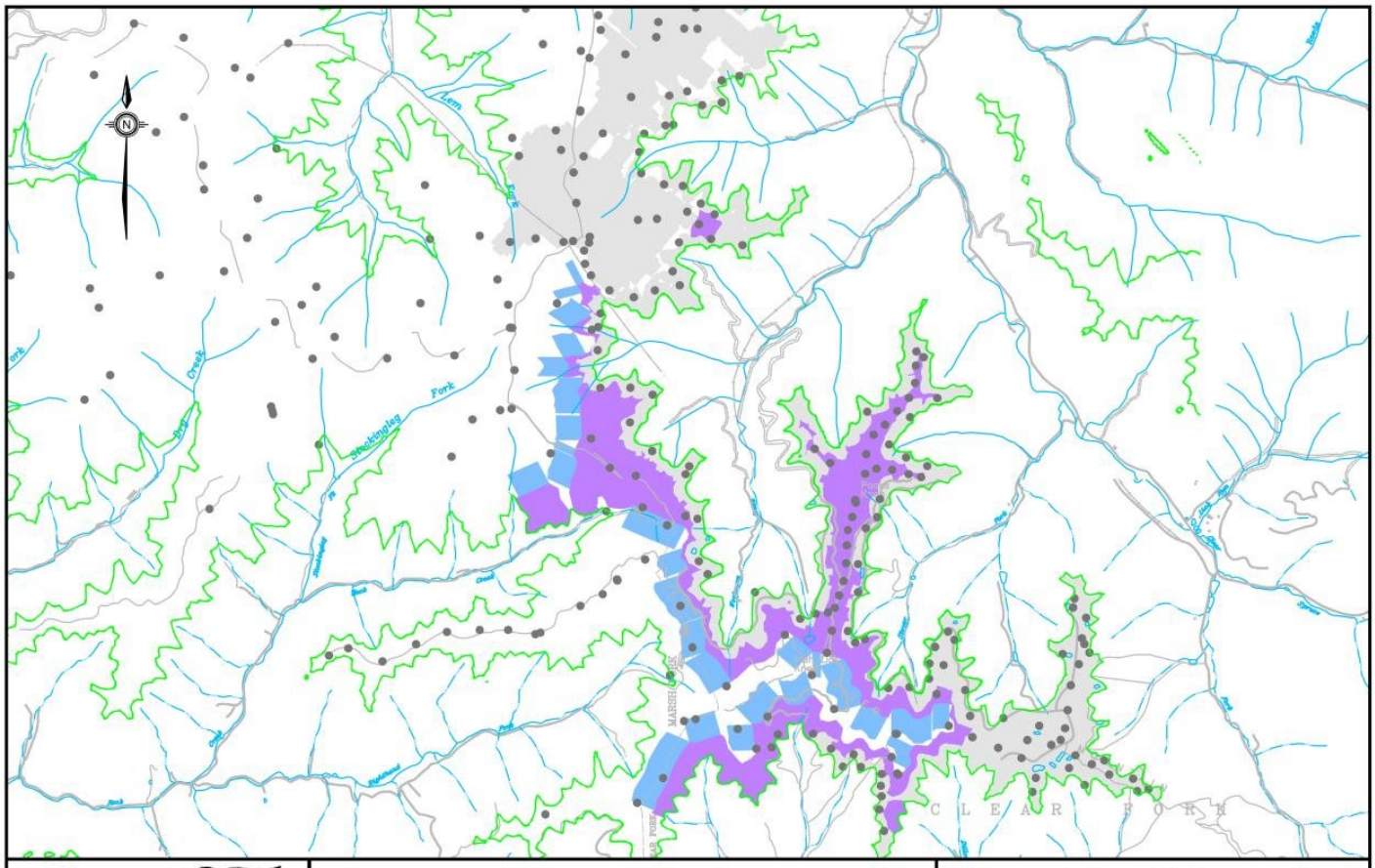
CES129 Bluefield, VA 2/22
MWV-W-EAG.dwg ko

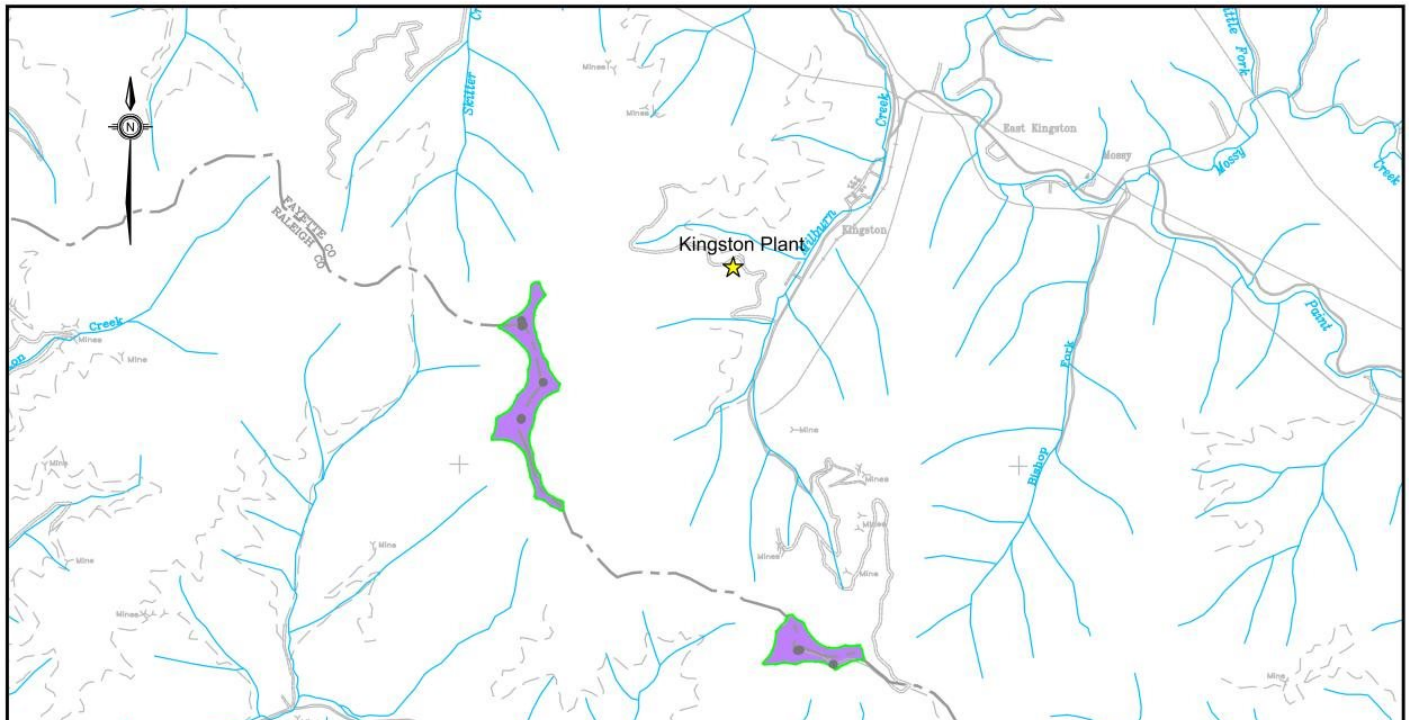
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

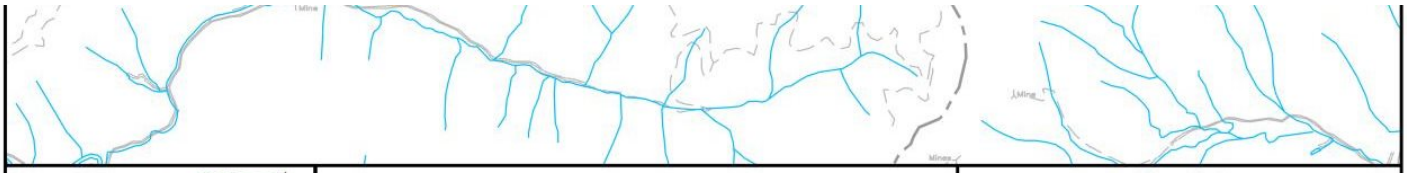
0 4000
Scale In Feet

Map W-13
Mid-West Virginia - Workman Eagle

Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27


N
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve
0
4000
Scale In Feet
MARSHALL MILLER &ASSOCIATES®
CES129 Bluefield, VA 2/22
MWV-W-LITEG.dwg ko
Map W-14
Mid-West Virginia - Workman
Little Eagle
Alpha Metallurgical Resources, LLC
Raleigh County, Virginia
Coordinate System: West Virginia South State Plane NAD 27


N
Kingston Plant
FAYETTE CO
RALEIGH CO
East Kingston
Mossy
Little Fork
Creek
Point
Branch
Bishop
Mine



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–K–CB–STK.dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

0 3000
Scale In Feet

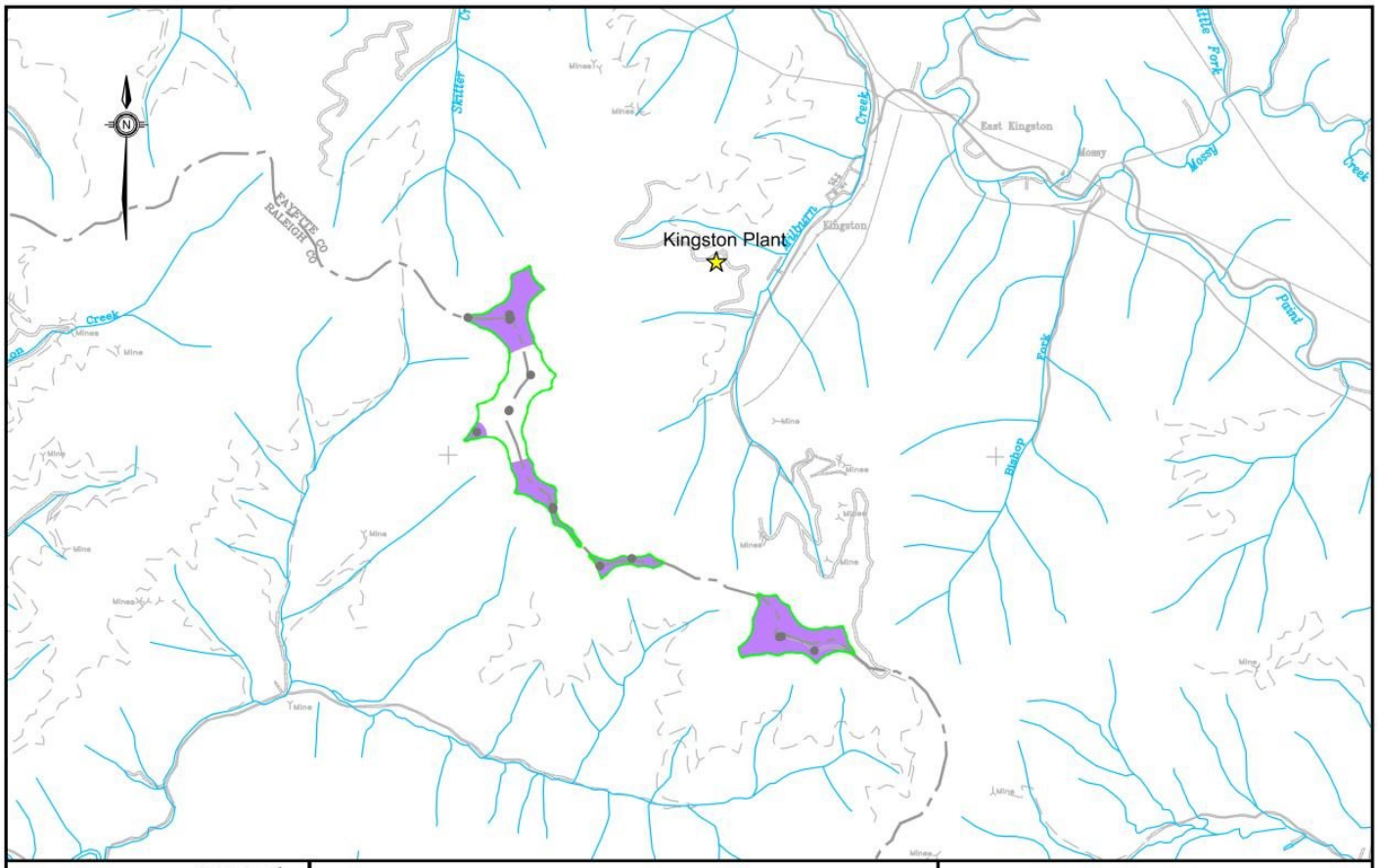
Map K-2

Mid-West Virginia - Kingston
Coalburg and Stockton

Alpha Metallurgical Resources, LLC

Fayette and Raleigh Counties, Virginia

Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–K–UWIN–LCB.dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

0 3000
Scale In Feet

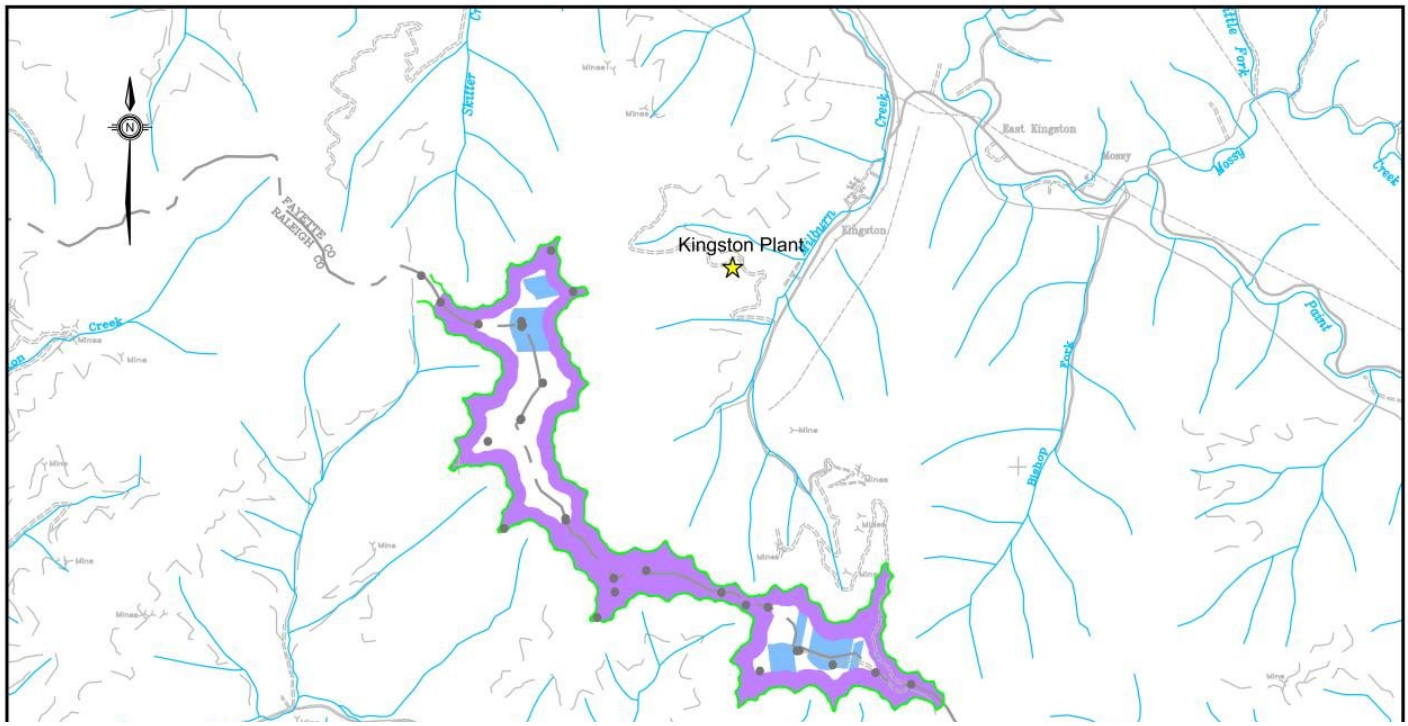
Map K-3

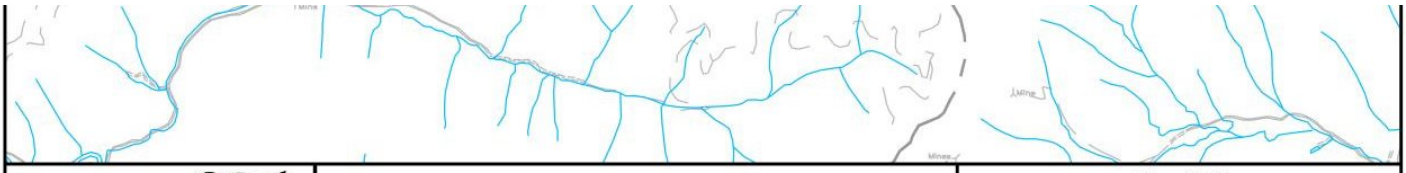
Mid-West Virginia - Kingston
Upper Winifrede Through Lower Coalburg

Alpha Metallurgical Resources, LLC

Fayette and Raleigh Counties, Virginia

Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–K–CHILR–LWIN.dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

HWM Reserve Chilton Rider - Chilton A, Chilton A Lower Split, Chilton A Upper Split and Upper Chilton A Highwall Miner Not Shown

0 3000
Scale In Feet

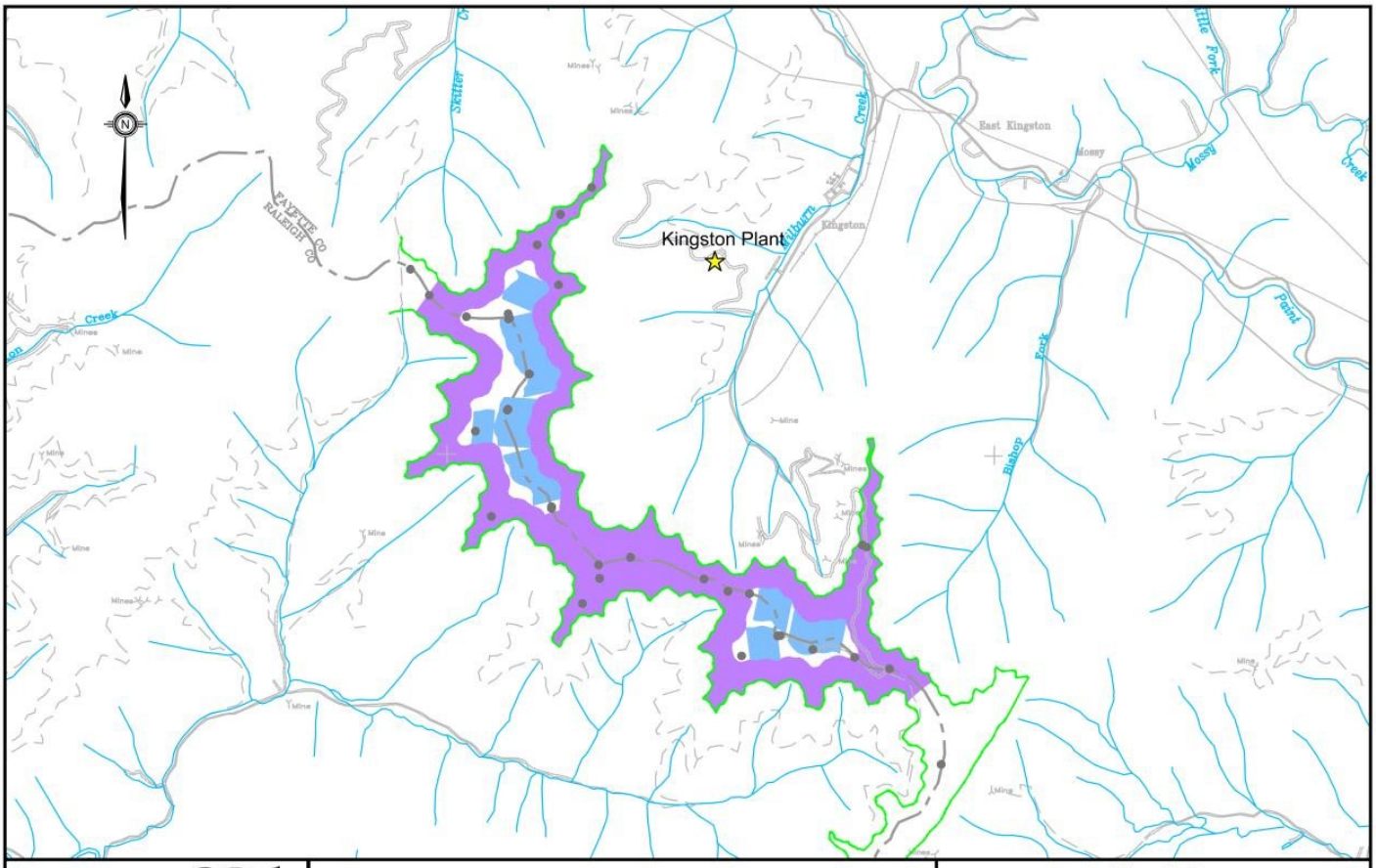
Map K-4

Mid-West Virginia - Kingston
Chilton Rider Through Lower Winifrede

Alpha Metallurgical Resources, LLC

Fayette and Raleigh Counties, Virginia

Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
MWV–K–LHRN–CHIL.dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

HWM Reserve - Upper Hernshaw
Highwall Miner Not Shown

0 3000
Scale In Feet

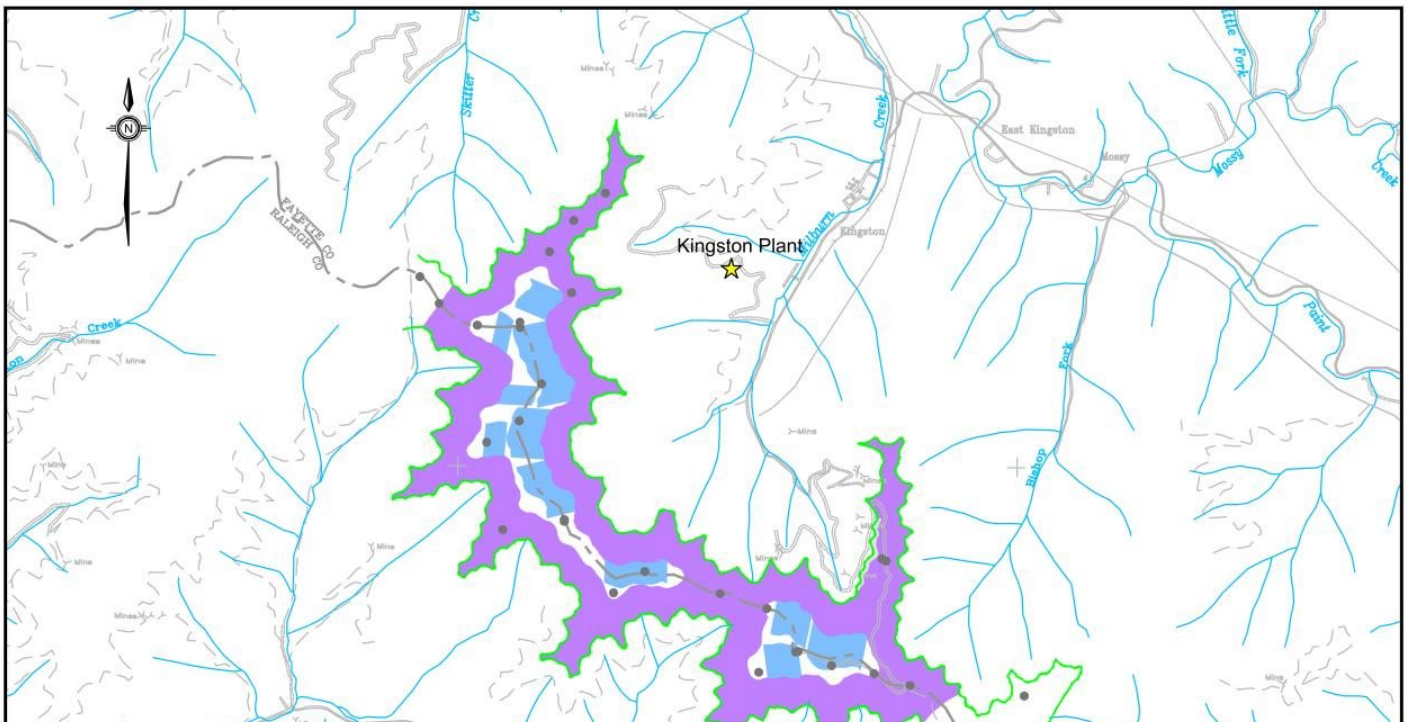
Map K-5

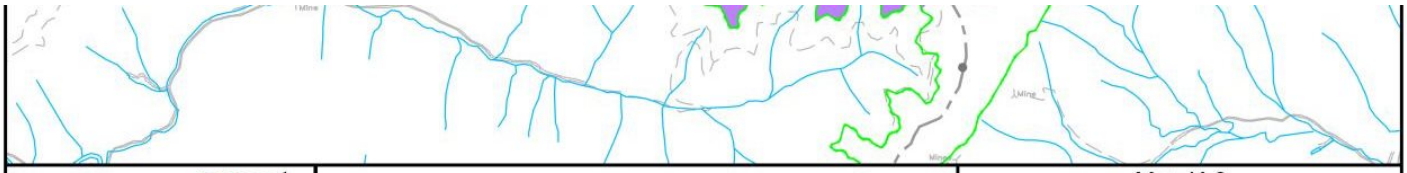
Mid-West Virginia - Kingston
Lower Hernshaw Through Chilton

Alpha Metallurgical Resources, LLC

Fayette and Raleigh Counties, Virginia

Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–K–MCG–UCGUS.dwg ko

Data Point Location

Previous Surface Mining

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

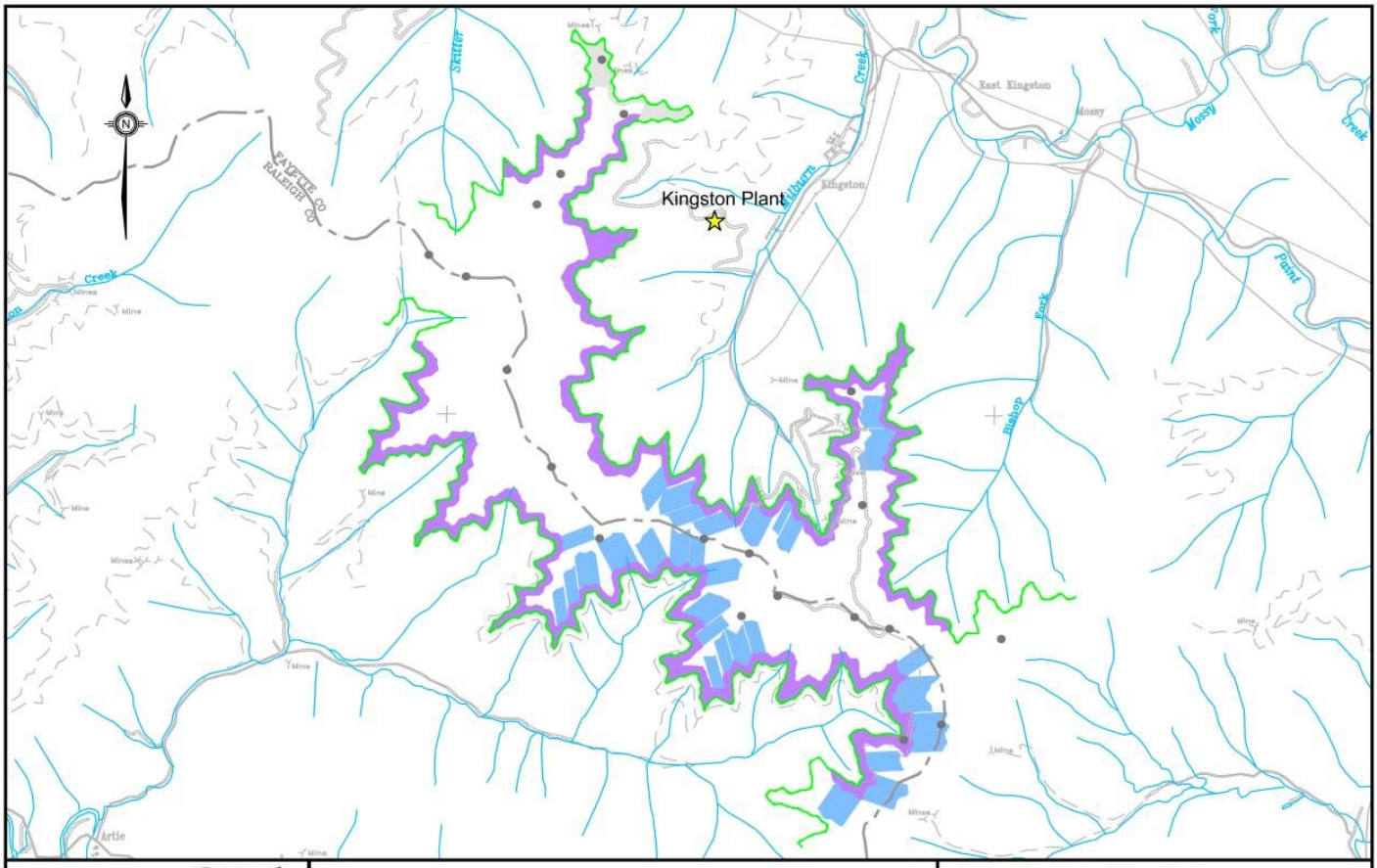
HWM Reserve - Upper Cedar Grove
Upper and Lower Splits Highwall Miner Not Shown

0 3000
Scale In Feet

Map K-6

Mid-West Virginia - Kingston
Middle Cedar Grove and Upper Cedar Grove
Upper and Lower Splits

Alpha Metallurgical Resources, LLC
Fayette and Raleigh Counties, Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV-K-PEERLS-LCGUS.dwg ko

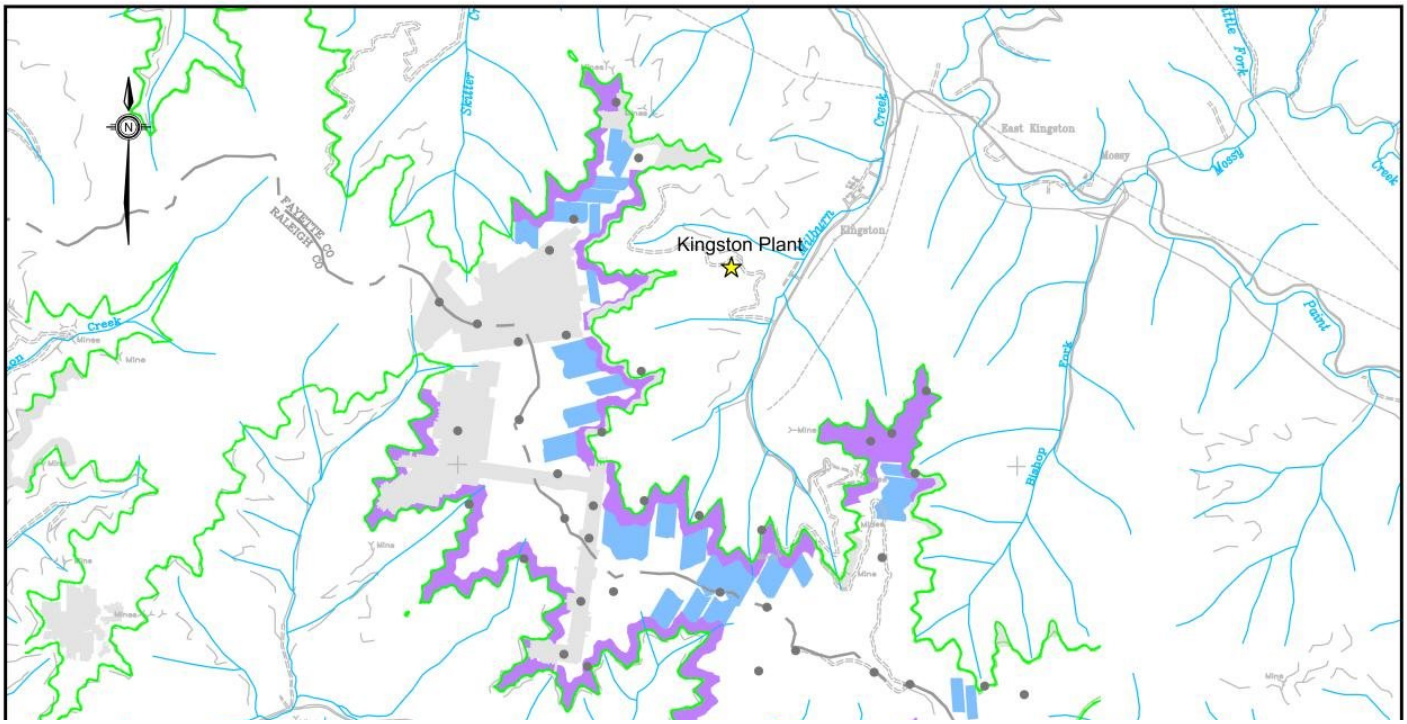
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

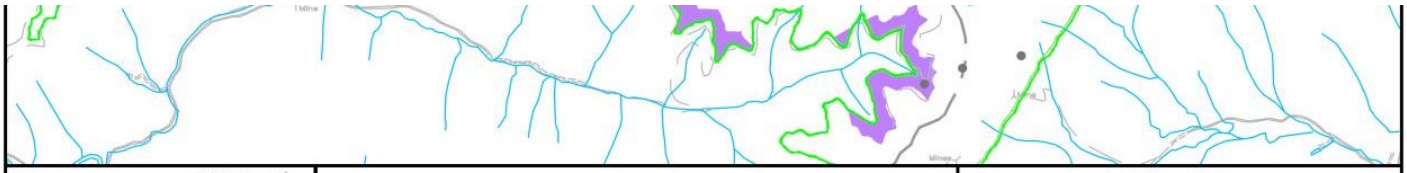
0 3000
Scale In Feet

Map K-7

Mid-West Virginia - Kingston
Peerless Lower and Upper Splits

Alpha Metallurgical Resources, LLC
Fayette and Raleigh Counties, Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–K–L2GAS–U2GAS.dwg ko

Data Point Location

Previous Surface / Underground Mining

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

HWM Reserve

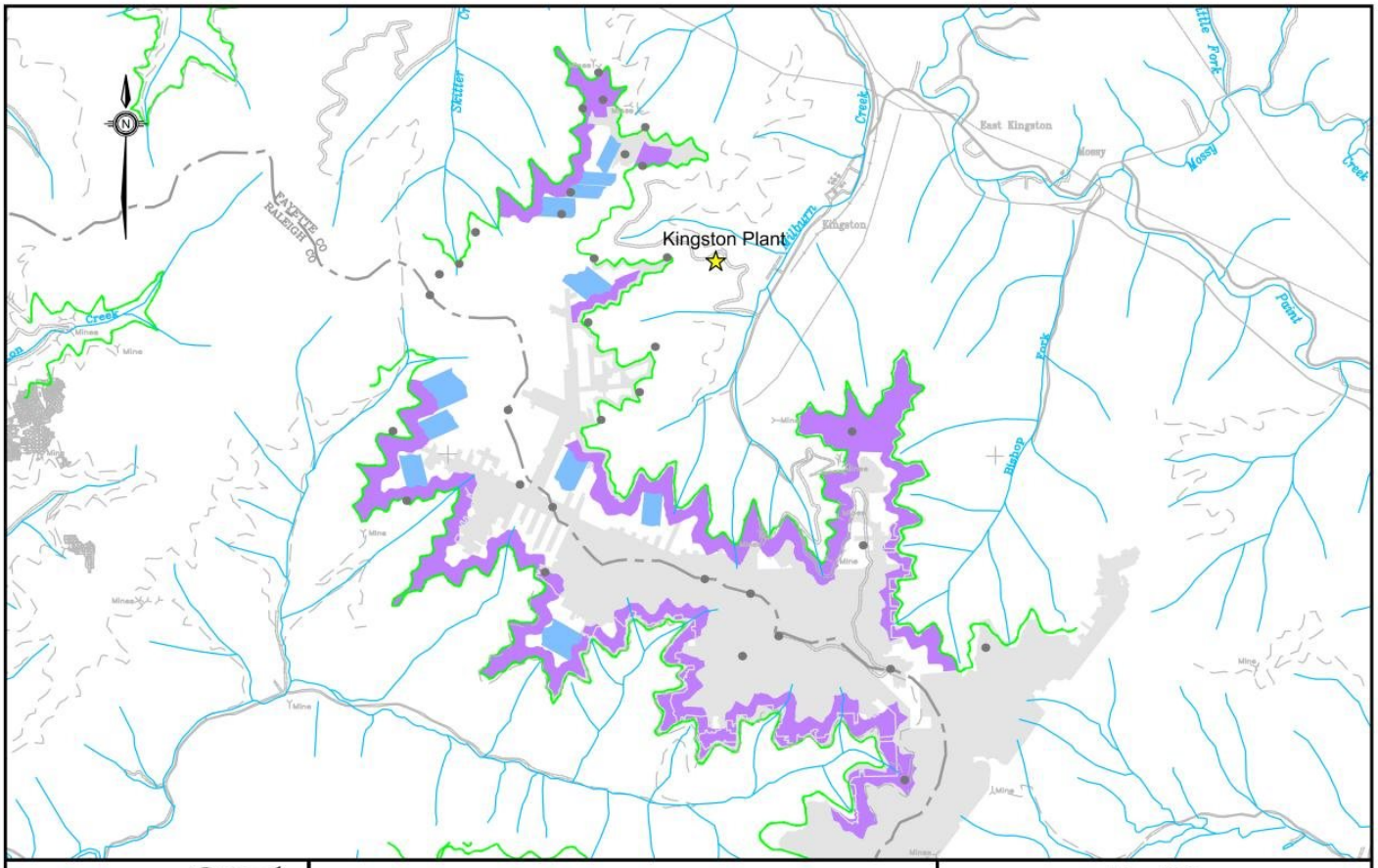
0 3000
Scale In Feet

Map K-8

Mid-West Virginia - Kingston
Lower and Upper 2 Gas

Alpha Metallurgical Resources, LLC

Fayette and Raleigh Counties, Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES

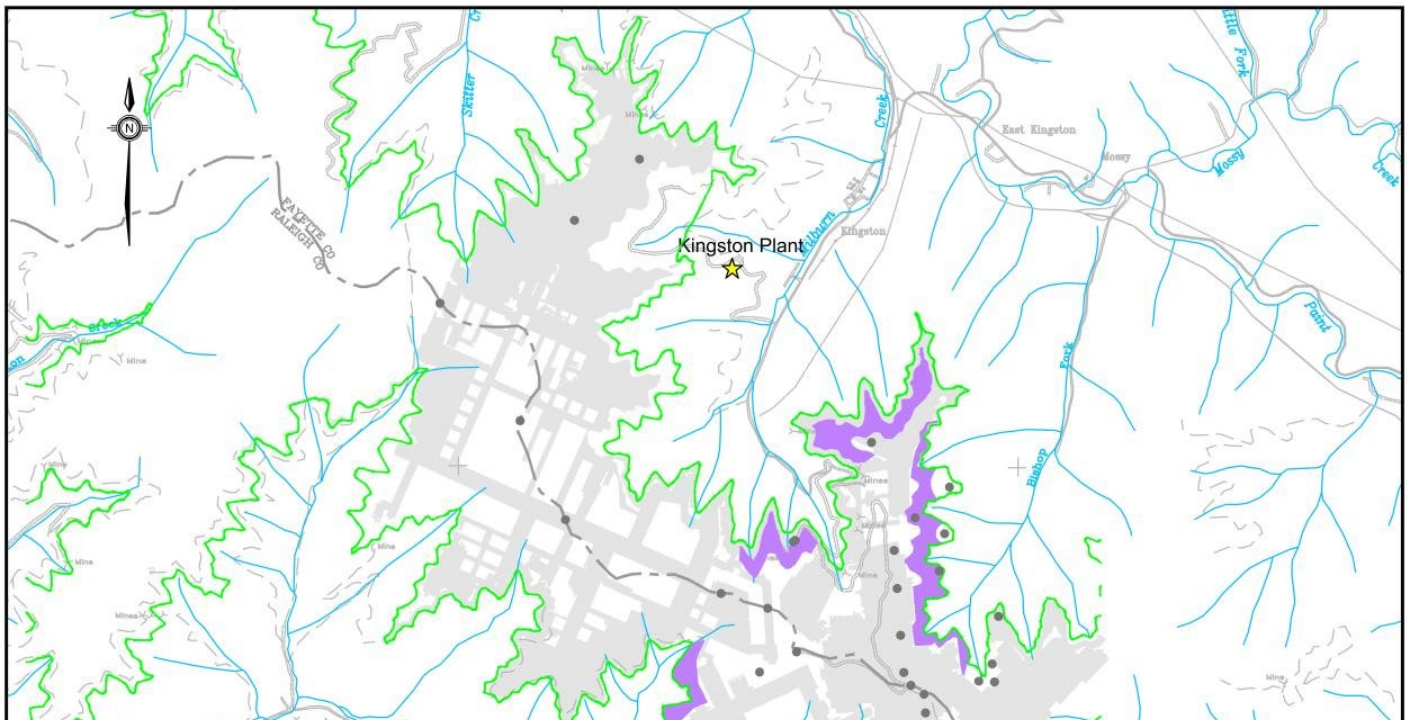
CES129 Bluefield, VA 2/22
MWV–W–K–POW.dwg ko

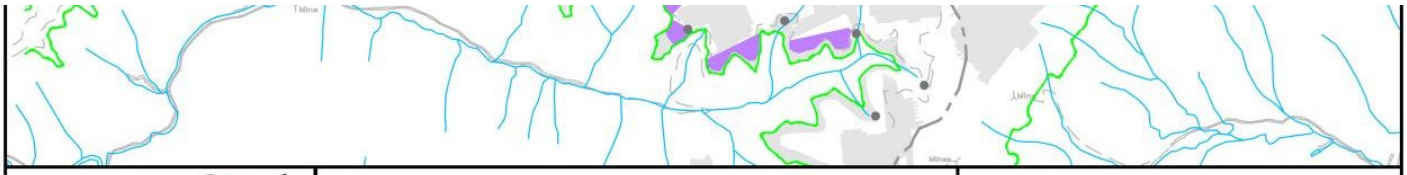
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

0 3000
Scale In Feet

Map K-9
Mid-West Virginia - Kingston
Powellton

Alpha Metallurgical Resources, LLC
Fayette and Raleigh Counties, Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
MWV-W-K-UEAG.dwg ko

Data Point Location

Previous Surface / Underground Mining

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

0 3000
Scale In Feet

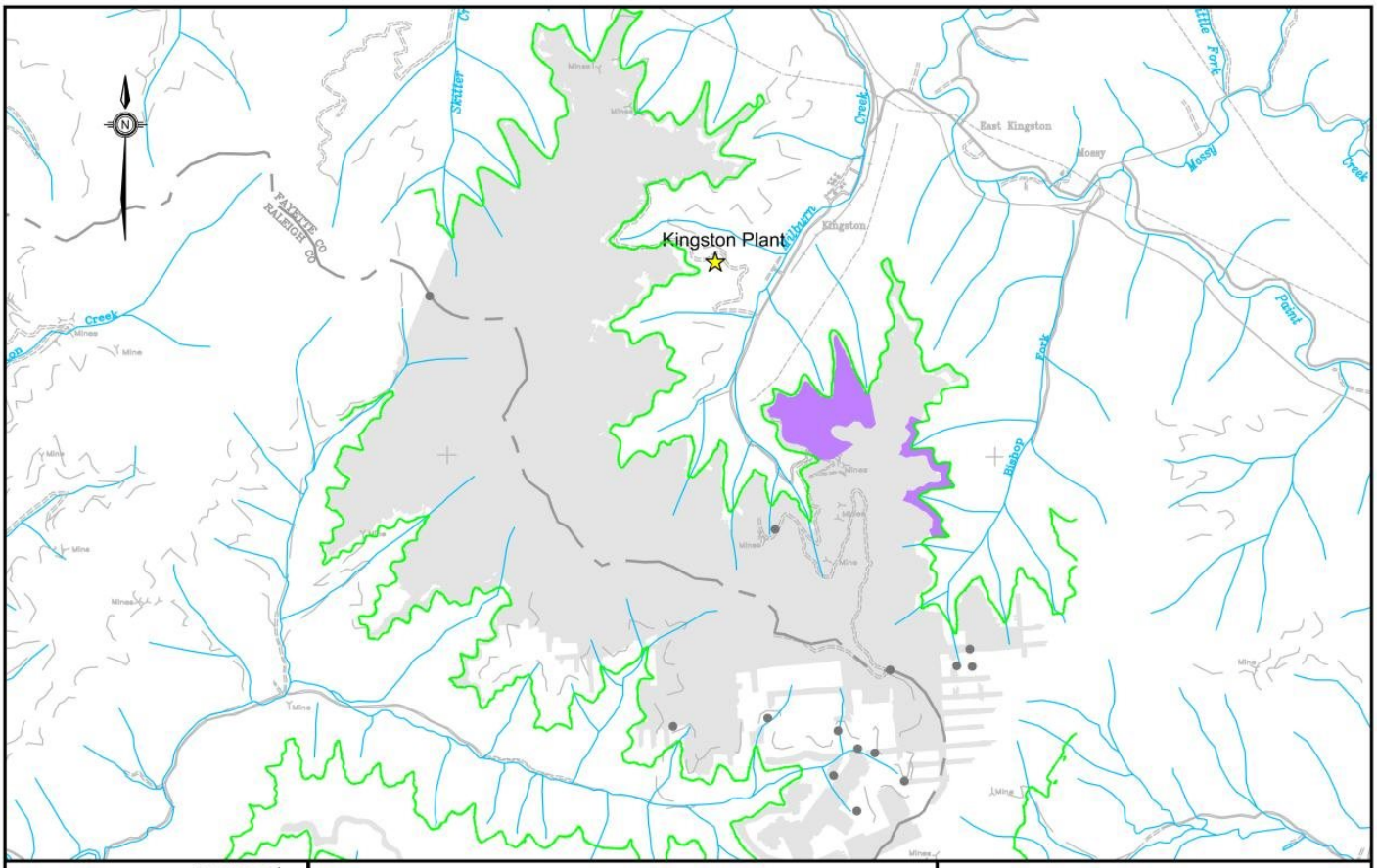
Map K-10

Mid-West Virginia - Kingston
Upper Eagle Through Powellton Lower Split

Alpha Metallurgical Resources, LLC

Fayette and Raleigh Counties, Virginia

Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV-K-EAGLS.dwg ko

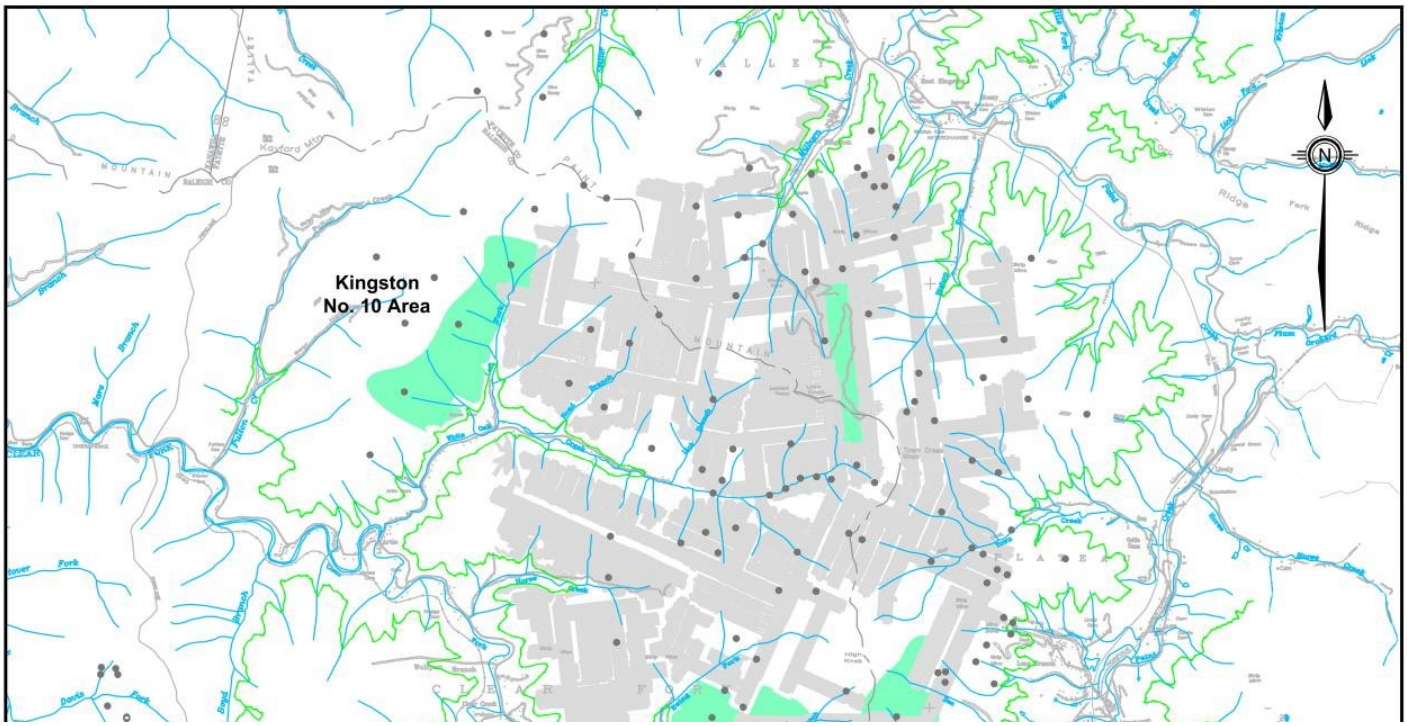
Data Point Location
Previous Surface / Underground Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve

0 3000
Scale In Feet

Map K-11

Mid-West Virginia - Kingston
Eagle Lower Split Through Eagle Rider Eagle A

Alpha Metallurgical Resources, LLC
Fayette and Raleigh Counties, Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
Douglas mh

Data Point Location

Previous Underground Mining

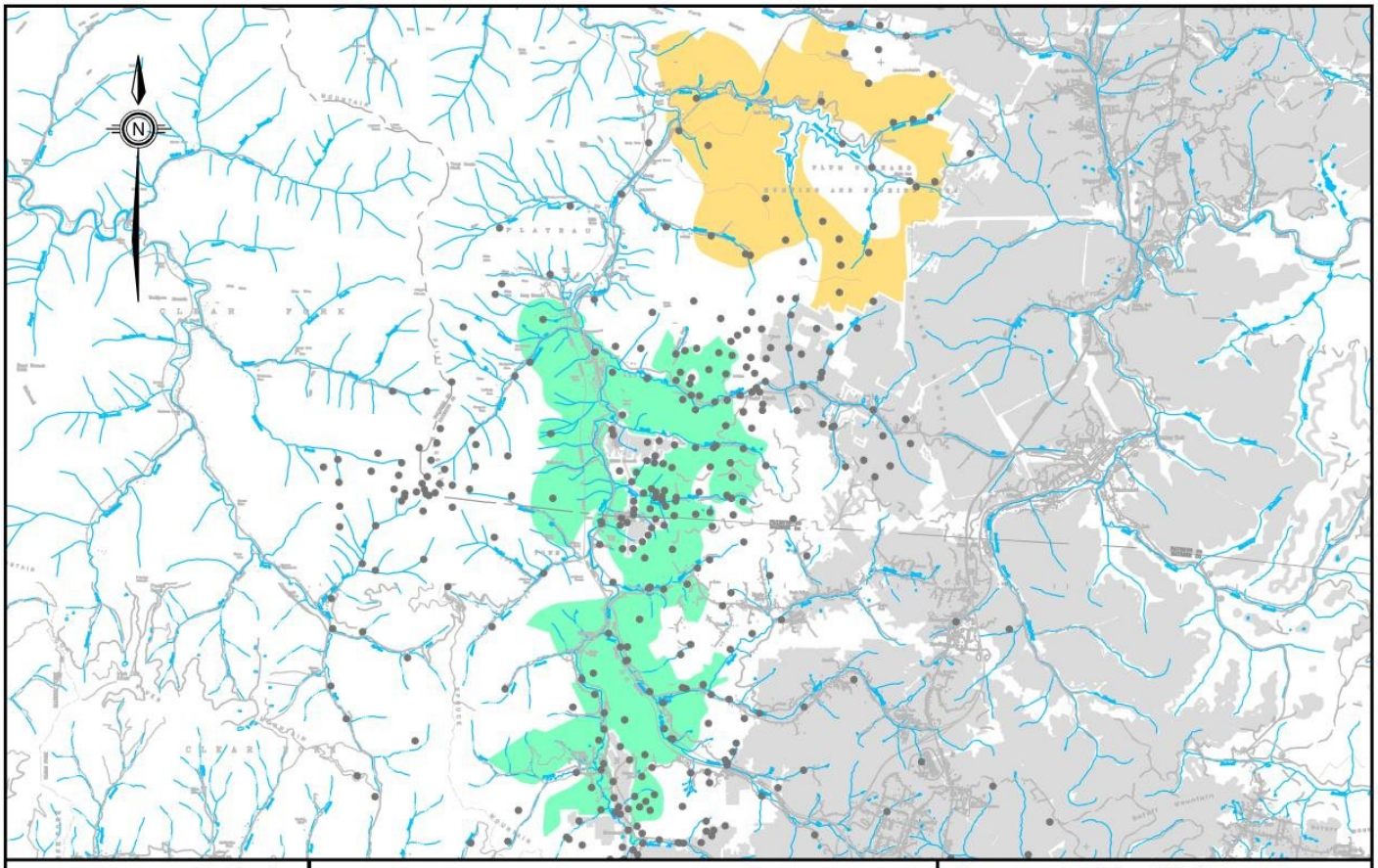
Controlled Underground Reserve / Resource as of 12/31/21

Reserve

0 5000'
Scale In Feet

Map UG-1
MWV Surface
Douglas Seam

Alpha Metallurgical Resource, LLC
Raleigh & Fayette Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWVS–Sewell mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 1.5
Scale In Miles

Map UG-2

MWV Surface
Sewell Seam

Alpha Metallurgical Resource, LLC

Raleigh & Fayette Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27

The statement is based on information provided by Alpha and reviewed by various professionals within **Marshall Miller & Associates, Inc. (*MM&A*)**.

MM&A professionals who contributed to the drafting of this report meet the definition of *Qualified Persons* (*QPs*), consistent with the requirements of the SEC.

The information in this TRS related to coal resources and reserves is based on, and fairly represents, information compiled by the QPs. At the time of reporting, MM&A's QPs have sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity they are undertaking to qualify as a QP as defined by the SEC.

Certain information set forth in this report contains "forward-looking information", including production, productivity, operating costs, capital costs, sales prices, and other assumptions. These statements are not guarantees of future performance and undue reliance should not be placed on them. The assumptions used to develop the forward-looking and the risks that could cause the actual results to differ materially are detailed in the body of this report.

Marshall Miller & Associates, Inc. (*MM&A*) hereby consents (i) to the use of the information contained in this report dated December 31, 2021, relating to estimates of coal resources and coal reserves controlled by Alpha, (ii) to the use of MM&A's name, any quotations from or summarizations of this TRS in Alpha's SEC filings, and (iii) to the filing of this TRS as an exhibit to Alpha's SEC filings.

Qualified Person:	**/s/ Marshall Miller & Associates, Inc.**
Date:	February 15, 2022

Table of Contents

1 **Executive Summary** **1**
1.1 Property Description 1
1.2 Ownership 2
1.3 Geology 2
1.4 Exploration Status 3
1.5 Operations and Development 3
1.6 Mineral Resource 4
1.7 Mineral Reserve 5
1.8 Capital Summary 6
1.9 Operating Costs 6
1.10 Economic Evaluation 8
1.10.1 Discounted Cash Flow Analysis 11
1.10.2 Sensitivity Analysis 11
1.11 Permitting 12
1.12 Conclusion and Recommendations 12
2 **Introduction** **13**
2.1 Registrant and Terms of Reference 13
2.2 Information Sources 13
2.3 Personal Inspections 14
3 **Property Description** **14**
3.1 Location 14
3.2 Titles, Claims or Leases 14
3.3 Mineral Rights 15
3.4 Encumbrances 15
3.5 Other Risks 15
4 **Accessibility, Climate, Local Resources, Infrastructure and Physiography** **15**
4.1 Topography, elevation and Vegetation 15
4.2 Access and Transport 16
4.3 Proximity to Population Centers 16
4.4 Climate and Length of Operating Season 16
4.5 Infrastructure 17
5 **History** **17**

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

5.1 Previous Operation 17
5.2 Previous Exploration 17
6 **Geological Setting, Mineralization and Deposit** **18**
6.1 Regional, Local and Property Geology 18
6.2 Mineralization 18
6.3 Deposits 19
7 **Exploration** **20**

7 **Exploration** **20**
7.1 Nature and Extent of Exploration 20
7.2 Drilling Procedures 22
7.3 Hydrology 23
7.4 Geotechnical Data 23
8 **Sample Preparation Analyses and Security** **23**
8.1 Prior to Sending to the Lab 23
8.2 Lab Procedures 24
9 **Data Verification** **24**
9.1 Procedures of Qualified Person 24
9.2 Limitations 25
9.3 Opinion of Qualified Person 25
10 **Mineral Processing and Metallurgical Testing** **25**
10.1 Testing Procedures 25
10.2 Relationship of Tests to the Whole 26
10.3 Lab Information 26
10.4 Relevant Results 26
11 **Mineral Resource Estimates** **27**
11.1 Assumptions, Parameters and Methodology 27
11.1.1 Geostatistical Analysis 28
11.2 Resources Exclusive of Reserves 32
11.2.1 Initial Economic Assessment 33
11.3 Qualified Person's Estimates 35
11.4 Qualified Person's Opinion 36
12 **Mineral Reserve Estimates** **36**
12.1 Assumptions, Parameters and Methodology 36
12.2 Underground Coal Reserves 38
12.2.1 Laurel Hernshaw (*Map 2*) 38
12.2.2 Coon/Ellis Upper Cedar Grove (UCG) (*Map 3*) 38

12.2.3 Round Bottom/Seng Creek Upper Cedar Grove (UCG) (*Map 3*) 38
12.2.4 Titan Middle Cedar Grove (MCG) (*Map 4*) 38
12.2.5 Low Gap Middle Cedar Grove (MCG) (*Map 4*) 39
12.2.6 Black King Lower Cedar Grove (LCG) (*Map 5*) 39
12.2.7 Berwind Area Lower Cedar Grove Seam (LCG) (*Map 5*) 39
12.2.8 Elk Run Hunter Peerless Seam (*Map 6*) 39
12.2.9 Browns Branch Powellton Seam (*Map 7*) 40
12.2.10 Slip Ridge and Bee Tree Powellton Seam (*Map 7*) 40
12.2.11 Roundbottom Powellton (*Map 7*) 40
12.2.12 Panther Eagle Seam (*Map 8*) 40
12.2.13 Horse Creek and Clear Fork Eagle Seam (*Map 8*) 40
12.2.14 Black Eagle Mine - Eagle Seam (*Map 8*) 41
12.2.15 Dow Fork Eagle Seam (*Map 8*) 41
12.2.16 Glen Alum Tunnel Seam (*Map 9*) 41
12.2.17 Workman Beckley Seam (*Map 10*) 41
12.3 Qualified Person's Estimates 41
12.4 Qualified Person's Opinion 42
13 **Mining Methods 43**
13.1 Geotech and Hydrology 43
13.2 Production Rates 43
13.3 Mining Related Requirements 47
13.3.1 Underground 47
13.4 Required Equipment and Personnel 47
13.4.1 Underground Mines 47
14 **Processing and Recovery Methods 55**
14.1 Description or Flowsheet 55
14.2 Requirements for Energy, Water, Material and Personnel 56
15 **Infrastructure 56**
15.1 Marfork Preparation Plant 56
15.2 Workman's Creek Coal Handling Facility 58
15.3 Underground Conveyor Coal Transport System 59
15.4 Proposed Coal Handling Facility on Clear Fork 60
15.5 Proposed Coal Handling Facility on Browns Branch of West Fork 61
15.6 Proposed Overland Conveyor – Black Eagle Mine to Marfork Preparation Plant 61
16 **Market Studies 62**

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

16.1 Market Description 62
16.2 Price Forecasts 62
16.3 Contract Requirements 63
17 **Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals 63**
17.1 Results of Studies 63
17.2 Requirements and Plans for Waste Disposal 64
17.3 Permit Requirements and Status 64

17.3 Permit Requirements and Status 64
17.4 Local Plans, Negotiations or Agreements 67
17.5 Mine Closure Plans 67
17.6 Qualified Person's Opinion 67
18 **Capital and Operating Costs 67**
18.1 Capital Cost Estimate 67
18.2 Operating Cost Estimate 71
19 **Economic Analysis 73**
19.1 Economic Evaluation 73
19.1.1 Introduction 73
19.1.2 Cash Flow Summary 78
19.1.3 Discounted Cash Flow Analysis 81
19.1.4 Sensitivity Analysis 82
20 **Adjacent Properties 82**
20.1 Information Used 82
21 **Other Relevant Data and Information 83**
22 **Interpretation and Conclusions 83**
22.1 Conclusion 83
22.2 Risk Factors 83
22.2.1 Governing Assumptions 84
22.2.2 Limitations 85
22.2.3 Methodology 85
22.2.4 Development of the Risk Matrix 86
22.2.5 Categorization of Risk Levels and Color Code Convention 88
22.2.6 Description of the Coal Property 88
22.2.7 Summary of Residual Risk Ratings 89
22.2.8 Risk Factors 89
23 **Recommendations 96**

24 **References** **96**

25 **Reliance on Information Provided by Registrant** **96**

FIGURES (IN REPORT)

Figure 1-1: Alpha's MWVUG Property Location Map 2
Figure 1-2: Projected Capital Expenditures – Consolidated MWVUG Operations 6
Figure 1-3: MWVUG Operating Costs 7
Figure 1-4: Sensitivity of NPV 12
Figure 6-1: MWVUG Stratigraphic Column 19
Figure 7-1: MWVUG Cross-Section 21
Figure 11-1: Histogram of the Total Seam Thickness for the Eagle Seam Present in the MWVUG Complex 29
Figure 11-2: Scatter plot of the Total Seam Thickness for the Eagle Seam Present in the MWVUG Complex 29
Figure 11-3: Variogram of the Total Seam Thickness for the Eagle Seam Present in the MWVUG Complex 30
Figure 11-4: Result of DHSA for the Eagle Seam Present in the MWVUG Complex 31
Figure 11-5: Results of Initial Economic Assessment 34
Figure 15-1: Marfork Facilities 57
Figure 15-2: Workman's Creek Coal Handling Facility 58
Figure 15-3: Underground Conveyor Coal Transport System 60
Figure 18-1: Projected Capital Expenditures – Consolidated MWVUG Operations 68
Figure 18-2: MWVUG Operating Costs 73
Figure 19-1: Projection of Sales Tons 74
Figure 19-2: Consolidated Annual Revenue 75
Figure 19-3: Revenue, Cash Costs, and EBITDA 76
Figure 19-4: Annual EBITDA 78
Figure 19-5: Net Cash Flow after Tax (Before Debt Service) 81
Figure 19-6: Sensitivity of NPV 82

TABLES (IN REPORT)

Table 1-1: Coal Resources Summary as of December 31, 2021 4
Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 5
Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 9
Table 1-4: Project Cash Flow Summary (000) 9
Table 11-1: General Reserve & Resource Criteria 28
Table 11-2: DHSA Results Summary for Radius from a Central Point 31
Table 11-3: Results of Initial Economic Assessment ($/ton) 34
Table 11-4: Coal Resources Summary as of December 31, 2021 35
Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 42
Table 13-1: MWV Deep Complex Underground Mine Production Schedule (x 1,000 Saleable Tons) .. 44

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 15-1: Clear Fork Coal Handling Facility 60
Table 15-2: Browns Branch Coal Handling Facility 61
Table 15-3: Black Eagle Coal Handling Facility 62
Table 16-1: Quality Specifications 62
Table 16-2: Price Forecasts 63
Table 17-1: Marfork Refuse Disposal Summary 64
Table 17-2: MWVUG Mining Permits lxvi
Table 18-1: Summary of Capital Expenditures Schedule by Mine 69

Table 18-2: Estimated Coal Production Taxes and Sales Costs 72
Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 77
Table 19-2: Project Cash Flow Summary (000) 78
Table 22-1: Probability Level Table 86
Table 22-2: Consequence Level Table 87
Table 22-3: Risk Matrix 88
Table 22-4: Risk Assessment Matrix 89
Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2) 90
Table 22-6: Environmental (Risks 3 and 4) 91
Table 22-7: Regulatory Requirements (Risk 5) 91
Table 22-8: Market and Transportation (Risk 6) 92
Table 22-9: Market and Transportation (Risk 7) 92
Table 22-10: Methane Management (Risk 8) 93
Table 22-11: Mine Fires (Risk 9) 93
Table 22-12: Ground Control (Risk 10) 94
Table 22-13: Availability of Supplies and Equipment (Risk 11) 94
Table 22-14: Labor – Work Stoppage (Risk 12) 95
Table 22-15: Labor – Retirement (Risk 13) 95
Table 22-16: Health and Safety (Risk 14) 95
Table 25-1: Information from Registrant Relied Upon by MM&A 97

Appendices

A .....Summary Tables
B ..... Initial Economic Assessment Resources Exclusive of Reserves (per Ton)
C .....Maps

1 Executive Summary

1.1 Property Description

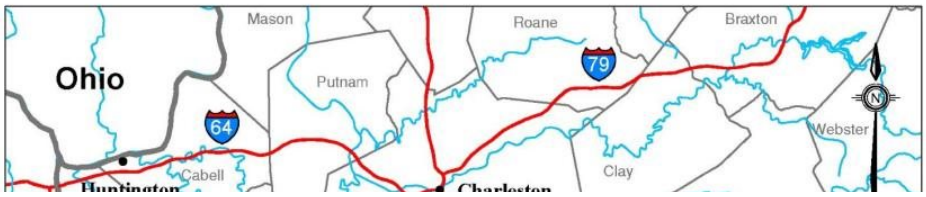
Alpha Metallurgical Resources, Inc. (*Alpha*) authorized **Marshall Miller & Associates, Inc. (*MM&A*)** to prepare this Technical Report Summary (*TRS*) of its controlled coal reserves located at the **Mid-West Virginia Underground Complex (*MWVUG*)** in Raleigh, Boone, Fayette and Kanawha Counties, West Virginia.

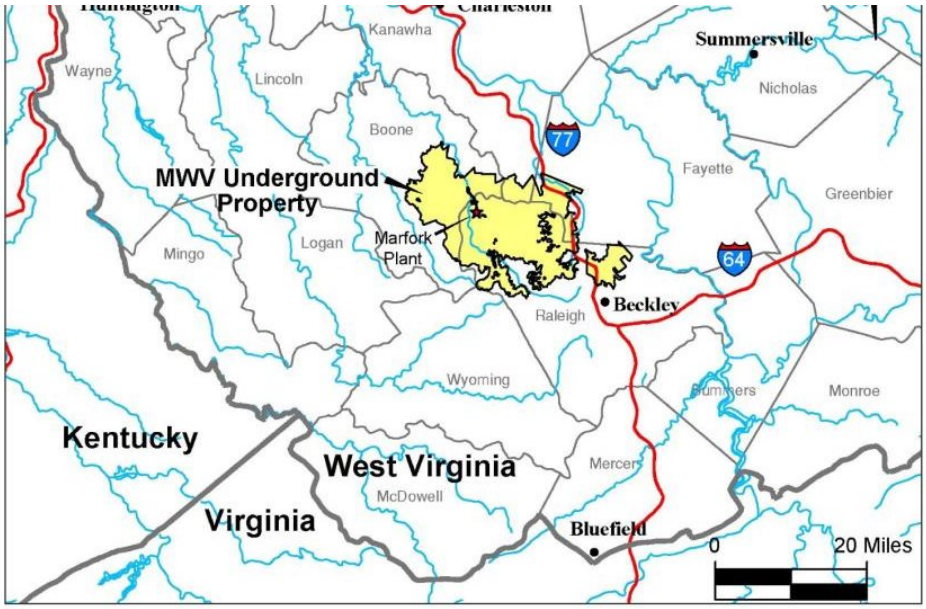
Coal resources and coal reserves are herein reported in imperial units of measurement.

Active surface facilities for the operations are located along Little Marsh Fork, a tributary of the Big Coal River adjacent to a CSX rail line. The property is located about 3 miles south of the town of Whitesville, West Virginia, and approximately 30 miles northwest of Beckley, the county seat of Raleigh County (see *Figure 1-1*) and is composed of approximately 187,000 total acres of mineral control, of which nearly all are contained within 30 separate leases. The mentioned leases are all subject to Alpha renewing the rights to extend the term of all leases which have various expiration dates, some of which expire in the next several years but are anticipated to be renewed by Alpha. Additionally, it is industry practice for major leases to have automatic renewal provisions in favor of the lessee.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 1-1: Alpha's MWVUG Property Location Map





1.2 Ownership

The MWVUG property involves a complex combination of previous ownership. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)** and **Massey Energy (*Massey*)** previously held mining rights on the majority of the property.

1.3 Geology

Operations at the MWVUG Mine Complex currently extract coal from the Eagle coal seam by the underground continuous mining method. Coal resources and reserves are located in the Chilton, Hernshaw, Upper Cedar Grove, Middle Cedar Grove, Lower Cedar Grove, Peerless, Powellton, Eagle, Glen Alum Tunnel, Beckley and Fire Creek seams. These coal seams are historically utilized as coking coal. Strata on the property reside in the Pennsylvanian-aged (approximately 290 to 330 million years

ago) Kanawha and New River Formations. Due to the high value of these coking coals, all the seams have been extensively mined in the past. The rock formations between the coal seams are characterized by large proportions of sandstone interspersed with shale units. The coal seams reach the highest structural elevations along the southeastern margin of the property, generally dipping toward the northwest.

1.4 Exploration Status

The Property has been extensively explored, largely by drilling using continuous coring and rotary drilling methods but also by obtaining coal measurements at mine exposures, and by downhole geophysical methods. A significant amount of historical data was acquired or generated by previous owners of the Property. These sources comprise the primary data used in the evaluation of the coal resources and coal reserves on the Property. MM&A examined the data available for the evaluation and incorporated all pertinent information into this TRS. Where data appeared to be anomalous or not representative, that data was excluded from the digital databases and subsequent processing by MM&A.

Ongoing exploration has been carried out by Alpha since acquiring the MWVUG Complex. The Alpha acquired exploration data has been consistent with past drilling activities.

1.5 Operations and Development

As of December 31, 2021, underground mine operations were active at the Black Eagle Mine, Panther Eagle and Horse Creek mines; all located in the Eagle coal seam. The active Slabcamp mine in the Stockton coal seam is part of MWVUG business unit although not part of this study. The Glen Alum mine and the Dow Fork mine are currently in the conceptual stage and are planned to operate in the Glen Alum Tunnel seam and the Eagle seam respectively. The active mines and the Dow Fork mine produce or will produce a High Volatile- metallurgical coal blend. The Glen Alum mine will produce a Mid-Volatile product.

Based on the mine plans developed as part of this TRS, annual deep mine production peaks at 3.99 million tons in 2048. Underground reserves will be depleted in 2068.

In addition to the mines, the MWVUG Complex also includes the Marfork Preparation Plant. The plant site includes raw coal storage, clean coal storage, a centrifugal dryer, a railroad loadout as well as two refuse disposal areas. Low density cyclones are used for intermediated separation and froth flotation and spirals are utilized for fine coal separation. The plant has a feed rate capacity of 2,400 raw tons per hour and produces 7.42 % ash at less than 1.02 % sulfur. For year-end 2021, the average utilization rate of the Marfork Preparation Plant was 53.62%.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

1.6 Mineral Resource

A coal resource estimate, summarized in *Table 1-1* was prepared as of December 31, 2021, for property controlled by Alpha.

Table 1-1: Coal Resources Summary as of December 31, 2021

Area/Mine	Seam	Coal Resource (Dry Tons, In Situ)			
		Measured	Indicated	Inferred	Total
Inclusive of Reserve					

Laurel Area	Hernshaw	19,404,000	5,902,000	0	25,306,000
Round Bottom UCG	Upper Cedar Grove	4,427,000	1,810,000	0	6,237,000
Seng Creek UCG	Upper Cedar Grove	7,343,000	2,249,000	0	9,592,000
Coon Cedar Grove	Upper Cedar Grove	4,264,000	182,000	0	4,446,000
Ellis Cedar Grove	Upper Cedar Grove	4,869,000	31,000	0	4,899,000
Titan	Middle Cedar Grove	10,849,000	4,649,000	0	15,498,000
Low Gap	Middle Cedar Grove	1,920,000	14,000	0	1,935,000
Black King LCG	Lower Cedar Grove	19,018,000	3,146,000	0	22,164,000
Berwind	Lower Cedar Grove	6,315,000	251,000	0	6,566,000
Elk Run - Hunter Peerless	Peerless	18,307,000	8,787,000	0	27,094,000
Browns Branch	Powellton	48,420,000	30,227,000	0	78,647,000
Browns Branch High Seam	Powellton	11,033,000	11,807,000	0	22,840,000
Roundbottom	Powellton	4,292,000	2,237,000	0	6,528,000
Beetree	Powellton	1,005,000	333,000	0	1,338,000
Slip Ridge Powellton	Powellton	1,094,000	271,000	0	1,364,000
Dow Fork	Eagle	30,546,000	13,104,000	2,000	43,652,000
Dow Fork	Eagle	33,792,000	15,540,000	0	49,332,000
Panther Eagle	Eagle	14,128,000	5,933,000	0	20,062,000
Horse Creek	Eagle	659,000	615,000	0	1,274,000
Clear Fork/Horse Creek	Eagle	1,110,000	28,000	0	1,139,000
Glen Alum Tunnel	Glen Alum Tunnel	9,700,000	3,449,000	0	13,149,000
Workman	Beckley	50,253,000	43,362,000	0	93,615,000
Subtotal	**Subtotal**	**302,748,000**	**153,928,000**	**2,000**	**456,677,000**
Exclusive of Reserve					
Elk Run - Seng Creek	Chilton	14,555,000	11,353,000	0	25,907,000
Titan	Middle Cedar Grove	393,000	8,000	0	401,000
Black King LCG	Lower Cedar Grove	4,589,000	644,000	0	5,234,000
Elk Run (Castle II)	Peerless	13,584,000	4,533,000	0	18,117,000
Browns Branch	Powellton	11,451,000	1,613,000	0	13,064,000
Browns Branch High Seam	Powellton	0	0	185,000	185,000
Powellton 10-B	Powellton	3,533,000	211,000	0	3,744,000
Dow Fork	Eagle	0	0	1,327,000	1,327,000
Panther Eagle	Eagle	843,000	634,000	0	1,477,000
Sycamore	Eagle	7,217,000	888,000	0	8,105,000
Glen Alum Tunnel	Glen Alum Tunnel	1,403,000	451,000	0	1,854,000
Workman	Beckley	2,934,000	5,605,000	57,000	8,596,000
Mountain Laurel	Beckley	14,800,000	14,565,000	55,000	29,420,000
Mountain Laurel	Fire Creek	4,389,000	1,506,000	0	5,895,000
Subtotal	**Subtotal**	**79,691,000**	**42,011,000**	**1,624,000**	**123,326,000**
Grand Total					
Inclusive of Reserve		302,748,000	153,928,000	2,000	456,677,000
Exclusive of Reserve		79,691,000	42,011,000	1,624,000	123,326,000
Grand Total		**382,439,000**	**195,939,000**	**1,626,000**	**580,004,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.

Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.

Note (3): The Property contains 121.7 million tons (Mt) of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.

Totals may not add due to rounding.

See Appendix A for detailed breakdown.

1.7 Mineral Reserve

The Resource estimate outlined in *Table 1-1* **inclusive** of reserves has been used as the basis for this Reserve calculation, which utilizes a reasonable Preliminary Feasibility Study, a Life-of Mine (*LOM*) Mine Plan and practical recovery factors. Production modeling was completed with an effective start date of January 1, 2022.

Factors that would typically preclude conversion of a coal resource to coal reserve, include the following: inferred resource classification; absence of coal quality; poor mine recovery; lack of access; geological encumbrances associated with overlying and underlying strata; seam thinning; structural complication; and insufficient exploration have all been considered. Reserve consideration excludes those portions of the resource area, which exhibit the aforementioned geological and operational encumbrances.

Proven and probable coal reserves were derived from the defined in-situ coal resource considering relevant processing, economic (including technical estimates of capital, revenue and cost), marketing, legal, environmental, socioeconomic, and regulatory factors. The proven and probable coal reserves on the Property are summarized below in *Table 1-2*.

Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
	By Reliability Category			By Control Type				
Seam	Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%*
Hernshaw	3,562,000	1,021,000	4,583,000	0	4,583,000	5	0.8	36
Upper Cedar Grove	5,225,000	1,123,000	6,348,000	0	6,348,000	9	0.8	35
Middle Cedar Grove	632,000	5,238,000	5,870,000	0	5,870,000	6	1.1	37
Lower Cedar Grove	10,634,000	1,437,000	12,071,000	0	12,071,000	5	0.8	36
Peerless	0	6,820,000	6,820,000	0	6,820,000	6	1.6	-
Powellton	13,716,000	10,093,000	23,809,000	0	23,809,000	6	1.0	34
Eagle	20,240,000	9,255,000	29,494,000	315,000	29,180,000	5	0.8	33
Glen Alum Tunnel	1,812,000	488,000	2,300,000	154,000	2,146,000	6	1.4	26
Beckley	13,343,000	12,851,000	26,195,000	1,558,000	24,636,000	5	0.9	20
Grand Total	**69,165,000**	**48,326,000**	**117,491,000**	**2,027,000**	**115,464,000**	**6**	**0.9**	**31**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory analysis from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
**Some reserves lack coal quality. As such, Ellis, Seng Creek and Round Bottom Lower Cedar Grove reserves are priced as High-Vol A. Low Gap Middle Cedar Grove and Berwind Lower Cedar Grove reserves are priced as High-Vol A. Peerless reserves were priced as High-Vol B and the Powellton reserves were priced as High-Vol A.*
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

In summary, as of December 31, 2021, Alpha controls a total of 117.5 million tons (*Mt*) (moist basis) of marketable coal reserves at MWVUG. Of that total, 59 percent are proven, and 41 percent are probable. Approximately 2.0 Mt are owned, and the remaining 115.5 Mt are leased coal reserves. Of the total, 46.2 Mt are permitted, and the remaining 71.3 Mt are not permitted. The maps included in *Appendix C* reflect mining depletion at the time of the resource/reserve calculation taken from Alpha

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

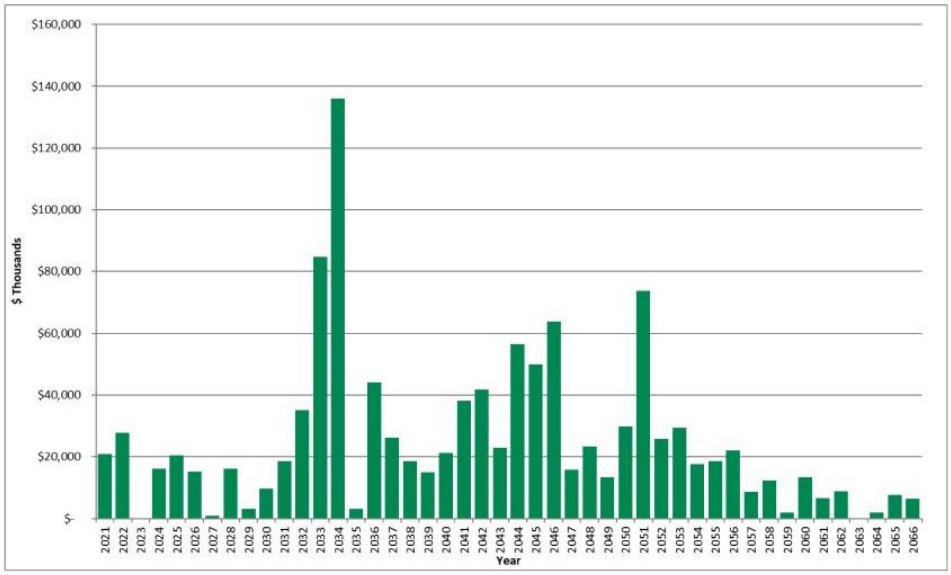
1.8 Capital Summary

Alpha provided MM&A with information related to the number of currently operating production units at MWVUG. MM&A's capital schedules assume that major equipment rebuilds occur over the course

of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated MWVUG operations is provided in *Figure 1-2* below.

Figure 1-2: Projected Capital Expenditures – Consolidated MWVUG Operations



1.9 Operating Costs

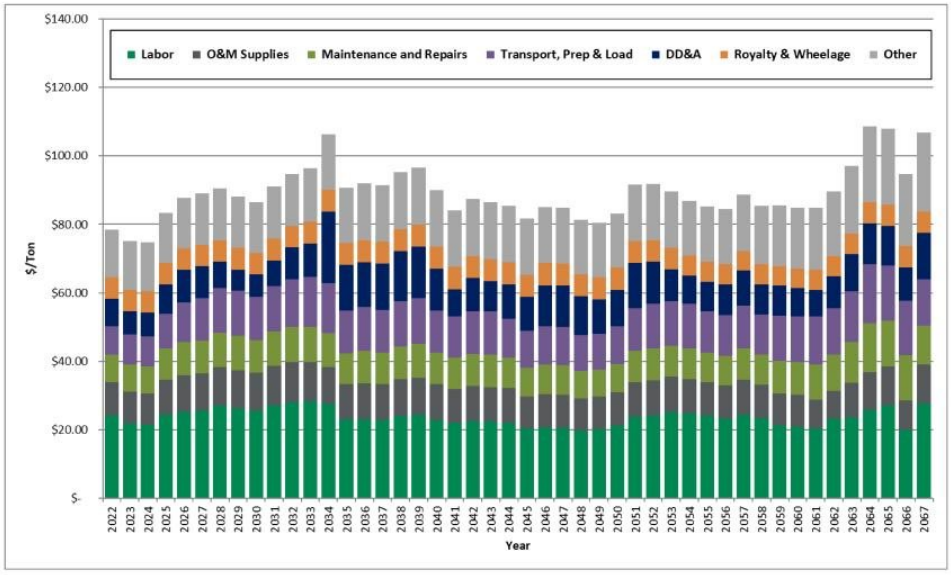
Alpha provided historical costs and budgeted projections of operating costs for its active mines including Panther Eagle, Black Eagle, Allen Powellton, Horse Creek Eagle, Coon Cedar and the Laurel

Hernshaw future mine for MM&A's review. MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for each mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

A summary of the projected operating costs for the consolidated MWVUG operations is provided in *Figure 1-3*.

Figure 1-3: MWVUG Operating Costs



Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

1.10 Economic Evaluation

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation, refuse disposal, coal loading, reclamation, and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long-term realization of $144 per short ton port pricing, with an average $104.65 per ton netback pricing reflective of the high-volatile product currently sold at MWVUG. These estimates are based on long-term pricing published by third party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha and their MWVUG business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the MWVUG business unit. *Table 1-3* shows the MM&A projected LOM tonnage, P&L, and EBITDA for each Alpha mine at MWVUG.

Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Laurel Hernshaw	4,583	$74,109	$16.17	$107,013	$23.35
Black King LCG Brown's Br	9,917	$219,922	$22.18	$307,378	$30.99
Seng Creek Roundbottom UCG	1,946	$57,547	$29.57	$69,033	$35.47
Seng Creek UCG	2,711	$45,351	$16.73	$66,276	$24.44
Berwind LCG	2,154	$32,966	$15.31	$50,855	$23.61
Low Gap MCG	632	$9,858	$15.59	$14,183	$22.44
Titan MCG	5,238	$68,736	$13.12	$108,591	$20.73
Coon UCG	783	$9,219	$11.78	$19,596	$25.03
Ellis UCG	908	$12,669	$13.95	$18,838	$20.75
Castle Peerless*	3,798	($43,759)	$(11.52)	$21,276	$5.60
Hunter Peerless	6,820	$88,880	$13.03	$126,303	$18.52
Brown's Branch Powellton	21,297	$251,484	$11.81	$485,834	$22.81
Slip Ridge Powellton	553	$5,151	$9.32	$8,886	$16.08
Bee Tree Powellton	451	$1,860	$4.12	$7,639	$16.94
Roundbottom Powellton	1,509	$23,158	$15.34	$39,439	$26.13
Black Eagle	12,952	$288,318	$22.26	$420,637	$32.48
Dow Fork Eagle	10,144	$93,423	$9.21	$165,567	$16.32
Horse Creek Eagle	673	$6,629	$9.85	$15,269	$22.69
Panther Eagle	6,192	$132,942	$21.47	$175,466	$28.34
Workman's Creek Beckley	26,195	$641,805	$24.50	$1,066,078	$40.70
Glen Alum Tunnel	2,300	$20,279	$8.82	$41,270	$17.94
Consolidated Deep Mines	**121,756**	**$2,040,546**	**$16.76**	**$3,335,427**	**$27.39**

Note:
* This resource area failed to achieve positive EBITDA in the economic evaluation. Therefore, the coal tons forecasted from this mine have been excluded from the estimate of coal reserves in this TR.
** LOM tonnage evaluated in the financial model includes September 2021 through December 2021 production (466,599 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 1-3,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated MWVUG operations show positive LOM P&L and EBITDA of $2.0 billion and $3.3 billion, respectively.

Alpha's consolidated MWVUG cash flow summary in constant dollars, excluding debt service, is shown in *Table 1-4* below.

Table 1-4: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	121,756	637	2,404	2,423	2,468	2,169	2,103
Total Revenue	$12,742,316	$66,790	$251,548	$252,367	$257,200	$225,985	$219,349
EBITDA	$3,335,427	$19,262	$82,164	$86,407	$89,835	$63,960	$54,602
Net Income	$1,659,628	($2,848)	$50,218	$57,393	$59,310	$37,139	$29,295
Net Cash Provided by Operating Activities	$2,954,510	$15,390	$57,266	$73,329	$76,517	$61,304	$51,573
Purchases of Property, Plant, and Equipment	($1,143,133)	($20,898)	($27,705)	($180)	($16,200)	($20,354)	($15,158)
Net Cash Flow	$1,811,377	($5,508)	$29,560	$73,149	$60,317	$40,950	$36,416

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	2,064	1,950	2,009	2,053	1,940	1,896	1,933
Total Revenue	$216,162	$204,358	$210,499	$215,161	$203,272	$198,729	$202,607
EBITDA	$51,749	$43,071	$45,847	$50,968	$41,502	$36,906	$35,181
Net Income	$27,631	$24,424	$28,328	$31,112	$21,633	$14,944	$12,836
Net Cash Provided by Operating Activities	$48,250	$40,761	$40,316	$44,167	$39,111	$34,466	$33,179
Purchases of Property, Plant, and Equipment	($868)	($16,200)	($3,240)	($9,745)	($18,667)	($35,134)	($84,732)
Net Cash Flow	$47,382	$24,561	$37,076	$34,422	$20,443	($668)	($51,553)

	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31

	2034	2035	2036	2037	2038	2039	2040
Production & Sales tons	2,082	3,271	3,450	3,481	3,323	3,286	3,473
Total Revenue	$218,768	$347,752	$369,675	$373,464	$357,099	$353,047	$373,114
EBITDA	$41,256	$94,963	$97,271	$102,500	$89,410	$85,218	$103,020
Net Income	($4,865)	$43,648	$46,524	$46,383	$33,435	$28,649	$49,725
Net Cash Provided by Operating Activities	$36,789	$77,566	$88,550	$92,545	$85,041	$79,644	$90,281
Purchases of Property, Plant, and Equipment	($136,068)	($3,200)	($44,038)	($26,146)	($18,532)	($14,887)	($21,282)
Net Cash Flow	($99,279)	$74,366	$44,512	$66,399	$66,509	$64,758	$68,999
	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	3,628	3,535	3,558	3,581	3,896	3,820	3,835
Total Revenue	$390,148	$379,864	$381,865	$386,470	$421,766	$413,933	$414,657
EBITDA	$114,006	$105,476	$105,720	$116,711	$142,472	$134,583	$135,172
Net Income	$70,256	$56,048	$60,941	$64,670	$82,271	$70,884	$72,383
Net Cash Provided by Operating Activities	$98,440	$93,426	$93,855	$100,510	$117,126	$119,328	$119,977
Purchases of Property, Plant, and Equipment	($38,094)	($41,815)	($22,907)	($56,546)	($49,870)	($63,704)	($15,690)
Net Cash Flow	$60,347	$51,612	$70,947	$43,965	$67,256	$55,624	$104,287
	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	3,998	3,924	3,773	3,538	3,508	3,380	3,438
Total Revenue	$432,449	$424,452	$405,942	$373,224	$360,465	$344,045	$341,917
EBITDA	$152,484	$147,881	$132,610	$95,796	$81,740	$72,814	$71,332
Net Income	$86,811	$87,265	$73,052	$37,754	$29,799	$35,469	$37,378
Net Cash Provided by Operating Activities	$130,731	$128,431	$117,739	$95,138	$80,524	$69,368	$62,460
Purchases of Property, Plant, and Equipment	($23,252)	($13,374)	($29,799)	($73,717)	($25,711)	($29,385)	($17,689)
Net Cash Flow	$107,479	$115,057	$87,940	$21,422	$54,813	$39,983	$44,771
	YE 12/31 2055	YE 12/31 2056	YE 12/31 2057	YE 12/31 2058	YE 12/31 2059	YE 12/31 2060	YE 12/31 2061
Production & Sales tons	3,480	3,340	2,756	2,123	1,858	1,794	1,801
Total Revenue	$340,341	$325,938	$266,018	$204,189	$179,896	$172,249	$175,964
EBITDA	$73,891	$73,695	$49,590	$41,595	$37,241	$34,871	$37,383
Net Income	$37,076	$36,319	$17,513	$19,964	$17,706	$16,632	$18,788
Net Cash Provided by Operating Activities	$67,091	$67,436	$52,390	$42,338	$35,134	$32,779	$34,299
Purchases of Property, Plant, and Equipment	($18,598)	($22,174)	($8,612)	($12,287)	($1,944)	($13,286)	($6,625)
Net Cash Flow	$48,493	$45,262	$43,778	$30,051	$33,190	$19,493	$27,674
	YE 12/31 2062	YE 12/31 2063	YE 12/31 2064	YE 12/31 2065	YE 12/31 2066	YE 12/31 2067	YE 12/31 2068
Production & Sales tons	1,277	961	591	564	767	483	132
Total Revenue	$126,755	$96,932	$61,964	$59,134	$80,426	$50,572	$13,798
EBITDA	$24,169	$13,941	$4,706	$4,725	$15,151	$5,565	($265)
Net Income	$10,038	$2,506	($2,323)	($1,844)	$6,083	($2,295)	($6,992)
Net Cash Provided by Operating Activities	$25,885	$17,009	$7,410	$6,658	$13,891	$8,980	$3,950
Purchases of Property, Plant, and Equipment	($8,760)	$0	($1,944)	($7,634)	($6,480)	$0	$0
Net Cash Flow	$17,125	$17,009	$5,466	($976)	$7,411	$8,980	$3,950

	YE 12/31 2069	YE 12/31 2070	YE 12/31 2071	YE 12/31 2072	YE 12/31 2073	YE 12/31 2074	YE 12/31 2075
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0
EBITDA	($2,933)	($1,179)	($607)	$0	$0	$0	$0
Net Income	($5,865)	($2,358)	($1,213)	$0	$0	$0	$0
Net Cash Provided by Operating Activities	($32,305)	($10,768)	($10,768)	$0	$0	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($32,305)	($10,768)	($10,768)	$0	$0	$0	$0

Note:

* The Castle II (Peerless) resource area failed to achieve positive EBITDA in the economic evaluation. Therefore, the coal tons forecasted from this mine have been excluded from the estimate of coal reserves in this TR.

** LOM tonnage evaluated in the financial model includes September 2021 through December 2021 production (466,599 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

Consolidated cash flows are driven by annual sales tonnage, which grows from 2.4 million tons in 2022 to a peak of nearly 4.0 million tons in 2048. Between years 2049 and 2056, sales ranges from 3.3 million to 3.9 million tons and between years 2057-2068, sales range from 0.1 million tons to 2.8 million tons. Projected consolidated revenue grows from $251 million in 2022 to a peak of $432 million in 2048. Revenue totals $12.7 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $130.7 million in 2048 and totals $3.0 billion over the project life. Capital expenditures total $100.5 million during the first five years and $1.1 billion over the project's life.

1.10.1 Discounted Cash Flow Analysis

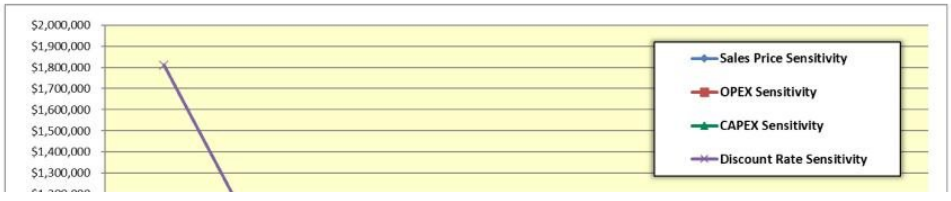
Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $279.7 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the MWVUG reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its MWVUG assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

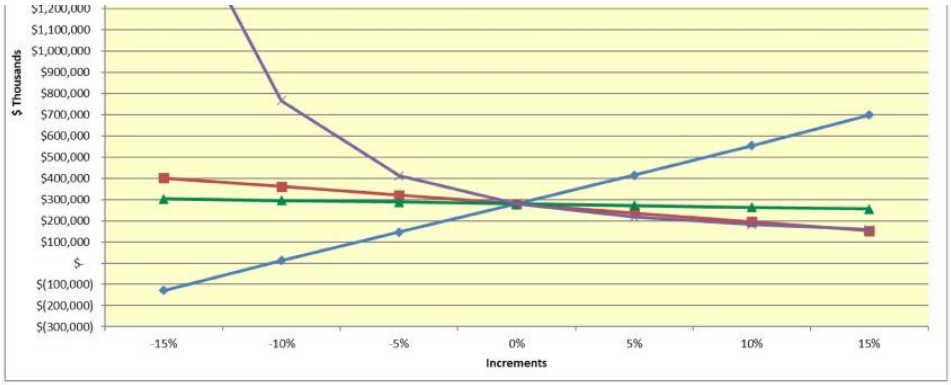
1.10.2 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 1-4: Sensitivity of NPV





As shown, NPV is quite sensitive to change in sales price, operating cost estimates and the discount rate, and slightly sensitive to changes in capital cost estimates.

1.11 Permitting

Alpha has obtained all mining and discharge permits to operate its active mines and processing, loadout or related support facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Alpha, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

1.12 Conclusion and Recommendations

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the MWVUG Property and reviewed in the study. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study concludes that the 117.5 Mt of marketable underground coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

2 Introduction

2.1 Registrant and Terms of Reference

This report was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors.

The report provides a statement of coal reserves for Alpha. Exploration results and Resource calculations were used as the basis for the mine planning and the preliminary feasibility study completed to determine the extent and viability of the reserve.

Coal resources and coal reserves are herein reported in imperial units of measurement.

2.2 Information Sources

The technical report is based on information provided by Alpha and reviewed by MM&A's professionals, including geologists, mining engineers, civil engineers, and environmental scientists. MM&A's professionals hold professional registrations and memberships which qualify them as Qualified Persons in accordance with SEC guidelines.

Alpha engaged MM&A to conduct a coal reserve evaluation of the Alpha coal properties as of December 31, 2021. For the evaluation, the following tasks were to be completed:

> Conduct site visits of the mines and mine infrastructure facilities;

> Process the information supporting the estimation of coal resources and reserves into geological models;

> Develop life-of-reserve mine (*LOM*) plans and financial models;

> Hold discussions with Alpha company management; and

> Prepare and issue a Technical Report Summary providing a statement of coal reserves which would include:

- A description of the mines and facilities.
- A description of the evaluation process.

- An estimation of coal reserves with compliance elements as stated under the new SEC Guidelines which will become effective for the first fiscal year commencing on or after January 1, 2022.

2.3 Personal Inspections

MM&A is very familiar with MWVUG's West Virginia Properties, having provided a variety of services in recent years. Qualitied Persons involved in this TRS have conducted multiple site visits most recently

3 Property Description

3.1 Location

The MWVUG Mine Complex is located in the Central Appalachian Basin of southern West Virginia (see *Figure 1-1*) with coal properties mostly in Raleigh and Boone counties. The Mine properties are generally centered around the Marfork preparation plant and facilities located approximately 3 miles south of the town of Whitesville, West Virginia, and 30 miles northwest of Beckley, West Virginia, the county seat of Raleigh County. Surface facilities for the operation are located in the Big Coal River drainage basin, central to the active mines as well as those currently in development. Numerous small communities are present throughout the property such as the previously mentioned town of Whitesville, as well as Sylvester, Montcoal and Clear Creek communities.

The nearest major population centers are Charleston, West Virginia (40 miles north), Bristol, Virginia (170 miles south), Roanoke, Virginia (160 miles east), Morgantown, West Virginia (200 miles north), and Lexington, Kentucky (220 miles west). The property is located on the following **United States Geological Survey (*USGS*)** Quadrangles: Williams Mnt., Sylvester, Eskdale, Wharton, Whitesville, Dorothy, Pax, Pilot Knob, Arnett, Eccles, and Beckley. The coordinate system and datum used for the model of the MWVUG Mine complex and the subsequent maps were produced in the West Virginia State Plane South system, NAD 27.

3.2 Titles, Claims or Leases

The property is composed of over 187,000 total acres of mineral control, nearly all of which is leased. Alpha's control is comprised of approximately 30 separate leases with varying expiration dates. Some leases expire over the next several years, but Alpha does not anticipate any challenges related to lease renewal. MM&A has not carried out a separate title verification for the coal properties and has not verified leases, deeds, surveys, or other property control instruments pertinent to the subject resources. Alpha has represented to MM&A that it controls the mining rights to the reserves as shown on its property maps, and MM&A has accepted these as being a true and accurate depiction of the

mineral rights controlled by Alpha. The TRS assumes the property is developed under responsible and experienced management.

3.3 Mineral Rights

Alpha supplied property control maps to MM&A related to properties for which mineral and/or surface property are controlled by Alpha. While MM&A accepted these representations as being true and accurate, through experience with the Property, MM&A has no knowledge of past property boundary disputes or other concerns, that could impact future mining operations or development potential.

Property control in Appalachia can be intricate. Coal mining properties are typically composed of numerous property tracts which are owned and/or leased from both land holding companies and private individuals or companies. It is common to encounter severed ownership, with different entities or individuals controlling the surface and mineral rights. Mineral control in the region is typically characterized by leases or ownership of larger tracts of land, with surface control generally comprised of smaller tracts, particularly in developed areas.

Control of the surface property is necessary to conduct surface mining but is not necessary to conduct underground mining aside from relatively limited areas required for seam access or ventilation infrastructure. Alpha's executive management team has a history of mining in Central Appalachia and has conveyed to MM&A that it has been successful in acquiring surface rights where needed for past operations.

3.4 Encumbrances

No Title Encumbrances are known. By assignment, MM&A did not complete a query related to Title Encumbrances.

3.5 Other Risks

There is always risk involved in property control. As is common practice, Alpha, and its predecessors, have had their land teams examine the deeds and title control to minimize this risk. Historically, property control has not posed any significant challenges related to MWVUG operations.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, elevation and Vegetation

Topography of the area surrounding the MWVUG mine complex is typical of the Central Appalachian Plateau's physiographic province, being rugged and deeply dissected by V-shaped river valleys and

flanked by steep-sided upland regions. Slopes in the area are mostly steep to very steep with some gently sloping with relatively narrow ridges. Surface elevations near the mine complex range from approximately 1,000 feet above sea level at streams to approximately 2,600 feet at ridge tops. The area is heavily vegetated and has a significant amount of hardwood forests. The property is not situated near any major urban centers.

4.2 Access and Transport

There is general access to the MWV Deep property via a well-developed network of primary, secondary, and unimproved roads. Interstate 64/77 is located near the eastern side of the property and is the primary throughfare in the area connecting the property to Beckley, Charleston, and Huntington, West Virginia, to the West and Lexington, Virginia, to the East. Numerous secondary and unimproved roads provide direct access to the mine property, some being federal-, state-, and town-maintained. These include West Virginia State Route 3 that runs north-south through the property holdings and provides direct access to surface office facilities and preparation plant from points north and south. These primary roads typically stay open throughout the year. Within the property, unimproved roads are utilized to access gas drainage wells and surface based deep mine infrastructure. The Alpha-owned office facilities, preparation plant and rail loadout are located approximately 3 miles south of the town of Whitesville along the CSX railroad system and serve as the primary transport means of processed coal.

4.3 Proximity to Population Centers

The MWVUG Mine Complex is located near the town of Beckley and is primarily in Raleigh and Boone Counties, West Virginia. There are no large population centers in proximity. The nearest major population centers are Charleston, West Virginia (40 miles north), Bristol, Virginia (170 miles south), Roanoke, Virginia (190 miles southeast), and Morgantown, West Virginia (200 miles northeast), and Lexington, Kentucky (220 miles west). As of the 2020 census, Raleigh County had just over 74,600 residents.

4.4 Climate and Length of Operating Season

The climate of the region is classified as humid continental with four distinct seasons: warm summers, cold winters, and moderate fall and spring seasons. Precipitation in the region is consistent throughout the year, approximately 3 to 5 inches per month, with the most rain falling in spring and the early months of summer. Average yearly precipitation is 40 inches. Summer months typically begin in late May and end in early September and range in average temperature from 46 to 78 degrees Fahrenheit. Winters typically begin in mid to late November and run until mid to late March with average temperatures ranging from 19 to 52 degrees Fahrenheit. Precipitation in the winter typically comes in the form of snowfall or as a wintery mix (sleet and snow) with severe snowfall events occurring occasionally. Seasonal variations in climate typically do not affect underground mining in West Virginia.

However, weather events could potentially negatively impact efficiency of surface and preparation plant operations on a very limited basis and lasting less than a few days.

4.5 Infrastructure

The MWVUG Mine Complex has sources of water, power, personnel, and supplies readily available for use. Personnel have historically been sourced from the surrounding communities in Raleigh, Kanawha, Fayette, and Boone Counties, and have proven to be adequate in numbers to conduct mining operations. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners. Water is sourced locally from public water sources or rivers, and electricity is sourced from **Appalachian Power**, a subsidiary of **American Electric Power (*AEP*)**. The service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc. Alpha's Marfork preparation plant services consumers with washed coal, which is transported via the adjacent CSX rail line at the Marfork loadout. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to the preparation plant.

5 History

5.1 Previous Operation

The MWVUG property involves a complex combination of previous ownership. Coal mining in the area occurred for nearly a century. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)** and **Massey Energy (*Massey*)** previously held mining rights on much of the property.

The current facilities were constructed in 1994 by Marfork Coal Company, a subsidiary of A. T. Massey Coal Company. The preparation plant, refuse disposal areas, utility infrastructure and rail transportation has been maintained and upgraded to provide a modern coal processing facility for the property.

5.2 Previous Exploration

Extensive exploration in the form of subsurface drill efforts has been carried out on the property by numerous entities, most of which efforts were completed prior to the inception of Alpha. Diamond core and rotary drilling are the primary types of exploration on the property. Data for correlation and mining conditions are derived from core descriptions and geophysical logging (e-logging). Coal-quality analyses were also employed during the core-exploration process. Development of this report included an assessment of over 2,100 exploration drill holes, largely comprised of coal measurements.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms.

MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recently drilled holes.

6 Geological Setting, Mineralization and Deposit

6.1 Regional, Local and Property Geology

The property lies in the Central Appalachian Coal basin in the Appalachian Plateau physiographic province.

The coal deposits in the eastern US are the oldest and most extensively developed coal deposits in the country. The coal deposits on the Property are Carboniferous in age, being of the Pennsylvanian system. Overall, these Carboniferous coals contain two-fifths of the US's bituminous coal deposits and extend over 900 miles from northern Alabama to Pennsylvania and are part of what is known as the *Appalachian Basin*. The Appalachian Basin is more than 250 miles wide and, in some portions, contains over 60 coal seams of varying economic significance.

Coal seams and zones of economic significance typically range between 24 and 48 inches in thickness, with relatively little structural deformation. Regional structure is typically characterized by gently dipping strata to the northwest at one to four percent, averaging three percent.

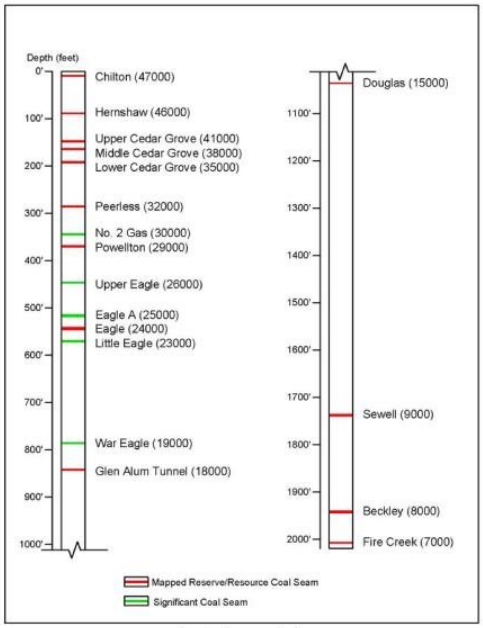
Strata on the property are mostly of the Pennsylvanian-age Kanawha Formation and the older, lower Beckley and Fire Creek seams are part of the New River Formation of the Pottsville Series. The rock formations between the coal seams are characterized by large proportions of sandstone interspersed with shale units.

Coal seams with remaining reserve or resource potential evaluated within this TRS include, in descending stratigraphic order the: Chilton, Hernshaw, Upper Cedar Grove, Middle Cedar Grove, Lower Cedar Grove, Peerless, Powellton, Eagle, Glen Alum Tunnel, Beckley and Fire Creek seams.

6.2 Mineralization

The generalized stratigraphic columnar section in *Figure 6-1* demonstrates the vertical relationship of the principal coal seams and rock formations on the Property.

Figure 6-1: MWVUG Stratigraphic Column



(not to scale)

6.3 Deposits

The coal produced at the MWVUG complex is mainly a High-volatile metallurgical bituminous coal. The higher rank Glen Alum and Beckley coals will produce a Mid-Volatile and a Low-Volatile product.

Due to the high value of these High Volatile coking coals, all the seams have been extensively mined in the past. Generally, the coal rank increases with depth whereas the highest seams stratigraphically and physically on the hills exhibit the greatest volatile matter content and deepest seams exhibit the lowest volatile matter content. The highest structural elevations are along the southeastern margin of the property with the strata generally dipping toward northwest. The seams of interest above drainage include the Chilton through the Glen Alum Tunnel and are accessible via an outcrop faceup. Below drainage seams of interest include the Beckley and Fire Creek and would require slope development access. The rock formations between the coal seams are characterized by large portions of sandstone with shale units interspersed throughout.

7 Exploration

7.1 Nature and Extent of Exploration

The Property has been extensively explored by subsurface drilling efforts carried out by numerous entities, most of which were completed prior to ownership by Alpha.

Diamond core and rotary drilling are the primary types of exploration on the property. Data for correlation and mining conditions are derived from core descriptions and geophysical logging (e-logging). Coal-quality analyses were also employed during the core-exploration process.

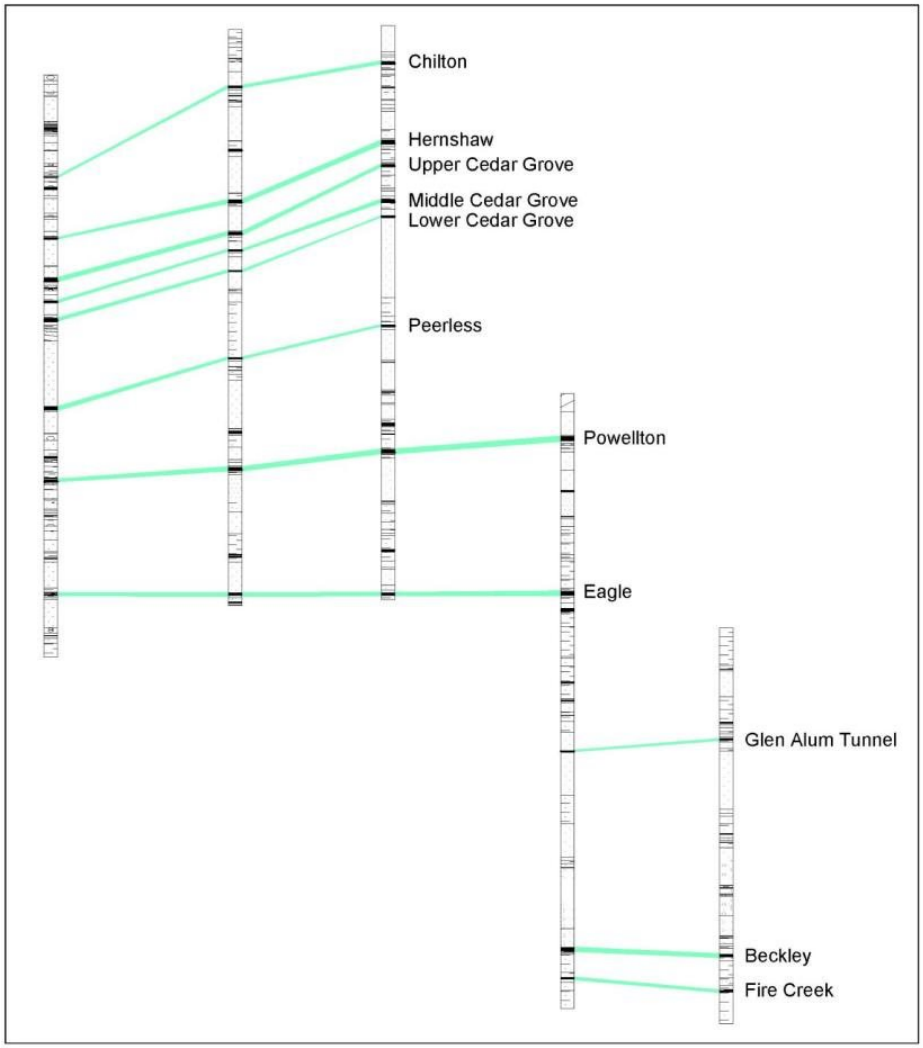
Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a portion of the past exploration holes, and currently logs most of the recently drilled holes.

The location of the drilling is shown on the maps included in *Appendix C.*

The concentration of exploration varies slightly across the property. Drilling on the property is typically sufficient for delineation of deep mineable coal horizons. Core logging is carried out by geologists in cases where roof and floor strata are of particular interest and in cases where greater resolution and geologic detail are needed. In many cases the drill hole data comes from simplified driller's logs, which may lack specific details regarding geotechnical conditions and specific geology, making correlations and floor and roof conditions difficult to determine. Geophysical logging (e-logging) techniques, by contrast, document specific details useful for geologic interpretation and mining conditions. Given the variability of data-gathering methods, *definitive* mapping of future mining conditions may not be possible, but projections and assumptions can be made within a *reasonable* degree of certainty. A significant effort was put into verifying the integrity of the database. Once this was established, stratigraphic columnar sections were generated using cross-sectional analysis to establish or confirm coal seam correlations.

A typical cross-section is shown in *Figure 7-1.*

Figure 7-1: MWVUG Cross-Section



Due to the long history of exploration by various parties on the Property, a wide variety of survey techniques exist for documentation of data point locations. Many of the older exploration drill holes

appear to have been located by survey and more recently completed drill holes are often located by high-resolution Global Positioning System (*GPS*) units. However, some holes appear to have been approximately located using USGS topography maps or other methods which are less accurate. Therefore, discretion had to be used regarding the accuracy for the location and ground surface elevation of some of these older drill holes. In instances where a drill hole location (or associated coal seam elevations) appeared to be inconsistent with the overall structural trend (or surface topography for surface-mineable areas), the data point was not honored for geological modeling. Others with

apparently minor variances were adjusted and then used by MM&A.

Surveying of the underground and surface mined areas has been performed by the mine operators and/or their consulting surveyors. By assignment, MM&A did not verify the accuracy or completeness of mine maps supplied by Alpha but accepted this information as being the work of responsible engineers and surveyors, as required by both State and Federal Law.

MM&A compiled comprehensive topographic map files by selecting the best available aerial mapping for each area and filling any gaps with digital USGS topographic mapping.

7.2 Drilling Procedures

Core drilling methods utilize NX-size ($2^1/_8$ inch) or similar-sized core cylinders to recover core samples, which can be used to delineate geologic characteristics, and for coal quality testing and geotechnical logging. For the core holes, the geophysical logs are especially useful in verifying the core recovery of both the coal samples (for assurance that sample is representative of the full seam) and of the roof and floor rock samples (for evaluating ground control characteristics of deep mineable coal seams). In addition to the core holes, rotary drilled holes also exist on the Property. Data for the rotary drilled holes is mainly derived from downhole geophysical logs, which are used to interpret coal and rock thickness and depth since logging of the drill cuttings is not reliable.

A wide variety of core-logging techniques exist for the Property. For many of the core holes, the primary data source is a generalized lithology description by the driller, more recent holes are generally supplemented by a more detailed core log completed by a geologist. These drilling logs were provided to MM&A as a geological database. MM&A geologists were not involved in the production of original core logs but did perform a basic check of information within the provided database. An audit of the AMR database was conducted by comparing seam depths, coal, and parting thicknesses in the electronic database against the source drill logs and the results were acceptable. Where geophysical logs for such holes are available, they were used by MM&A geologists to verify the coal thickness and core recovery of seams.

7.3 Hydrology

Hydrologic testing and forecasting are necessary parts of the permitting process and as such are routinely considered in the mine planning process.

MWVUG has a lengthy history of operation and three currently active mines with no significant hydrologic concerns or material issues experienced in its history. Future mining is projected to occur in areas exhibiting similar hydrogeological conditions as past mining. Based upon the successful history of the operation with regards to hydrogeological features, MM&A assumes that the operation will not be hindered by such issues in the future.

7.4 Geotechnical Data

Life-of-Mine (*LOM*) Mining plans for potential underground mines were developed by MM&A through incorporation of budget maps from Alpha. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS)* program that was developed by the **National Institute for Occupational Safety and Health (*NIOSH*)**. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan. Coal and rock strengths from core testing are used to verify the empirical assumptions integral to ACPS.

8 Sample Preparation Analyses and Security

8.1 Prior to Sending to the Lab

Most of the coal samples have been obtained from the Property by subsurface exploration using core drilling techniques. The protocol for preparing and testing the samples has varied over time and is not well documented for the older holes drilled on the Property. Typical US core drilling sampling technique is for the coal core sample, once recovered from the core barrel, to be described then wrapped in a sealed plastic sleeve and placed into a covered core box, which is the length of the sample so that the core can be delivered to a laboratory in relatively intact condition and with original moisture content. The core identification number and the depth are scribed on the sample box lid to identify the sample. This process has been the norm for both historical and ongoing exploration activities at MWVUG.

This work is typically performed by the supervising driller, geologist or company personnel. Samples are most often delivered to the company by the driller after each shift or acquired by company personnel or representatives. Most of the coal core samples were obtained by previous operators on the Property. MM&A did not participate in the collection, sampling and analysis of the majority of core samples within the exploration database. However, it is reasonable to assume, given the sophistication level of the previous operators, that these samples were generally collected and processed under

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

industry best-practices. This assumption is based on MM&A's familiarity with the operating companies and the companies used to perform the analysis.

8.2 Lab Procedures

Coal quality testing has been performed over a large number of years by operating companies using different laboratories and testing regimens. Some of the samples have raw analyses and washabilities on the full seam (with coal and rock parting layers co-mingled) and are mainly useful for characterizing

the coal quality for projected production from underground and highwall mining. Other samples have coal and rock analyzed separately, the results of which can be manipulated to forecast either surface or underground mining quality. Care has been taken to use only those analyses that are representative of the coal quality parameters for the appropriate mining type for each sample.

Standard procedure upon receipt of core samples by the testing laboratory is to log the depth and thickness of the sample, then perform testing as specified by a representative of the operating company. Each sample is then analyzed in accordance with procedures defined under **American Society for Testing and Materials (*ASTM*)** standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

9 Data Verification

9.1 Procedures of Qualified Person

MM&A reviewed the Alpha-supplied digital geologic database and supplemented the database with its own in-house records which have been maintained for both Alpha and previous operators of the property. The database consists of data records, which include drill hole information for holes that lie within and adjacent to the Property and records for numerous supplemental coal seam thickness measurements. Once the initial integrity of the database was established, stratigraphic columnar sections were generated using cross-sectional analysis to establish or confirm coal seam correlations. Geophysical logs were used wherever available to assist in confirming the seam correlation and to verify proper seam thickness measurements and recovery of coal samples.

Additionally, an audit of the AMR digital database was conducted by comparing seam depths, coal, and parting thicknesses in the database against the source drill logs and the results were acceptable.

After establishing and/or verifying proper seam correlation, seam data control maps and geological cross-sections were generated and again used to verify seam correlations and data integrity. Once the database was fully vetted, seam thickness, base-of-seam elevation, roof and floor lithology, and overburden maps were independently generated for use in the mine planning process.

Coal quality was analyzed and summarized by MM&A's team of geologists and engineers. Quality was provided by Alpha in various database formats, laboratory data sheets, and also obtained directly from MM&A's files. Care was taken to ensure that sampled data was representative of the mineable section. In instances where minimal representative data was noted, geological tonnages were estimated based upon applying assumed densities of coal and non-coal material to thicknesses expressed in geological database files.

9.2 Limitations

As with any exploration program, localized anomalies cannot always be discovered. The greater the density of the samples taken, the less the risk. Once an area is identified as being of interest for inclusion in the mine plan, additional samples are taken to help reduce the risk in those specific areas. In general, provision is made in the mine planning portion of the study to allow for localized anomalies that are typically classed more as a nuisance than a hinderance.

9.3 Opinion of Qualified Person

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the MWVUG Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

10 Mineral Processing and Metallurgical Testing

10.1 Testing Procedures

Basic chemical analyses (both raw and washed quality), petrographic data, rheological data and ash, ultimate and sulfur analysis are available but not summarized for this filing.

Available coal quality data sourced from MM&A's vaults (associated with former projects for Alpha and its predecessors) was tabulated by resource area in a Microsoft® EXCEL workbook. Such data contained laboratory sheets which MM&A utilized to confirm that sampled intervals were representative of geological models and confirm that appropriate laboratory procedures were utilized to derive raw and clean coal parameters. Additionally, Alpha provided MM&A with a database of its own in-house coal quality information which did **not** include backup laboratory information or sampled intervals. MM&A compared wash recovery values from Alpha's dataset to proximal holes with wash recovery data in MM&A's dataset and calculated estimates of wash recovery based upon the relative percentages of coal and rock from lithologic descriptions. In general, MM&A found that Alpha's dataset was representative and appropriate for inclusion in coal quality summaries. Quality tables also provide basic statistical analyses of the coal quality datasets, including average value; maximum and minimum

values; and the number of samples available to represent each quality parameter of the seam. Coal samples that were deemed by MM&A geologists to be unrepresentative were not used for statistical analysis of coal quality, as documented in the tabulations.

The amount and areal extent of coal sampling for geological data is generally sufficient to represent the quality characteristics of the coal horizons and allow for proper market placement of the subject coal seams. For some of the coal deposits there are considerable laboratory data from core samples that are representative of the full extent of the resource area; and for others there are more limited data to

are representative of the full extent of the resource area; and for others there are more limited data to represent the resource area. For example, in the active operations with considerable previous mining, there may be limited quality data within some of the remaining resource areas; however, in those cases the core sampling data can be supplemented with operational data from mining and shipped quality samples representative of the resource area.

10.2 Relationship of Tests to the Whole

The extensive sampling and testing procedures typically followed in the Coal Industry result in an excellent correlation between samples and Marketable product. As shipped analyses of the coal from MWVUG were reviewed to verify that the coal quality and characteristics were as expected. The MWVUG Property has a long history of saleable production, in the High-volatile metallurgical and thermal markets, confirming exploration results.

In select instances, those areas which did not contain exploration information inclusive of coal quality analysis but were located relatively adjacent to active producing areas and/or areas which contained coal quality information were downgraded to a "probable" classification. Based upon the extensive production history locally and regionally, the report authors deemed this process acceptable.

10.3 Lab Information

Each sample is analyzed at area Laboratories that operate in accordance with procedures defined under ASTM standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); Free Swell Index (*FSI*) (ASTM D720).

10.4 Relevant Results

No critical factors have been found that would adversely affect the recovery of the Reserve. Any quality issues that occur, either localized or generally are accounted for in the Marketing Study done for this TRS.

11 Mineral Resource Estimates

MM&A created independent geologic models to define the coal resources at MWVUG. Coal resources were estimated as of December 31, 2021.

11.1 Assumptions, Parameters and Methodology

Geological data was imported into Carlson Mining® (formerly SurvCADD®) geological modelling software in the form of Microsoft® Excel files incorporating drill hole collars, seam and thickness picks, bottom seam elevations and raw and washed coal quality. These data files were validated prior to importing into the software. Once imported, a geologic model was created, reviewed, and verified- with a key element being a gridded model of coal seam thickness. Resource tons were estimated by using the seam thickness grid based on each valid point of observation and by defining resource confidence arcs around the points of observation. Points of observation for Measured and Indicated confidence arcs were defined for all valid drill holes that intersected the seam using standards deemed acceptable by MM&A based on a detailed geologic evaluation and a statistical analysis of all drill holes within the projected reserve areas as described in *Section 11.1.1*. The geological evaluation incorporated an analysis of seam thickness related to depositional environments, adjacent roof and floor lithologies, and structural influences.

After validating coal seam data and establishing correlations, the seam thickness, coal thickness and elevation for seams of economic interest were used to generate a geologic model. Local geologic and physical conditions were incorporated into the model where mineability and or mining costs could be affected by the conditions. Both coal thickness and quality data are deemed by MM&A to be reasonably sufficient within the resource areas. Therefore, there is a reasonable level of confidence in the geologic interpretations required for coal resource determination based on the available data and the techniques applied to the data.

Table 11-1 below provides the geological mapping and coal tonnage estimation criteria used for the coal resource and reserve evaluation. These cut-off parameters have been developed by MM&A based on its experience with the Alpha Property and are typical of mining operations in the Central Appalachian coal basin. This experience includes technical and economic evaluations of numerous properties in the region for the purposes of determining the economic viability of the subject coal reserves.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 11-1: General Reserve & Resource Criteria

Item	Parameters	Technical Notes & Exceptions*
• **General Reserve Criteria**		
Reserve Classification	Reserve and Resource	Coal resources as reported are inclusive of coal reserves.
Reliability Categories	Reserve (Proven and Probable) Resource (Measured, Indicated & Inferred)	To better reflect geological conditions of the coal deposits, distance between points of observation is determined via statistical analysis
Proven and Measured Classification	0.25 Mile, (1320') Projection form Measurement Point	Based on 11.1.1 Analysis
Probable and Indicated Classification	0.25 to 0.75 Mile, (1320' to 3960') Projection form Measurement Point	Based on 11.1.1 Analysis; Required for Reserve or Resource Classification

Classification	Measurement Point	Resource Classification
Inferred Classification	0.75 to 3.0 Mile, (3960' to 15,840) Projection form Measurement Point	Based on 11.1.1 Analysis
Effective Date of Resource Estimate	December 31, 2021	Coal resources were estimated based upon depletion maps as of September 30, 2021, and a fourth quarter 2021 production depletion adjustment.
Effective Date of Reserve Estimate	December 31, 2021	Coal reserves were estimated based upon depletion maps as of September 30, 2021, and a fourth quarter 2021 production depletion adjustment
Seam Density - with Raw Seam Analysis	1.25 + (Raw Ash% / 100)	
Seam Density - without Raw Seam Analysis	Estimated by (1) assuming specific gravity of 1.30 for coal and 2.25 for rock parting	
• **Underground-Mineable Criteria**		
Map Thickness	Total seam thickness	
Minimum Seam Thickness	30 inches	Minor Exceptions for localized zones of thinner coal
Minimum Mining Thickness	48 to 54 inches	
Minimum Total Coal Thickness	30 inches	Minor Exceptions for localized zones of thinner coal
Minimum In-Seam Wash Recovery	Determined as function of seam thickness	
Wash Recovery Applied to Coal Reserves	Based on average yield for drill holes within reserve area, or in the absence of laboratory washability data, based on estimated visual recovery using specific gravities noted above and 95 percent yield on "clean" coal	
Out-of-Seam Dilution Thickness for Run-of-Mine Tons Applied to ROM tonnages	Delta between minimum mining thickness (54 inches) and seam thickness	2 inches minimum OSD
Mine Barrier	200-foot distance from abandoned mines and 50' sealed or pillared areas of active Alpha mines	
Minimum Reserve Tonnage	400 thousand recoverable tons for individual area (logical mining unit)	
Minimum Overburden Depth	100 feet	
Minimum Interval to Rider Coal	Considered on a case-by-case basis, depending on interval lithology, etc.	
Minimum Interval to Overlying or Underlying Reserves	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Minimum Interval to Overlying or Underlying Mined Areas	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Adjustments Applied to Coal Reserves	6.0 percent moisture increase; 5 percent preparation plant inefficiency	

Note: Exceptions for application of these criteria to reserve estimation are made as warranted and demonstrated by either actual mining experience or detailed data that allows for empirical evaluation of mining conditions. Final classification of coal reserve is made based on the pre-feasibility evaluation.

11.1.1 Geostatistical Analysis

MM&A completed a geostatistical analysis on drill holes within the reserve boundaries to determine the applicability of the common United States classification system for measured and indicated coal resources. Historically, the United States has assumed that coal within ¼-mile (1,320 feet) of a point of

observation represents a measured resource whereas coal between ¼-mile (1,320 feet) and ¾-mile (3,960 feet) from a point of observation is classified as indicated. Inferred resources are commonly assumed to be located between ¾-mile (3,960 feet) and 3 miles (15,840 feet) from a point of observation. Per SEC regulations, only measured and indicated resources may be considered for reserve classification, respectively as proven and probable reserves.

MM&A performed a geostatistical analysis test of the MWVUG, Black Eagle data set using the Drill Hole Spacing Analysis (*DHSA*) method. This method attempts to quantify the uncertainty of applying a measurement from a central location to increasingly larger square blocks and provides recommendations for determining the distances between drill holes for measured, indicated, and inferred resources.

To perform DHSA the data set was processed to remove any erroneous data points, clustered data points, as well as directional trends. This was achieved through the use of histograms, as seen in *Figure 11-1*, color coded scatter plots showing the geospatial positioning of the borings, *Figure 11-2*, and trend analysis.

Figure 11-1: Histogram of the Total Seam Thickness for the Eagle Seam Present in the MWVUG Complex

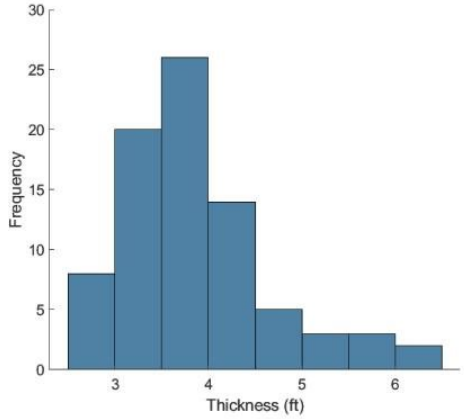
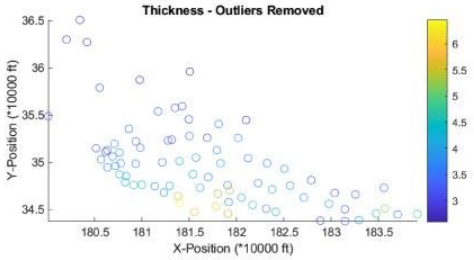


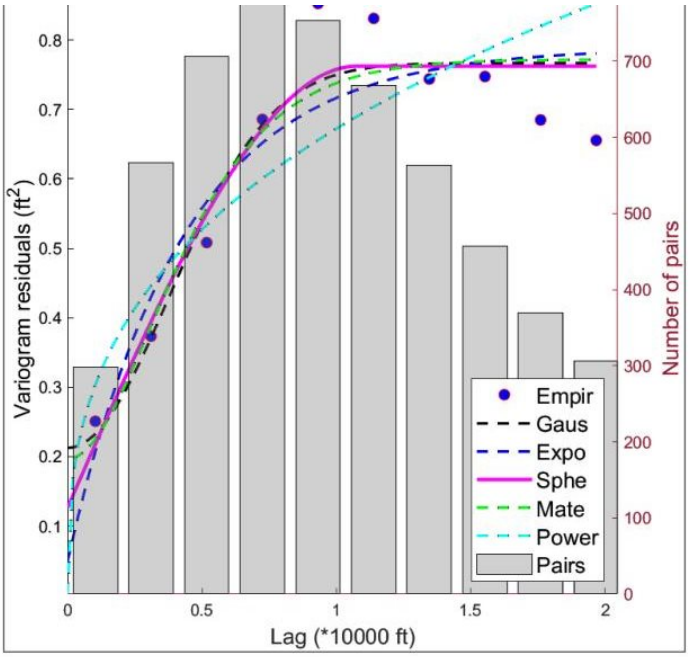
Figure 11-2: Scatter plot of the Total Seam Thickness for the Eagle Seam Present in the MWVUG Complex



Following the completion of data processing, a variogram of the data set was created, *Figure 11-3*. The variogram plots average square difference against the separation distance between the data pairs. The separation distance is broken up into separate bins defined by a uniform lag distance (e.g., for a lag distance of 500 feet the bins would be 0 – 500 feet, 501 – 1,000 feet, etc.). Each pair of data points that are less than one lag distance apart are reported in the first bin. If the data pair is further apart than one lag distance but less than two lag distances apart, then the variance is reported in the second

bin. The numerical average for differences reported for each bin is then plotted on the variogram. Care was taken to define the lag distance in such a way as to not overestimate any nugget effect present in the data set. Lastly, modeled equations, often spherical, gaussian, or exponential, are applied to the variogram in order to represent the data set across a continuous spectrum.

Figure 11-3: Variogram of the Total Seam Thickness for the Eagle Seam Present in the MWVUG Complex



The estimation variance is then calculated using information from the modeled variogram as well as charts published by Journel and Huijbregts (1978). This value estimates the variance from applying a single central measurement to increasingly larger square blocks. Care was taken to ensure any nugget effect present was added back into the data. This process was repeated for each test block size.

The final step of the process is to calculate the global estimation variance. In this step the number square blocks that would fit inside the selected study area is determined for each block size that was investigated in the previous step. The estimation variance is then divided by the number of blocks that would fit inside the study area for each test block size. Following this determination, the data is then transformed back to represent the relative error in the 95th-percentile range.

Figure 11-4 shows the results of the DHSA performed on the Eagle seam data for the MWVUG Complex. DHSA provides hole to hole spacing values, these distances need to be converted to radius from a central point to compare to the historical standards. A summary of the radius data is shown in *Table 11-2*. DHSA prescribes measured, indicated, and inferred drill hole spacings be determined at the 10-percent, 20-percent, and 50-percent levels of relative error, respectively.

Figure 11-4: Result of DHSA for the Eagle Seam Present in the MWVUG Complex

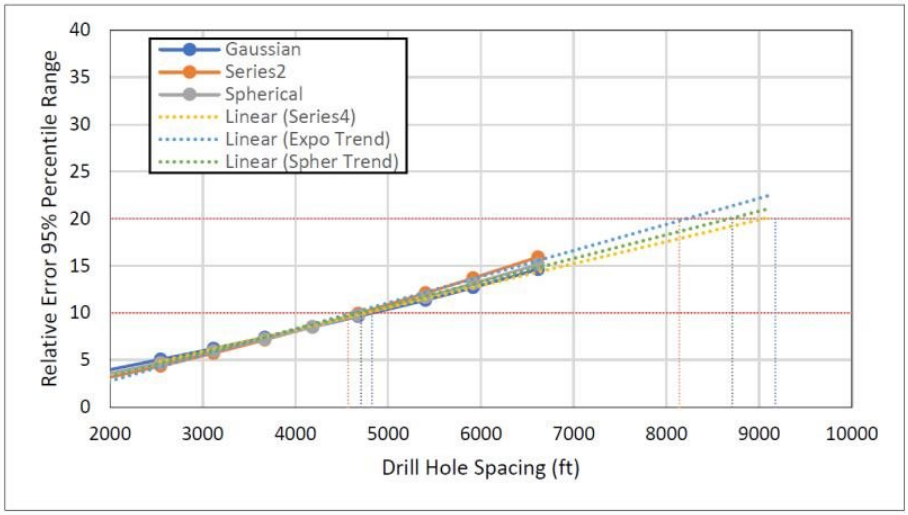


Table 11-2: DHSA Results Summary for Radius from a Central Point

Model:	Measured Radial Distance (10% Relative Error) (Miles)	Indicated Radial Distance (20% Relative Error) (Miles)	Inferred Radial Distance (50% Relative Error) (Miles)
Gaussian:	0.46	0.87	2.10
Spherical:	0.45	0.82	1.96
Exponential:	0.43	0.77	1.79

Comparing the results of the DHSA to the historical standards, it is evident that the historical standards are more conservative than even the most conservative DHSA model with regards to determining measured resources. The Spherical model recommends using a radius of 0.45 miles for measured resources compared to the historical value of 0.25 miles. With respect to indicated resources the DHSA falls in line closely with the historical standards. The Spherical model recommends using a radius 0.82 miles, while the Gaussian model recommend a radius of 0.87 miles and Exponential model recommend a radius of 0.77 miles. These values line up closely with the historical radius of 0.75 miles. These results

have led the QP's to report the data following the historical classification standards, as outlined in **United States Geological Survey** Circular 891 rather than use the results of the DHSA.

11.2 Resources Exclusive of Reserves

The MWVUG property contains multiple resource blocks which were not deemed to exhibit reserve potential at the time of the study. These resources, formally identified as resources exclusive of reserves, are in the: Chilton, Upper, Middle and Lower Cedar Groves, Powellton, Eagle, Glen Alum

Tunnel, Beckley and Fire Creek seams. Reasons which may preclude elevation of resources to reserves include, but are not limited to:

1. Limited availability of quality information to document coal seam market characteristics.
    a. Chilton Seam – *Map 1*: limited metallurgical analysis
2. Coal quality inconsistent with typical metallurgic properties preferred for coking coal.
    a. Chilton Seam – *Map 1*: historically not a coking coal, sulfur >1%
3. Isolation of resource blocks in which seam access costs are cost prohibitive at the time of the study.
    a. Titan Middle Cedar Grove – *Map 4*: eastern resource block isolated from reserve by below cutoff coal thickness
    b. Black King Lower Cedar Grove – *Map 5*: isolated block bound on three sides by abandoned mine workings
    c. Brown's Branch Powellton – *Map 7*: resource along White Castle abandoned mine works due to limited access and poor geometry for a new mine
    d. Glen Alum Tunnel – *Map 9*: resource located in two blocks, north of the sandstone washout
4. Unfavorable economics at the PFS level, yet economics could become attractive in the future under different market conditions.
    a. Castle II Peerless - *Map 6*: raw coal haul distance and difficult up-dip access
    b. 10-B Area Powellton Seam – *Map 7*: uncertain access through a sealed existing mine or a faceup where the surface is not controlled
    c. Mountain Laurel Beckley – *Map 10*: below-drainage slope access and raw haul to coal processing
    d. Mountain Laurel Fire Creek – *Map 11*: below-drainage slope access and raw haul to coal processing

5. Exclusion from LOM planning by mining operator due to remaining resource blocks which are relatively small, isolated blocks and not currently attractive from an operational perspective.
    a. 10-B Area Powellton Seam - *Map 7*: uncertain access through a sealed existing mine or a faceup where the surface is not controlled
    b. Panther Eagle – *Map 8*: two small coal blocks between the Horse Creek mine workings and the outcrop that will be isolated when the mine is sealed
    c. Sycamore Eagle– *Map 8*: isolated block
    d. Roland Beckley - *Map 10*: isolated block where additional mineral control is needed for access
6. Mineability constraints due to over/under mining, underground conditions and physical locations.
    a. Ellis Upper Cedar Grove – *Map 3*: area where interburden to Middle Cedar Grove >30 feet
    b. Dow Fork Eagle – *Map 8*: inferred resource adjacent to inclusive LOM plan
    c. Sycamore Eagle – *Map 8*: mine plan is not defined as whether deep mine or surface mine. Jurisdictional water determinations have not been completed for a surface assessment.
    d. Mountain Laurel Beckley – *Map 10*: two below-drainage coal blocks located on the north side of Beckley, West Virginia. Overburden depth is 360 feet to 920 feet. These blocks are questionable due to permitting and potential liability of a mine under an urban area with shopping malls, residential areas, Interstate and State highways.
    e. Mountain Laurel Fire Creek – *Map 11*: single coal block laced approximately 70 feet to 110 feet below the Mountain Laurel Beckley. Would require an in-mine slope from the Beckley seam for access.

11.2.1 Initial Economic Assessment

MM&A completed an initial economic assessment to determine the potential economic viability of resources exclusive of reserves. MM&A applied relevant technical factors to estimate potential saleable tons without the resource blocks, should the resources be extracted via deep, continuous mining methods. MM&A developed cash cost profiles for the resource blocks, including direct cash costs (labor, supplies, roof control, maintenance and repair, power, and other); washing, trucking, materials handling, general and administrative, and environmental costs; and indirect cash costs (royalties, production taxes, property tax, insurance). Costs were developed based off relevant cost drivers (per-ft, per-raw-ton, per-clean-ton). Additionally, MM&A estimated capital costs to access resources. Capital costs associated with mine development were amortized across the resource's potential saleable tonnages). Additional non-cash items (depreciation of equipment and depletion) and cash costs were compared to an assumed sale price of $130 per ton netback FOB loadout

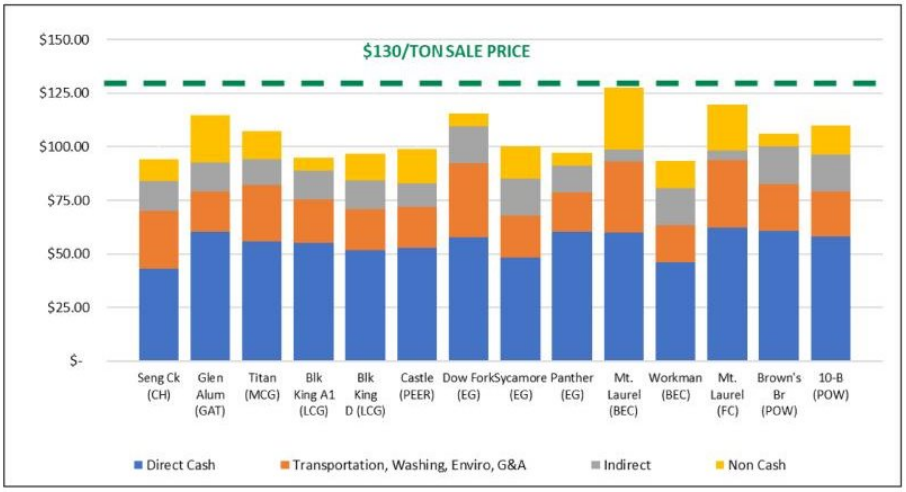
Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

(approximately $171 per ton U.S. East Coast basis) for high-volatile markets. This resource assumed sales value was developed as a premium to the market-based reserve sales value to properly estimate the sales related expenses should these resources be extracted during higher-than-average market conditions. Pricing used for the primary product was selected by the QP and deemed reasonable based on a review of historical average pricing for the MWVUG complex coal products over the past 5 years. Results of the analysis are shown below and demonstrate potential profitability on a fully loaded cost basis. Detailed summaries are shown in *Appendix B*.

Table 11-3: Results of Initial Economic Assessment ($/ton)

Mine	Resource Block	Direct Cash	Transportation, Washing, Enviro, G&A	Indirect	Non-Cash	Total Cost	Fully Loaded P&L
Seng Creek	Chilton	$43.07	$26.89	$14.17	$10.11	$94.24	$5.76
Glen Alum	GAT	$60.22	$18.99	$13.57	$21.93	$114.72	$15.28
Titan Block D	MCG	$55.93	$26.05	$12.27	$13.12	$107.37	$22.63
Black King Block A1	LCG	$54.97	$20.25	$13.57	$6.00	$94.79	$35.21
Black King Block D	LCG	$51.60	$19.38	$13.57	$12.22	$96.77	$33.23
Castle Peerless	PEER	$52.93	$18.89	$11.17	$15.92	$98.90	$1.10
Dow Fork Eagle	EG	$57.60	$34.53	$17.47	$6.00	$115.61	$14.39
Sycamore Eagle	EG	$48.32	$19.37	$17.47	$15.01	$100.17	$29.83
Panther Eagle	EG	$60.34	$18.42	$12.27	$6.00	$97.03	$32.97
Beckley Mt. Laurel	BEC	$59.85	$33.03	$5.77	$28.80	$127.45	$2.55
Beckley Workman	BEC	$46.12	$17.20	$17.47	$12.77	$93.56	$36.44
Fire Creek Mt. Laurel	FC	$62.31	$31.53	$4.47	$21.22	$119.53	$10.47
Brown's Br Powellton	POW	$60.83	$21.71	$17.47	$6.00	$106.01	$23.99
Powellton Block 10-B	POW	$57.95	$21.01	$17.47	$13.37	$109.80	$20.20

Figure 11-5: Results of Initial Economic Assessment



11.3 Qualified Person's Estimates

Based on the work previously described and detailed modelling of those areas, considering all the modifying actors, a coal resource estimate, summarized in *Table 11-4*, was prepared as of December 31, 2021, for property controlled by Alphas MWVUG operating unit.

Table 11-4: Coal Resources Summary as of December 31, 2021

Area/Mine	Seam	Coal Resource (Dry Tons, In Situ)			
		Measured	Indicated	Inferred	Total
Inclusive of Reserve					
Laurel Area	Hernshaw	19,404,000	5,902,000	0	25,306,000
Round Bottom UCG	Upper Cedar Grove	4,427,000	1,810,000	0	6,237,000
Seng Creek UCG	Upper Cedar Grove	7,343,000	2,249,000	0	9,592,000
Coon Cedar Grove	Upper Cedar Grove	4,264,000	182,000	0	4,446,000
Ellis Cedar Grove	Upper Cedar Grove	4,869,000	31,000	0	4,899,000
Titan	Middle Cedar Grove	10,849,000	4,649,000	0	15,498,000
Low Gap	Middle Cedar Grove	1,920,000	14,000	0	1,935,000
Black King LCG	Lower Cedar Grove	19,018,000	3,146,000	0	22,164,000
Berwind	Lower Cedar Grove	6,315,000	251,000	0	6,566,000
Elk Run - Hunter Peerless	Peerless	18,307,000	8,787,000	0	27,094,000
Browns Branch	Powellton	48,420,000	30,227,000	0	78,647,000
Browns Branch High Seam	Powellton	11,033,000	11,807,000	0	22,840,000
Roundbottom	Powellton	4,292,000	2,237,000	0	6,528,000
Beetree	Powellton	1,005,000	333,000	0	1,338,000
Slip Ridge Powellton	Powellton	1,094,000	271,000	0	1,364,000
Dow Fork	Eagle	30,546,000	13,104,000	2,000	43,652,000
Dow Fork	Eagle	33,792,000	15,540,000	0	49,332,000
Panther Eagle	Eagle	14,128,000	5,933,000	0	20,062,000
Horse Creek	Eagle	659,000	615,000	0	1,274,000
Clear Fork/Horse Creek	Eagle	1,110,000	28,000	0	1,139,000
Glen Alum Tunnel	Glen Alum Tunnel	9,700,000	3,449,000	0	13,149,000
Workman	Beckley	50,253,000	43,362,000	0	93,615,000
Subtotal	**Subtotal**	**302,748,000**	**153,928,000**	**2,000**	**456,677,000**
Exclusive of Reserve					
Elk Run - Seng Creek	Chilton	14,555,000	11,353,000	0	25,907,000
Titan	Middle Cedar Grove	393,000	8,000	0	401,000
Black King LCG	Lower Cedar Grove	4,589,000	644,000	0	5,234,000
Elk Run (Castle II)	Peerless	13,584,000	4,533,000	0	18,117,000
Browns Branch	Powellton	11,451,000	1,613,000	0	13,064,000
Browns Branch High Seam	Powellton	0	0	185,000	185,000
Powellton 10-B	Powellton	3,533,000	211,000	0	3,744,000
Dow Fork	Eagle	0	0	1,327,000	1,327,000
Panther Eagle	Eagle	843,000	634,000	0	1,477,000
Sycamore	Eagle	7,217,000	888,000	0	8,105,000
Glen Alum Tunnel	Glen Alum Tunnel	1,403,000	451,000	0	1,854,000
Workman	Beckley	2,934,000	5,605,000	57,000	8,596,000
Mountain Laurel	Beckley	14,800,000	14,565,000	55,000	29,420,000
Mountain Laurel	Fire Creek	4,389,000	1,506,000	0	5,895,000
Subtotal	**Subtotal**	**79,691,000**	**42,011,000**	**1,624,000**	**123,326,000**
Grand Total					
Inclusive of Reserve		302,748,000	153,928,000	2,000	456,677,000
Exclusive of Reserve		79,691,000	42,011,000	1,624,000	123,326,000
Grand Total		**382,439,000**	**195,939,000**	**1,626,000**	**580,004,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Note (3): The Property contains 121.7 million tons (Mt) of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

11.4 Qualified Person's Opinion

While there is some stratigraphically controlled seam-thickness variability due to seam splitting, sand channels, etc., MM&A geologists and engineers modeled the deposit and resource areas to reflect realistic mining scenarios, giving special consideration to seam thickness, floor and roof conditions, mining equipment, etc. This statistical study demonstrates that for each configuration of mineable seams, the classification system of **measured** (0 – ¼ mile), **indicated** (¼ to ¾ mile), and **inferred** (¾ to 3 miles) is reasonably adequate to predict seam thickness variation for modeling and mining purposes.

Based on MM&A's geostatistical analysis, it would be possible to extend the measured, and indicated arcs slightly beyond historically accepted practices due to consistent geological settings. The QP's have again elected not to extend arc distances, introducing a level of conservatism in measured and indicated coal classification.

Based on the data review, the attendant work done to verify the data integrity and the creation of an independent Geologic Model, MM&A believes this is a fair and accurate representation of the MWVUG coal resources.

12 Mineral Reserve Estimates

12.1 Assumptions, Parameters and Methodology

Coal Reserves are classified as *proven* or *probable* considering "modifying factors" including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors.

- **Proven Coal Reserves** are the economically mineable part of a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.
- **Probable Coal Reserves** are the economically mineable part of an indicated coal resource, and in some circumstances a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.

Upon completion of delineation and calculation of coal resources, MM&A generated a LOM plan for MWVUG. The footprint of each reserve area is shown on the maps in *Appendix C*. The Mine plan was generated based on 5-year budget mine plans provided by Alpha and supplemented with additional projections by MM&A to reflect LOM plans that honor property control limits, geologic mapping, or other factors determined during the evaluation.

Carlson Mining software was used to generate the LOM plan for MWVUG. The mine plan was sequenced based on productivity schedules provided by Alpha. MM&A judged the productivity estimates and plans to be reasonable based on experience and current industry practice.

Raw, ROM production data outputs from LOM plan sequencing were processed into Microsoft® EXCEL spreadsheets and summarized on an annual basis for processing into the economic model. Average seam densities were estimated to determine raw coal tons produced from the LOM plan. Average mine recovery and wash recovery factors were applied to determine coal reserve tons.

Coal reserve tons in this evaluation are reported at a 6.0-percent moisture and represent the saleable product from the Property.

Pricing data as provided by Alpha is described in *Table 16-2*. The pricing data assumes a flat-line long term realization of $144 per short ton port pricing, with an average $104.65 per ton netback pricing reflective of the product currently sold at MWVUG. These estimates are based on long-term pricing published by third party sources and adjusted for quality and transportation.

The coal resource mapping and estimation process, described in the report, was used as a basis for the coal reserve estimate. Proven and probable coal reserves were derived from the defined coal resource considering relevant processing, economic (including technical estimates of capital, revenue, and cost), marketing, legal, environmental, socio-economic, and regulatory factors and are presented on a moist, recoverable basis.

As is customary in the US, the categories for proven and probable coal reserves are based on the distances from valid points of measurement as determined by the QP for the area under consideration. For this evaluation, measured resource, which may convert to a proven reserve, is based on a ¼-mile radius from a valid point of observation.

Points of observation include exploration drill holes, and mine measurements which have been fully vetted and processed into a geologic model. The geologic model is based on seam depositional modeling, the interrelationship of overlying and underlying strata on seam mineability, seam thickness trends, the impact of seam structure, intra-seam characteristics, etc. Once the geologic model was completed, a statistical analysis, described in *Section 11.1.1* was conducted and a ¼-mile radius from a valid point of observation was selected to define Measured Resources.

Likewise, the distance between ¼ and ¾ of a mile radius was selected to define Indicated Resources. Indicated Resources may convert to Probable Reserves.

Inferred Resources (greater than a ¾-mile radius from a valid point of observation) have been excluded from Reserve consideration.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

12.2 Underground Coal Reserves

MWVUG Property reserves are derived from multiple coal seams as shown on *Figure 7-1*. Demonstrated reserve tons are listed in the discussion below. *Table 12-1* shows the demonstrated tonnage by Proven and Probable status.

12.2.1 Laurel Hernshaw (*Map 2*)

Laurel Hernshaw demonstrated reserves are 4.6 Mt clean recoverable tons. The Hernshaw seam is

generally characterized by two benches of coal with an approximate 0.5-foot to 1.0-foot shale parting. The parting thickness increases and the seam splits in the southern portion of the reserve, forming the southern reserve boundary. The average Hernshaw seam thickness of the reserve is 4.7 feet. The roof and floor rock are typically shale. A localized sandstone channel is present in the immediate roof and in the floor in the northeast portion of the reserve. This area is not included as a reserve due to mine cuttability.

12.2.2 Coon/Ellis Upper Cedar Grove (UCG) (*Map 3*)

Coon UCG demonstrated reserves are 0.8 Mt clean recoverable tons, and Ellis area demonstrated Reserves are 0.9 Mt clean recoverable tons. Coon reserves are the remaining, unmined portion of the Coon Cedar Grove deep mine and the Ellis reserve is located on the ridge south of Coon.

The UCG is generally two benches separated by an approximate 1-foot to 3-foot parting. The parting thickness increases and the seam splits in the northeast portion of the reserve, forming the eastern Coon reserve boundary. The average seam thickness of the reserve is 5.4 to 6.1 feet. Roof rock is generally sandstone, and the floor is shale. The southern limit of reserves is marked by a sandstone channel that has cut into the seam, eroding most of the coal. The northern limit to the Ellis reserve is defined by less than 30-foot of interburden to the mined out Middle Cedar Grove seam.

12.2.3 Round Bottom/Seng Creek Upper Cedar Grove (UCG) (*Map 3*)

Round Bottom UCG demonstrated reserves are 1.9 Mt clean recoverable tons, and Seng Creek UCG demonstrated reserves are 2.7 Mt clean recoverable tons. The reserves are located in two blocks separated by thin, below-cutoff coal zone. Due to low coal between the blocks, separate portal areas are proposed for each reserve. The roof is generally sandstone, and a sandstone channel has likely eroded the coal, forming the thin coal zone. Additionally, one drill hole in the north block indicates a complete seam washout. The floor is mostly shale and will be cuttable developing through the low coal zone. The seam generally contains 3 to 4 coal benches separated by thin partings. The average seam thickness of the reserves is 4.2 feet.

12.2.4 Titan Middle Cedar Grove (MCG) (*Map 4*)

Titan MCG Demonstrated reserves are 5.2 Mt clean recoverable tons. Republic surface mine has developed a faceup area for the Titan mine. The roof and floor rock are generally cuttable shale. The

seam is generally 1 to 2 coal benches separated by thin partings. A third, lower bench is present in the western part of the reserve creating a thicker seam and coal. The average seam thickness of the reserve is 3.20 feet. Sulfur averages greater than 1% west of the reserve area, although MM&A has no coal quality analysis within the reserve. With no washed coal quality analysis within the reserve boundary, the reserve is classified as a Probable Reserve.

12.2.5 Low Gap Middle Cedar Grove (MCG) (*Map 4*)

Low Gap MCG demonstrated reserves are 0.6 Mt clean recoverable tons. The reserve is located on the hilltop immediately north of the MWV Deep Office. The reserve is an extension of the Marsh Fork Mine, west of the low gap that is below the crop line. The roof and floor rock are generally cuttable shale. A sandstone is present in the roof in the southeast area of the reserves and has reduced the coal/seam thickness. The seam is generally comprised of two coal benches separated by thin parting. A third, lower bench, is present in the central part of the reserve creating a thicker seam and coal. The average seam thickness of the reserve is 3.46 feet.

12.2.6 Black King Lower Cedar Grove (LCG) (*Map 5*)

Black King LCG Demonstrated reserves are 9.9 Mt clean recoverable tons. The reserve is located adjacent to and north and west of the closed Black King 1 Mine. Roof rock is mostly sandstone, and the floor is cuttable shale. The northeast reserve limit is defined by a sandstone washout of the coal seam. The seam is generally one clean bench of coal. The average seam thickness of the reserve is 2.81 feet. An isolated seam block south of the Black King Mine is classified as a resource due difficult reserve access.

12.2.7 Berwind Area Lower Cedar Grove Seam (LCG) (*Map 5*)

Berwind LCG Demonstrated reserves are 2.2 Mt clean recoverable tons. The reserve is located west of Hazy Creek. Roof rock is thick sandstone, and the floor is cuttable shale. The seam is generally one clean bench of coal. The average seam thickness of the reserve is 2.8 feet. An isolated seam block northwest of the reserve is classified as a resource due to access through below cutoff coal.

12.2.8 Elk Run Hunter Peerless Seam (*Map 6*)

Elk Run Hunter Peerless seam demonstrated reserves are 6.8 Mt clean recoverable tons. The reserve is unmined areas west and east of the closed Hunter Peerless mine. Access to the reserves will require rehabilitation to the closed mine, and due to uncertain conditions of the mine the reserve is classified as Probable. The Peerless seam is comprised of two distinct coal beds separated by a 0.5-foot to 3.0-foot shale parting. The parting thickens to the south and the seam eventually splits. Access to the eastern reserve will be through splitting, thick parting coal seam. The roof rock is shale, and the floor rock is shale or sandstone. The average seam thickness of the reserve is 5.6 feet. The Peerless sulfur is greater than 2% and will likely need to be blended with lower sulfur coal and/or sold in specialty market.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

12.2.9 Browns Branch Powellton Seam (*Map 7*)

Browns Branch Powellton seam demonstrated reserves are 18.8 Mt clean recoverable tons. The Browns Branch area includes the area from Browns Branch east to the Elk Run impoundment, from the White Knight Mine to north of the Revolution Mine. The Powellton seam is comprised of multiple coal benches with shale partings. Locally, the parting to the top bench thickens and the top bench is not considerate part of the minable seam. The roof rock is shale and sandstone, and the floor rock is shale. No hard cutting areas were identified. The average seam thickness of the reserve is 3.78 feet.

An isolated High Seam area where the No. 2 Gas seam has merged with the Powellton seam is located near the Elk Run Impoundment. The High Seam demonstrated reserves are 2.5 Mt clean recoverable tons. The average seam thickness of the reserve is 9.32 feet. The projected inseam yield is 31%.

12.2.10 Slip Ridge and Bee Tree Powellton Seam (*Map 7*)

Slip Ridge area Powellton reserve is located north of the Brushy Fork Impoundment and south of Little Marsh Fork and would be accessed by two portals. Slip Ridge and Bee Tree Powellton seam Demonstrated reserves are 0.6 Mt and 0.5 Mt clean recoverable tons, respectively. The seam is comprised of one coal bench generally void of any partings. Roof rock is shale and sandstone on the east portion of the reserve and the floor rock is shale and fireclay. The average seam thickness of the reserve is 2.7 to 2.9 feet.

12.2.11 Roundbottom Powellton (*Map 7*)

Roundbottom Powellton reserve is the remaining reserve of the closed Roundbottom mine. The reserves are located in barrier blocks and north of the existing mine workings. Access to the reserves will require rehabilitation to the closed mine, and due to uncertain conditions of the mine the reserve is classified as Probable. Demonstrated reserves are 1.5 Mt clean recoverable tons. The average seam thickness of the reserve is 3.57 feet.

12.2.12 Panther Eagle Seam (*Map 8*)

Panther Eagle reserve is actively being mined. Demonstrated reserves are 6.1 Mt clean recoverable tons. The seam generally has two coal benches separated by a thin 0.15-foot to 0.30-foot parting. Roof rock is dominated by sandstone and may have washed out the upper coal bench where the seam thins below cutoff. The floor rock is mostly shale making the seam cuttable. The average seam thickness of the reserve is 3.16 feet.

12.2.13 Horse Creek and Clear Fork Eagle Seam (*Map 8*)

Horse Creek and Clear Fork Eagle are two remaining reserve blocks to be mined from the active Horse Creek mine. Reserves were calculated for the blocks and the reserve blocks are projected to be totally exhausted in 2022. The seam contains two coal benches separated by an approximately 0.3-foot

parting. Roof rock is shale and sandstone, and the floor rock is generally shale. The average seam thickness of the reserve is 3.2 feet.

12.2.14 Black Eagle Mine - Eagle Seam (*Map 8*)

Black Eagle reserve is actively being mined. Demonstrated reserves are 12.8 Mt clean recoverable tons. The seam contains two distinct coal benches with a parting up to 0.5 feet thick. The roof is mostly sandstone with localized thin shale between the seam and sandstone main roof. The floor is generally shale. The average seam thickness of the reserve is 3.5 feet.

12.2.15 Dow Fork Eagle Seam (*Map 8*)

Dow Fork Eagle Demonstrated reserves are 10.1 Mt clean recoverable tons. The seam, consistent with other Eagle reserves, is two distinct coal benches separated by a parting. Parting is less than 1.0 foot in the west and northeast portions of the reserve. The parting thickness increases in the center portion of the reserve and eventually splits the seam creating the reserve southern limit. The roof rock is dominated by sandstone in the west and east with shale roof common in the center portion on the reserve. Floor rock is shale. The average seam thickness of the reserve is 4.5 feet.

12.2.16 Glen Alum Tunnel Seam (*Map 9*)

Glen Alum Tunnel mine faceup is currently being developed in the Workman Creek area. Demonstrated reserves are 2.3 Mt clean recoverable tons. The seam is composed of multiple coal benches and partings. The parting above the lower coal bench increases to over 15 feet in the center portion of the property, splitting the reserve into two blocks. The reserve is bound by a sandstone channel that has eroded the coal seam to the north and outcrop to the south. Roof and floor rock is predominantly shale with isolated areas of sandstone. The average seam thickness of the reserve is 4.7 feet.

12.2.17 Workman Beckley Seam (*Map 10*)

Workman Beckley seam reserve is below drainage and located east of the Workman Creek facilities and west of Interstate Highway I77. Demonstrated reserves are 26.2 Mt clean recoverable tons. Overburden thickness ranges from 600 feet to over 2,000 feet along the ridges. The roof is typically sandstone with areas of shale roof. The west and east reserve limits are bound by north-south trending sandstone seam washout zones. The closed and abandoned Bonny mine encountered small scale, localized seam washouts within the reserve. Additional, unidentified seam washouts are likely within the reserve. The floor rock is generally shale. Previous mining in the Bonny and Beckley mines indicate in situ horizontal stress and methane gas will be present. The average seam thickness of the reserve is 4.3 feet.

12.3 Qualified Person's Estimates

The coal reserves, as shown in *Table 12-1*, are based on a technical evaluation of the geology and a preliminary feasibility study of the coal deposits. The extent to which the coal reserves may be affected

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

by any known environmental, permitting, legal, title, socio-economic, marketing, political, or other relevant issues has been reviewed rigorously. Similarly, the extent to which the estimates of coal reserves may be materially affected by mining, metallurgical, infrastructure and other relevant factors has also been considered.

The results of this TRS define an estimated 117.5 Mt of proven and probable marketable coal reserves. The maps included in *Appendix C* reflect mining depletion at the time of the resource/reserve calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion

calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
	By Reliability Category			By Control Type				
Seam	Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%*
Hernshaw	3,562,000	1,021,000	4,583,000	0	4,583,000	5	0.8	36
Upper Cedar Grove	5,225,000	1,123,000	6,348,000	0	6,348,000	9	0.8	35
Middle Cedar Grove	632,000	5,238,000	5,870,000	0	5,870,000	6	1.1	37
Lower Cedar Grove	10,634,000	1,437,000	12,071,000	0	12,071,000	5	0.8	36
Peerless	0	6,820,000	6,820,000	0	6,820,000	6	1.6	-
Powellton	13,716,000	10,093,000	23,809,000	0	23,809,000	6	1.0	34
Eagle	20,240,000	9,255,000	29,494,000	315,000	29,180,000	5	0.8	33
Glen Alum Tunnel	1,812,000	488,000	2,300,000	154,000	2,146,000	6	1.4	26
Beckley	13,343,000	12,851,000	26,195,000	1,558,000	24,636,000	5	0.9	20
Grand Total	**69,165,000**	**48,326,000**	**117,491,000**	**2,027,000**	**115,464,000**	**6**	**0.9**	**31**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory analysis from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
**Some reserves lack coal quality. As such, Ellis, Seng Creek and Round Bottom Lower Cedar Grove reserves are priced as High-Vol A. Low Gap Middle Cedar Grove and Berwind Lower Cedar Grove reserves are priced as High-Vol A. Peerless reserves were priced as High-Vol B and the Powellton reserves were priced as High-Vol A.*
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

12.4 Qualified Person's Opinion

The estimate of coal reserves was determined in accordance with the new SEC Guidelines which will become effective for the first fiscal year falling on or after January 1, 2022.

The LOM mining plan for MWVUG was prepared to the level of preliminary feasibility. Mine projections were prepared, and timing scheduled to match production with coal seam characteristics. Production timing was carried out from current locations to depletion of the coal reserve area. Coal reserve estimates could be materially affected by the risk factors described in *Section 22.2*.

Based on the Preliminary Feasibility Study and the attendant Economic Review, MM&A believes this is a fair and accurate calculation of the MWVUG coal reserves.

13 Mining Methods

Twenty underground mining areas were modeled and tested economically. Once the Resources were calculated, mine plans were created to project operating each resource area to depletion, with crews and equipment scheduled to move to subsequent mining areas as depletion occurs. Underground mine operations are projected to be exhausted in 2068. Individual mine lives range from 2 to 34 years.

13.1 Geotech and Hydrology

Mining plans for potential underground mines were developed by Alpha and MM&A. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS)* program that was developed by NIOSH. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan.

Hydrology has not been an issue of concern at MWV Deep. Based on numerous site visits to the underground operations of the property by the QP's, it has been determined that this is not a significant concern. Mining of future reserves is projected to occur in areas which exhibit similar hydrogeological characteristics as those formerly mined areas.

13.2 Production Rates

Operations at MWVUG by Alpha and its predecessors have been on-going for many years. The Mine plan and productivity expectations reflect historical performance and efforts have been made to adjust the plan to reflect future conditions. MM&A is confident that the mine plan is reasonably representative to provide an accurate estimation of coal reserves. Mine development and operation have not been optimized within the TRS.

Carlson Mining software was used by MM&A to generate mine plans for the mineable coal seams. Mine plans were sequenced based on productivity schedules provided by Alpha, which were based on historically achieved productivity levels. All production forecasting ties assumed production rates to geological models as constructed by MM&A's team of geologists and mining engineers.

The MWVUG Mining Complex currently operates three underground mines with a total of seven (7) operating sections. The Horse Creek Eagle mine is phasing out of production as reserves deplete and one of the operating sections will be introduced into Panther Eagle Mine. The Glen Alum mine is located in the Workman Creek surface area and is currently being developed and will accept one operating section. The projected underground mines are set up similarly to the currently active operation. Black Eagle will operate three production sections, Panther Eagle will operate two production sections and the Glen Alum Mine will operate two production sections. All sections are configured with dual continuous miners in a super section operation. In all cases, mines are forecasted to produce coal two shifts each day. Production is scheduled Monday through Friday each week, and every other Saturday.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

As shown in *Table 13-1*, the twenty areas planned for underground mines produce coal until 2068. Clean coal production varies directly with coal thickness.

Table 13-1: MWV Deep Complex Underground Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
Laurel Hernshaw	0	0	0	0	0	0	0	0
Black King LCG Brown's Br	0	0	0	0	0	0	0	0
Seng Creek Roundbottom UCG	0	0	0	0	0	0	0	0
Seng Creek UCG	0	0	0	0	0	0	0	0

Seng Creek UCG	0	0	0	0	0	0	0	0
Berwind LCG	0	0	0	0	0	0	0	0
Low Gap MCG	0	0	0	0	0	0	0	0
Titan MCG	0	0	0	0	0	0	0	0
Coon UCG	0	0	0	0	0	0	0	0
Ellis UCG	0	0	0	0	0	0	0	0
Castle Peerless	0	0	0	0	0	0	0	0
Hunter Peerless	0	0	0	0	0	0	0	0
Brown's Branch Powellton	0	0	0	0	0	0	0	0
Slip Ridge Powellton	0	0	0	0	0	0	0	0
Bee Tree Powellton	0	0	0	0	0	0	0	0
Roundbottom Powellton	0	0	0	0	0	0	0	0
Black Eagle	297	1,260	1,244	1,207	1,044	982	939	863
Dow Fork Eagle	0	0	0	0	0	184	538	567
Horse Creek Eagle	206	467	0	0	0	0	0	0
Panther Eagle	134	531	560	683	605	537	552	520
Workman's Creek Beckley	0	0	0	0	0	0	0	0
Glen Alum Tunnel	0	147	619	579	520	401	36	0
Total	**637**	**2,404**	**2,423**	**2,468**	**2,169**	**2,103**	**2,064**	**1,950**

Mine Name	2029	2030	2031	2032	2033	2034	2035	2036
Laurel Hernshaw	0	0	0	0	183	318	325	334
Black King LCG Brown's Br	0	0	0	0	0	83	590	580
Seng Creek Roundbottom UCG	0	0	0	0	0	0	0	0
Seng Creek UCG	0	0	0	0	0	0	0	0
Berwind LCG	0	0	0	0	0	0	0	0
Low Gap MCG	0	0	0	0	0	0	0	0
Titan MCG	0	0	0	0	0	0	0	0
Coon UCG	0	0	0	0	0	0	0	0
Ellis UCG	0	0	0	0	0	0	0	0
Castle Peerless	0	0	0	0	0	0	0	0
Hunter Peerless	0	0	0	0	0	0	0	0
Brown's Branch Powellton	0	0	0	0	0	101	669	622
Slip Ridge Powellton	0	0	0	0	34	247	254	18
Bee Tree Powellton	0	0	11	252	188	0	0	0
Roundbottom Powellton	0	0	0	0	0	0	0	0
Black Eagle	890	878	873	869	889	653	65	0
Dow Fork Eagle	563	565	541	504	523	595	609	650
Horse Creek Eagle	0	0	0	0	0	0	0	0
Panther Eagle	556	611	514	272	117	0	0	0
Workman's Creek Beckley	0	0	0	0	0	85	760	1,247
Glen Alum Tunnel	0	0	0	0	0	0	0	0
Total	**2,009**	**2,053**	**1,940**	**1,896**	**1,933**	**2,082**	**3,271**	**3,450**

Mine Name	2037	2038	2039	2040	2041	2042	2043	2044
Laurel Hernshaw	318	285	282	294	286	285	330	318
Black King LCG Brown's Br	600	572	571	576	579	594	564	552
Seng Creek Roundbottom UCG	0	0	0	0	0	0	0	0
Seng Creek UCG	0	0	0	0	0	0	0	0
Berwind LCG	0	0	0	0	0	0	0	0
Low Gap MCG	0	0	0	0	0	0	0	0
Titan MCG	0	0	0	0	0	0	0	121
Coon UCG	0	0	0	0	0	0	0	0
Ellis UCG	0	0	0	0	0	0	0	0
Castle Peerless	0	0	0	0	0	0	0	0
Hunter Peerless	0	0	0	0	0	0	0	0
Brown's Branch Powellton	595	528	525	552	570	625	769	734
Slip Ridge Powellton	0	0	0	0	0	0	0	0
Bee Tree Powellton	0	0	0	0	0	0	0	0
Roundbottom Powellton	0	0	0	0	0	0	0	0
Black Eagle	0	0	0	0	0	0	0	0
Dow Fork Eagle	630	574	564	648	667	581	515	128
Horse Creek Eagle	0	0	0	0	0	0	0	0
Panther Eagle	0	0	0	0	0	0	0	0
Workman's Creek Beckley	1,338	1,364	1,343	1,403	1,526	1,450	1,381	1,728
Glen Alum Tunnel	0	0	0	0	0	0	0	0
Total	**3,481**	**3,323**	**3,286**	**3,473**	**3,628**	**3,535**	**3,558**	**3,581**

Mine Name	2045	2046	2047	2048	2049	2050	2051	2052
Laurel Hernshaw	319	324	347	35	0	0	0	0
Black King LCG Brown's Br	547	557	587	586	589	576	447	167
Seng Creek Roundbottom UCG	0	0	0	0	0	0	0	318
Seng Creek UCG	0	0	0	0	0	0	0	0
Berwind LCG	0	0	0	0	0	279	311	305
Low Gap MCG	0	0	0	0	0	0	193	295
Titan MCG	280	272	352	688	631	630	602	551
Coon UCG	0	0	0	0	0	0	239	381
Ellis UCG	0	0	0	0	0	0	309	382
Castle Peerless	0	0	0	0	0	0	110	430
Hunter Peerless	0	0	0	0	0	0	0	0
Brown's Branch Powellton	671	576	589	615	661	660	653	658
Slip Ridge Powellton	0	0	0	0	0	0	0	0
Bee Tree Powellton	0	0	0	0	0	0	0	0
Roundbottom Powellton	0	0	0	0	0	0	0	0
Black Eagle	0	0	0	0	0	0	0	0
Dow Fork Eagle	0	0	0	0	0	0	0	0
Horse Creek Eagle	0	0	0	0	0	0	0	0
Panther Eagle	0	0	0	0	0	0	0	0
Workman's Creek Beckley	2,079	2,091	1,960	2,073	2,044	1,628	674	22
Glen Alum Tunnel	0	0	0	0	0	0	0	0
Total	**3,896**	**3,820**	**3,835**	**3,998**	**3,924**	**3,773**	**3,538**	**3,508**

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Mine Name	2053	2054	2055	2056	2057	2058	2059	2060
Laurel Hernshaw	0	0	0	0	0	0	0	0
Black King LCG Brown's Br	0	0	0	0	0	0	0	0
Seng Creek Roundbottom UCG	364	377	383	353	152	0	0	0
Seng Creek UCG	179	336	322	291	299	330	356	302
Berwind LCG	302	301	256	351	50	0	0	0
Low Gap MCG	144	0	0	0	0	0	0	0
Titan MCG	595	408	108	0	0	0	0	0
Coon UCG	163	0	0	0	0	0	0	0
Ellis UCG	217	0	0	0	0	0	0	0

Castle Peerless	594	598	565	546	575	315	64	0
Hunter Peerless	0	477	860	862	758	755	803	923
Brown's Branch Powellton	658	597	613	662	633	659	635	569
Slip Ridge Powellton	0	0	0	0	0	0	0	0
Bee Tree Powellton	0	0	0	0	0	0	0	0
Roundbottom Powellton	165	343	373	275	290	64	0	0
Black Eagle	0	0	0	0	0	0	0	0
Dow Fork Eagle	0	0	0	0	0	0	0	0
Horse Creek Eagle	0	0	0	0	0	0	0	0
Panther Eagle	0	0	0	0	0	0	0	0
Workman's Creek Beckley	0	0	0	0	0	0	0	0
Glen Alum Tunnel	0	0	0	0	0	0	0	0
Total	**3,380**	**3,438**	**3,480**	**3,340**	**2,756**	**2,123**	**1,858**	**1,794**
Mine Name	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
Laurel Hernshaw	0	0	0	0	0	0	0	0
Black King LCG Brown's Br	0	0	0	0	0	0	0	0
Seng Creek Roundbottom UCG	0	0	0	0	0	0	0	0
Seng Creek UCG	298	0	0	0	0	0	0	0
Berwind LCG	0	0	0	0	0	0	0	0
Low Gap MCG	0	0	0	0	0	0	0	0
Titan MCG	0	0	0	0	0	0	0	0
Coon UCG	0	0	0	0	0	0	0	0
Ellis UCG	0	0	0	0	0	0	0	0
Castle Peerless	0	0	0	0	0	0	0	0
Hunter Peerless	746	415	220	0	0	0	0	0
Brown's Branch Powellton	757	862	741	591	564	767	483	132
Slip Ridge Powellton	0	0	0	0	0	0	0	0
Bee Tree Powellton	0	0	0	0	0	0	0	0
Roundbottom Powellton	0	0	0	0	0	0	0	0
Black Eagle	0	0	0	0	0	0	0	0
Dow Fork Eagle	0	0	0	0	0	0	0	0
Horse Creek Eagle	0	0	0	0	0	0	0	0
Panther Eagle	0	0	0	0	0	0	0	0
Workman's Creek Beckley	0	0	0	0	0	0	0	0
Glen Alum Tunnel	0	0	0	0	0	0	0	0
Total	**1,801**	**1,277**	**961**	**591**	**564**	**767**	**483**	**132**

*LOM tonnage evaluated in the financial model includes 3.8 million tons for Castle Peerless underground mine, which failed to achieve positive economic results, as well as 4th quarter 2021 production (466,599 clean tons) which was subtracted from coal reserves in order to make the effective date of reserves December 31, 2021.

13.3 Mining Related Requirements

13.3.1 Underground

A mine plan with sequenced mining projections was prepared for each logical mining unit. For each mine plan, the appropriate number of production units is selected for the resource area, and a productivity level assigned, expressed in feet of advance per unit-shift of production. The productivity is based on the equipment and personnel configuration, mining height and expected physical conditions.

13.4 Required Equipment and Personnel

13.4.1 Underground Mines

13.4.1.1 Panther Eagle Mine (Map 8)

The Panther Eagle Mine is currently a two-section room-and-pillar mine operating in the Eagle Seam. The location is near the Marfork Preparation Plant with its run-of-mine (*ROM*) product transported by conveyor belt to the plant's Raw Coal Stockpiles. The mine produces metallurgical grade coal from leased mineral property. The mine started production in 2017.

One production unit utilizes a mobile bridge unit in lieu of shuttle cars while the other is a traditional supersection.

Production is scheduled for approximately 265 days each year, which represents production on Monday through Friday plus every other Saturday. On each day, production sections are scheduled to produce coal on two shifts. The sections are configured as super sections with two continuous miners used for production on each section. Productivity is planned at the rate of 270 feet of advance per shift on the super section and 250 feet per shift from the bridge unit.

Principal production equipment for the super section includes two continuous miners, two roof bolters, four shuttle cars, and one scoop. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is transported to the Raw Coal Stockpiles at the preparation plant.

Principal production equipment for the bridge unit includes one continuous miner, two roof bolters, mechanical bridge unit and one scoop. Coal is extracted from the production face with the continuous miner and transported to the section conveyor belt by the bridge unit. The mine conveyors carry the coal to the surface and then to the Raw Coal Stockpile at the preparation plant.

Coal is then transported by means of surface conveyors to the Raw Coal Stockpile at the Marfork Preparation Plant where it is processed and loaded onto CSX rail for transport to the consumer.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

The Panther Eagle mine is operational at the time of this report; all necessary infrastructure and utilities are in place; all necessary permits have been obtained. Estimated expenditures for site closure and reclamation are included in the financial model for this site.

Plans to develop a Coal Handling Facility at Dorothy, West Virginia would include transporting the run-of-mine coal from future mines located along Clear Fork through the Panther Eagle mine to the Marfork Preparation Plant. The required environmental permits have been acquired which allows the Panther Eagle Mine to develop a portal in the Clear Fork watershed.

Eagle Mine to develop a portal in the Clear Fork watershed.

The Mine is scheduled to deplete its mining assignment in 2033.

13.4.1.2 Black Eagle Mine (Map 8)

The Black Eagle Mine, which is currently operational with two (2) continuous mining sections producing coal in the Eagle seam on leased mineral property. The Black Eagle Mine started production in 2019.

The Black Eagle Mine is a two (2) section mine with each working section operated as a super section (two sets of mining equipment operating simultaneously and sharing a common dumping point on the same section, with each set being ventilated by a separate split of intake air) Each super section operates two (2) Continuous Miners, two (2) Roof Bolters, four (4) Shuttle Cars and one (1) scoop. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stockpiled. Coal is then transported via highway truck haulage to the Marfork Preparation Plant where it is processed and loaded into CSX rail for transport to the consumer.

A third continuous miner unit will be added during calendar year 2022.

Additional plans are in place for a set of ventilation shafts at the western side of the boundary. This will provide the necessary ventilation to support the operations through its assignment.

A Materials Handling Project to use a surface conveyor belt system to transport the Black Eagle product to the Marfork Preparation Plant has been discussed but is not currently within the CAPEX budget for the operation. The conveyor system would replace the truck haul that is currently being used.

Long range plans include the development of a Coal Handling Facility to accommodate the future mines in the Powellton and Upper Cedar Grove Seams. The facility would be located in Browns Branch of the West Fork of the Pond Fork River, roughly 8 miles west of the Marfork Preparation Plant.

The Black Eagle mine is operational at the time of this report with all necessary infrastructure and utilities in place. All necessary permits have been obtained. Estimated expenditures for site closure and reclamation are included in the financial model for this site.

The mine is scheduled to deplete its mining assignment in 2035.

13.4.1.3 Glen Alum Tunnel Mine at Workman's Creek (Map 9)

The Glen Alum Tunnel Seam produces a premium metallurgical coal. The current 5-year plan projects the development of a two-section room-and-pillar mine near the Workman's Creek Coal Handling Facility. There is an existing SMRCA permit for the mineral boundary and the location adjacent to the active Coal Handling Facility will provide an economical method to transport the product back to the Marfork Preparation Plant.

The mine will produce metallurgical grade coal using two (2) active sections with two (2) continuous miners, two (2) roof bolters, three (3) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is placed in a stockpile before being loaded on off-highway trucks to transport to the Workman's Creek Coal Handling Facility. The Workman's Creek Coal Handling Facility uses an underground conveyor system that travels through three underground mines in three different seams to reach the Marfork Preparation Plant approximately 8 miles to the west.

Operating life for the proposed mine is forecast as 4 years – 8 months with two operating sections.

13.4.1.4 Dow Fork Eagle (Map 8)

The Dow Fork Eagle Mine is located in the Clear Fork watershed north of the Marfork Preparation Plant. The mineral boundary has two existing environmental permits for portals. The portal site is located on Dow Fork of Long Branch of the Clear Fork of the Coal River. The site is an existing contour surface mine area that is part of the Republic Mining Complex. The reserve can support two operating areas for two continuous miner production sections.

The product would be transported by highway trucks. The one-way haul distance to the proposed Clear Fork Coal Handling Facility is 6.96 miles. Coal would be placed into a stockpile prior to being transported on an underground and surface conveyor system to the Marfork Preparation Plant. The one-way haul distance directly to the Marfork Preparation Plant is 15.14 miles.

The report includes an initial starting date in 2026 with a second production unit starting in 2027. One continuous mining production unit will deplete its assignment in 2043 and the second production unit would deplete its assignment in 2044.

13.4.1.5 Bee Tree Powellton (Map 7)

The Bee Tree Powellton area is located along the Powellton Seam outcrop upstream of the Marfork Preparation Plant. The mining area is relatively small and would be mined using the bridge conveyor mining unit from the Panther Eagle Mine.

Principal production equipment for the bridge unit includes one continuous miner, two roof bolters, mechanical bridge unit and one scoop. Coal is extracted from the production face with the continuous

miner and transported to the section conveyor belt by the bridge unit. The mine conveyors carry the coal to the surface and then to the Raw Coal Stockpile at the preparation plant.

A haul road would be constructed from the valley floor up to the Powellton Seam contour bench level. The faceup would be along a newly exposed highwall to eliminate the potential hazard of weathered rock walls.

The run of mine product would be transported by off highway trucks for a distance of 2.8 miles to the Raw Coal Stockpiles at the Marfork Preparation Plant.

Operating life for the mine is forecast as 22 months for one production unit.

13.4.1.6 Slip Ridge Powellton (Map 7)

The Slip Ridge Powellton area is the successor to the Bee Tree Powellton. Slip Ridge Powellton will be located on an existing contour surface mine bench. The White Queen mine operated in the Number 2 Gas seam and punched out in Slip Ridge. The Slip Ridge Powellton portal is adjacent to the White Queen surface site and will share facilities. This will be a bridge unit utilizing the mobile bridge conveyor system.

Principal production equipment for the bridge unit includes one continuous miner, two roof bolters, mechanical bridge unit and one scoop. Coal is extracted from the production face with the continuous miner and transported to the section conveyor belt by the bridge unit. The mine conveyors carry the coal to the surface and then to the Raw Coal Stockpile at the preparation plant.

The run of mine product would be transported by off highway trucks for a distance of 3.8 miles to the Raw Coal Stockpiles at the Marfork Preparation Plant.

The report includes an initial starting date in 2033. The mining will complete in 2036. Operating life for this mine is forecast as twenty-seven months (2 years – 3 months).

13.4.1.7 Laurel Hernshaw (Map 2)

The Laurel Hernshaw Mine is located in Laurel Branch of Clear Fork. Previous mining in the area included the Laurel Eagle and Laurel Alma Mines in the 1990's and the basic infrastructure including haul roads and stockpile areas remain.

The Laurel Hernshaw Mine will be a single super section continuous miner operation. A new mine bench will be constructed above the former portal location for the Laurel Alma Mine. Mine product would be deposited into the Laurel Alma stockpile area.

The product would be transported by highway trucks. The one-way haul distance to the proposed Clear Fork Coal Handling Facility is 2.13 miles. Coal would be placed into a stockpile prior to being transported on an underground and surface conveyor system to the Marfork Preparation Plant. The one-way haul distance directly to the Marfork Preparation Plant is 10.31 miles.

Operating life for this mine is forecast as 14 years – 8 months with one production unit.

13.4.1.8 Titan Cedar Grove (Map 4)

The Titan Cedar Grove Mine is located in the Clear Fork watershed north of the Marfork Preparation Plant. The portal site is located on Long Branch of the Clear Fork of the Coal River. The site will be created with a new bench and fill area. The reserve can support two operating areas for two continuous miner production super sections.

The product would be transported by highway trucks. The one-way haul distance to the proposed Clear Fork Coal Handling Facility is 5.26 miles. Coal would be placed into a stockpile prior to being transported on an underground and surface conveyor system to the Marfork Preparation Plant. The one-way haul distance directly to the Marfork Preparation Plant is 13.44 miles.

Operating life for this mine is forecast as 11 years – 0 months.

13.4.1.9 Brown's Branch Powellton (Map 7)

The Powellton Seam in the Brown's Branch area will be accessed by excavating a boxcut. The excavation will provide space to install portals and a conveyor system. The boxcut provides an alternative to accessing below drainage coal seams that would involve shaft and slope construction.

The mine will support two continuous miner units.

The construction would include a conveyor belt system to transport the coal from the faceup at the bottom of the boxcut to a stockpile at the Brown's Branch Coal Handling Facility.

The boxcut will be located near the access to the Eagle seam in the Black Eagle Mine. The access would be a gloryhole excavation in the terms of a vertical shaft 300 feet deep. Coal would be dropped into

the gloryhole to a feeder at the Eagle Seam level. The feeder would distribute the coal onto the conveyor system in the Black Eagle Mine. The coal product would then be transported to the Marfork Preparation Plant for processing and shipping on the CSX rail system.

Operating life for this mine is forecast as 33 years – 9 months for two production units.

13.4.1.10 Black King Lower Cedar Grove at Browns Branch (Map 5)

The Lower Cedar Grove Seam would be accessed by excavating a contour portal area and a stockpile

The Lower Cedar Grove Seam would be accessed by excavating a contour portal area and a stockpile area. Surface support facilities such as a mine office, change house, warehousing, parking, electrical power, water, sewage and parking would be provided on site.

The mine will produce metallurgical grade coal using two (2) active sections with two (2) continuous miners, two (2) roof bolters, three (3) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is placed in a stockpile before being loaded to a proposed gloryhole construction to the Black Eagle Mine where the run-of-mine product would be transported to the Marfork Preparation Plant.

Mine life is forecast as 17 years – 10 months for two operating sections.

13.4.1.11 Beckley Seam at Workman's Creek (Map 10)

The Beckley Seam is a metallurgical coal that has been regionally mined for over a century. Remaining reserve locations of this size are rare. In as much, there is a considerable effort to be made to reach this reserve body.

Historic mines in the area include the Bonny Mine, New Beckley Mine, Maple Meadow and Arch's Beckley Mine. The coal appears in pod type deposits in that mineable height is located in a small region that correlates with its deposition.

The coal seam is at 600 feet depth below the valley floor. Access to the seam will be by slope and shaft methods. Construction time will be considerable before coal can be produced from the development.

The mine is projected with five (5) continuous miner units operating as super sections. Coal would be transported to the surface through a slope constructed with a conveyor galley on the top and a haulage galley in the bottom of the excavation. From the surface, the coal can be transported to the Workman's Creek Coal Handling Facility by proposed surface conveyors with final delivery to the Marfork Preparation Plant for processing and loading onto the CSX rail system.

The mine life is 17 years – 4 Months with an average of four operating sections.

13.4.1.12 Coon Upper Cedar Grove (Map 3)

The Coon Cedar mine is maintained in a non-production active status. The coal conveyor haulage system from Workman's Creek requires that the mine be maintained to meet the requirements of the federals and state regulations. The mine is ventilated and inspected on a regular basis. Additionally, a small workforce is available for maintaining the conveyor system and any maintenance work that develops.

A small reserve block remains for the Coon Cedar Mine. Mining would use the existing infrastructure for access and support. The run-of-mine coal would use the coal conveyor system to transport the product to the Marfork Preparation Plant for processing and loading onto the CSX rail system.

Operating life for this mine is forecast as 2 years – 0 months for one production section.

13.4.1.13 Low Gap Middle Cedar Grove (Map 4)

The Low Gap area hosts the coarse refuse disposal area. Access to the site is provided by a well-developed system of roads that have supported the coarse refuse disposal area, a Cedar Grove Seam Mine to the east and two Powellton Seam mines.

Access to the site will require the construction of a new access road to reach the outcrop on the western side of the valley. A contour mine bench would be created to access the seam and coal transport off the bench to the Powellton Seam level below would be accomplished with conveyors.

The mine would be a single super section mine operating along a relatively narrow ridgetop.

Coal would be transported 1.2 miles by truck down the existing haul road to the Marfork Preparation Plant where the product would be processed and shipped by rail on the CSX rail system.

Operating life for this mine is forecast as 2 years – 3 months for one production section.

13.4.1.14 Ellis Upper Cedar Grove (Map 3)

The Ellis Cedar Grove Mine has received its environmental permits. The mine is projected in the Upper Cedar Grove Seam in Ellis Creek off Marsh Fork, approximately 3.3 miles south of the Marfork Preparation Plant. The portal area will be located adjacent to the existing portal facility that was constructed as part of the Slip Ridge Cedar Grove Mine in the Middle Cedar Grove Seam. In as much, infrastructure such as haul roads, drainage control and utilities have been available at the site.

The mine would feature a single super section with two (2) continuous miners, two (2) roof bolters, three (3) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

conveyor. The conveyors carry the coal to the outside, where it is placed in a stockpile before being loaded onto trucks to be hauled for a distance of 9.4 miles to the Marfork Preparation Plant.

Operating life for this mine is forecast as 2 years – 11 months for one production section.

13.4.1.15 Berwind Lower Cedar Grove (Map 5)

The Berwind Cedar Grove area is an isolated block in the Lower Cedar Grove Seam. The portal location has been set along a tributary of Hazy Creek of Marsh Fork and is located approximately 5.6 miles

has been set along a tributary of Hazy Creek of Marsh Fork and is located approximately 5.6 miles southwest of the Marfork Preparation Plant. No environmental permits have been acquired for this reserve at this time.

The portal area will utilize existing infrastructure as well as new construction to build a contour bench for the portal area. The excess material would be placed below the contour bench to create a stockpile area for the mine product.

The mine will develop through an area of low coal to reach the body of the reserve.

The mine would feature a single super section with two (2) continuous miners, two (2) roof bolters, three (3) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is placed in a stockpile before being loaded onto trucks to be hauled for a distance of 11.0 miles to the Marfork Preparation Plant.

Operating life for this mine is forecast as 7 years – 1 month for one production section.

13.4.1.16 Seng Creek Upper Cedar Grove (Map 3)

The Seng Creek Cedar Grove area is located on Seng Creek of the Big Coal River. The faceup area is located approximately 4.1 miles north of the Marfork Preparation Plant. No environmental permits have been acquired for this proposed facility.

The portal area would be reached by excavating an access road to the Upper Cedar Grove level and creating a contour bench. The excess material would be placed below the contour bench to create a stockpile area for the mine product.

The mine will develop through an area of low coal to reach the body of the reserve.

The mine would feature a single super section with two (2) continuous miners, two (2) roof bolters, three (3) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the

conveyor. The conveyors carry the coal to the outside, where it is placed in a stockpile before being loaded onto trucks to be hauled for a distance of 8.8 miles to the Marfork Preparation Plant.

Operating life for the mine is forecast as 8 years – 6 months with one production section.

13.4.1.17 Roundbottom Upper Cedar Grove (Map 3)

The Roundbottom Cedar Grove area is located on Roundbottom Branch of the Big Coal River. The faceup area is located approximately 5.2 miles northwest of the Marfork Preparation Plant. No environmental permits have been acquired for this proposed facility.

The portal area would be reached by excavating an access road to the Upper Cedar Grove level and creating a contour bench. The excess material would be placed below the contour bench to create a stockpile area for the mine product.

Existing infrastructure from the Roundbottom Powellton Mine including a haul road and utilities access would assist in the construction of the mine faceup.

The mine would feature a single super section with two (2) continuous miners, two (2) roof bolters, three (3) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is placed in a stockpile before being loaded onto trucks to be hauled for a distance of 7.5 miles to the Marfork Preparation Plant.

Operating life for this mine is forecast as 5 years – 4 months for one production section.

14 Processing and Recovery Methods

14.1 Description or Flowsheet

The MWVUG Division currently includes the Marfork Preparation Plant in addition to the supporting mines. The plant was originally constructed in 1994 and received its latest upgrade in 2019.[1] The plant produces a typical product with an ash content of 7.42% and typical sulfur content of 1.02% at a utilization rate of 53.62% in 2021. The infrastructure includes four (4) distinct raw coal stockpiles and seven (7) distinct clean coal stockpiles. The plant itself includes separation equipment including a heavy media vessel, cyclones, froth flotation, spirals, centrifugal dryers, screens, pumps and sumps. The plant design feed rate is 2400 tons per hour.

[1] Coal Age Magazine, October 2021, Prep Plant Census

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Coarse and fine refuse are disposed at the Brushy Branch Impoundment and coarse refuse disposal is supplemented at the Low Gap Refuse Disposal Facility.

Plant feed can be blended from the different stockpiles and plant products can be blended during the loading process.

The flood railroad loadout is serviced by the CSX rail system. The empty train is cut once to create two strings for loading a 150-car unit train. Coal is recovered from the clean coal stockpiles by a reclaim

belt located in a tunnel beneath the stockpiles.

Processes and equipment are typical of those used in the coal industry and are in use in nearly all plants in the Central Appalachian Basin.

14.2 Requirements for Energy, Water, Material and Personnel

Personnel have historically been sourced from the surrounding communities in Raleigh, Kanawha, Fayette, and Boone Counties, and have proven to be adequate in numbers to conduct processing operations at MWV Deep. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners.

Water is sourced locally from public water sources or rivers, and electricity is sourced from American Electric Power. The service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc.

15 Infrastructure

Alpha's Marfork preparation plant services the area with washed coal, which is transported via the CSX rail line at the plant's loadout. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to the preparation plant. This practice will continue for future reserves.

15.1 Marfork Preparation Plant

The preparation plant and associated refuse disposal areas have been established and maintained to provide a modern coal processing facility. Product flexibility is available with the in-bound product transportation systems that maximize the ability of the facility to reach regional reserves. Unique to the Marfork infrastructure is an existing transportation system that utilizes conveyor belts in underground mines as well as surface conveyors to transport raw coal to the facility for processing. This allows the plant ability to bring feed from considerable distance without incurring the cost of trucking over highways. Additionally, the rock content of the mine product does not impact the transportation cost as much as a trucking cost due to the efficiency of the conveyors.

Product flexibility includes surface and underground mine production that is processed or shipped directly to the CSX rail system. The various areas and different seams provide a method to offer a wide variety of coal products for the customer.

The coal handling ability in both the raw coal and clean coal areas allows for separating different types of coals for servicing different customer's needs. The existing blending capabilities and the variety of coal seams reporting to the facility allows for a custom coal to be provided.

An aerial photo of the facility follows in *Figure 15-1*:

Figure 15-1: Marfork Facilities

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

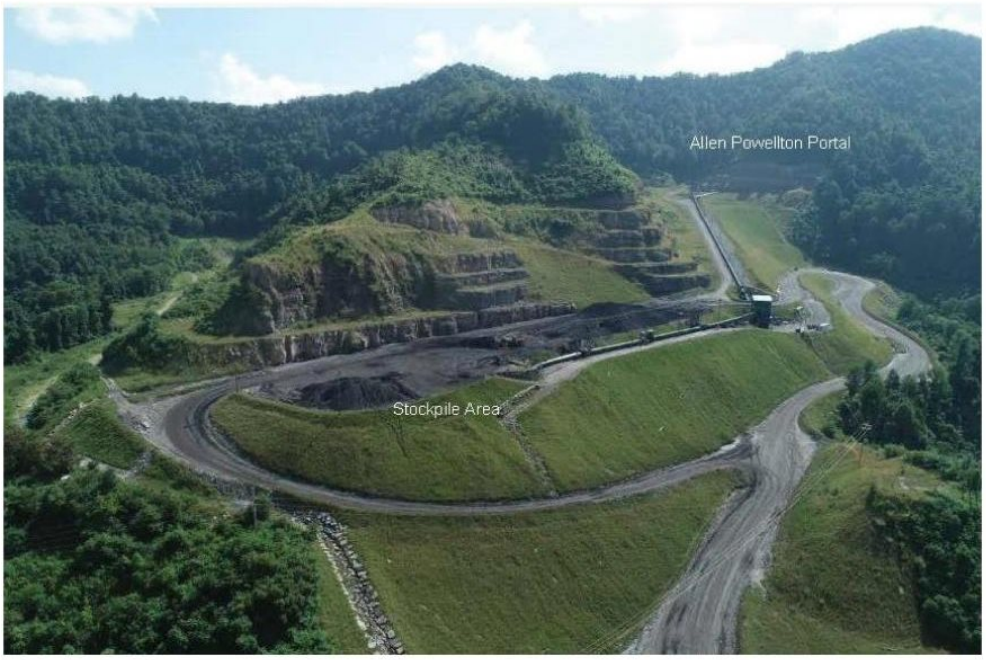
15.2 Workman's Creek Coal Handling Facility

The existing transport system reaches from the preparation plant approximately 8 miles to the east to the Workman Creek Coal Handling Facility. The facility provides transport for coal product from the existing surface mine operations surrounding the site generally located within the Rowland Land holdings. Coal is transported to the Marfork Preparation Plant for processing and shipping metallurgical and steam products.

The Coal Handling Facility includes a stockpile area at the Upper Powellton level. The stockpile area feeds coal onto a conveyor system that enters the non-producing Allen Powellton Mine. The conveyor system travels through underground mines and surface areas to transport the product to the Marfork Preparation Plant for processing and shipment on the CSX rail system. The conveyor system covers 10.7 miles in total.

An aerial view of the Workman's Creek Coal Handling Facility is shown in *Figure 15-2*.

Figure 15-2: Workman's Creek Coal Handling Facility



15.3 Underground Conveyor Coal Transport System

Starting at the Workman's Creek Coal Handling Facility, the coal transportation system consists of a conveyor belt system that travels through three non-producing coal mines to reach the Marfork Preparation Plant. The transportation system provides an economical alternative to trucking coal over large distances to reach existing preparation and shipping facilities.

The Allen Powellton Mine is used to transport from the Workman's Creek Coal Handling Facility to the mine's original portal area in Horse Creek. The mine's original stockpile area and overland conveyor to the portal in the Slip Ridge Cedar Grove Mine is utilized for the transportation system. The overall underground conveyor distance is 18,825 feet.

The Horse Creek Coal Handling Facility provided coal transportation for the Horse Creek Eagle Mine and the Allen Powellton Mine. The Allen Powellton Mine recently ceased production in 2021 and the Horse Creek Eagle Mine is projected to close in early 2022. With the mine closings, the coal transport system will be dedicated to the operations at Workman's Creek.

From the Horse Creek Coal Handling Facility, the coal is transported in the Slip Ridge Cedar Grove Mine located in the overlying Middle Cedar Grove Seam. The Slip Ridge Cedar Grove Mine has been idled since 2020. The underground conveyors transport the coal to the Brushy Creek Portal on the face of the impoundment. The overall underground conveyor distance is 17,363 feet.

The conveyor system daylights and crosses the impoundment face to the Coon Cedar Brushy Creek Portal on the other side of the valley, a distance of 1,570 feet.

The Coon Cedar Mine has been in non-producing status since 2021. This mine is located in the Upper Cedar Grove Seam which is the seam above the Middle Cedar Grove Seam. The underground conveyors transport the coal from the Impoundment Portal for a distance of 9,063 feet to the main portal area in Coon Branch which is located above the raw coal stockpiles.

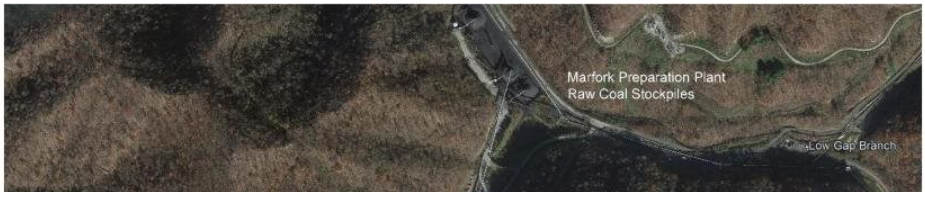
A series of surface conveyors transport the coal from the portal area 4,374 feet to the raw coal stockpiles. At the raw coal stockpiles, the coal can be placed in different stockpiles to provide product separation for blending purposes.

The conveyor system covers 10.7 miles in total.

Figure 15-3 is an aerial view of the conveyor system along the mine benches located in Coon Branch above the Marfork Preparation Plant.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 15-3: Underground Conveyor Coal Transport System



As new areas are developed, the infrastructure requirements will change. These changes have been considered in the LOM plans and financial model.

15.4 Proposed Coal Handling Facility on Clear Fork

The Panther Eagle Mine has been permitted to punchout into the Clear Fork watershed near Dorothy, West Virginia. Included within the plans is the construction of a Coal Handling Facility for bringing coal from the Clear Fork watershed from underground mines:

Table 15-1: Clear Fork Coal Handling Facility

Mine	Raw Tons	Clean Tons
Laurel Hernshaw	10,208,000	4,583,000
Titan MCG	11,266,000	5,238,000
Dow Fork Eagle	22,241,000	10,144,000
Total	**43,714,000**	**19,965,000**

The conveyor system would eliminate 16.4 miles from a highway truck round trip to the Marfork Preparation Plant.

Construction would include a new bridge to span Clear Fork, a stockpile area, a reclaim system and a 3500-ft long overland conveyor belt system from the stockpiles to the Panther Eagle punchout.

Estimated CAPEX costs for the facility are included within the financial model.

15.5 Proposed Coal Handling Facility on Browns Branch of West Fork

Browns Branch is located between the towns of Van and Bandytown in Boone County, West Virginia. The site is approximately 8 miles west of the Marfork Preparation Plant. Two proposed mines located on Brown's Branch are included within this report. The Brown's Branch Powellton and Brown's Branch Lower Cedar Grove Mines would portal near the mouth of the valley and the coal would be transported to the Marfork Preparation Plant by utilizing the Black Eagle Mine's conveyor transportation system.

Table 15-2: Browns Branch Coal Handling Facility

	Raw Tons	Clean Tons
Browns Br Powellton	47,554,000	21,297,000
Browns Br LCG	21,683,000	9,917,000
Total	**69,237,000**	**31,214,000**

A vertical gloryhole would be used to drop the run-of-mine product to the Eagle Seam Level. A vertical shaft is constructed and a feeder system that is placed at the bottom. The vertical shaft performs similar to a coal storage silo and allows the coal to be brought to the lower level in a controlled manner.

Coal would be stockpiled at the mine sites as needed to separate the quality. Coal would be batched through the system to maintain separation for quality control.

Estimated CAPEX costs for the facility are included within the financial model.

15.6 Proposed Overland Conveyor – Black Eagle Mine to Marfork Preparation Plant

Not included within the CAPEX in the financial package is the cost of an overland conveyor system to transport coal from the existing Black Eagle Mine to the Marfork Preparation Plant. The coal is currently transported with highway trucks for a one-way distance of 2.7 miles.

The active Black Eagle Mine will operate until 2035 and will produce approximately 25,000,000 ROM tons during its life span. The Browns Branch Coal Handling Facility will service approximately 70,000,000 raw tons during its lifetime from the Browns Branch Powellton Mine and the Black King LCG Mine. An operations savings could be realized with a conveyor project.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 15-3: Black Eagle Coal Handling Facility

	Raw Tons	Clean Tons
Black Eagle	25,486,000	13,283,000
Browns Br Powellton	47,554,000	21,297,000
Browns Br LCG	21,683,000	9,917,000
Total	**94,723,000**	**44,497,000**

16.1 Market Description

The quality characteristics for the subject coal resources and coal reserves have been reviewed in detail by MM&A. The drill hole data were utilized to develop average coal quality characteristics for the mining site. These average coal quality characteristics were then utilized as the basis for determining the various markets into which the saleable coal will likely be placed.

Quality Specifications for the MWVUG products are as shown in *Table 16-1*.

Table 16-1: Quality Specifications

	HVA
Ash (%)	7.04
Sulfur (%)	1.02
Volatile Matter (%)	31.39

The mine production serves the high-volatile metallurgical markets.

16.2 Price Forecasts

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long-term realization of $144 per short ton port pricing, with an average $104.65 per ton netback pricing reflective of the high-volatile product currently sold at MWVUG. These estimates are based on long-term pricing published by third party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha and their MWVUG business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the MWVUG business unit.

Table 16-2: Price Forecasts

Coal Quality	Market Pricing Per Ton (1) (2)
High-Vol. A	$138
High- Vol. B	$117
Mid-Vol.	$144
Low-Vol.	$144
Thermal	$76

(1) Market pricing shown on U.S. East Coast basis.
(2) Metallurgical and thermal pricing based on 10-year and 3-year average, respectively of forecasted pricing from pricing services.

16.3 Contract Requirements

Some contracts are necessary for successful marketing of the coal. For MWVUG, since all mining, preparation and marketing is done in-house, the remaining contracts required are:

> **Transportation** – Alpha contracts with the CSX Railroad to transport coal to market

> **Sales** – Sales contracts are a mix of spot and contract sales. With the volatility of the market, long-term contracts are not typically written.

17 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals

17.1 Results of Studies

MM&A completed an environmental review in 2011 of the Massey properties acquired by Alpha, including those operations that were active at MWVUG at that time. The environmental review completed by MM&A included site inspections, reviews of historical records, database searches of State and Federal regulatory records and interviews to identify potential recognized environmental conditions (*RECs*) that may create environmental liability for the sites. While MM&A identified RECs during both studies, MM&A's opinion was that those issues would not preclude the continued or future use of the properties as a coal mining/preparation venture.

Based on this former ESA completed by MM&A, it is MM&A's opinion that MWVUG has a generally typical coal industry record of compliance with applicable mining, water quality, and environmental laws. Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models.

17.2 Requirements and Plans for Waste Disposal

Based on a recent engineering review, done by Alpha, approximately 78 years of fine refuse disposal capacity and 66 years of coarse refuse disposal capacity at current rates have been identified, a significant portion of which is permitted and active. Securing additional coarse and fines capacity will be critical to execute the business plan as outlined in this TRS. The table below outlines the current estimated capacities and permits of Marfork's coarse refuse disposal area and slurry impoundment.

Table 17-1: Marfork Refuse Disposal Summary

Refuse Facility	State SMCRA Permit Number	MSHA ID	Refuse Disposal Type	Classified as a Dam	Permit Status	Current Planned Maximum Coarse Life (Approved + Planned)	Current Planned Maximum Fines Life (Approved + Planned)	Est. Coarse/ Combined Refuse Life (Approved/ Permitted)	Est. Fine Refuse Life (Approved/ Permitted)
Brushy Fork Refuse Impoundment	O-3010-95	1211-WV40234-02	Slurry Impoundment - Downstream and Upstream	Yes	Active	48.1	78.5	0.6	21.6
Low Gap Refuse Disposal Area	O-3005-94	1211-WV40234-01	Coarse Refuse Fill	No	Active	18.5	0.0	18.5	0.0

The estimated facility life was based on a 10-year average of 466 acre-feet of slurry storage consumed per year and coarse placement of 4,000,000 refuse tons per year. Total facility capacity provided 66.7 years of coarse refuse storage and 78.5 years of fine storage capacity.

Reclamation permit outlines indicate that both storage facilities have been permitted to the top of the ridgelines to maximize the storage capacity.

The current MSHA approved impoundment design (Crest Elevation 2200 feet) provides 21 years of slurry disposal.

17.3 Permit Requirements and Status

All mining operations are subject to federal and state laws and must obtain permits to operate mines, coal preparation and related facilities, haul roads, and other incidental surface disturbances necessary for mining to occur. Permits generally require that the permittee post a performance bond in an amount established by the regulatory program to provide assurance that any disturbance or liability created during mining operations is properly restored to an approved post-mining land use and that all regulations and requirements of the permits are fully satisfied before the bond is returned to the permittee. Significant penalties exist for any permittee who fails to meet the obligations of the permits including cessation of mining operations, which can lead to potential forfeiture of the bond. Any

company, and its directors, owners and officers, which are subject to bond forfeiture can be denied future permits under the program.[2]

New permits or permit revisions will occasionally be necessary to facilitate the expansion or addition of new mining areas on the Property, such as amendments to existing permits and new permits for mining of reserve areas. Exploration permits also are required. Property under lease includes provisions for exploration among the terms of the lease. New or modified mining permits are subject to a public advertisement process and comment period, and the public is provided an opportunity to raise objections to any proposed mining operation. MM&A is not aware of any specific prohibition of mining on the subject property and given sufficient time and planning, Alpha should be able to secure new permits to maintain its planned mining operations within the context of current regulations. Necessary permits are in place to support current production on the Property, but future permits are required to maintain and expand production. Portions of the Property are located near local communities. Regulations prohibit mining activities within 300 feet of a residential dwelling, school, church, or similar structure unless written consent is first obtained from the owner of the structure. Where required, Alpha reports that such consents have been obtained where mining is proposed beyond the regulatory limits.

Alpha has obtained all mining and discharge permits to operate its mines and processing, loadout or related facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. MWVUG, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

The Mining permits currently held by MWVUG are shown in *Table 17-2.*

[2] Monitored under the Applicant Violator System (AVS) by the Federal Office of Surface Mining.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Table 17-2: MWVUG Mining Permits

Mine Name	Seam	Permit	Status	Expires	Acres Disturbed	Acres Reclaimed	Acres Bonded
Marfork Coal Company, LLC							
RtFk Low Gap BR. Coal. Ref. Dis	-	O-3005-94	Active, no coal removed	6/12/2023	116.95	25.16	249.76
Brushy Fork Slurry Impoundment	-	O-3010-95	Active, no coal removed	11/28/2025	645	88	660.75
Marfork Processing	-	O-3024-93	Active, no coal removed	3/16/2024	100.34	0	100.45
Slip Ridge HWM Surface Mine	2 Gas, Powellton	S-3008-09	Phase 1	8/20/2015	42.85	42.85	55.5
	Chilton, Hernshaw, Coalburg, 2 Gas, Stockton,						

Bee Tree Surface Mine	Winifrede, Eagle, Peerless, Powellton, Cedar Grove	S-3010-04	Inactive	7/11/2026	244.36	141.27	1080.24
Hazy Creek Highwall Mine No. 1	2 Gas, Powellton	S-3017-09	Not Started	10/17/2022	0	0	109.59
Horse Creek Eagle Deep Mine	Eagle	U-3001-04	Active, moving coal	12/23/2024	136.76	2.97	139.73
Black Eagle Deep Mine	Eagle	U-3001-18	Active, moving coal	8/8/2023			109.72
Horse Creek No. 2 Gas Deep Mine	2 Gas	U-3002-04	Active, moving coal	12/23/2024	79.21	3.4	82.61
Bee Tree Powellton re-permit	Powellton	U-3003-18	Not Started	1/30/2024	0	0	3.75
Panther Eagle Deep Mine	Eagle	U-3003-98	Active, moving coal	3/2/2024	8.09	0	32.66
Brushy Eagle #1 Mine	-	U-3006-93	Active, moving coal	10/21/2023	85.65	2.32	102.56
Coon - Cedar Grove Deep Mine	Cedar Grove	U-3009-00	Active, moving coal	12/21/2025	16.41	7.16	23.57
Glen Alum Tunnel Mine	Glen Alum Tunnel	U-3012-09	Not Started	7/11/2022	0	0	14.54
Ellis Upper Cedar Grove Mine	Cedar Grove	U-3013-19	Not Started	9/8/2025	0	0	5.48
Lower Cedar Grove Mine #1	-	U-3013-94	Active, reclamation only	6/7/2026	35.85	0	35.85
Slip Ridge Powellton	2 Gas, Powellton	U-3013-99	Active, no coal removed	5/3/2025	17.36	0	20.46
Parker Peerless Deep Mine	Peerless	U-3014-06	Inactive	4/20/2022	18.32	0	18.78
Beckley Seam Deep Mine	Beckley	U-3017-08	Inactive	12/4/2024	30.16	0	31.19
Slip Ridge Cedar Grove	Cedar Grove	U-3021-00	Active, moving coal	4/29/2022	150.38	0	147.81
Coon Hollow No. 3	-	U-5003-93	Active, no coal removed	6/11/2023	139.01	14.54	162.18

17.4 Local Plans, Negotiations or Agreements

MM&A found no indication of agreements beyond the scope of Federal or State Regulations.

17.5 Mine Closure Plans

Applicable regulations require that mines be properly closed, and reclamation commenced immediately upon abandonment. In general, site reclamation includes removal of structures, backfilling, regrading, and revegetation of disturbed areas. For surface mines, the majority of the expense for backfilling and regrading is completed as part of ongoing mining operations, with only reclamation of final pits and HWM benches required at end-of-mine life. Sediment control is required during the establishment of vegetation, and bond release generally requires a minimum five-year period of site maintenance, water sampling, and sediment control following mine completion. This requirement is reduced to two years for certain operations involving re-mining. Reclamation of underground mines includes closure and sealing of mine openings such as portals and shafts in addition to the items listed above.

Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models. As with all mining companies, an accretion calculation is performed annually so the necessary Asset Retirement Obligations (*ARO*) can be shown as a Liability on the Balance Sheet.

17.6 Qualified Person's Opinion

The MWVUG complex is an operating facility; all necessary permits for current production have been obtained. MM&A knows of no reason that any permits revisions that may be required cannot be obtained.

Estimated expenditures for site closure and reclamation are included in the financial model for this site.

18 Capital and Operating Costs

18.1 Capital Cost Estimate

The production sequence selected for a property must consider the proximity of each reserve area to coal preparation plants, river docks and/or railroad loading points, along with suitability of production equipment to coal seam conditions. The in-place infrastructure was evaluated, and any future needs were planned to a level suitable for a Preliminary Feasibility Study and included in the Capital Forecast.

Alpha provided MM&A with information related to the number of currently operating production units at MWVUG. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine

belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated MWVUG operations is provided in *Figure 18-1* below. Total capital by mine is summarized in *Table 18-1*.

Figure 18-1: Projected Capital Expenditures – Consolidated MWVUG Operations

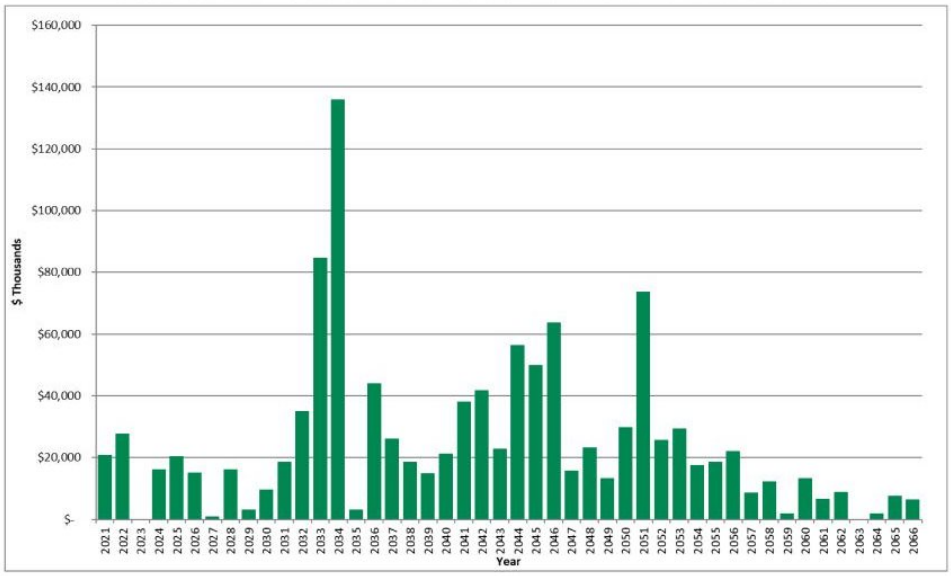


Table 18-1: Summary of Capital Expenditures Schedule by Mine

Item	Total	2021	2022	2023	2024	2025	2026	2027
Laurel Hernshaw	**$30,131**	$0	$0	$0	$0	$0	$0	$0
Black King LCG Brown's Br	**$79,376**	$0	$0	$0	$0	$0	$0	$0
Seng Creek Roundbottom UCG	**$10,244**	$0	$0	$0	$0	$0	$0	$0
Seng Creek UCG	**$20,150**	$0	$0	$0	$0	$0	$0	$0
Berwind LCG	**$21,301**	$0	$0	$0	$0	$0	$0	$0
Low Gap MCG	**$6,157**	$0	$0	$0	$0	$0	$0	$0
Titan MCG	**$38,273**	$0	$0	$0	$0	$0	$0	$0
Coon UCG	**$7,145**	$0	$0	$0	$0	$0	$0	$0
Ellis UCG	**$14,511**	$0	$0	$0	$0	$0	$0	$0
Castle Peerless	**$62,938**	$0	$0	$0	$0	$0	$0	$0
Hunter Peerless	**$34,328**	$0	$0	$0	$0	$0	$0	$0
Brown's Branch Powellton	**$164,282**	$0	$0	$0	$0	$0	$0	$0
Slip Ridge Powellton	**$4,503**	$0	$0	$0	$0	$0	$0	$0
Bee Tree Powellton	**$10,636**	$0	$0	$0	$0	$0	$0	$0
Roundbottom Powellton	**$13,108**	$0	$0	$0	$0	$0	$0	$0
Black Eagle	**$102,482**	$20,898	$21,355	$0	$3,240	$9,803	$6,810	$868
Dow Fork Eagle	**$62,718**	$0	$0	$0	$0	$0	$6,675	$0
Panther Eagle	**$29,304**	$0	$0	$0	$6,480	$3,503	$1,328	$0
Workman's Creek Beckley	**$411,145**	$0	$0	$0	$0	$0	$0	$0
Glen Alum Tunnel	**$20,402**	$0	$6,350	$180	$6,480	$7,048	$344	$0
Total	**$1,143,133**	**$20,898**	**$27,705**	**$180**	**$16,200**	**$20,354**	**$15,158**	**$868**

Item	2028	2029	2030	2031	2032	2033	2034	2035
Laurel Hernshaw	$0	$0	$0	$0	$0	$5,872	$0	$800
Black King LCG Brown's Br	$0	$0	$0	$0	$0	$0	$31,139	$0
Seng Creek Roundbottom UCG	$0	$0	$0	$0	$0	$0	$0	$0
Seng Creek UCG	$0	$0	$0	$0	$0	$0	$0	$0
Berwind LCG	$0	$0	$0	$0	$0	$0	$0	$0
Low Gap MCG	$0	$0	$0	$0	$0	$0	$0	$0
Titan MCG	$0	$0	$0	$0	$0	$0	$0	$0
Coon UCG	$0	$0	$0	$0	$0	$0	$0	$0
Ellis UCG	$0	$0	$0	$0	$0	$0	$0	$0
Castle Peerless	$0	$0	$0	$0	$0	$0	$0	$0
Hunter Peerless	$0	$0	$0	$0	$0	$0	$0	$0
Brown's Branch Powellton	$0	$0	$0	$0	$0	$0	$40,661	$0
Slip Ridge Powellton	$0	$0	$0	$0	$0	$3,703	$0	$800
Bee Tree Powellton	$0	$0	$0	$4,892	$5,744	$0	$0	$0
Roundbottom Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Black Eagle	$3,240	$3,240	$4,740	$4,985	$11,814	$11,488	$0	$0
Dow Fork Eagle	$6,480	$0	$1,600	$6,770	$11,488	$0	$0	$1,600
Panther Eagle	$6,480	$0	$3,405	$2,020	$6,088	$0	$0	$0
Workman's Creek Beckley	$0	$0	$0	$0	$0	$63,670	$64,268	$0
Glen Alum Tunnel	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$16,200**	**$3,240**	**$9,745**	**$18,667**	**$35,134**	**$84,732**	**$136,068**	**$3,200**

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Item	2036	2037	2038	2039	2040	2041	2042	2043
Laurel Hernshaw	$6,103	$0	$0	$524	$4,040	$3,385	$0	$0
Black King LCG Brown's Br	$0	$0	$6,480	$6,286	$688	$0	$6,480	$0
Seng Creek Roundbottom UCG	$0	$0	$0	$0	$0	$0	$0	$0
Seng Creek UCG	$0	$0	$0	$0	$0	$0	$0	$0
Berwind LCG	$0	$0	$0	$0	$0	$0	$0	$0
Low Gap MCG	$0	$0	$0	$0	$0	$0	$0	$0
Titan MCG	$0	$0	$0	$0	$0	$0	$0	$0
Coon UCG	$0	$0	$0	$0	$0	$0	$0	$0
Ellis UCG	$0	$0	$0	$0	$0	$0	$0	$0
Castle Peerless	$0	$0	$0	$0	$0	$0	$0	$0

Hunter Peerless	$0	$0	$0	$0	$0	$0	$0	$0
Brown's Branch Powellton	$0	$180	$6,480	$6,286	$868	$0	$19,412	$0
Slip Ridge Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Bee Tree Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Roundbottom Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Black Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Dow Fork Eagle	$12,206	$0	$344	$704	$8,080	$6,770	$0	$0
Panther Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Workman's Creek Beckley	$25,729	$25,966	$5,228	$1,086	$7,606	$27,939	$15,922	$22,907
Glen Alum Tunnel	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$44,038**	**$26,146**	**$18,532**	**$14,887**	**$21,282**	**$38,094**	**$41,815**	**$22,907**
Item	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**
Laurel Hernshaw	$5,400	$1,144	$2,863	$0	$0	$0	$0	$0
Black King LCG Brown's Br	$1,600	$6,770	$11,488	$0	$0	$1,960	$6,484	$0
Seng Creek Roundbottom UCG	$0	$0	$0	$0	$0	$0	$0	$0
Seng Creek UCG	$0	$0	$0	$0	$0	$0	$0	$0
Berwind LCG	$0	$0	$0	$0	$0	$3,334	$3,678	$700
Low Gap MCG	$0	$0	$0	$0	$0	$0	$0	$6,157
Titan MCG	$12,068	$1,144	$2,343	$0	$6,480	$0	$1,600	$7,978
Coon UCG	$0	$0	$0	$0	$0	$0	$0	$3,905
Ellis UCG	$0	$0	$0	$0	$0	$0	$3,111	$3,455
Castle Peerless	$0	$0	$0	$0	$0	$0	$0	$47,802
Hunter Peerless	$0	$0	$0	$0	$0	$0	$0	$0
Brown's Branch Powellton	$1,600	$6,770	$11,488	$0	$0	$1,600	$12,206	$0
Slip Ridge Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Bee Tree Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Roundbottom Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Black Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Dow Fork Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Panther Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Workman's Creek Beckley	$35,877	$34,042	$35,522	$15,690	$16,772	$6,480	$2,720	$3,720
Glen Alum Tunnel	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$56,546**	**$49,870**	**$63,704**	**$15,690**	**$23,252**	**$13,374**	**$29,799**	**$73,717**

Item	2052	2053	2054	2055	2056	2057	2058	2059
Laurel Hernshaw	$0	$0	$0	$0	$0	$0	$0	$0
Black King LCG Brown's Br	$0	$0	$0	$0	$0	$0	$0	$0
Seng Creek Roundbottom UCG	$9,263	$0	$180	$800	$0	$0	$0	$0
Seng Creek UCG	$0	$7,043	$180	$800	$8,087	$0	$0	$0
Berwind LCG	$3,240	$3,205	$800	$180	$6,164	$0	$0	$0
Low Gap MCG	$0	$0	$0	$0	$0	$0	$0	$0
Titan MCG	$6,480	$0	$180	$0	$0	$0	$0	$0
Coon UCG	$3,240	$0	$0	$0	$0	$0	$0	$0
Ellis UCG	$2,800	$5,145	$0	$0	$0	$0	$0	$0
Castle Peerless	$344	$704	$4,840	$9,248	$0	$0	$0	$0
Hunter Peerless	$0	$0	$3,428	$800	$7,923	$8,088	$1,143	$0
Brown's Branch Powellton	$344	$704	$8,080	$6,770	$0	$0	$11,144	$1,944
Slip Ridge Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Bee Tree Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Roundbottom Powellton	$0	$12,584	$0	$0	$0	$524	$0	$0
Black Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Dow Fork Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Panther Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Workman's Creek Beckley	$0	$0	$0	$0	$0	$0	$0	$0
Glen Alum Tunnel	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$25,711**	**$29,385**	**$17,689**	**$18,598**	**$22,174**	**$8,612**	**$12,287**	**$1,944**

Item	2060	2061	2062	2063	2064	2065	2066	2067
Laurel Hernshaw	$0	$0	$0	$0	$0	$0	$0	$0
Black King LCG Brown's Br	$0	$0	$0	$0	$0	$0	$0	$0
Seng Creek Roundbottom UCG	$0	$0	$0	$0	$0	$0	$0	$0
Seng Creek UCG	$4,040	$0	$0	$0	$0	$0	$0	$0
Berwind LCG	$0	$0	$0	$0	$0	$0	$0	$0
Low Gap MCG	$0	$0	$0	$0	$0	$0	$0	$0
Titan MCG	$0	$0	$0	$0	$0	$0	$0	$0
Coon UCG	$0	$0	$0	$0	$0	$0	$0	$0
Ellis UCG	$0	$0	$0	$0	$0	$0	$0	$0
Castle Peerless	$0	$0	$0	$0	$0	$0	$0	$0
Hunter Peerless	$4,040	$6,625	$2,280	$0	$0	$0	$0	$0
Brown's Branch Powellton	$5,206	$0	$6,480	$0	$1,944	$7,634	$6,480	$0
Slip Ridge Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Bee Tree Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Roundbottom Powellton	$0	$0	$0	$0	$0	$0	$0	$0
Black Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Dow Fork Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Panther Eagle	$0	$0	$0	$0	$0	$0	$0	$0
Workman's Creek Beckley	$0	$0	$0	$0	$0	$0	$0	$0
Glen Alum Tunnel	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$13,286**	**$6,625**	**$8,760**	**$0**	**$1,944**	**$7,634**	**$6,480**	**$0**

18.2 Operating Cost Estimate

Alpha provided historical costs and budgeted projections of operating costs for its active mines (Black Eagle, Panther Eagle, and Horse Creek Eagle) and the planned Glen Alum Tunnel mine for MM&A's review. MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for the mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

fees.

Statutory sales related costs are summarized in *Table 18-2*.

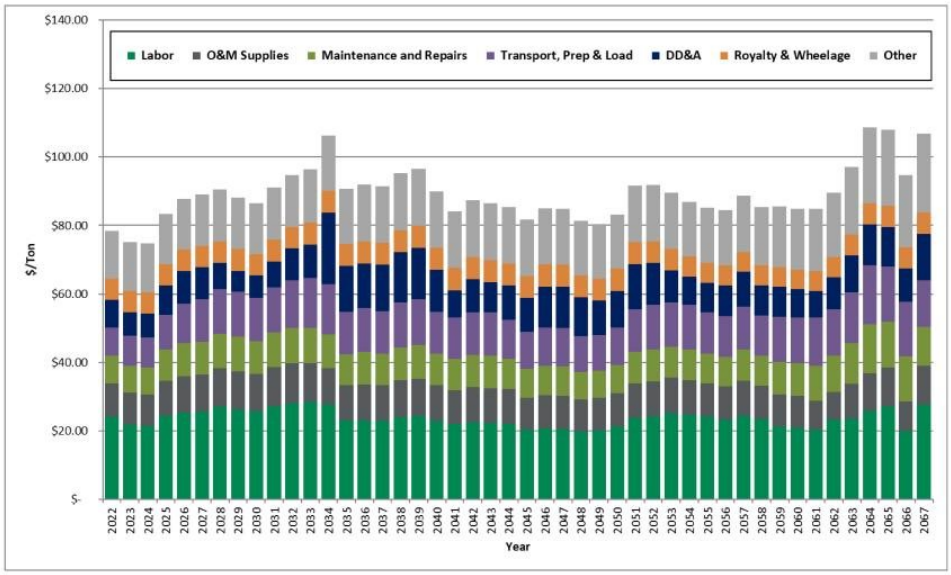
Table 18-2: Estimated Coal Production Taxes and Sales Costs

Description of Tax or Sales Cost	Basis of Assessment	Cost
Federal Black Lung Excise Tax - Underground	Per Ton	$1.10
Federal Reclamation Fees – Underground	Per Ton	$0.12
West Virginia Reclamation Tax - Underground	Per Ton	$0.279
West Virginia Severance Tax	Percentage of Revenue	1 to 5%
Royalties - Underground	Percentage of Revenue	6.0%

Notes: 1. Federal black lung excise tax is paid only on coal sold domestically. MM&A assumed 50% of sales will be into domestic market.

A summary of the projected operating costs for the consolidated MWVUG operations is provided in *Figure 18-2*.

Figure 18-2: MWVUG Operating Costs



19 Economic Analysis

19.1 Economic Evaluation

19.1.1 Introduction

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation, refuse disposal, coal loading, reclamation and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs

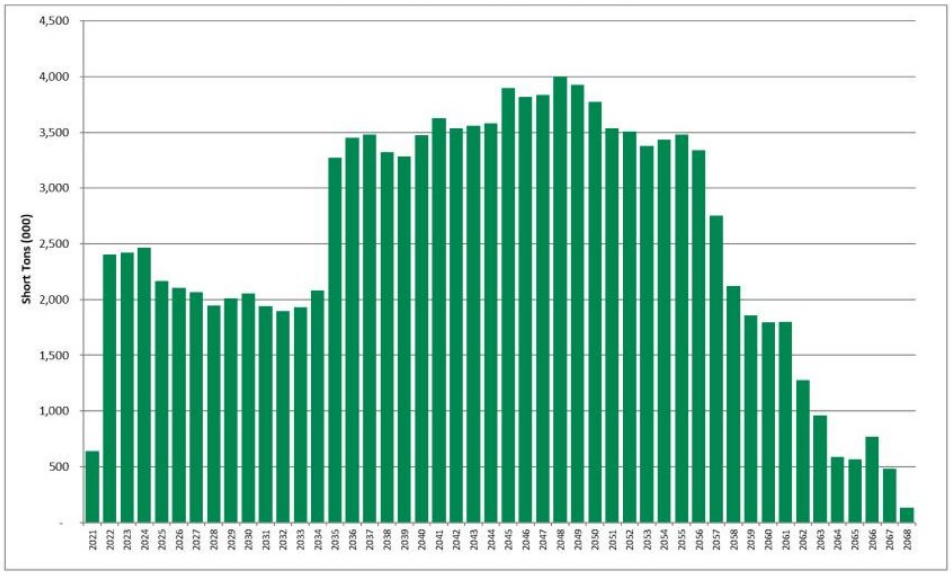
Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

The operations are projected on a calendar year basis. MM&A's projection of annual sales tonnage is summarized in the chart below. While all Alpha coal resources properties deemed by MM&A to have potential for classification as coal reserves were evaluated as part of the economic model, some of those resource areas were determined to be uneconomical in the current market and were therefore

those resource areas were determined to be uneconomical in the current market and were therefore excluded from coal reserves as discussed below.

Figure 19-1: Projection of Sales Tons



Sales revenue is based on the metallurgical coal price information provided to MM&A by Alpha. Only the revenue from Alpha's captive mining operations is included in the financial model used for this TRS.

The P&L projections of the individual mines of Alpha's MWVUG operations are then consolidated into a P&L and cash flow schedule for further testing of the economics. Projected debt service is excluded from the P&L and cash flow model in order to determine Enterprise Value of the aggregated entity.

The financial model expresses coal sales prices, operating costs, and capital expenditures in current day dollars without adjustment for inflation. Capital expenditures and reclamation costs are included based

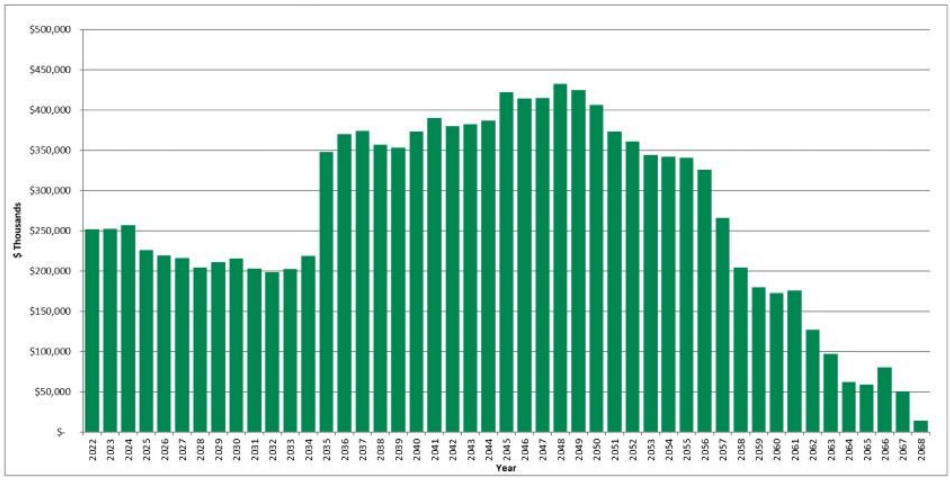
on engineering estimates for each mine by year. MM&A also included an estimate of administrative costs in the financial projections.

Alpha will pay royalties for the various current and projected operations. The royalty rates vary by location as provided by Alpha. The royalty rates were assumed to be 6.0% of the sales revenue.

The projection model also includes consolidated income tax calculations at Alpha's MWVUG Division level, incorporating statutory depletion calculations, as well as state income taxes, and a federal tax rate of 21%. To the extent the Alpha mines generate net operating losses for tax purposes, the losses are carried over to offset future taxable income from Alpha mines. The terms "cash flows" and "project cash flows" used in this report refer to after-tax cash flows.

Alpha's projected consolidated annual revenue for the MWVUG operations is shown in the chart below:

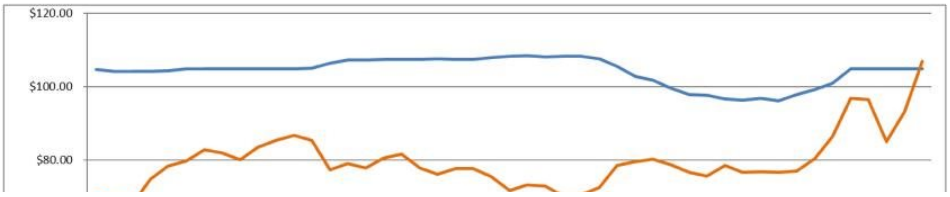
Figure 19-2: Consolidated Annual Revenue

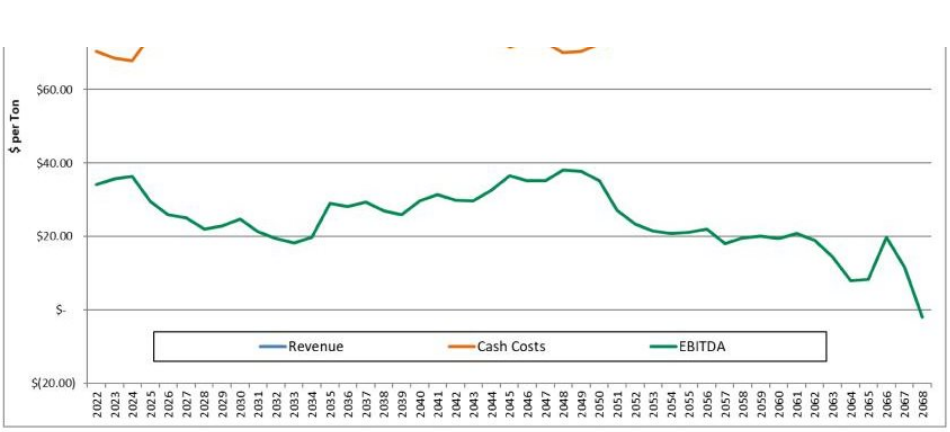


Projected consolidated revenue, cash costs, and EBITDA for the Marfork operations are expressed in dollars per ton in the graph below.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

Figure 19-3: Revenue, Cash Costs, and EBITDA





The above chart shows an average LOM revenue of $105 per ton, cash costs of $68 to $97 per ton and EBITDA of $8 to $38 per ton at steady state. Positive EBITDA per ton averages $27.39 per ton over the life of the operations.

Table 19-1 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at MWVUG.

Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

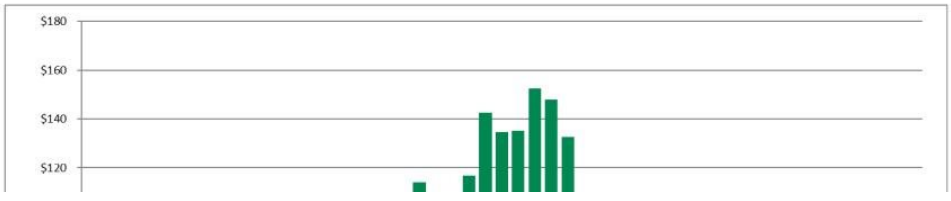
	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Laurel Hernshaw	4,583	$74,109	$16.17	$107,013	$23.35
Black King LCG Brown's Br	9,917	$219,922	$22.18	$307,378	$30.99
Seng Creek Roundbottom UCG	1,946	$57,547	$29.57	$69,033	$35.47
Seng Creek UCG	2,711	$45,351	$16.73	$66,276	$24.44
Berwind LCG	2,154	$32,966	$15.31	$50,855	$23.61
Low Gap MCG	632	$9,858	$15.59	$14,183	$22.44
Titan MCG	5,238	$68,736	$13.12	$108,591	$20.73
Coon UCG	783	$9,219	$11.78	$19,596	$25.03
Ellis UCG	908	$12,669	$13.95	$18,838	$20.75
Castle Peerless*	3,798	($43,759)	$(11.52)	$21,276	$5.60
Hunter Peerless	6,820	$88,880	$13.03	$126,303	$18.52
Brown's Branch Powellton	21,297	$251,484	$11.81	$485,834	$22.81
Slip Ridge Powellton	553	$5,151	$9.32	$8,886	$16.08
Bee Tree Powellton	451	$1,860	$4.12	$7,639	$16.94
Roundbottom Powellton	1,509	$23,158	$15.34	$39,439	$26.13
Black Eagle	12,952	$288,318	$22.26	$420,637	$32.48
Dow Fork Eagle	10,144	$93,423	$9.21	$165,567	$16.32
Horse Creek Eagle	673	$6,629	$9.85	$15,269	$22.69
Panther Eagle	6,192	$132,942	$21.47	$175,466	$28.34
Workman's Creek Beckley	26,195	$641,805	$24.50	$1,066,078	$40.70
Glen Alum Tunnel	2,300	$20,279	$8.82	$41,270	$17.94
Consolidated Deep Mines	**121,756**	**$2,040,546**	**$16.76**	**$3,335,427**	**$27.39**

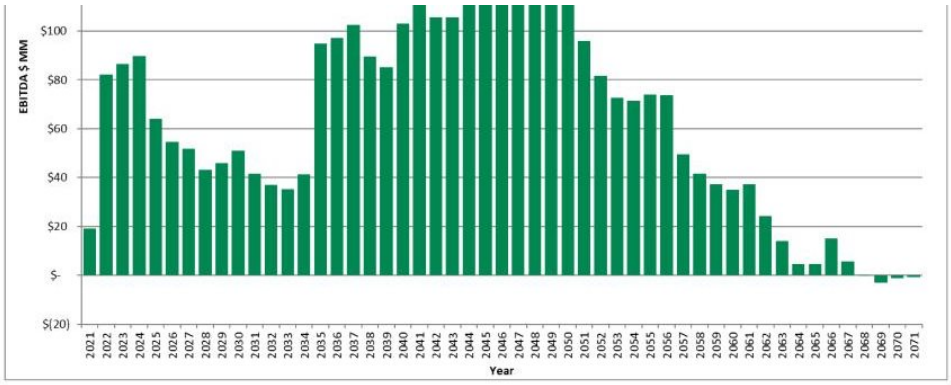
Note:
* This resource area failed to achieve positive EBITDA in the economic evaluation. Therefore, the coal tons forecasted from this mine have been excluded from the estimate of coal reserves in this TR.
** LOM tonnage evaluated in the financial model includes September 2021 through December 2021 production (466,599 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 19-1,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated Marfork operations show positive LOM P&L and EBITDA of $2.0 billion and $3.3 billion, respectively.

A breakdown of projected EBITDA for the consolidated MWVUG operations is shown in the chart below:

Figure 19-4: Annual EBITDA





19.1.2 Cash Flow Summary

Alpha's consolidated MWVUG cash flow summary in constant dollars, excluding debt service, is shown in *Table 19-2* below.

Table 19-2: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	121,756	637	2,404	2,423	2,468	2,169	2,103
Total Revenue	$12,742,316	$66,790	$251,548	$252,367	$257,200	$225,985	$219,349
EBITDA	$3,335,427	$19,262	$82,164	$86,407	$89,835	$63,960	$54,602
Net Income	$1,659,628	($2,848)	$50,218	$57,393	$59,310	$37,139	$29,295
Net Cash Provided by Operating Activities	$2,954,510	$15,390	$57,266	$73,329	$76,517	$61,304	$51,573
Purchases of Property, Plant, and Equipment	($1,143,133)	($20,898)	($27,705)	($180)	($16,200)	($20,354)	($15,158)
Net Cash Flow	$1,811,377	($5,508)	$29,560	$73,149	$60,317	$40,950	$36,416

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	2,064	1,950	2,009	2,053	1,940	1,896	1,933
Total Revenue	$216,162	$204,358	$210,499	$215,161	$203,272	$198,729	$202,607
EBITDA	$51,749	$43,071	$45,847	$50,968	$41,502	$36,906	$35,181
Net Income	$27,631	$24,424	$28,328	$31,112	$21,633	$14,944	$12,836
Net Cash Provided by Operating Activities	$48,250	$40,761	$40,316	$44,167	$39,111	$34,466	$33,179
Purchases of Property, Plant, and Equipment	($868)	($16,200)	($3,240)	($9,745)	($18,667)	($35,134)	($84,732)
Net Cash Flow	$47,382	$24,561	$37,076	$34,422	$20,443	($668)	($51,553)
	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	2,082	3,271	3,450	3,481	3,323	3,286	3,473
Total Revenue	$218,768	$347,752	$369,675	$373,464	$357,099	$353,047	$373,114
EBITDA	$41,256	$94,963	$97,271	$102,500	$89,410	$85,218	$103,020
Net Income	($4,865)	$43,648	$46,524	$46,383	$33,435	$28,649	$49,725
Net Cash Provided by Operating Activities	$36,789	$77,566	$88,550	$92,545	$85,041	$79,644	$90,281
Purchases of Property, Plant, and Equipment	($136,068)	($3,200)	($44,038)	($26,146)	($18,532)	($14,887)	($21,282)
Net Cash Flow	($99,279)	$74,366	$44,512	$66,399	$66,509	$64,758	$68,999
	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	3,628	3,535	3,558	3,581	3,896	3,820	3,835
Total Revenue	$390,148	$379,864	$381,865	$386,470	$421,766	$413,933	$414,657
EBITDA	$114,006	$105,476	$105,720	$116,711	$142,472	$134,583	$135,172
Net Income	$70,256	$56,048	$60,941	$64,670	$82,271	$70,884	$72,383
Net Cash Provided by Operating Activities	$98,440	$93,426	$93,855	$100,510	$117,126	$119,328	$119,977
Purchases of Property, Plant, and Equipment	($38,094)	($41,815)	($22,907)	($56,546)	($49,870)	($63,704)	($15,690)
Net Cash Flow	$60,347	$51,612	$70,947	$43,965	$67,256	$55,624	$104,287
	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	3,998	3,924	3,773	3,538	3,508	3,380	3,438
Total Revenue	$432,449	$424,452	$405,942	$373,224	$360,465	$344,045	$341,917
EBITDA	$152,484	$147,881	$132,610	$95,796	$81,740	$72,814	$71,332
Net Income	$86,811	$87,265	$73,052	$37,754	$29,799	$35,469	$37,378
Net Cash Provided by Operating Activities	$130,731	$128,431	$117,739	$95,138	$80,524	$69,368	$62,460
Purchases of Property, Plant, and Equipment	($23,252)	($13,374)	($29,799)	($73,717)	($25,711)	($29,385)	($17,689)
Net Cash Flow	$107,479	$115,057	$87,940	$21,422	$54,813	$39,983	$44,771
	YE 12/31 2055	YE 12/31 2056	YE 12/31 2057	YE 12/31 2058	YE 12/31 2059	YE 12/31 2060	YE 12/31 2061
Production & Sales tons	3,480	3,340	2,756	2,123	1,858	1,794	1,801
Total Revenue	$340,341	$325,938	$266,018	$204,189	$179,896	$172,249	$175,964
EBITDA	$73,891	$73,695	$49,590	$41,595	$37,241	$34,871	$37,383
Net Income	$37,076	$36,319	$17,513	$19,964	$17,706	$16,632	$18,788
Net Cash Provided by Operating Activities	$67,091	$67,436	$52,390	$42,338	$35,134	$32,779	$34,299
Purchases of Property, Plant, and Equipment	($18,598)	($22,174)	($8,612)	($12,287)	($1,944)	($13,286)	($6,625)
Net Cash Flow	$48,493	$45,262	$43,778	$30,051	$33,190	$19,493	$27,674
	YE 12/31 2062	YE 12/31 2063	YE 12/31 2064	YE 12/31 2065	YE 12/31 2066	YE 12/31 2067	YE 12/31 2068
Production & Sales tons	1,277	961	591	564	767	483	132
Total Revenue	$126,755	$96,932	$61,964	$59,134	$80,426	$50,572	$13,798
EBITDA	$24,169	$13,941	$4,706	$4,725	$15,151	$5,565	($265)
Net Income	$10,038	$2,506	($2,323)	($1,844)	$6,083	($2,295)	($6,992)
Net Cash Provided by Operating Activities	$25,885	$17,009	$7,410	$6,658	$13,891	$8,980	$3,950
Purchases of Property, Plant, and Equipment	($8,760)	$0	($1,944)	($7,634)	($6,480)	$0	$0
Net Cash Flow	$17,125	$17,009	$5,466	($976)	$7,411	$8,980	$3,950
	YE 12/31 2069	YE 12/31 2070	YE 12/31 2071	YE 12/31 2072	YE 12/31 2073	YE 12/31 2074	YE 12/31 2075
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0

EBITDA	($2,933)	($1,179)	($607)	$0	$0	$0	$0
Net Income	($5,865)	($2,358)	($1,213)	$0	$0	$0	$0
Net Cash Provided by Operating Activities	($32,305)	($10,768)	($10,768)	$0	$0	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($32,305)	($10,768)	($10,768)	$0	$0	$0	$0

Note:

* The Castle II (Peerless) resource area failed to achieve positive EBITDA in the economic evaluation. Therefore, the coal tons forecasted from this mine have been excluded from the estimate of coal reserves in this TR.

** LOM tonnage evaluated in the financial model includes September 2021 through December 2021 production (466,599 clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

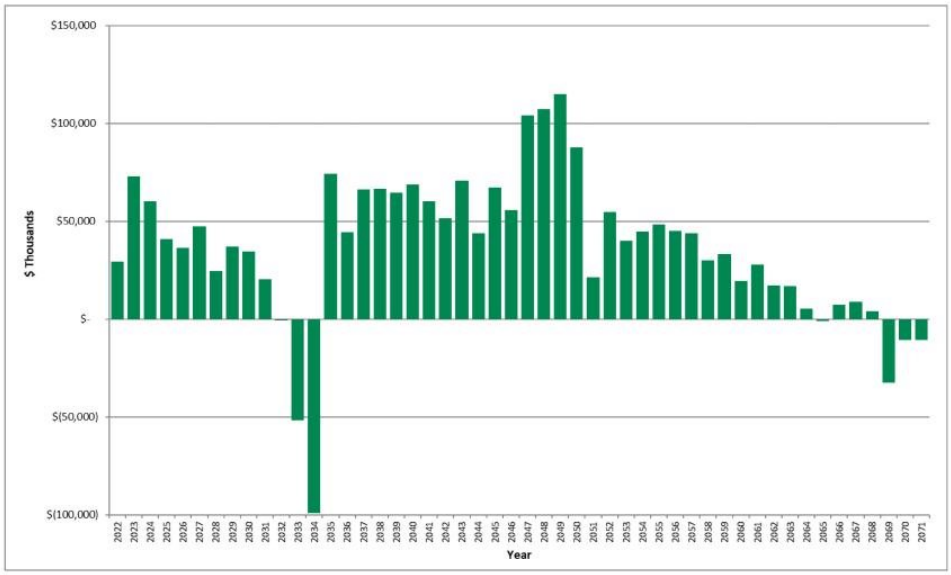
Consolidated cash flows are driven by annual coal tonnages, which range from 2.4 million tons in 2022

Consolidated cash flows are driven by annual sales tonnage, which grows from 2.4 million tons in 2022 to a peak of nearly 4.0 million tons in 2048. Between years 2049 and 2056, sales ranges from 3.3 million to 3.9 million tons and between years 2057-2068, sales range from 0.1 million tons to 2.8 million tons. Projected consolidated revenue grows from $251 million in 2022 to a peak of $432 million in 2048. Revenue totals $12.7 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $130.7 million in 2048 and totals $3.0 billion over the project life. Capital expenditures total $100.5 million during the first five years and $1.1 billion over the project's life.

Consolidated MWVUG net cash flow after tax, but before debt service, is shown by year in the chart below:

Figure 19-5: Net Cash Flow after Tax (Before Debt Service)



LOM Net cash flow is positive for this project. The cash flows in years 2033-2034 are related to heavy capital expenditures for new mines and after year 2068 are generally related to end of mine reclamation expenditures, which are accrued over the life of the mines.

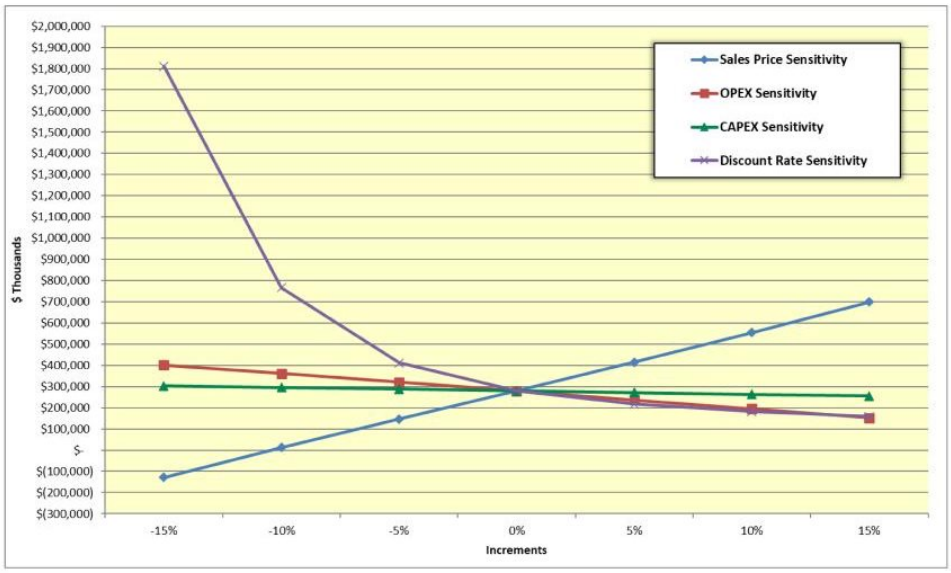
19.1.3 Discounted Cash Flow Analysis

Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $279.7 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the MWVUG reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its MWVUG assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

19.1.4 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 19-6: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

20 Adjacent Properties

20.1 Information Used

No Proprietary information associated with neighboring properties was used as part of this study.

21 Other Relevant Data and Information

MM&A performed a previous audit of all the Property in year 2020 for reserves effective as of December 31, 2020, for Alpha based on **U.S. Securities and Exchange Commission (*SEC*)** Industry Guide 7 standards. MM&A utilized this former audit study as the basis of an updated study which meets those standards set forth by the SEC for 2021 reserve compliance.

22 Interpretation and Conclusions

22.1 Conclusion

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the MWVUG Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study is sufficient to conclude that the 117.5 Mt of marketable coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

22.2 Risk Factors

Risks have been identified for operational, technical and administrative subjects addressed in the Pre-Feasibility Study. A risk matrix has been constructed to present the risk levels for all the risk factors identified and quantified in the risk assessment process. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

The purpose of the characterization of the project risk components is to inform the project stakeholders of key aspects of the Alpha projects that can be impacted by events whose consequences can affect the success of the venture. The significance of an impacted aspect of the operation is directly related to both the probability of occurrence and the severity of the consequences. The initial risk for a risk factor is herein defined as the risk level after the potential impact of the risk factor is addressed by competent and prudent management utilizing control measures readily available. Residual risk for a risk factor is

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

herein defined as the risk level following application of special mitigation measures if management determines that the initial risk level is unacceptable. Initial risk and residual risk can be quantified numerically, derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

The probability and consequence parameters are subjective numerical estimates made by practiced mine engineers and managers. Both are assigned values from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and

the lowest probability and least consequence, and the value 5 represents the highest probability and greatest consequence. The products, which define the Risk Level, are classified from very low to very high.

Risk Level Table (R = P x C)

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Risk aspects identified and evaluated during this assignment total 13. No residual risks are rated Very High. Three (3) residual risks are rated High. Six (6) of the risk aspects could be associated with Moderate residual risk. Four (4) of the risk aspects were attributed Low or Very Low residual risks.

22.2.1 Governing Assumptions

The listing of the aspects is not presumed to be exhaustive. Instead that listing is presented based on the experiences of the contributors to the TRS.

1. The probability and consequence ratings are subjectively assigned, and it is assumed that this subjectivity reasonably reflects the condition of the active and projected mine operations.
2. The Control Measures shown in the matrices presented in this chapter are not exhaustive. They represent a condensed collection of activities that the author of the risk assessment section has observed to be effective in coal mining scenarios.
3. Mitigation Measures listed for each risk factor of the operation are not exhaustive. The measures listed, however, have been observed by the author to be effective.
4. The monetary values used in ranking the consequences are generally-accepted quantities for the coal mining industry.

22.2.2 Limitations

The risk assessment proposed in this report is subject to the limitations of the information currently collected, tested, and interpreted at the time of the writing of the report.

22.2.3 Methodology

The numerical quantities (i.e., risk levels) attributable to either "initial" or "residual" risks are derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

$$R = P \times C$$

Where: R = Risk Level
P = Probability of Occurrence
C = Consequence of Occurrence

The Probability (P) and Consequence (C) parameters recited in the formula are subjective numerical estimates made by practiced mine engineers and managers. Both P and C are assigned integer values ranging from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and greatest consequence. The products (R = P x C) which define the Risk Level, are thereafter classified from very low to very high.

Risk Level Table

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Very high initial risks are considered to be unacceptable and require corrective action well in advance of project development. In short, measures must be applied to reduce very high initial risks to a tolerable level.

As shown and discussed above, after taking into account the operational, technical, and administrative actions that have been applied or are available for action when required, the residual risk can be determined. The residual risk provides a basis for the management team to determine if the residual risk level is acceptable or tolerable. If the risk level is determined to be unacceptable, further actions should be considered to reduce the residual risk to acceptable or tolerable levels to provide justification for continuation of the proposed operation.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

22.2.4 Development of the Risk Matrix

Risks have been identified for the technical, operational, and administrative subjects addressed in the TRS. The risk matrix and risk assessment process is modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

22.2.4.1 Probability Level Table

Table 22-1: Probability Level Table

Category	Probability Level (P)		
1	Remote	Not likely to occur except in exceptional circumstances.	<10%
2	Unlikely	Not likely to occur; small in degree.	10 - 30%
3	Possible	Capable of occurring.	30 - 60%
4	Likely	High chance of occurring in most circumstances.	60 - 90%
5	Almost Certain	Event is expected under most circumstances; impossible to avoid.	>90%

The lowest rated probability of occurrence is assigned the value of 1 and described as remote, with a likelihood of occurrence of less than 10 percent. Increasing values are assigned to each higher probability of occurrence, culminating with the value of 5 assigned to incidents considered to be almost certain to occur.

22.2.4.2 Consequence Level Table

Table 22-2 lists the consequence levels.

Table 22-2: Consequence Level Table

Correlation of Events in Key Elements of the Project Program to Event Severity Category							
Category	Severity of the Event	Financial Impact of the Event	Unplanned Loss of Production (Impact on Commercial Operations)	Events Impacting on the Environment	Events Affecting the Program's Social and Community Relations	Resultant Regulatory / Sovereign Risk	Events Affecting Occupational Health & Safety
1	**Insignificant**	< USD $0.5 million	≤ 12 hours	Insignificant loss of habitat; no irreversible effects on water, soil and the environment.	Occasional nuisance impact on travel.		Event recurrence avoided by corrective action through established procedures (Engineering, guarding, training).
2	**Minor**	USD $0.5 million to $2.0 million	≤ 1 day	No significant change to species populations; short-term reversible perturbation to ecosystem function.	Persistent nuisance impact on travel. Transient adverse media coverage.		**First aid – lost time.** Event recurrence avoided by corrective action thought established procedures.
3	**Moderate**	USD $2.0 million to $10.0 million	≤ 1 week	Appreciable change to species population; medium-term (≤10 years) detriment to ecosystem function.	Measurable impact on travel and water/air quality. Significant adverse media coverage / transient public outrage.	Uncertainty securing or retaining essential approval / license. Change to regulations (tax; bonds; standards).	**Medical Treatment –** permanent incapacitation Avoiding event recurrence requires modification to established corrective action procedures**.**
4	**Major**	USD $10.0 million to $50.0 million	1 to 2 weeks	Change to species population threatening viability; long-term (>10 years) detriment to ecosystem function.	Long-term, serious impact on travel and use of water resources; degradation of air quality; sustained and effective public opposition.	Suspension / long-delay in securing essential approval / license. Change to laws (tax; bonds; standards).	**Fatality.** Avoiding event recurrence requires modification to established corrective action procedures and staff retraining.
5	**Critical**	>USD $50.0 million	>1 month	Species extinction; irreversible damage to ecosystem function.	Loss of social license.	Withdraw / failure to secure essential approval / license.	**Multiple fatalities.** Avoiding event recurrence requires major overhaul of policies and procedures.

The lowest rated consequence is assigned the value of 1 and is described as Insignificant Consequence with parameters that include non-reportable safety incidents with zero days lost accidents, no environmental damage, loss of production or systems for less than one week and cost of less than USD $0.5 million. Increasing values are assigned to each higher consequence, culminating with the value of 5 assigned to critical consequences, the parameters of which include multiple-fatality accidents, major environmental damage, and loss of production or systems for longer than one month and cost of greater than USD $50.0 million.

Composite Risk Matrix R = P x C and Color-Code Convention

The risk level, defined as the product of probability of occurrence and consequence, ranges in value from 1 (lowest possible risk) to 25 (maximum risk level). The values are color-coded to facilitate identification of the highest risk aspects.

Table 22-3: Risk Matrix

P x C = R	Consequence (C)				
	Insignificant	Minor	Moderate	Major	Critical
	1	2	3	4	5

Probability Level (P)							
	Remote	1	1	2	3	4	5
	Unlikely	2	2	4	6	8	10
	Possible	3	3	6	9	**12**	**15**
	Likely	4	4	8	**12**	**16**	**20**
	Almost Certain	5	5	10	**15**	**20**	**25**

22.2.5 Categorization of Risk Levels and Color Code Convention

Very high risks are considered to be unacceptable and require corrective action. Risk reduction measures must be applied to reduce very high risks to a tolerable level.

22.2.6 Description of the Coal Property

The MWVUG is located in Raleigh, Kanawha, Fayette and Boone Counties, West Virginia and is an active operation with three underground mines. The active underground operations within the MWVUG Mine Complex (Black Eagle Mine, Panther Eagle, and Horse Creek Eagle) utilize continuous mining production sections. The method provides continuity, preserving skilled work groups and enabling effective

utilization of production equipment. The active and projected mines are located above and below drainage and as such are accessed via a combination of drifts, box cuts, shafts and slopes.

22.2.7 Summary of Residual Risk Ratings

Each risk factor is numbered, and a risk level for each is determined by multiplying the assigned probability by the assigned consequence. The risk levels are plotted on a risk matrix to provide a composite view of the Alpha risk profile. The average risk level is 6.6, which is defined as Moderate.

Table 22-4: Risk Assessment Matrix

Consequence		<10% Remote	10-30% Unlikely	30-60% Possible	60-90% Likely	>90% Almost Certain
Critical	>$50 MM					
Major	$10-50MM	9			6	
Moderate	$2-10 MM	1, 12	2, 4, 8, 14	3		
Minor	$0.5-$2 MM			13	5, 7, 10	
Low	<$0.5 MM			11		

22.2.8 Risk Factors

A high-level approach is utilized to characterize risk factors that are generally similar across a number of the active and proposed mining operations. Risk factors that are unique to a specific operation or are particularly noteworthy are addressed individually.

22.2.8.1 Geological and Coal Resource

Coal mining is accompanied by risk that, despite exploration efforts, mining areas will be encountered where geological conditions render extraction of the resource to be uneconomic, or that coal quality characteristics disqualify the product for sale into target markets.

Offsetting the geological and coal resource risk are the size of the controlled property which allows flexibility in the selection of mine areas away from areas where coal quality and mineability are less favorable. In addition, many of the underground mines are designed to operate with multiple production sections each, which lessens the immediate impact when one section encounters difficulties. The large reserve areas also provide a mitigation strategy of varying the timing of

development of mines to offset expected or encountered adverse conditions, thereby maintaining consistent production and quality. This flexibility requires additional extension or development cost but increases performance consistency.

The larger reserve areas will be developed with multiple production sections and the small, replacement production reserve areas provide ready access to alternative locations if geological and coal resource characteristics require abandonment of an active production area.

Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Recoverable coal tons recognized to be significantly less than previously estimated.	Reserve base is adequate to serve market commitments and respond to opportunities for many years. Local adverse conditions may increase frequency and cost of production unit relocations.	Previous and ongoing exploration and extensive regional mining history provide a high level of confidence of coal seam correlation, continuity of the coal seams, and coal resource tons.	1	4	4	Optimize mine plan to increase resource recovery; develop mine plan to provide readily available alternate mining locations to sustain expected production level.	1	3	3
Coal quality locally proves to be lower than initially projected.	If uncontrolled, production and sale of coal that is out of specification can result in rejection of deliveries, cancellation of coal sales agreements and damage to reputation.	Exploration and vast experience and history in local coal seams provide confidence in coal quality; limited excursions can be managed with careful product segregation and blending.	2	5	10	Develop mine plan to provide readily available alternate mining locations to sustain expected production level; modify coal sales agreements to reflect coal quality.	2	3	6

22.2.8.2 Environmental

Water quality and other permit requirements are subject to modification and such changes could have a material impact on the capability of the operator to meet modified standards or to receive new permits and modifications to existing permits. Permit protests may result in delays or denials to permit applications.

Environmental standards and permit requirements have evolved significantly over the past 50 years and to-date, mining operators and regulatory bodies have been able to adapt successfully to evolving environmental requirements.

Table 22-6: Environmental (Risks 3 and 4)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Environmental performance standards are modified in the future.	Delays in receiving new permits and modifications to existing permits; cost of testing and treatment of water and soils	Work with regulatory agencies to understand and influence final standards; implement testing, treatment and other actions to comply with new standards.	3	4	12	Modify mining and reclamation plans to improve compliance with new standards while reducing cost of compliance.	3	3	9
New permits and permit modifications are increasingly delayed or denied.	Interruption of production and delayed implementation of replacement production from new mines.	Comply quickly with testing, treatment and other actions required; continue excellent compliance performance within existing permits.	2	4	8	Establish and maintain close and constructive working relationships with regulatory agencies, local communities and community action groups.	2	3	6

22.2.8.3 Regulatory Requirements

Federal and state health and safety regulatory agencies occasionally amend mine laws and regulations. The impact is industry wide. Mining operators and regulatory agencies have been able to adapt successfully to evolving health and safety requirements.

Table 22-7: Regulatory Requirements (Risk 5)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Federal and state mine safety and health regulatory agencies amend mine laws and regulations.	Cost of training, materials, supplies and equipment; modification of mine examination and production procedures; modification of mining plans.	Participate in hearings and workshops when possible to facilitate understanding and implementation; work cooperatively with agencies and employees to facilitate implementation of new laws and regulations.	4	3	12	Familiarity and experience with new laws and regulations results in reduced impact to operations and productivity and improved supplies and equipment options.	4	2	8

22.2.8.4 Market and Transportation

Most of the current and future production is expected to be directed to domestic and international metallurgical markets. Historically, the metallurgical markets have been cyclical and highly volatile.

Table 22-8: Market and Transportation (Risk 6)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Volatile coal prices drop precipitously.	Loss of revenue adversely affects profitability; reduced cash flow may disrupt capital expenditures plan.	Cost control measures implemented; capital spending deferred.	4	5	20	High-cost operations closed, and employees temporarily furloughed.	4	4	16

Occasional delay or interruption of rail, river and terminals service may be expected. The operator can possibly minimize the impact of delays by being a preferred customer by fulfilling shipment obligations promptly and maintaining close working relationships.

Table 22-9: Market and Transportation (Risk 7)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Rail or river transport is delayed; storage and shipping access at river and ocean terminals is not available.	Fulfillment of coal sales agreements delayed; limited coal storage at mines may increase cost of rehandling; production may be temporarily idled.	Provide adequate storage capacity at mines; coordinate continuously with railroad and shipping companies to respond quickly and effectively to changing circumstances.	4	3	12	Provide back-up storage facility along with personnel, equipment and rehandle plan to sustain production and fulfill sales obligations timely.	4	2	8

22.2.8.5 Mining Plan

Occupational health and safety risks are inherent in mining operations. Comprehensive training and retraining programs, internal safety audits and examinations, regular mine inspections, safety meetings, along with support of trained fire brigades and mine rescue teams are among activities that greatly reduce accident risks. Employee health monitoring programs coupled with dust and noise monitoring and abatement reduce health risks to miners.

As underground mines are developed and extended, observation of geological, hydrogeological and geotechnical conditions lead to modification of mine plans and procedures to enable safe work within the mine environments.

Highlighted below are selected examples of safety and external factors relevant to Alpha's operations.

22.2.8.5.1 Methane Management

Coalbed methane is present in coal operations below drainage. Often the methane concentration in shallow coal seams is at such low levels that it can be readily managed with frequent testing and monitoring, vigilance and routine mine ventilation. Very high methane concentrations may be present

at greater depths. High methane concentrations may require degasification of the coal seam to assure safe mining. Methane is not expected to be present in most of the MWVUG property.

Table 22-10: Methane Management (Risk 8)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Methane hazard is present in mines operating below drainage.	Injury or loss of life; possible ignition of gas and mine explosion; potential loss of mine and equipment temporarily or permanently; additional mine fan, mine power, ventilation, monitoring and examination requirements.	Low to moderate levels can be managed with frequent examinations, testing and monitoring within the mine ventilation system. Excellent rock dust maintenance minimizes explosion propagation risk should an ignition occur.	2	5	10	Very high-level methane concentrations may require coal seam degasification and gob degasification where pillar extraction methods are employed.	2	3	6

22.2.8.5.2 Mine Fires

Mine fires, once common at mine operations, are rare today. Most active coal miners have not encountered a mine fire. Vastly improved mine power and equipment electrical systems, along with safe mine practices reduce mine fire risks. Crew training and fire brigade support and training improve response for containment and control if a fire occurs. Spontaneous combustion within coal mines, which is the source of most fires that occur today, is not expected to commonly occur at the Alpha property. When spontaneous combustion conditions are present, monitoring systems are employed for early detection and mine plans are designed to facilitate isolation, containment and rapid extinguishment.

Table 22-11: Mine Fires (Risk 9)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Mine fire at underground operation or plant stockpile fire.	Injury or loss of life; potential loss of mine temporarily or permanently; damage to equipment and mine infrastructure.	Inspection and maintenance of mine power, equipment and mine infrastructure; good housekeeping; frequent examination of conveyor belt entries; prompt removal of accumulations of combustible materials.	1	5	5	If spontaneous combustion conditions are present, enhanced monitoring and examination procedures will be implemented; mine design will incorporate features to facilitate isolation, containment and extinguishment of spontaneous combustion locations.	1	4	4

22.2.8.5.3 Ground Control

Underground mining exposes miners to the risks of roof falls and rib rolls. Ground control-based risks can be mitigated through effective roof control plans which are supplemented with a strong understanding of future geotechnical conditions. Foremen and crews should be trained to examine the roof, rib and floor conditions and identify pending and immediate hazards. Multiple publicly available software programs can be used to assess pillar sizing and stability.

Table 22-12: Ground Control (Risk 10)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Ground control issues cause roof failures, rib rolls, floor heave, etc.	Injury or loss of life; catastrophic damage to equipment; production interruption.	Regular inspection for change and signs of failure. Dynamic design of roof control plan and safety measures to honor observed conditions and exploration-based information; conservative pillar design.	4	3	12	Multiple operating sections to mitigate any lost production; availability of new working areas in case abandonment of section is required; availability of alternative roof control technologies in case of abrupt changes in mining conditions.	4	2	8

22.2.8.5.4 Availability of Supplies and Equipment

The industry has periodically experienced difficulty receiving timely delivery of mine supplies and equipment. Availability issues often accompanied boom periods for coal demand. Any future delivery of supplies and equipment delays are expected to be temporary with limited impact on production.

Table 22-13: Availability of Supplies and Equipment (Risk 11)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Disruption of availability for supplies and equipment.	Temporary interruption of production.	Force majeure provision in coal sales agreements to limit liability for delayed or lost sales.	3	2	6	Work closely with customers to assure delayed coal delivery rather than cancelled sales; monitory external conditions and increase inventory of critical supplies; accelerate delivery of equipment when possible.	3	1	3

22.2.8.5.5 Labor

Work stoppage due to labor protests are considered to be unlikely and accompanied by limited impact should it occur. Excellent employee relations and communications limit the exposure to outside

protesters. Loss of supervisors and skilled employees to retirement is inevitable; the impact can be lessened with succession planning and training and training and mentorship of new employees.

Table 22-14: Labor – Work Stoppage (Risk 12)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Work stoppage due to slowdowns or secondary boycott activity.	Loss of production and coal sales; damaged customer and employee relations; reputation loss.	Maintain excellent employee relations and communications; maintain frequent customer communications.	2	3	6	Develop plan for employee communications and legal support to minimize impact of secondary boycott activities.	1	3	3

Table 22-15: Labor – Retirement (Risk 13)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Retirement of supervisors and skilled employees.	Loss of leadership and critical skills to sustain high levels of safety, maintenance and productivity.	Monitor demographics closely and maintain communications with employees who are approaching retirement age; maintain employee selection and training programs.	3	3	9	Maintain selection of candidates and implementation of in-house or third-party training for electricians and mechanics; develop employee mentoring program.	3	2	6

22.2.8.6 Comprehensive Health and Safety

While largely incorporated in mine plan-based risk factors, effective health and safety programs reduce the risk of accidents, associated loss of production and fines. Currently, coal mining and processing requires a robust health and safety team, consisting of executive level health and safety roles, regional health and safety managers, and multiple operational level health and safety coordinators.

Table 22-16: Health and Safety (Risk 14)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Failure to attain operations safety standards and associated occurrence of accidents	Injuries and possible loss of life; damage to morale and workforce confidence; loss of production and diminished productivity; regulatory issues, closures and fines; reputation loss	Safety and loss control awareness training to help employees recognize hazardous conditions and actions; frequent job observations and feedback; periodic employee performance reviews	2	5	10	Senior management's active participation in safety process; utilization of motivational methods to reinforce company's values and commitment to safety; regular comprehensive safety audits to assure safety standards are maintained.	2	3	6

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Mid-West Virginia Underground Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
West Virginia, USA

23 Recommendations

Alpha should continue to work both internally and with outside assistance to further define their Resource Base and to Optimize the LOM Plan.

24 References

Publicly available information from various State and Federal agencies was used where relevant.

JOURNEL, A.G., & HUIJBREGTS, CH, J., 1978: Mining Geostatistics, The Blackburn Press Caldwell, New Jersey.

25 Reliance on Information Provided by Registrant

For the purpose of this TRS, MM&A utilized the Geological and Coal Quality data provided by Alpha. This information was subjected to verification of its integrity and completeness.

Historical productivity and operating costs were also supplied by Alpha. This information was combined with the experience and knowledge of the QP's to forecast the LOM plan.

Alpha supplied a long-term price forecast based on published benchmark pricing. This benchmark pricing was adjusted by Alpha to reflect the effects of quality and transportation borne after FOB plant costs were calculated.

A summary of the information provided by Alpha relied upon by MM&A for the purposes of this TRS is provided in *Table 25-1*.

Table 25-1: Information from Registrant Relied Upon by MM&A

Category	Information Provided by Alpha	Report Section
Legal	Mineral control and surface control rights as shown on maps	3.2, 3.3
Geological	Geologic data including digital databases and original source data including geologist logs, driller's logs, geophysical logs	9.1
Coal Quality	Database of coal quality information supplemented with original source laboratory sheets where available	10.1
Mining	Historical productivities and manpower from operating and future Alpha mines	13.2, 13.4
Coal Preparation	Flow sheet and other information representing current and future methods of coal processing	14.1
Marketing	Long-term price forecast used in financial projections	16.2
Waste Disposal	Engineering data and estimates representing remaining capacities for coarse and fine coal waste disposal	17.2
Environmental	Permit and bonding information	17.3
Costs	Historical and budgetary operating cost information used to derive cost drivers for reserve financial modeling	18.2

APPENDIX

A

SUMMARY TABLES

Alpha Metallurgical Resources

2021 SEC Update - MWV Underground

Summary of Coal Resource (Short Tons) • Effective December 31, 2021

Appendix A Table 1

		Coal Resource (Dry Tonnes, In Situ)									Quality (Dry Basis)		
		By Reliability Category					By Control Type		By Permit Status				
Mine/Area	Seam	Measured	Indicated	Total	Inferred	Grand Total	Owned	Leased	Permitted	Not Permitted	Ash%	Sulfur%	VM%
Elk Run - Seng Creek	Chilton	14,555,000	11,353,000	25,907,000	0	25,907,000	25,907,000	0	0	25,907,000	-	-	-
Titan	Middle Cedar Grove	393,000	8,000	401,000	0	401,000	0	401,000	401,000	0	-	-	-
Black King LCG	Lower Cedar Grove	4,589,000	644,000	5,234,000	0	5,234,000	0	5,234,000	0	5,234,000	7	0.8	-
Elk Run (Castle II)	Peerless	13,584,000	4,533,000	18,117,000	0	18,117,000	0	18,117,000	9,161,000	8,956,000	25	2.4	-
Browns Branch	Powellton	11,451,000	1,613,000	13,064,000	0	13,064,000	0	13,064,000	0	13,064,000	-	-	-
Browns Branch High Seam	Powellton	0	0	0	185,000	185,000	0	0	0	0	-	-	-
Powellon 10-B	Powellton	3,533,000	211,000	3,744,000	0	3,744,000	0	3,744,000	0	3,744,000	-	-	-
Dow Fork	Eagle	0	0	0	1,327,000	1,327,000	0	0	0	0	36	0.7	-
Panther Eagle	Eagle	843,000	634,000	1,477,000	0	1,477,000	0	1,477,000	1,477,000	0	13	1.7	-
Sycamore	Eagle	7,217,000	888,000	8,105,000	0	8,105,000	0	8,105,000	0	8,105,000	-	-	-
Glen Alum Tunnel	Glen Alum Tunnel	1,403,000	451,000	1,854,000	0	1,854,000	0	1,854,000	1,854,000	0	26	1.2	-
Workman	Beckley	2,934,000	5,605,000	8,539,000	57,000	8,596,000	0	8,539,000	0	8,539,000	20	1.3	-
Mountain Laurel	Beckley	14,800,000	14,565,000	29,365,000	55,000	29,420,000	29,365,000	0	0	29,365,000	-	-	-
Mountain Laurel	Fire Creek	4,389,000	1,506,000	5,895,000	0	5,895,000	5,895,000	0	0	5,895,000	4	0.7	20
	Total	**79,691,000**	**42,011,000**	**121,702,000**	**1,624,000**	**123,326,000**	**61,168,000**	**60,534,000**	**12,893,000**	**108,809,000**	**16**	**0.9**	**20**

*Note(1): Resource tons are **exclusive** of reserve tons.*

Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.

Note (3): The Property contains 121.7 million tons (Mt) of dry, in-place measured and indicated coal resources exclusive of reserves as of December 31, 2021.

All resources exclusive of reserves are considered a met market.

Totals may not add due to rounding.

Alpha Metallurgical Resources

2021 SEC Update - MWV Underground

Summary of Coal Reserves (Short Tons) • Effective December 31, 2021

Appendix A Table 2

		Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)											Quality (Dry Basis)		
		By Reliability Category			By Mining Type		By Control Type		By Permit Status		By Market				
Mine/Area	Mine	Proven	Probable	Total	Surface	UG	Owned	Leased	Permitted	Not Permitted	Thermal	Met	Ash%	Sulfur%	VM%
Elk Run - Seng Creek	Chilton	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Laurel Area	Hernshaw	3,562,000	1,021,000	4,583,000	0	4,583,000	0	4,583,000	0	4,583,000	0	4,583,000	5	0.8	36
Round Bottom UCG	Upper Cedar Grove	1,465,000	481,000	1,946,000	0	1,946,000	0	1,946,000	0	1,946,000	0	1,946,000	10	0.7	-
Seng Creek UCG	Upper Cedar Grove	2,095,000	616,000	2,711,000	0	2,711,000	0	2,711,000	0	2,711,000	0	2,711,000	10	0.7	-
Coon Cedar Grove	Upper Cedar Grove	765,000	18,000	783,000	0	783,000	0	783,000	783,000	0	0	783,000	7	1.1	35
Ellis Cedar Grove	Upper Cedar Grove	901,000	7,000	908,000	0	908,000	0	908,000	908,000	0	0	908,000	5	0.9	-
Titan	Middle Cedar Grove	0	5,238,000	5,238,000	0	5,238,000	0	5,238,000	3,932,000	1,306,000	0	5,238,000	6	1.1	37
Low Gap	Middle Cedar Grove	632,000	0	632,000	0	632,000	0	632,000	0	632,000	0	632,000	6	0.8	-
Black King LCG	Lower Cedar Grove	8,534,000	1,383,000	9,917,000	0	9,917,000	0	9,917,000	4,509,000	5,408,000	0	9,917,000	5	0.7	36
Berwind	Lower Cedar Grove	2,100,000	54,000	2,154,000	0	2,154,000	0	2,154,000	0	2,154,000	0	2,154,000	5	0.9	-
Elk Run - Hunter Peerless	Peerless	0	6,820,000	6,820,000	0	6,820,000	0	6,820,000	4,909,000	1,911,000	0	6,820,000	6	1.6	-
Elk Run (Castle II)	Peerless	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Browns Branch	Powellton	11,694,000	7,085,000	18,779,000	0	18,779,000	0	18,779,000	5,741,000	13,038,000	0	18,779,000	6	1.0	34
Browns Branch High Seam	Powellton	1,220,000	1,298,000	2,518,000	0	2,518,000	0	2,518,000	0	2,518,000	0	2,518,000	8	0.9	34
Roundbottom	Powellton	0	1,509,000	1,509,000	0	1,509,000	0	1,509,000	1,509,000	0	0	1,509,000	4	1.1	-
Powellon 10-B	Powellton	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Beetree	Powellton	335,000	116,000	451,000	0	451,000	0	451,000	274,000	177,000	0	451,000	2	0.8	-
Slip Ridge Powellton	Powellton	466,000	86,000	553,000	0	553,000	0	553,000	343,000	209,000	0	553,000	3	1.0	-
Black Eagle	Eagle	8,581,000	4,204,000	12,785,000	0	12,785,000	0	12,785,000	8,876,000	3,909,000	0	12,785,000	5	0.8	35
Dow Fork	Eagle	7,057,000	3,087,000	10,144,000	0	10,144,000	315,000	9,829,000	7,171,000	2,973,000	0	10,144,000	4	0.7	32
Panther Eagle	Eagle	4,181,000	1,889,000	6,070,000	0	6,070,000	0	6,070,000	3,789,000	2,281,000	0	6,070,000	4	1.2	35
Horse Creek	Eagle	172,000	70,000	242,000	0	242,000	0	242,000	242,000	0	0	242,000	4	1.2	35
Cledar Fork/Horse Creek	Eagle	249,000	4,000	253,000	0	253,000	0	253,000	253,000	0	0	253,000	5	1.3	30
Sycamore	Eagle	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Glen Alum Tunnel	Glen Alum Tunnel	1,812,000	488,000	2,300,000	0	2,300,000	154,000	2,146,000	4,000	2,296,000	0	2,300,000	6	1.4	24
Workman	Beckley	13,343,000	12,851,000	26,195,000	0	26,195,000	1,558,000	24,636,000	2,984,000	23,211,000	0	26,195,000	5	0.9	12

Workman	Beckley	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mountain Laurel	Beckley	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Mountain Laurel	Fire Creek	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Grand Total	**Grand Total**	**69,165,000**	**48,326,000**	**117,491,000**	**0**	**117,491,000**	**2,027,000**	**115,464,000**	**46,227,000**	**71,264,000**	**0**	**117,491,000**	**6**	**0.9**	**31**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory analysis from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.

**Some reserves lack coal quality. As such, Ellis, Seng Creek and Round Bottom Lower Cedar Grove reserves are priced as High-Vol A. Low Gap Middle Cedar Grove and Berwind Lower Cedar Grove reserves are priced as High-Vol A.*

Peerless reserves were priced as High-Vol B and the Powellton reserves were priced as High-Vol A.

Totals may not add due to rounding.

APPENDIX

B

INITIAL ECONOMIC ASSESSMENT RESOURCES EXCLUSIVE OF RESERVES (PER TON)

Alpha Metallurgical Resources, Inc.
Initial Economic Assessment Resources Exclusive of Reserves (per Ton)
Appendix B: MWVUG Complex

Seam:	CH MWVUG	GAT MWVUG	MCG MWVUG	LCG MWVUG	LCG MWVUG	PEER MWVUG	EG MWVUG	EG MWVUG	EG MWVUG	BEC MWVUG	BEC MWVUG	FC MWVUG	POW MWVU	POW MWVUG
Area:	Elk Run Seng Creek Chilton	Glen Alum Tunnel	Cedar Grove Block D	Black King I Block A1	Black King I Block D	Castle Peerless	Dow Fork Eagle	Sycamore Eagle	Panther Eagle	Beckley Mt. Larel	Beckley Workman	Firecreek Mt. Laurel	Brown's Branch Powellton	Powellton Block 10-B
In-Place Resource Tons	25,907,456	1,854,136	401,168	2,064,401	3,169,107	18,117,235	1,326,773	8,104,903	1,476,559	29,420,161	8,595,909	5,895,383	13,249,279	3,743,627
Potentially Recoverable Tons*	6,087,799	502,060	165,040	834,610	1,286,241	6,352,718	256,940	2,774,995	542,920	6,928,735	2,216,202	1,642,268	3,026,311	1,085,872
Mining Method	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM
Assumed Sales Realization at Plant**	$ 100	$ 130	$ 130	$ 130	$ 130	$ 100	$ 130	$ 130	$ 130	$ 130	$ 130	$ 130	$ 130	$ 130
Initial Capex Estimate to Access Resources***	$ 25,000,000	$ 8,000,000	$ 2,000,000	$ -	$ 8,000,000	$ 63,000,000	$ -	$ 25,000,000	$ -	$ 158,000,000	$ 15,000,000	$ 25,000,000	$ -	$ 8,000,000
Direct Mining Costs:														
Labor****	$ 19.83	$ 33.84	$ 31.27	$ 29.62	$ 27.90	$ 29.23	$ 29.11	$ 25.56	$ 31.12	$ 32.10	$ 25.32	$ 34.50	$ 32.63	$ 31.20
Supplies, Excluding Roof Control	$ 3.97	$ 6.77	$ 6.25	$ 5.92	$ 5.58	$ 5.85	$ 5.82	$ 5.11	$ 6.22	$ 6.42	$ 5.06	$ 6.90	$ 6.53	$ 6.24
Roof Control	$ 3.97	$ 6.77	$ 6.25	$ 5.92	$ 5.58	$ 5.85	$ 5.82	$ 5.11	$ 6.22	$ 6.42	$ 5.06	$ 6.90	$ 6.53	$ 6.24
M&R	$ 10.60	$ 8.89	$ 8.41	$ 9.35	$ 8.68	$ 8.31	$ 11.66	$ 8.68	$ 11.61	$ 10.32	$ 7.39	$ 9.70	$ 10.48	$ 9.88

Power	$ 2.35	$ 1.98	$ 1.87	$ 2.08	$ 1.93	$ 1.85	$ 2.59	$ 1.93	$ 2.58	$ 2.29	$ 1.64	$ 2.16	$ 2.33	$ 2.20
Other	$ 2.35	$ 1.98	$ 1.87	$ 2.08	$ 1.93	$ 1.85	$ 2.59	$ 1.93	$ 2.58	$ 2.29	$ 1.64	$ 2.16	$ 2.33	$ 2.20
Total Direct Cash Costs	$ 43.07	$ 60.22	$ 55.93	$ 54.97	$ 51.60	$ 52.93	$ 57.60	$ 48.32	$ 60.34	$ 59.85	$ 46.12	$ 62.31	$ 60.83	$ 57.95
Transporation, Washing, Environmental & G&A Costs:														
Coal Prep*****	$ 9.42	$ 7.90	$ 7.47	$ 8.31	$ 7.72	$ 7.38	$ 10.37	$ 7.71	$ 10.32	$ 13.76	$ 6.57	$ 12.93	$ 9.32	$ 8.78
Materials Handling	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50
Raw Coal Trucking*****	$ 9.37	$ 2.99	$ 10.47	$ 3.83	$ 3.56	$ 3.41	$ 16.07	$ 3.56	$ -	$ 11.17	$ 2.53	$ 10.49	$ 4.30	$ 4.13
Clean Coal Trucking	$ 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
Enviro******	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35
G&A	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00
Total Transporation, Washing, Environmental & G&A Co	**$ 26.89**	**$ 18.99**	**$ 26.05**	**$ 20.25**	**$ 19.38**	**$ 18.89**	**$ 34.53**	**$ 19.37**	**$ 18.42**	**$ 33.03**	**$ 17.20**	**$ 31.53**	**$ 21.71**	**$ 21.01**
Indirect Cash Costs														
Royalty	$ 6.00	$ 7.80	$ 7.80	$ 7.80	$ 7.80	$ 6.00	$ 7.80	$ 7.80	$ 7.80	$ -	$ 7.80	$ -	$ 7.80	$ 7.80
Black Lung Excise Tax	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55
SMCRA	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12
State Severance	$ 5.00	$ 2.60	$ 1.30	$ 2.60	$ 2.60	$ 2.00	$ 6.50	$ 6.50	$ 1.30	$ 2.60	$ 6.50	$ 1.30	$ 6.50	$ 6.50
Property Tax & Insurance	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50
Total Indirect Cash Costs	**$ 14.17**	**$ 13.57**	**$ 12.27**	**$ 13.57**	**$ 13.57**	**$ 11.17**	**$ 17.47**	**$ 17.47**	**$ 12.27**	**$ 5.77**	**$ 17.47**	**$ 4.47**	**$ 17.47**	**$ 17.47**
Non Cash Costs														
Amorititztion of Development Capital	$ 4.11	$ 15.93	$ 12.12	$ -	$ 6.22	$ 9.92	$ -	$ 9.01	$ -	$ 22.80	$ 6.77	$ 15.22	$ -	$ 7.37
Depreciation of Initial Equipment and Sustaining Capital	$ 5.00	$ 5.00	$ -	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00
Depletion	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Total Non Cash	$ 10.11	$ 21.93	$ 13.12	$ 6.00	$ 12.22	$ 15.92	$ 6.00	$ 15.01	$ 6.00	$ 28.80	$ 12.77	$ 21.22	$ 6.00	$ 13.37
Total Cash Cost	**$ 84.13**	**$ 92.78**	**$ 94.25**	**$ 88.79**	**$ 84.55**	**$ 82.99**	**$ 109.61**	**$ 85.16**	**$ 91.03**	**$ 98.65**	**$ 80.79**	**$ 98.31**	**$ 100.01**	**$ 96.43**
EBITDA	**$ 15.87**	**$ 37.22**	**$ 35.75**	**$ 41.21**	**$ 45.45**	**$ 17.01**	**$ 20.39**	**$ 44.84**	**$ 38.97**	**$ 31.35**	**$ 49.21**	**$ 31.69**	**$ 29.99**	**$ 33.57**
Fully Loaded Cost	**$ 94.24**	**$ 114.72**	**$ 107.37**	**$ 94.79**	**$ 96.77**	**$ 98.90**	**$ 115.61**	**$ 100.17**	**$ 97.03**	**$ 127.45**	**$ 93.56**	**$ 119.53**	**$ 106.01**	**$ 109.80**
Fully Loaded P&L	**$ 5.76**	**$ 15.28**	**$ 22.63**	**$ 35.21**	**$ 33.23**	**$ 1.10**	**$ 14.39**	**$ 29.83**	**$ 32.97**	**$ 2.55**	**$ 36.44**	**$ 10.47**	**$ 23.99**	**$ 20.20**
Passes Resource Inital Economic Assessment?	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**

*Potentially recoverable tons are calculated by applying appropriate modifying factors to in-place resource tonnages

**Sales relization represents estimated long range sales price.

***No initial capital required where resources are accessible from existing mines.

****Labor rates are driven based off of super section productivities assuming 250 to 350 feet per unit shift per section.

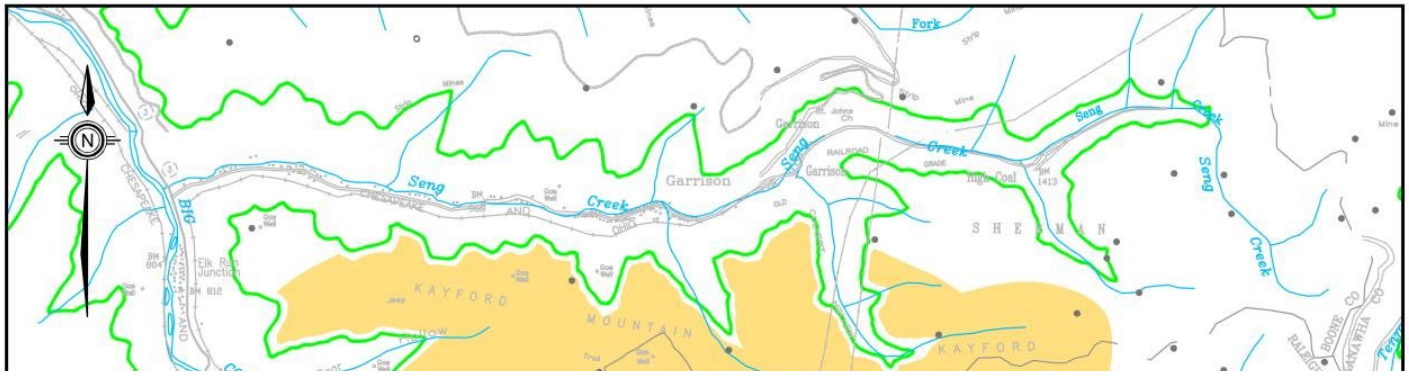
*****Processing assumed to occur at Marfork plant with the exception of Mt. Laurel resouces, which are assumed to be toll washed at another regional plant.

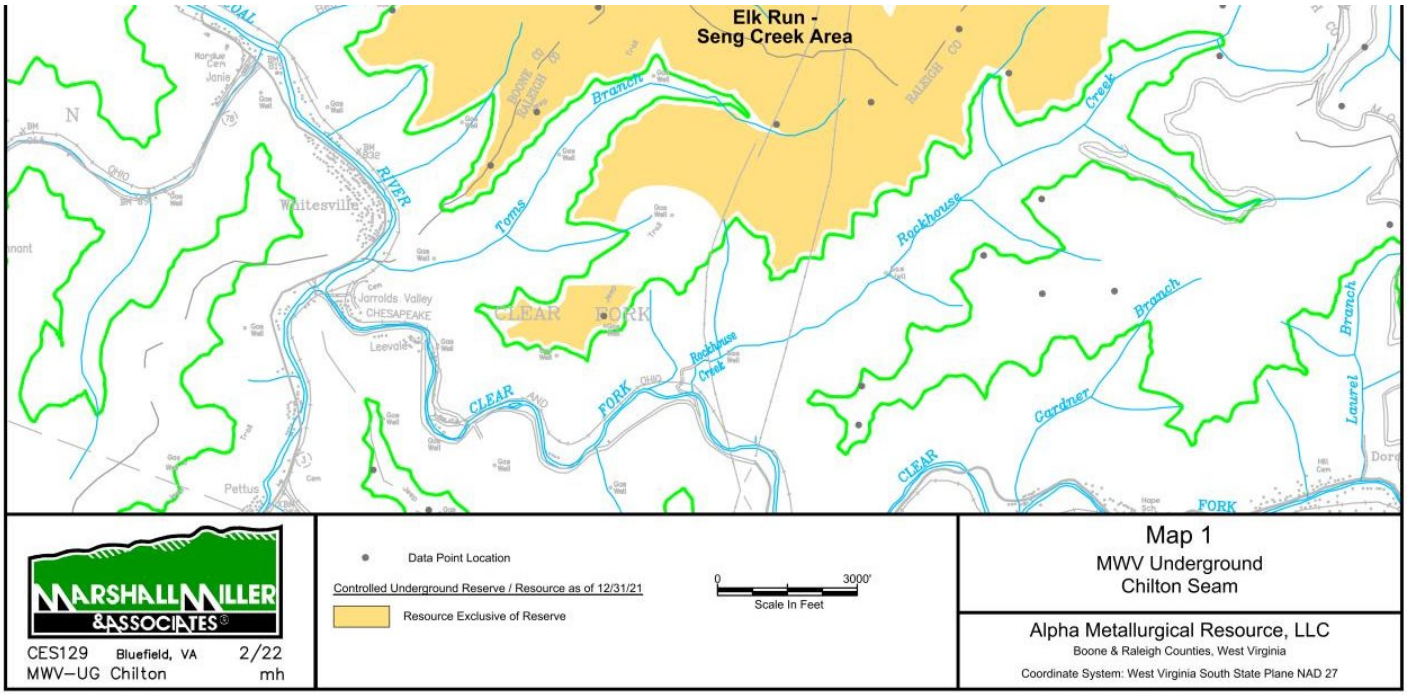
******Environmental costs assumed to include permiting, outfall maintenance, etc.

APPENDIX

C

MAPS





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–UG Chilton mh

Data Point Location

Controlled Underground Reserve / Resource as of 12/31/21

Resource Exclusive of Reserve

0 3000'
Scale In Feet

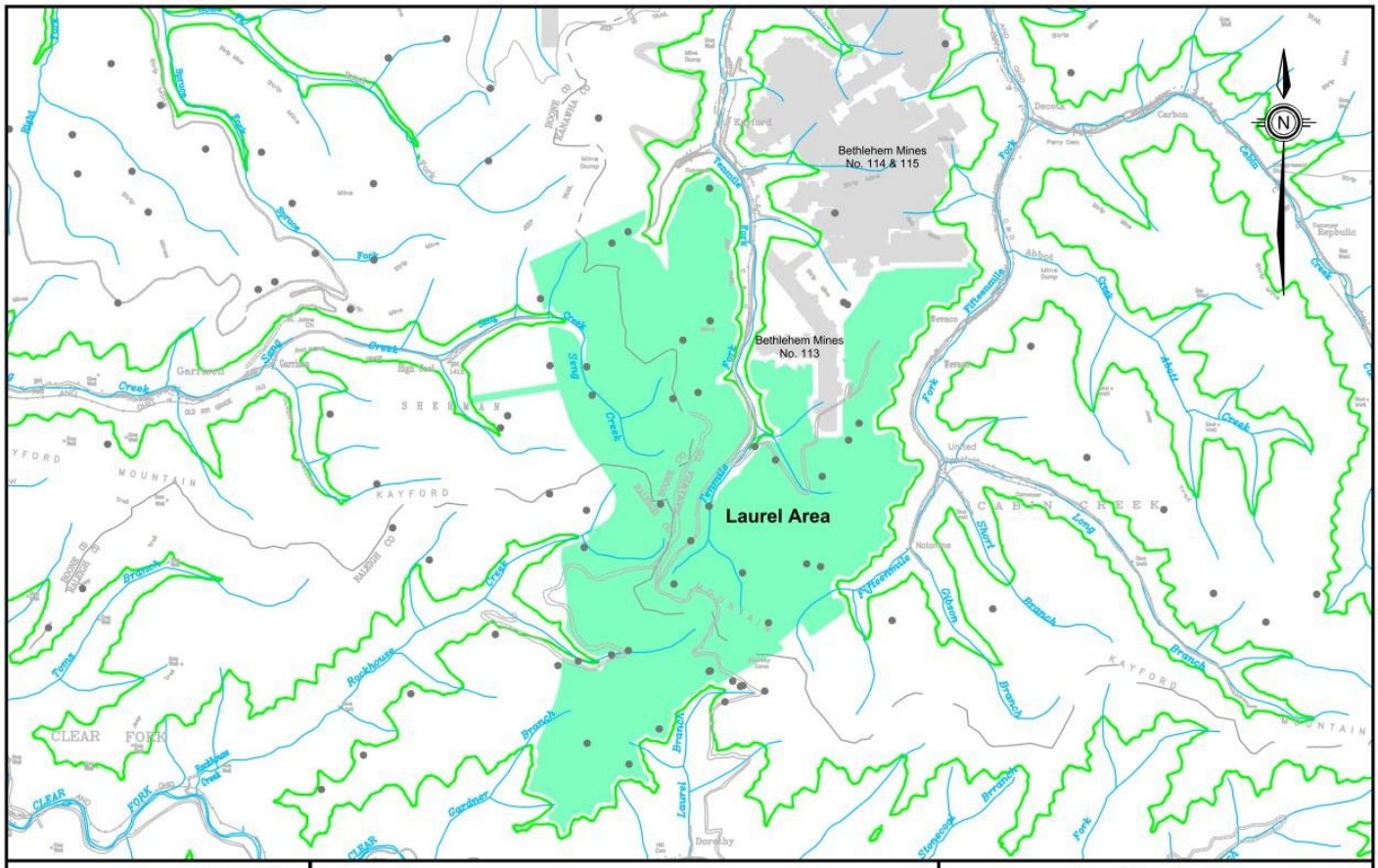
Map 1

MWV Underground
Chilton Seam

Alpha Metallurgical Resource, LLC

Boone & Raleigh Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–UG Hernshaw mh

Data Point Location

Previous Underground Mining

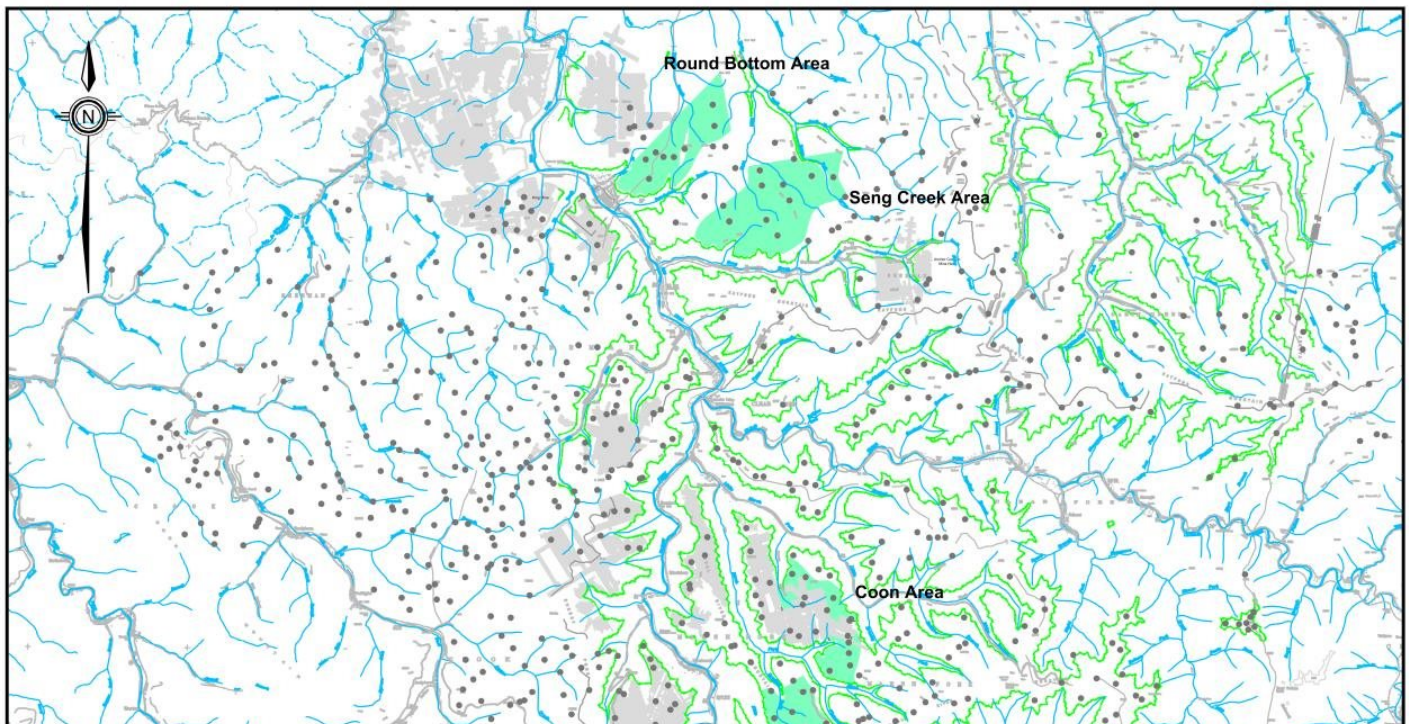
Controlled Underground Reserve / Resource as of 12/31/21

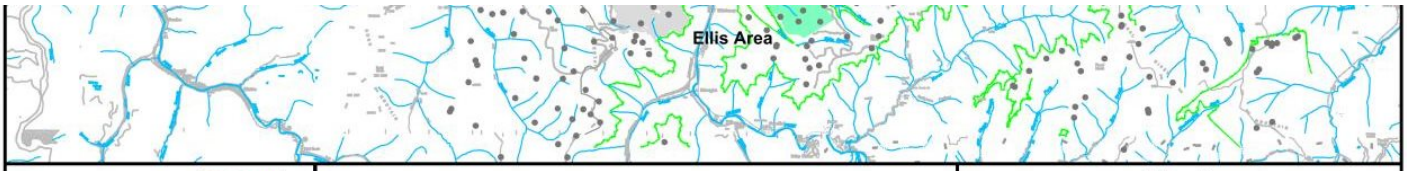
Reserve

0 4000'
Scale In Feet

Map 2
MWV Underground
Hernshaw Seam

Alpha Metallurgical Resource, LLC
Boone, Raleigh & Kanawha Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27





MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
MWV–UG UCG mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

0 1 2
Scale In Miles

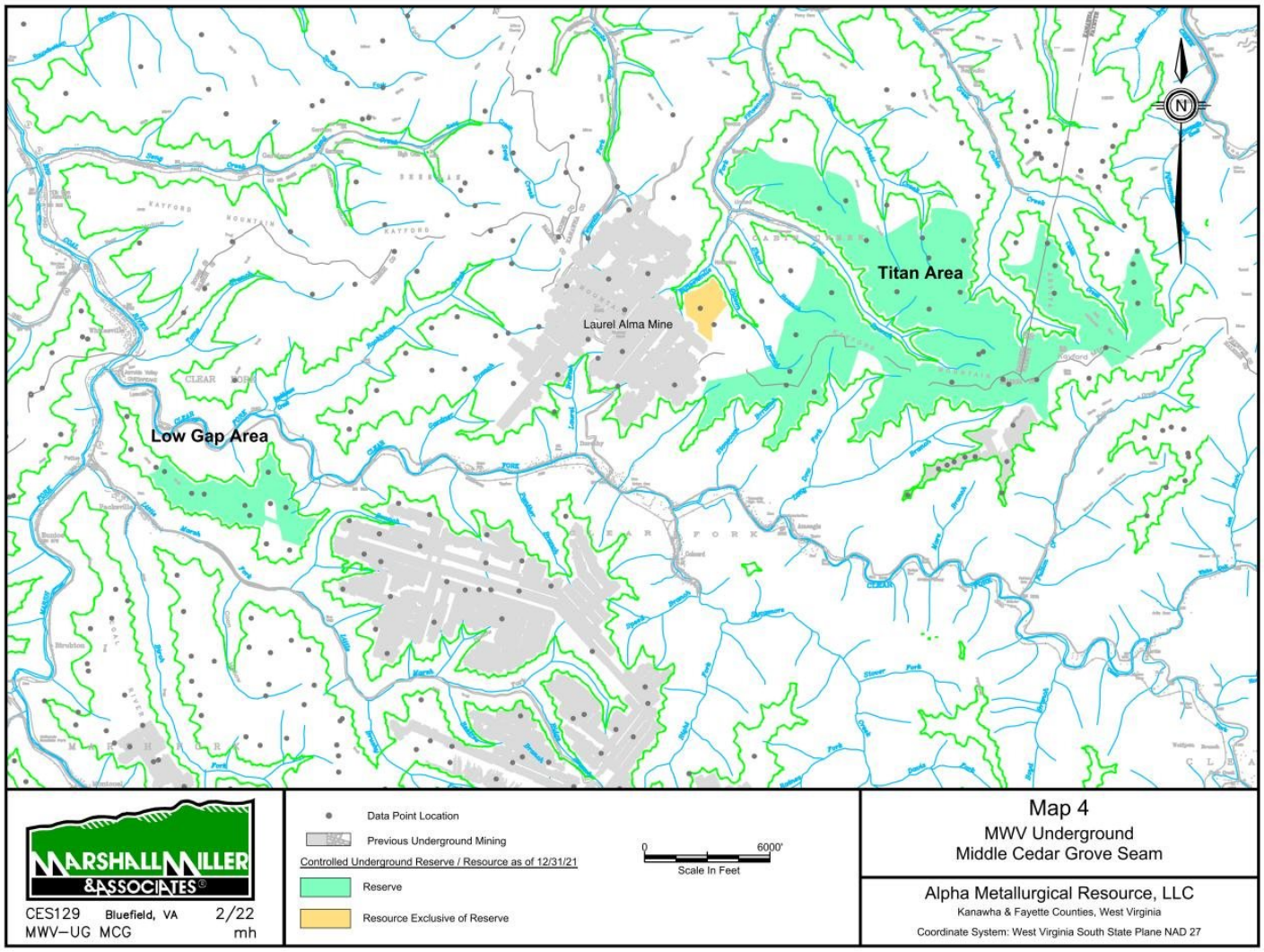
Map 3

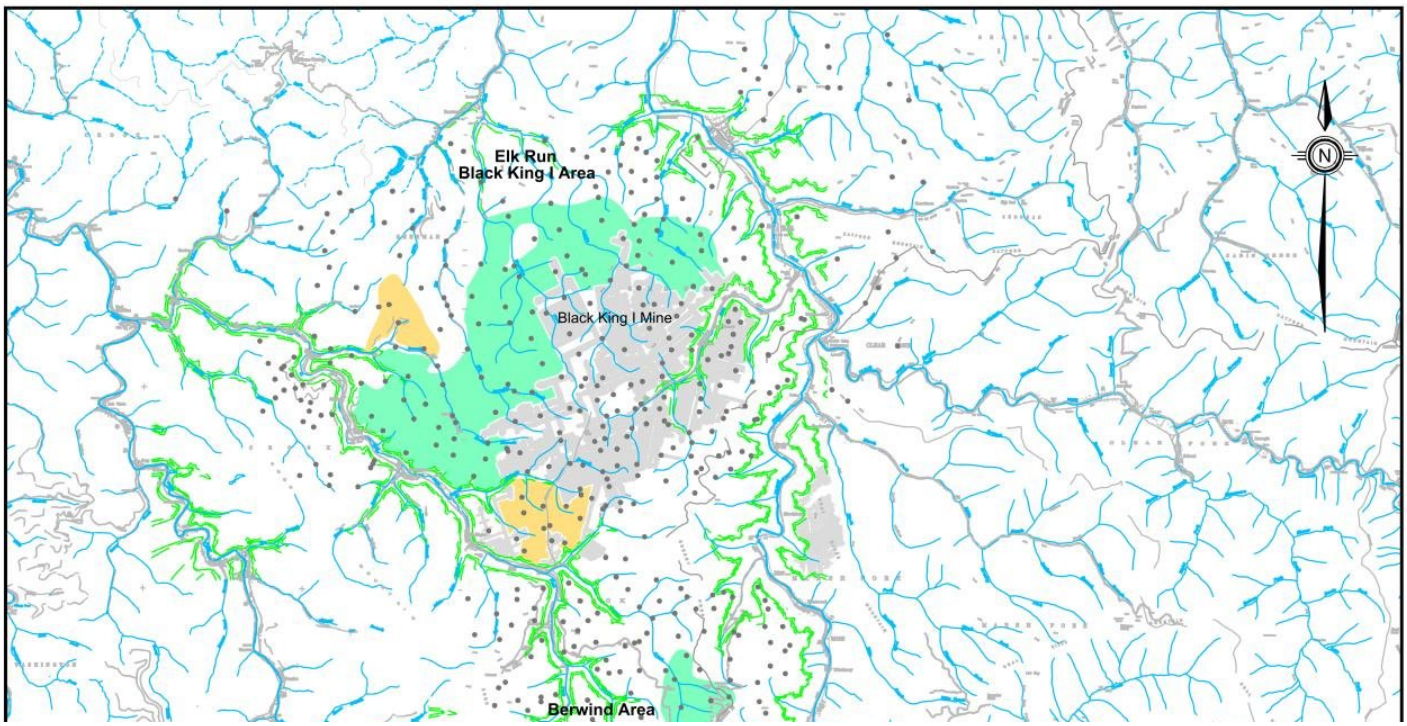
MWV Underground
Upper Cedar Grove Seam

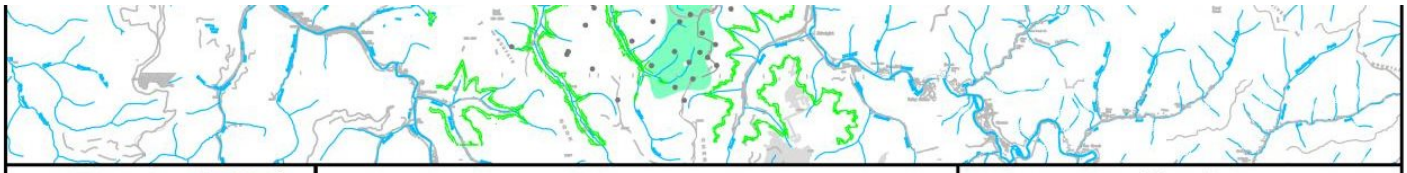
Alpha Metallurgical Resource, LLC

Boone & Raleigh Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27


Titan Area
Laurel Alma Mine
Low Gap Area
N
MARSHALL MILLER &ASSOCIATES®
CES129 Bluefield, VA 2/22
MWV–UG MCG mh
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0 6000'
Scale In Feet
Map 4
MWV Underground
Middle Cedar Grove Seam
Alpha Metallurgical Resource, LLC
Kanawha & Fayette Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27


Elk Run
Black King I Area
Black King I Mine
Berwind Area
N



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–UG LCG mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 2
Scale In Miles

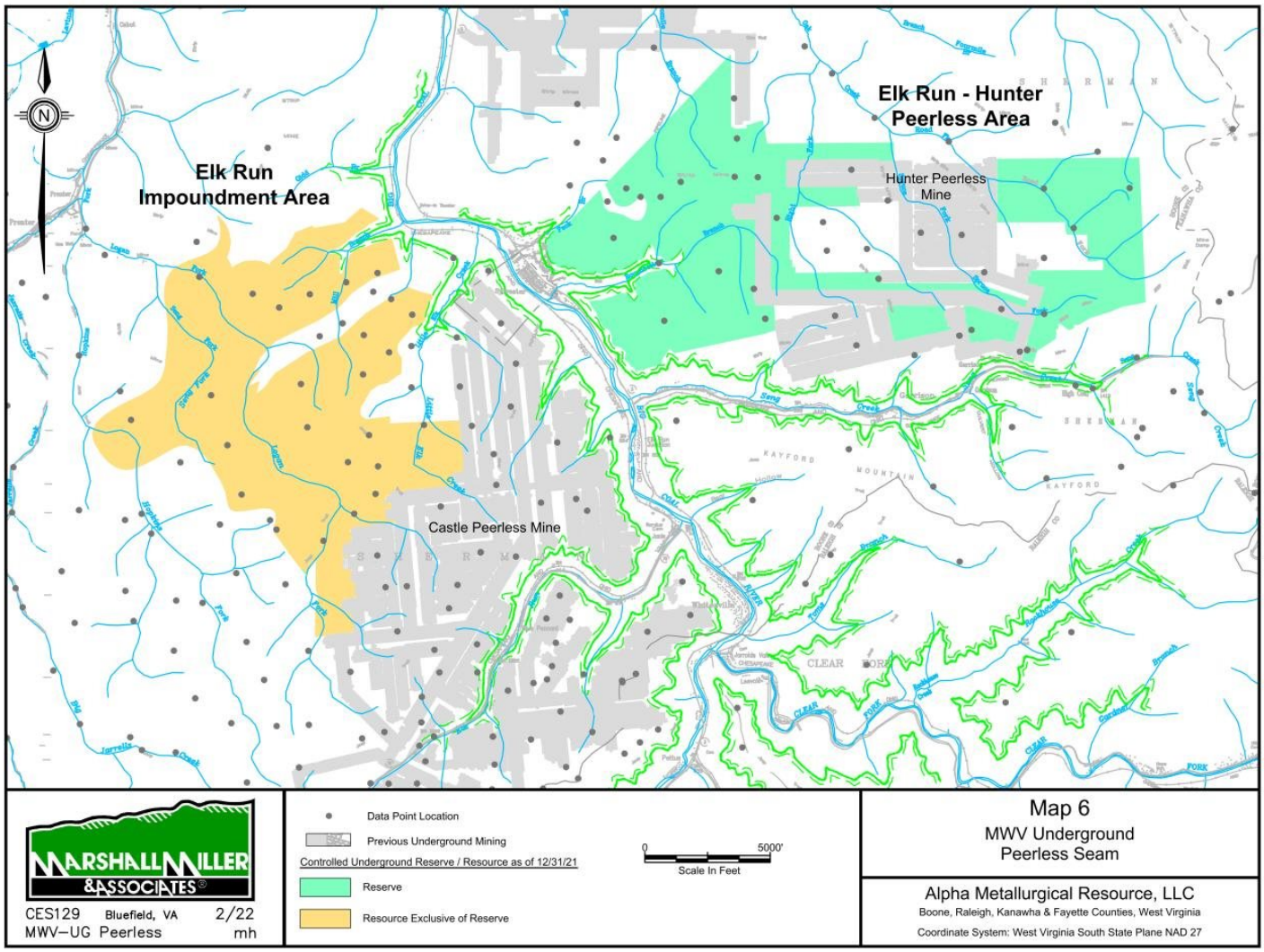
Map 5

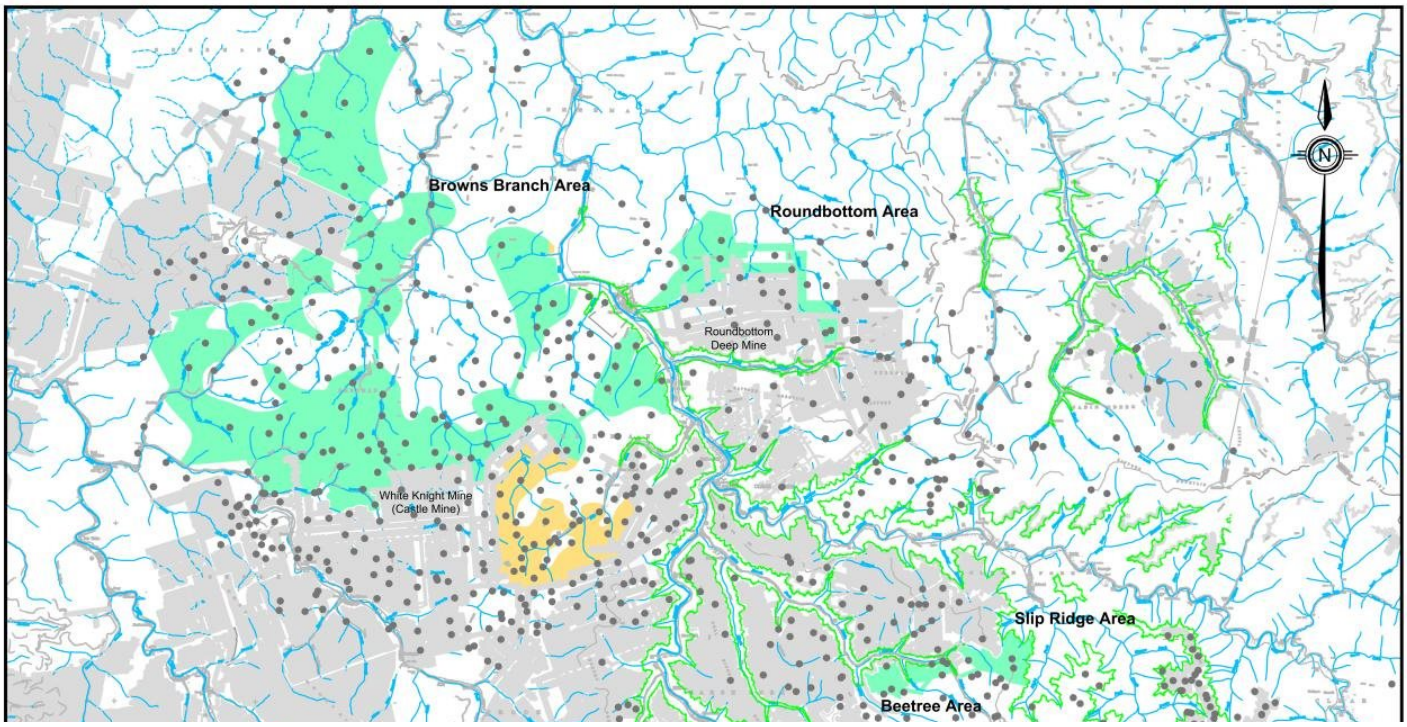
MWV Underground
Lower Cedar Grove Seam

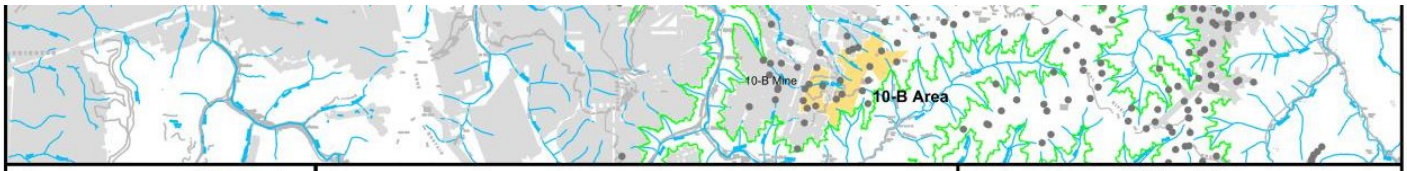
Alpha Metallurgical Resource, LLC

Boone & Raleigh Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27


Elk Run
Impoundment Area
Elk Run - Hunter
Peerless Area
Hunter Peerless
Mine
Castle Peerless Mine
MARSHALL MILLER
&ASSOCIATES
CES129 Bluefield, VA 2/22
MWV–UG Peerless mh
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0
5000'
Scale In Feet
Map 6
MWV Underground
Peerless Seam
Alpha Metallurgical Resource, LLC
Boone, Raleigh, Kanawha & Fayette Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27


Browns Branch Area
Roundbottom Area
Roundbottom
Deep Mine
White Knight Mine
(Castle Mine)
Slip Ridge Area
Beetree Area



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–UG Powellton mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 2.25
Scale In Miles

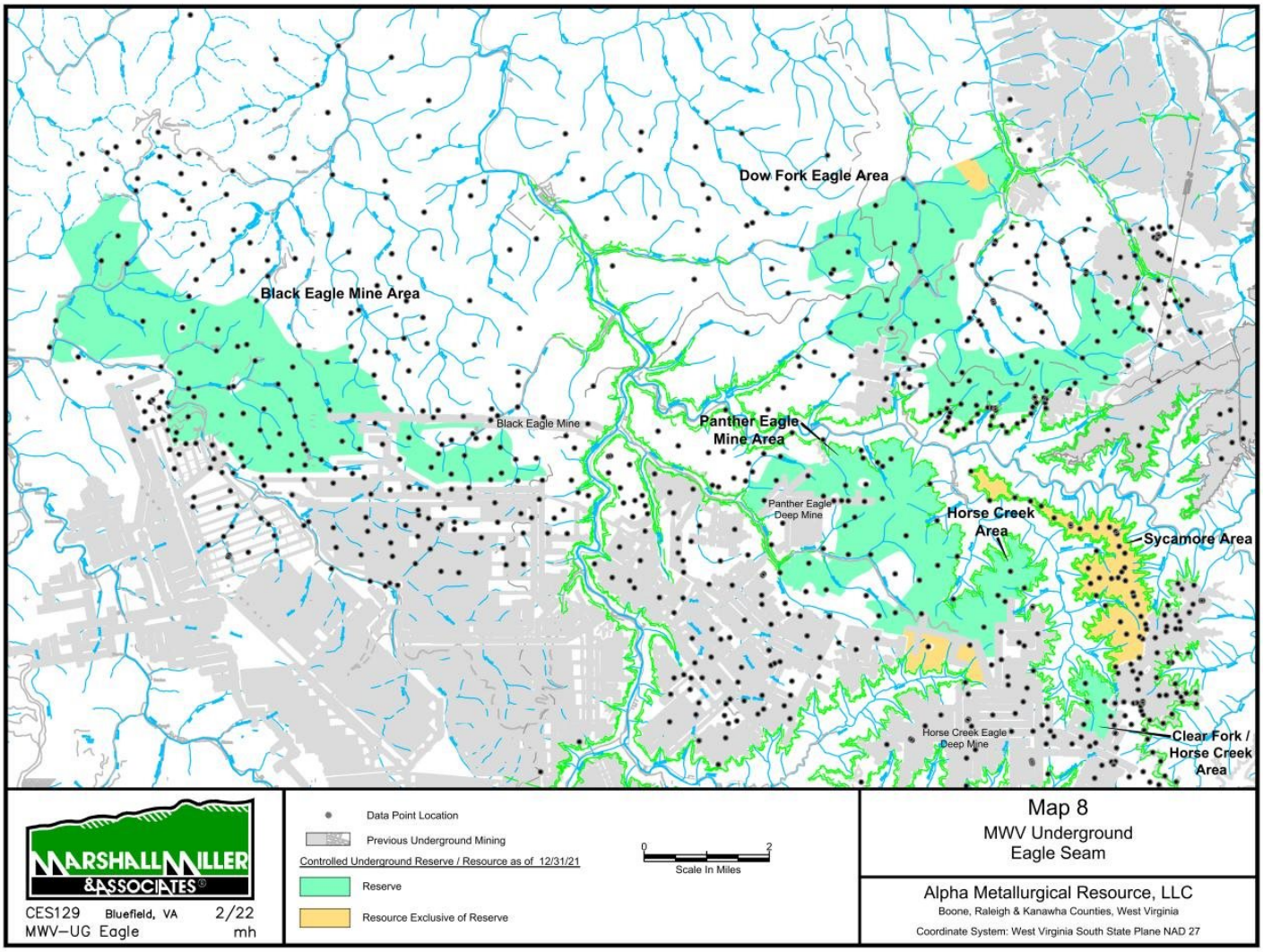
Map 7

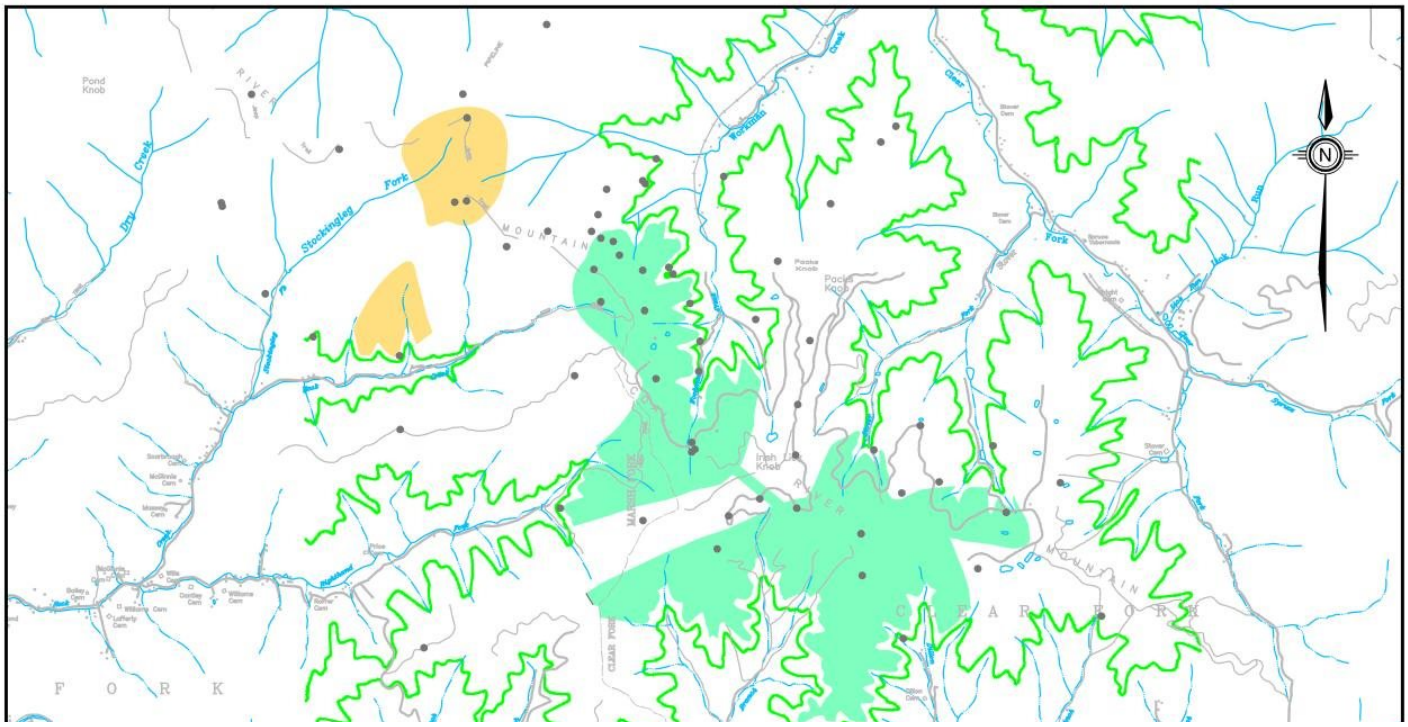
MWV Underground
Powellton Seam

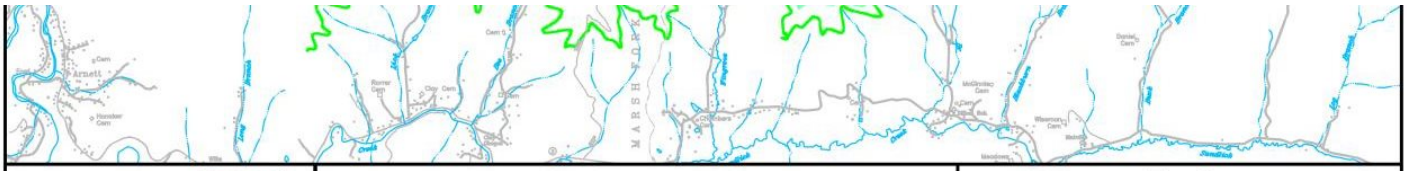
Alpha Metallurgical Resource, LLC

Boone & Raleigh Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27


Dow Fork Eagle Area
Black Eagle Mine Area
Black Eagle Mine
Panther Eagle Mine Area
Panther Eagle Deep Mine
Horse Creek Area
Sycamore Area
Horse Creek Eagle Deep Mine
Clear Fork / Horse Creek Area
MARSHALL MILLER & ASSOCIATES
CES129 Bluefield, VA 2/22
MWV–UG Eagle mh
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0
2
Scale In Miles
Map 8
MWV Underground
Eagle Seam
Alpha Metallurgical Resource, LLC
Boone, Raleigh & Kanawha Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27


N



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
MWV–UG GAT mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

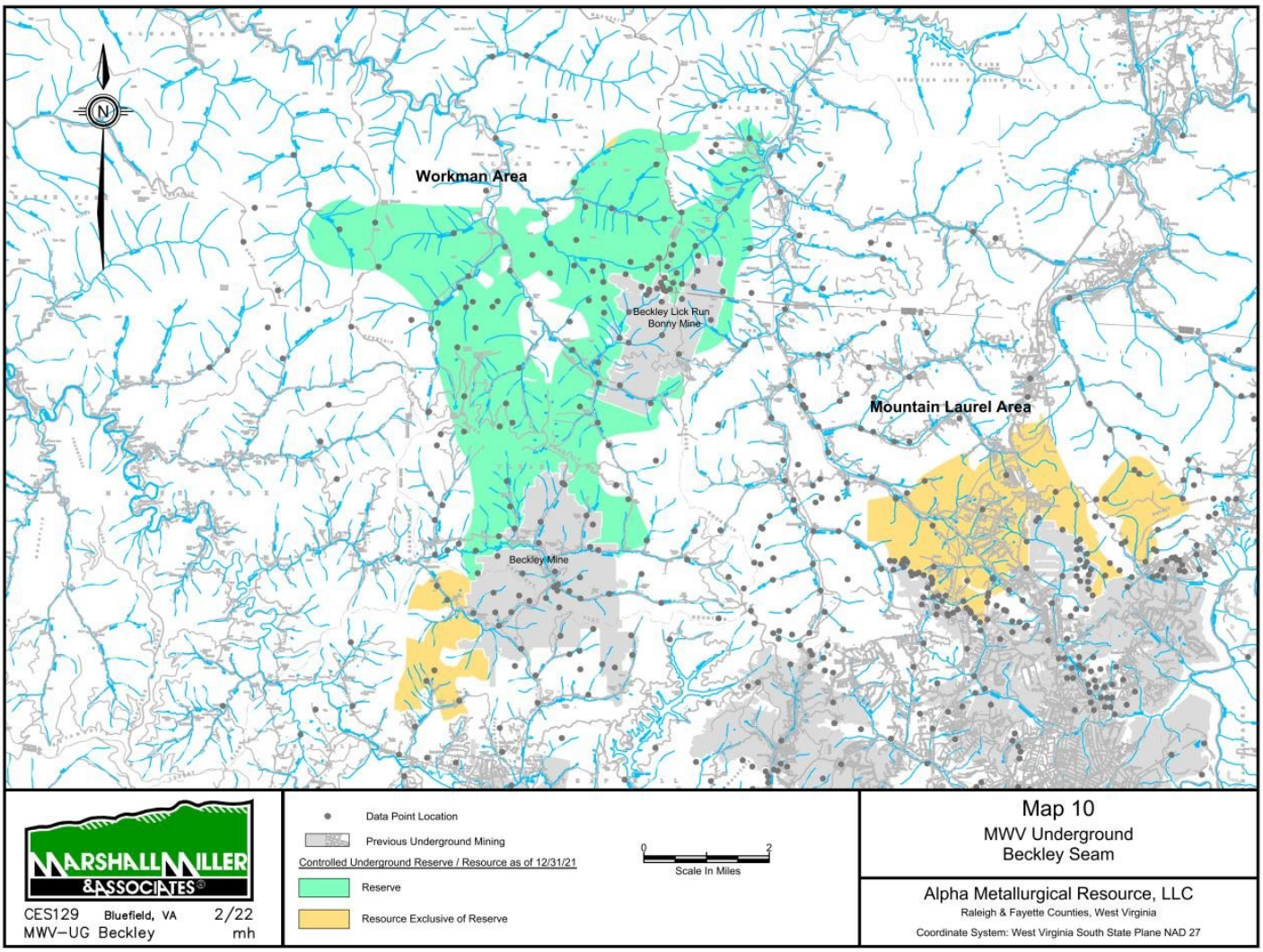
Resource Exclusive of Reserve

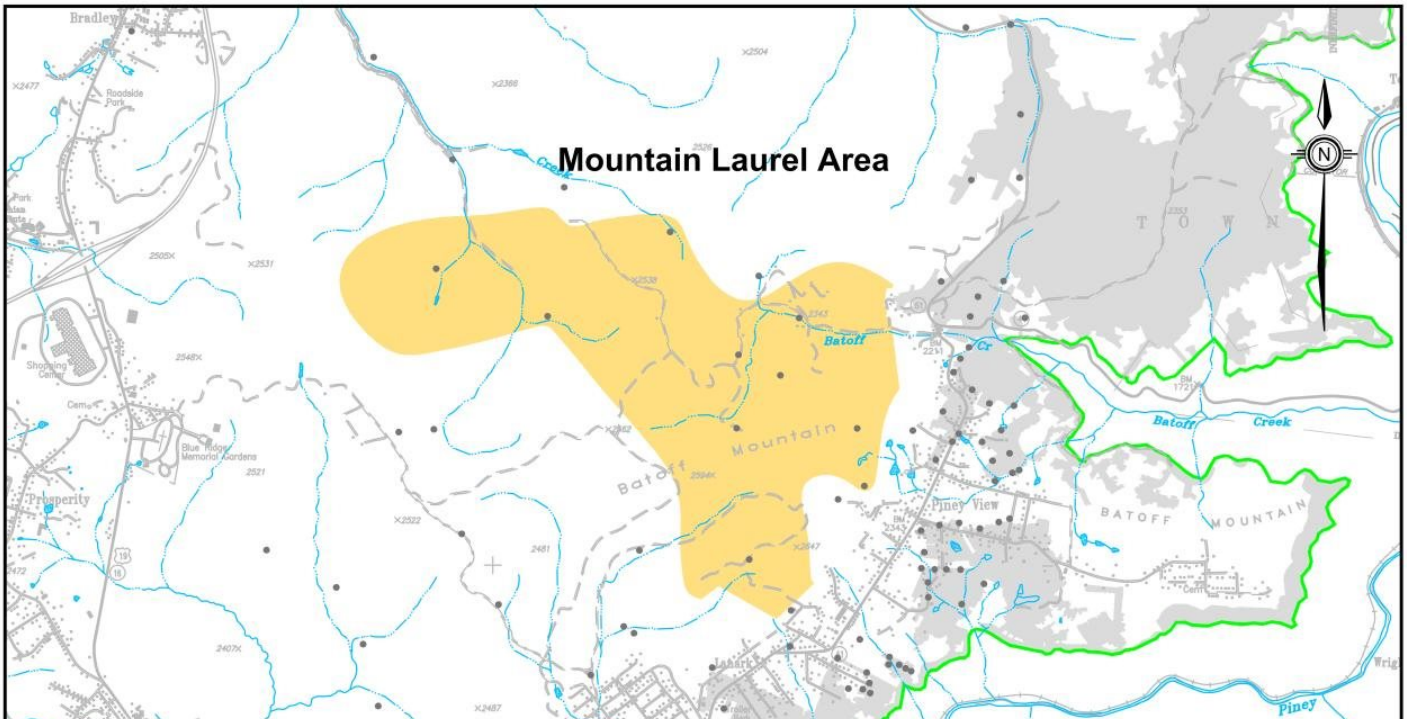
0 4000'
Scale In Feet

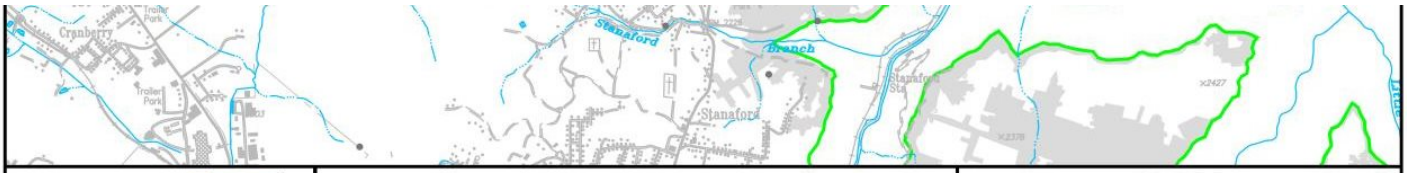
Map 9

MWV Underground
Glen Alum Tunnel Seam

Alpha Metallurgical Resource, LLC
Raleigh County, West Virginia
Coordinate System: West Virginia South State Plane NAD 27


Workman Area
Beckley Lick Run
Bonny Mine
Mountain Laurel Area
Beckley Mine
MARSHALL MILLER & ASSOCIATES
CES129 Bluefield, VA 2/22
MWV–UG Beckley mh
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0
2
Scale In Miles
Map 10
MWV Underground
Beckley Seam
Alpha Metallurgical Resource, LLC
Raleigh & Fayette Counties, West Virginia
Coordinate System: West Virginia South State Plane NAD 27


Mountain Laurel Area
Batoff
Mountain
Batoff Creek
Piney View
BATOFF MOUNTAIN
Piney
Bradley
Prosperity



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
MWV–UG Fire Creek mh

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Resource Exclusive of Reserve

0 3000'
Scale In Feet

Map 11
MWV Underground
Fire Creek Seam

Alpha Metallurgical Resource, LLC

Boone, Raleigh, Kanawha & Fayette Counties, West Virginia

Coordinate System: West Virginia South State Plane NAD 27

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the Virginia Complex in Accordance with United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

February 2022

Prepared for:
Alpha Metallurgical Resources, Inc.
340 Martin Luther King Jr. Blvd.
Bristol, TN 37620

Prepared by:
Marshall Miller & Associates, Inc.
582 Industrial Park Road
Bluefield, Virginia 24605
www.mma1.com

Statement of Use and Preparation

This Technical Report Summary (*TRS*) was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors. Copies or references to information in this report may not be used without the written permission of Alpha.

The report provides a statement of coal resources and coal reserves for **Alpha**, as defined under the **United States Securities and Exchange Commission (*SEC*)**.

The statement is based on information provided by Alpha and reviewed by various professionals within **Marshall Miller & Associates, Inc. (*MM&A*)**.

MM&A professionals who contributed to the drafting of this report meet the definition of *Qualified Persons* (*QPs*), consistent with the requirements of the SEC.

The information in this TRS related to coal resources and reserves is based on, and fairly represents, information compiled by the QPs. At the time of reporting, MM&A's QPs have sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity they are undertaking to qualify as a QP as defined by the SEC.

Certain information set forth in this report contains "forward-looking information", including production, productivity, operating costs, capital costs, sales prices, and other assumptions. These statements are not guarantees of future performance and undue reliance should not be placed on them. The assumptions used to develop the forward-looking and the risks that could cause the actual results to differ materially are detailed in the body of this report.

Marshall Miller & Associates, Inc. (*MM&A*) hereby consents (i) to the use of the information contained in this report dated December 31, 2021, relating to estimates of coal resources and coal reserves controlled by Alpha, (ii) to the use of MM&A's name, any quotations from or summarizations of this TRS in Alpha's SEC filings, and (iii) to the filing of this TRS as an exhibit to Alpha's SEC filings.

Qualified Person:	**/s/ Marshall Miller & Associates, Inc.**
Date:	February 15, 2022

Table of Contents

1 **Executive Summary** **1**
1.1 Property Description 1
1.2 Ownership 2
1.3 Geology 2
1.4 Exploration Status 3
1.5 Operations and Development 3
1.6 Mineral Resource 4
1.7 Mineral Reserve 5
1.8 Capital Summary 6
1.9 Operating Costs 7
1.10 Economic Evaluation 8
1.10.1 Discounted Cash Flow Analysis 11
1.10.2 Sensitivity Analysis 12
1.11 Permitting 12
1.12 Conclusion and Recommendations 12
2 **Introduction** **13**
2.1 Registrant and Terms of Reference 13
2.2 Information Sources 13
2.3 Personal Inspections 14
3 **Property Description** **14**
3.1 Location 14
3.2 Titles, Claims or Leases 14
3.3 Mineral Rights 15
3.4 Encumbrances 15
3.5 Other Risks 15
4 **Accessibility, Climate, Local Resources, Infrastructure and Physiography** **16**
4.1 Topography, elevation, and Vegetation 16
4.2 Access and Transport 16
4.3 Proximity to Population Centers 16
4.4 Climate and Length of Operating Season 17
4.5 Infrastructure 17

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

5 **History** **17**
5.1 Previous Operation 17
5.2 Previous Exploration 18
6 **Geological Setting, Mineralization and Deposit** **18**
6.1 Regional, Local and Property Geology 18
6.2 Mineralization 19
6.3 Deposits 20

6.3 Deposits 20
7 **Exploration 21**
7.1 Nature and Extent of Exploration 21
7.2 Drilling Procedures 23
7.3 Hydrology 23
7.4 Geotechnical Data 24
8 **Sample Preparation Analyses and Security 24**
8.1 Prior to Sending to the Lab 24
8.2 Lab Procedures 25
9 **Data Verification 25**
9.1 Procedures of Qualified Person 25
9.2 Limitations 26
9.3 Opinion of Qualified Person 26
10 **Mineral Processing and Metallurgical Testing 26**
10.1 Testing Procedures 26
10.2 Relationship of Tests to the Whole 27
10.3 Lab Information 27
10.4 Relevant Results 28
11 **Mineral Resource Estimates 28**
11.1 Assumptions, Parameters and Methodology 28
11.1.1 Geostatistical Analysis 30
11.2 Resources Exclusive of Reserves 33
11.2.1 Initial Economic Assessment 34
11.3 Qualified Person's Estimates 35
11.4 Qualified Person's Opinion 36
12 **Mineral Reserve Estimates 37**
12.1 Assumptions, Parameters and Methodology 37
12.2 Mineral Reserves 38

12.2.1 Surface Reserves 39
12.2.2 Underground Reserves 40
12.3 Qualified Person's Estimates 42
12.4 Qualified Person's Opinion 43
13 Mining Methods 43
13.1 Geotech and Hydrology 43
13.2 Production Rates 44
13.3 Mining Related Requirements 46
13.3.1 Underground 46
13.4 Required Equipment and Personnel 46
13.4.1 Underground Mines 46
13.4.2 Surface Mines 51
14 Processing and Recovery Methods 55
14.1 Description or Flowsheet 55
14.2 Requirements for Energy, Water, Material and Personnel 57
15 Infrastructure 58
16 Market Studies 61
16.1 Market Description 61
16.2 Price Forecasts 61
16.3 Contract Requirements 62
17 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals 62
17.1 Results of Studies 62
17.2 Requirements and Plans for Waste Disposal 62
17.3 Permit Requirements and Status 63
17.4 Local Plans, Negotiations or Agreements 66
17.5 Mine Closure Plans 66
17.6 Qualified Person's Opinion 66
18 Capital and Operating Costs 66
18.1 Capital Cost Estimate 66
18.2 Operating Cost Estimate 69
19 Economic Analysis 71
19.1 Economic Evaluation 71
19.1.1 Introduction 71

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

19.1.2 Cash Flow Summary 75
19.1.3 Discounted Cash Flow Analysis 78
19.1.4 Sensitivity Analysis 79
20 Adjacent Properties 79
20.1 Information used 79
21 Other Relevant Data and Information 80

22 **Interpretation and Conclusions** **80**
22.1 Conclusion 80
22.2 Risk Factors 80
22.2.1 Governing Assumptions 81
22.2.2 Limitations 82
22.2.3 Methodology 82
22.2.4 Development of the Risk Matrix 83
22.2.5 Categorization of Risk Levels and Color Code Convention 85
22.2.6 Description of the Coal Property 85
22.2.7 Summary of Residual Risk Ratings 86
22.2.8 Risk Factors 86
23 **Recommendations** **93**
24 **References** **93**
25 **Reliance on Information Provided by Registrant** **94**

FIGURES (IN REPORT)

Figure 1-1: Alpha's Virginia Property Location Map 2
Figure 1-2: Projected Capital Expenditures – Consolidated Virginia Operations 7
Figure 1-3: Virginia Operating Costs 8
Figure 1-4: Sensitivity of NPV 12
Figure 6-1: Virginia Stratigraphic Column 20
Figure 7-1: Virginia Cross-Section 22
Figure 11-1: Histogram of the Total Seam Thickness for the Jawbone Seam Present in the Virginia Complex 31
Figure 11-2: Scatter plot of the Total Seam Thickness for the Jawbone Seam Present in the Virginia Complex 31
Figure 11-3: Variogram of the Total Seam Thickness for the Jawbone Seam Present in the Virginia Complex 32
Figure 11-4: Result of DHSA for the Jawbone Seam Present in the Virginia Complex 33
Figure 11-5: Results of Initial Economic Assessment 35
Figure 13-1: Long Branch Surface Mine Aerial View 51

Figure 13-2: 88-Strip/Three Forks Surface Mine Aerial View 53
Figure 14-1: McClure River Preparation Plant and Refuse Area 56
Figure 14-2: Tom's Creek Preparation Plant and Slurry Impoundment 57
Figure 15-1: McClure River Preparation Plant & Surface Facilities 59
Figure 15-2: Tom's Creek Preparation Plant & Surface Facilities 60
Figure 18-1: Projected Capital Expenditures – Consolidated Virginia Operations 67
Figure 18-2: Virginia Operating Costs 70
Figure 19-1: Projection of Sales Tons 72
Figure 19-2: Consolidated Annual Revenue 73
Figure 19-3: Revenue, Cash Costs, and EBITDA 74
Figure 19-4: Annual EBITDA 75
Figure 19-5: Net Cash Flow after Tax (Before Debt Service) 78
Figure 19-6: Sensitivity of NPV 79

TABLES (IN REPORT)

Table 1-1: Coal Resources Summary as of December 31, 2021 4
Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 5
Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 9
Table 1-4: Project Cash Flow Summary (000) 10
Table 11-1: General Reserve & Resource Criteria 29
Table 11-2: DHSA Results Summary for Radius from a Central Point 33
Table 11-3: Results of Initial Economic Assessment 35
Table 11-4: Coal Resources Summary as of December 31, 2021 36
Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021 42
Table 13-1: Virginia Complex Underground Mine Production Schedule (x 1,000 Saleable Tons) 44
Table 13-2: Virginia Complex Surface Mine Production Schedule (x 1,000 Saleable Tons) 46
Table 13-3: Virginia Complex Highwall Mine Production Schedule (x 1,000 Saleable Tons) 46
Table 16-1: 2021 Produced Quality 61
Table 16-2: Price Forecasts 61
Table 17-1: Virginia Refuse Disposal Summary 63
Table 17-2: Virginia Mining Permits 65
Table 18-1: Summary of Capital Expenditures Schedule by Mine 68
Table 18-2: Estimated Coal Production Taxes and Sales Costs 70
Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA 74
Table 19-2: Project Cash Flow Summary (000) 76
Table 22-1: Probability Level Table 83
Table 22-2: Consequence Level Table 84
Table 22-3: Risk Matrix 85
Table 22-4: Risk Assessment Matrix 86
Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2) 87
Table 22-6: Environmental (Risks 3 and 4) 88
Table 22-7: Regulatory Requirements (Risk 5) 88

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Table 22-8: Market and Transportation (Risk 6) 89
Table 22-9: Market and Transportation (Risk 7) 89
Table 22-10: Methane Management (Risk 8) 90
Table 22-11: Mine Fires (Risk 9) 90
Table 22-12: Ground Control (Risk 10) 91
Table 22-13: Availability of Supplies and Equipment (Risk 11) 91
Table 22-14: Labor – Work Stoppage (Risk 12) 92
Table 22-15: Labor – Retirement (Risk 13) 92

Table 22-16: Health and Safety (Risk 14) 93
Table 22-17: Refuse Disposal (Risk 15) 93
Table 25-1: Information from Registrant Relied Upon by MM&A 94

Appendices

A ..... Summary Tables
B ..... Initial Economic Assessment, Resources Exclusive of Reserves (per Ton)
C ..... Maps

1 Executive Summary

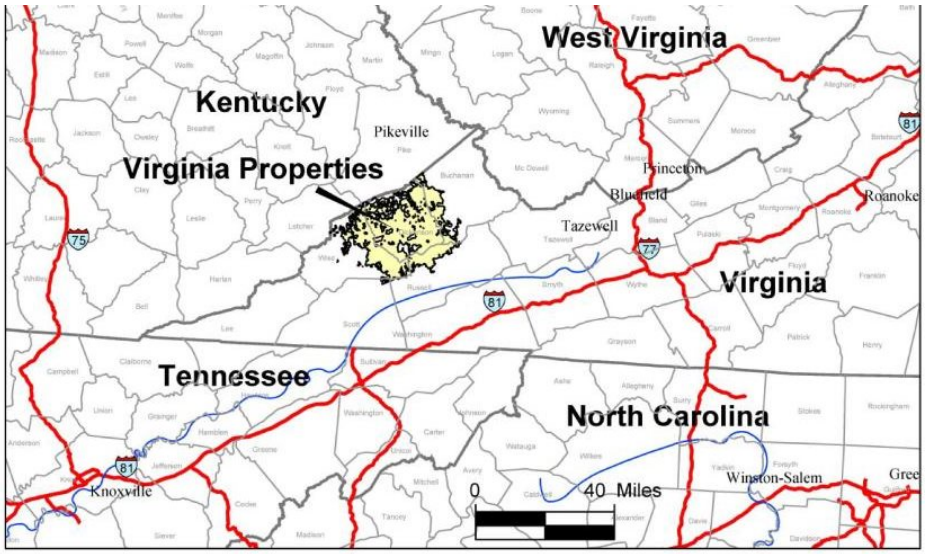
1.1 Property Description

Alpha Metallurgical Resources, Inc. (*Alpha*) authorized **Marshall Miller & Associates, Inc. (*MM&A*)** to prepare this Technical Report Summary (*TRS*) of its controlled coal reserves located at the **Virginia Complex (*Virginia*** or the *Property*) in Buchanan, Dickenson, Russell and Wise counties, Virginia.

Active surface facilities for the operations include the McClure River Preparation plant (*McClure*) in Dickenson County Virginia, located along the McClure River and adjacent to a CSX rail line. The McClure Plant is about 9 miles southeast of the town of Clintwood, Virginia, the county seat of Dickenson County, and approximately 30 miles northwest of Lebanon VA; the Tom's Creek Preparation plant in Wise County Virginia is located by Toms Creek, a tributary of the Guest River. The plant is adjacent to a Norfolk Southern (*NS*) rail line, and is about 10 to 15 miles, route dependent, east of the town of Wise Virginia, and approximately 46 miles northwest of Lebanon Virginia (see *Figure 1-1*). The property is composed of approximately 321,700 total acres of mineral control, of which nearly all are contained within 20 separate leases. The mentioned leases are all subject to Alpha renewing the rights to extend the term of all leases which have various expiration dates, some of which expire in the next several years but are anticipated to be renewed by Alpha.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Figure 1-1: Alpha's Virginia Property Location Map



1.2 Ownership

The Virginia property involves a complex combination of previous ownership. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)**, **Dickenson Russell Coal Company**, **Dickenson-Russell Contura LLC**, **Paramont Coal Company Virginia LLC (*Paramont*)**, **Paramont Contura LLC**, and **Clinchfield Coal Company** all previously held mining rights on most of the Property.

1.3 Geology

Coal seams of currently active operations at the Virginia Mine Complex include the Jawbone, Jawbone Rider, Upper Banner, Lower Banner, Big Fork, Kennedy, Aily, Raven splits, Jawbone and Tiller. These seams are all historically utilized as coking coal. Strata on the Property, among the active sites, are of the Pennsylvanian-aged (approximately 290 to 330 million years ago) Wise Formation. Some of the in-active sites include coals in the overlying Norton Formation. Due to the high value of these coking coals, all the seams have been extensively mined in the past. The rock formations between the coal seams

are characterized by proportions of sandstone and shale units. In general, the coal seams reach the highest structural elevations along the southeastern margin of the Property, generally dipping toward the northwest. Several faults trending northwest – southeast impact the underground deposit of the Jawbone Rider seam of the Prater Quadrangle and the 88 Strip surface mine of the Prater Quadrangle from measured vertical displacement, while the Russell Fork fault impacts the Jawbone Rider seam with horizontal offset. Several faults run through the Jawbone reserve but appear to have limited impact on mining.

1.4 Exploration Status

The Property has been extensively explored, largely by drilling using continuous coring, and rotary drilling methods but also by obtaining coal measurements at mine exposures, and by downhole geophysical methods. Most of the data was acquired or generated by previous owners of the Property. These sources comprise the primary data used in the evaluation of the coal resources and coal reserves on the Property. MM&A examined the data available for the evaluation and incorporated all pertinent information into this TRS. Where data appeared to be anomalous or not representative, that data was excluded from the digital databases and subsequent processing by MM&A.

Ongoing exploration has been carried out by Alpha since acquiring the Virginia Complex. The Alpha acquired exploration data has been consistent with past drilling activities.

1.5 Operations and Development

As of December 31, 2021, underground mine operations were active at Deep Mine 41, Deep Mine 44, and the Bear Ridge deep mine. Deep Mine 41 produces Mid-Vol coal. High Vol-A coal is produced by Deep Mine 44 and by the Bear Ridge deep mine. Deep Mine 46, also referred to as the Ball Ridge Mine, is in the planning/pre-development stage. Production is anticipated to begin in fiscal year 2022 and is expected to produce High-Vol A quality coal from the Lower Banner seam.

Active surface mine operations, with associated Highwall-Miners, include The Long Branch surface mine and 88 Strip. Both mines produce High Vol-A quality coal.

Based on the mine plans developed as part of this TRS, annual deep mine production peaks at 2.8 million tons in 2024. Underground reserves will be depleted in 2064. Annual surface and highwall mine production peaks at 0.6 and 0.3 million tons, respectively in 2024. Surface and highwall reserves are both depleted in 2035.

In addition to the mines, the Virginia Complex includes the McClure River and Toms Creek Preparation Plants.

The McClure River Prep Plant site, with a feed rate capacity of 1,050raw tons per hour, uses a Heavy Media Vessel for primary separation, Low Density Cyclone for Intermediate Separation and Froth

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Flotation and Spirals in the Fine Coal Circuit. The plant utilizes both centrifugal and thermal dryers. The McClure River plant produces a product with an ash ranging from 6.75% to 12.00% and less than 1.2% sulfur.

The Tom's Creek Prep Plant, also with a feed rate of 1,050 tons/hour, produces a product with a 7% to 12% ash, and 1.2% to 2.5% sulfur ranges. The plant uses centrifugal dryers; a Heavy Media Vessel for primary separation; Low Density and Heavy Media Cyclones for Intermediate Separation; Froth Flotation, Spirals and Columns for the Fine Coal Circuit.

Flotation, Spirals and Columns for the Fine Coal Circuit.

1.6 Mineral Resource

A coal resource estimate, summarized in *Table 1-1* was prepared as of December 31, 2021, for property controlled by Alpha.

Table 1-1: Coal Resources Summary as of December 31, 2021

Area	Seam	Coal Resource (Dry Tons, In Situ)			
		Measured	Indicated	Inferred	Total
Inclusive of Reserve					
88Strip/3Frks	Upper Banner-Tiller	12,880,000	2,154,000	0	15,034,000
Long Branch	Upper Banner 2 - Lower Banner	2,791,000	924,000	0	3,715,000
Holly Creek	Upper Banner (4650)	5,589,000	1,576,000	0	7,165,000
Bear Ridge	Upper Banner (4650)	828,000	142,000	0	970,000
Ball Ridge (Deep Mine 46)	Lower Banner (4900)	4,836,000	383,000	0	5,219,000
Long Branch (Deep Mine 45)	Lower Banner (4900)	3,448,000	383,000	0	2,369,000
Toms Creek	Lower Banner (4900)	0	0	0	0
Rush Branch	Lower Banner (4900)	3,169,000	0	0	3,169,000
Deep Mine 43	Jawbone Rider (5950)	35,456,000	24,216,000	340,000	60,012,000
Black Dog	Jawbone (6000)	16,128,000	1,948,000	0	18,076,000
Deep Mine 41	Jawbone (6000)	63,573,000	17,197,000	0	80,770,000
Deep Mine 42	Jawbone (6000)	47,710,000	12,003,000	0	59,713,000
Total Inclusive of Reserve		**196,407,000**	**60,927,000**	**340,000**	**256,212,000**
Exclusive of Reserve					
88Strip/3Frks	Upper Banner-Tiller	0	0	0	0
Long Branch	Upper Banner 2 - Lower Banner	0	0	0	0
Holly Creek	Upper Banner (4650)	5,000	579,000	0	585,000
Bear Ridge	Upper Banner (4650)	0	0	0	0
Ball Ridge (Deep Mine 46)	Lower Banner (4900)	1,003,000	32,000	0	1,035,000
Long Branch (Deep Mine 45)	Lower Banner (4900)	0	0	0	0
Toms Creek	Lower Banner (4900)	0	0	0	0
Rush Branch	Lower Banner (4900)	3,884,000	210,000	0	4,093,000
Deep Mine 43	Jawbone Rider (5950)	10,653,000	8,216,000	409,000	19,279,000
Black Dog	Jawbone (6000)	4,342,000	1,301,000	0	5,643,000
Deep Mine 41	Jawbone (6000)	1,772,000	34,000	0	1,806,000
Deep Mine 42	Jawbone (6000)	240,000	9,000	0	249,000
Total Exclusive of Reserve		**21,899,000**	**10,382,000**	**409,000**	**32,690,000**
Grand Total					
Inclusive of Reserve		196,407,000	60,927,000	340,000	256,212,000
Exclusive of Reserve		21,899,000	10,382,000	409,000	32,690,000
Grand Total		**218,307,000**	**71,309,000**	**749,000**	**288,902,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

1.7 Mineral Reserve

The Resource estimate outlined in *Table 1-1* **inclusive** of reserves has been used as the basis for this Reserve calculation, which utilizes a reasonable Preliminary Feasibility Study, a Life-of Mine (*LOM*) Mine Plan and practical recovery factors. Production modeling was completed with an effective start date of January 1, 2022.

Factors that would typically preclude conversion of a coal resource to coal reserve, include the following: inferred resource classification; absence of coal quality; poor mine recovery; lack of access to the deposit; geological encumbrances associated with overlying and underlying strata; thin seam trends; complex structures; and insufficient exploration data. The listed factors have all been considered. Reserve consideration excludes those portions of the resource area, which exhibit the afore mentioned geologic and/ or operational encumbrances.

Proven and probable coal reserves were derived from the defined in-situ coal resource considering relevant processing, economic (including technical estimates of capital, revenue and cost), marketing, legal, environmental, socioeconomic, and regulatory factors. The proven and probable coal reserves on the Property are summarized below in *Table 1-2*.

Table 1-2: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
	By Reliability Category			By Control Type				
Seam/Area	Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%
Surface Mineable								
88 Strip/Three Forks	179,000	3,836,000	4,015,000	0	4,015,000	7	0.9	29
88 Strip/Three Forks	637,000	2,398,000	3,035,000	0	3,035,000	6	0.9	29
Long Branch	220,000	151,000	370,000	0	370,000	5	0.8	32
Long Branch	718,000	202,000	920,000	0	920,000	5	0.8	31
Total Surface Mineable	**1,754,000**	**6,587,000**	**8,341,000**	**0**	**8,341,000**	**6**	**0.8**	**31**
Underground								
Upper Banner (4650)								
Holly Creek	1,444,000	482,000	1,926,000	0	1,926,000	5	0.8	35
Bear Ridge	165,000	24,000	189,000	0	189,000	5	0.7	33
Total	**1,609,000**	**506,000**	**2,115,000**	**0**	**2,115,000**	**5**	**0.8**	**35**
Lower Banner (4900)								
Ball Ridge (Deep Mine 46)	1,190,000	92,000	1,282,000	0	1,282,000	6	0.7	29
Long Branch (Deep Mine 45)	699,000	16,000	716,000	0	716,000	6	0.7	30
Rush Branch	789,000	0	789,000	0	789,000	6	0.8	30
Total	**2,678,000**	**109,000**	**2,787,000**	**0**	**2,787,000**	**6**	**0.7**	**29**
Jawbone Rider (5950)								
Deep Mine 43	12,926,000	9,102,000	22,028,000	0	22,028,000	3	0.8	24
Total	**12,926,000**	**9,102,000**	**22,028,000**	**0**	**22,028,000**	**3**	**0.8**	**24**
Jawbone (6000)								
Black Dog	4,503,000	676,000	5,178,000	0	5,178,000	9	0.6	28
Deep Mine 41	17,796,000	4,669,000	22,465,000	0	22,465,000	9	0.8	26
Deep Mine 42	13,776,000	3,387,000	17,163,000	0	17,163,000	8	0.7	26
Total	**36,075,000**	**8,732,000**	**44,806,000**	**0**	**44,806,000**	**9**	**0.7**	**26**
Total UG Mineable	**53,287,000**	**18,448,000**	**71,736,000**	**0**	**71,736,000**	**7**	**0.8**	**26**

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
	By Reliability Category			By Control Type				
Seam/Area	Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%
Grand Total								
Grand Total	**55,041,000**	**25,035,000**	**80,077,000**	**0**	**80,077,000**	**7**	**0.8**	**26**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

See Appendix A for detailed breakdown.

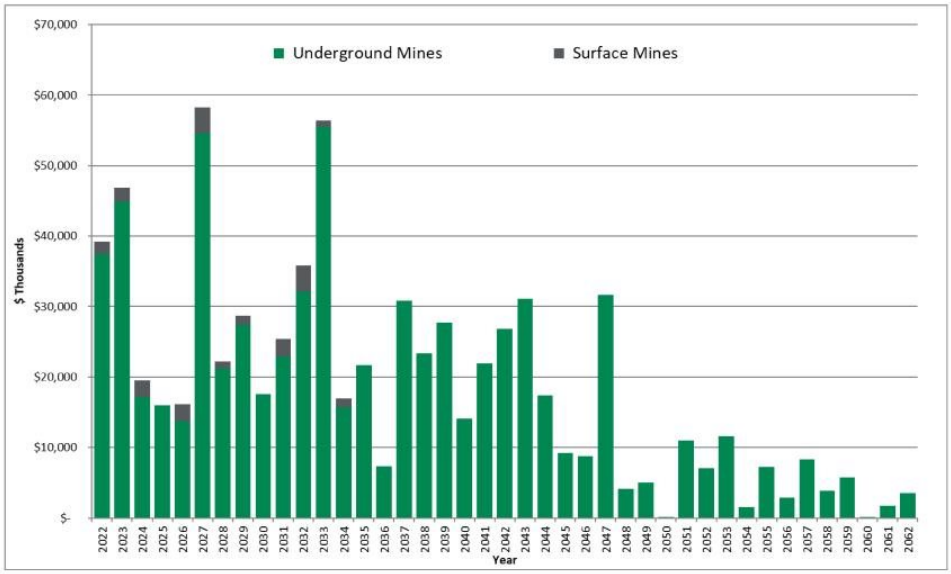
In summary, Alpha controls a total of 80.1 Mt (moist basis) of marketable coal reserves, at Virginia, as of December 31, 2021. Of that total, 69 percent are proven, and 31 percent are probable. All 80.1 Mt are leased coal reserves. The maps included in *Appendix C* reflect mining depletion at the time resource/reserve calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

1.8 Capital Summary

Alpha provided MM&A with information related to the number of currently operating production units at the Virginia complex. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement mine.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated Virginia operations is provided in *Figure 1-2* below.

Figure 1-2: Projected Capital Expenditures – Consolidated Virginia Operations



1.9 Operating Costs

Alpha provided historical costs and budgeted projections of operating costs for its active mines; for Deep Mines 41 & 44, Bear Ridge, and Long Branch surface mine and 88 Strip for MM&A's review, along with budgetary cost information for the proposed Deep Mine 46. MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for each mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, coal preparation (prep) plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

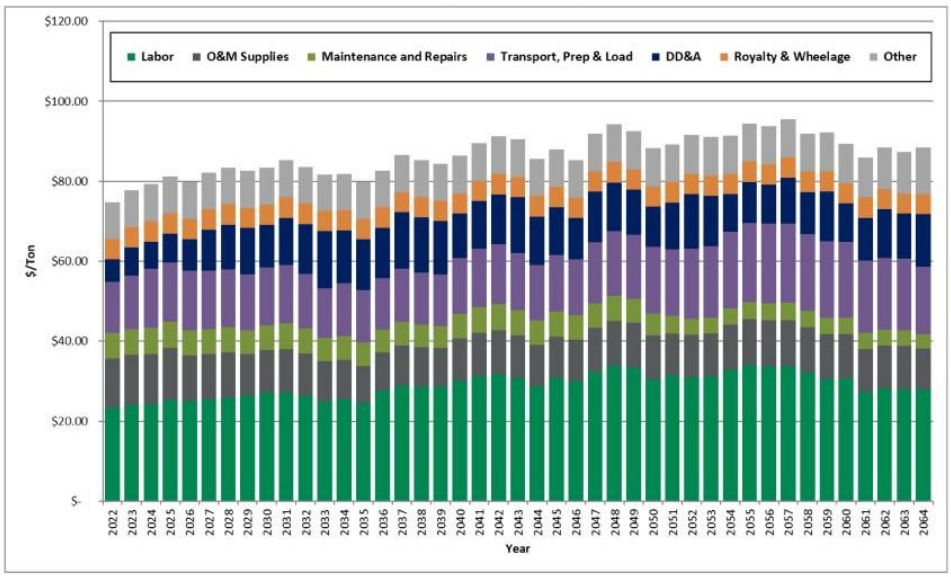
Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long term realization of $144 per short ton port pricing, with an average $101.52 netback pricing reflective of the high- and mid -volatile product currently sold at Virginia. These estimates are based on long term pricing published by third party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha and their Virginia business group is shipped

internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the Virginia business unit.

A summary of the projected operating costs for the consolidated Virginia operations is provided in *Figure 1-3*.

Figure 1-3: Virginia Operating Costs



1.10 Economic Evaluation

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves.

Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities cost for materials handling, coal preparation, refuse disposal, coal loading, reclamation, and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

Table 1-3 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at Virginia.

Table 1-3: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Underground Mines					
DM 41-42-Black Dog (Jawbone)	45,353	$1,103,077	$24.32	$1,573,566	$34.70
Long Branch Deep (L. Banner)	716	$12,701	$17.74	$17,923	$25.04
DM44 (Lower Banner)	929	$2,388	$2.57	$12,948	$13.93
Holly Creek (Upper Banner)	1,942	$23,829	$12.27	$50,031	$25.77
DM43 (Jawbone Rider)	22,046	$52,422	$2.38	$367,402	$16.67
Ball Ridge DM46 (L. Banner)	1,282	$13,664	$10.66	$27,764	$21.66
Bear Ridge (Upper Banner)	208	$1,102	$5.31	$1,806	$8.70
Consolidated Deep Mines	**72,476**	**$1,209,182**	**$16.68**	**$2,051,441**	**$28.31**
Surface Mines					
Long Branch	440	($2,344)	($5.33)	$4,615	$10.50
88 Strip	4,354	$27,545	$6.33	$53,566	$12.30
Consolidated Surface Mines	**4,794**	**$25,201**	**$5.26**	**$58,182**	**$12.14**
HWM Operations					
Long Branch HWM	1,051	$26,913	$25.61	$39,500	$37.58
88 Strip HWM	3,211	$122,503	$38.15	$125,050	$38.95
Consolidated HWMs	**4,262**	**$149,416**	**$35.06**	**$164,551**	**$38.61**
Grand Total	**81,532**	**$1,383,799**	**$16.97**	**$2,274,174**	**$27.89**

Note: (1) The financial model contains 0.018 million tons of inferred coal and an additional 0.015 million tons of resource that have been excluded from reserves. LOM tonnage evaluated in the financial model includes March 2021 through December 2021 production for the active surface mines and October 2021 through December 2021 production for the active underground mines (1.4 million total clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 1-3,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated Virginia operations show positive LOM P&L and EBITDA of $1.4 billion and $2.3 billion, respectively.

Alpha's consolidated Virginia cash flow summary in constant dollars, excluding debt service, is shown in *Table 1-4* below.

Table 1-4: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	81,532	1,904	3,171	3,388	3,757	3,548	3,428
Total Revenue	$8,276,993	$193,998	$322,618	$344,774	$382,382	$360,760	$348,845
EBITDA	$2,274,174	$57,226	$103,638	$105,020	$110,094	$97,951	$102,207
Net Income	$1,129,708	$32,010	$68,607	$65,106	$67,291	$59,459	$60,553
Net Cash Provided by Operating Activities	$2,020,082	$39,443	$78,703	$90,053	$93,775	$87,792	$88,473
Purchases of Property, Plant, and Equipment	($756,970)	($11,676)	($39,221)	($46,864)	($19,529)	($16,021)	($16,184)
Net Cash Flow	$1,263,113	$27,767	$39,482	$43,189	$74,246	$71,771	$72,289

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	3,250	3,138	2,881	2,797	2,614	2,631	2,701
Total Revenue	$330,692	$319,409	$293,174	$284,672	$266,182	$267,911	$274,911
EBITDA	$97,011	$92,634	$88,812	$81,066	$74,401	$80,702	$93,115
Net Income	$50,049	$46,518	$46,101	$43,182	$35,327	$39,050	$42,480
Net Cash Provided by Operating Activities	$85,891	$83,974	$81,502	$75,496	$69,361	$70,101	$79,967
Purchases of Property, Plant, and Equipment	($58,214)	($22,213)	($28,703)	($17,541)	($25,423)	($35,810)	($56,431)
Net Cash Flow	$27,677	$61,760	$52,798	$57,955	$43,938	$34,291	$23,536

	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	2,522	2,569	2,219	2,074	2,095	2,095	1,987
Total Revenue	$256,418	$261,401	$224,784	$209,929	$212,029	$212,072	$201,064
EBITDA	$83,127	$89,331	$69,456	$59,744	$62,461	$63,606	$51,651
Net Income	$42,058	$46,040	$35,023	$25,864	$27,863	$29,563	$25,311
Net Cash Provided by Operating Activities	$76,511	$78,412	$65,842	$50,224	$54,209	$56,757	$49,215
Purchases of Property, Plant, and Equipment	($16,936)	($21,672)	($7,330)	($30,811)	($23,380)	($27,712)	($14,080)
Net Cash Flow	$59,575	$56,741	$58,512	$19,413	$30,829	$29,045	$35,135

	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	1,918	1,890	1,948	2,086	1,955	1,998	1,815
Total Revenue	$194,137	$191,326	$197,192	$211,111	$197,883	$202,196	$183,664
EBITDA	$45,323	$42,484	$48,096	$57,853	$49,243	$52,500	$39,830
Net Income	$18,375	$15,135	$16,511	$27,053	$21,743	$26,755	$13,164
Net Cash Provided by Operating Activities	$42,275	$39,698	$43,092	$51,081	$47,028	$47,252	$38,967
Purchases of Property, Plant, and Equipment	($21,937)	($26,856)	($31,128)	($17,410)	($9,203)	($8,743)	($31,657)
Net Cash Flow	$20,338	$12,841	$11,963	$33,671	$37,825	$38,510	$7,310

	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	1,662	1,519	1,244	977	809	777	737
Total Revenue	$168,261	$153,737	$125,880	$98,889	$81,899	$78,634	$74,599
EBITDA	$31,809	$30,318	$28,595	$23,116	$18,892	$17,640	$14,156
Net Income	$9,280	$11,184	$13,718	$9,496	$6,137	$6,974	$6,569
Net Cash Provided by Operating Activities	$31,691	$29,401	$27,639	$22,919	$18,810	$14,154	$13,454
Purchases of Property, Plant, and Equipment	($4,096)	($5,071)	($172)	($10,987)	($7,048)	($11,608)	($1,571)
Net Cash Flow	$27,595	$24,330	$27,467	$11,933	$11,762	$2,546	$11,883

	YE 12/31 2055	YE 12/31 2056	YE 12/31 2057	YE 12/31 2058	YE 12/31 2059	YE 12/31 2060	YE 12/31 2061
Production & Sales tons	712	719	717	678	555	553	494
Total Revenue	$72,027	$72,801	$72,608	$68,587	$56,221	$55,925	$50,020
EBITDA	$12,164	$12,395	$12,331	$13,431	$11,882	$11,858	$12,878
Net Income	$3,887	$4,308	$3,069	$5,109	$3,969	$5,497	$6,138
Net Cash Provided by Operating Activities	$11,453	$11,441	$11,445	$12,638	$11,833	$11,324	$11,947
Purchases of Property, Plant, and Equipment	($7,286)	($2,904)	($8,320)	($3,867)	($5,744)	($172)	($1,743)
Net Cash Flow	$4,167	$8,537	$3,125	$8,771	$6,089	$11,153	$10,204

	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31	YE 12/31

	2062	2063	2064	2065	2066	2067	2068
Production & Sales tons	384	386	231	0	0	0	0
Total Revenue	$38,860	$39,117	$23,392	$0	$0	$0	$0
EBITDA	$9,615	$9,696	$6,016	($685)	($272)	($137)	($69)
Net Income	$3,922	$4,254	$2,403	($1,370)	($544)	($274)	($139)
Net Cash Provided by Operating Activities	$9,930	$9,215	$8,366	($7,604)	($2,535)	($1,267)	($634)
Purchases of Property, Plant, and Equipment	($3,524)	($172)	$0	$0	$0	$0	$0
Net Cash Flow	$6,406	$9,043	$8,366	($7,604)	($2,535)	($1,267)	($634)

	YE 12/31 2069	YE 12/31 2070	YE 12/31 2071	YE 12/31 2072	YE 12/31 2073	YE 12/31 2074	YE 12/31 2075
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0
EBITDA	($36)	$0	$0	$0	$0	$0	$0
Net Income	($71)	$0	$0	$0	$0	$0	$0
Net Cash Provided by Operating Activities	($634)	($0)	($0)	$0	$0	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($634)	($0)	($0)	$0	$0	$0	$0

Note: (1) The financial model contains 0.018 million tons of inferred coal and an additional 0.015 million tons of resource that have been excluded from reserves. LOM tonnage evaluated in the financial model includes March 2021 through December 2021 production for the active surface mines and October 2021 through December 2021 production for the active underground mines (1.4 million total clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

Consolidated cash flows are driven by annual sales tonnage, which grows from 3.2 million tons in 2022 to a peak of 3.8 million tons in 2024. Between years 2025 and 2046, sales ranges from 1.9 million to 3.5 million tons and between years 2047-2064, sales range from 0.2 million tons to 1.8 million tons. Projected consolidated revenue grows from $322.6 million in 2022 to a peak of $382.4 million in 2024. Revenue totals $8.3 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $93.8 in 2024 and totals $2.0 billion over the project life. Capital expenditures total $149.5 million during the first five years and $757.0 million over the project's life.

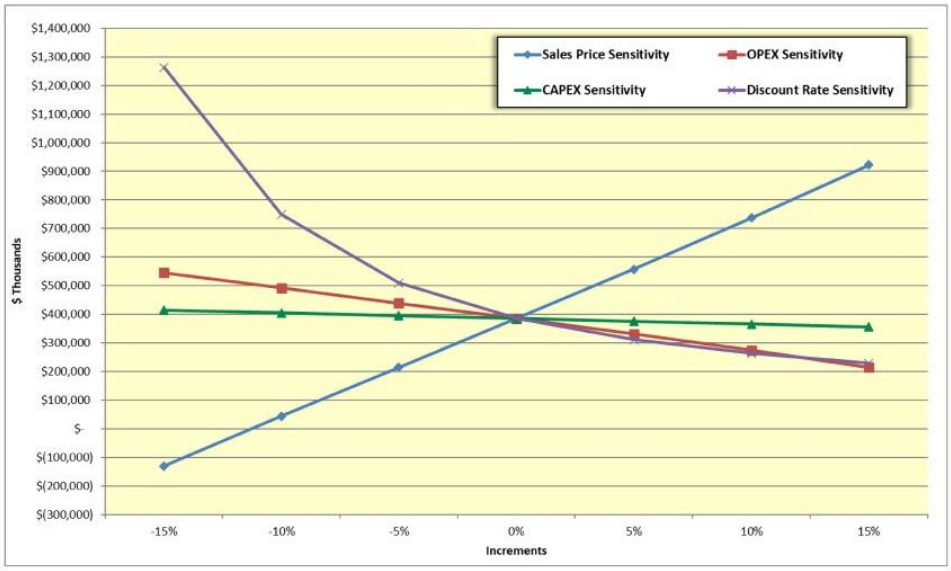
1.10.1 Discounted Cash Flow Analysis

Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $385.9 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the Virginia reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its Virginia assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

1.10.2 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 1-4: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

1.11 Permitting

Alpha has obtained all mining and discharge permits to operate its active mines and processing, loadout, or related support facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Alpha, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

1.12 Conclusion and Recommendations

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons

situated on the Virginia Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study concludes that the 80.1 Mt of marketable coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

2 Introduction

2.1 Registrant and Terms of Reference

This report was prepared for the sole use of **Alpha Metallurgical Resources, Inc. (*Alpha*)** and its affiliated and subsidiary companies and advisors.

The report provides a statement of coal reserves for Alpha located at the Virginia Complex (*Virginia* or *the Property*) in Buchanan, Dickenson, Russell and Wise Counties, Virginia. Exploration results and Resource calculations were used as the basis for the mine planning and the preliminary feasibility study completed to determine the extent and viability of the reserve.

Coal resources and coal reserves are herein reported in imperial units of measurement and are rounded to millions of short tons (*Mt*).

2.2 Information Sources

The technical report is based on information provided by Alpha and reviewed by MM&A's professionals, including geologists, mining engineers, civil engineers, and environmental scientists. MM&A's professionals hold professional registrations and memberships which qualify them as Qualified Persons in accordance with SEC guidelines.

Alpha engaged MM&A to conduct a coal reserve evaluation of the Alpha coal properties as of December 31, 2021. For the evaluation, the following tasks were to be completed:

> Conduct site visits of the mines and mine infrastructure facilities.

> Process the information supporting the estimation of coal resources and reserves into geological models.

> Develop life-of-reserve mine (*LOM*) plans and financial models.

> Hold discussions with Alpha company management; and

> Prepare and issue a Technical Report Summary providing a statement of coal reserves which would include:

- A description of the mines and facilities.
- A description of the evaluation process.
- An estimation of coal reserves with compliance elements as stated under the new SEC Guidelines which will become effective for the first fiscal year commencing on or after January 1, 2022.

will become effective for the first fiscal year commencing on or after January 1, 2022.

2.3 Personal Inspections

MM&A is very familiar with the Virginia properties, having provided a variety of services in recent years and QP's involved in this TRS have conducted multiple site visits.

3 Property Description

3.1 Location

The Virginia Mine Complex is in the Central Appalachian Basin in southwest Virginia (see *Figure 1-1*) north of Lebanon, Virginia, and U.S. Highway 19 and south of Pikeville, Kentucky. The complex covers part of four counties: Buchanan, Dickenson, Russell and Wise. Surface facilities for the operation are located near the community of McClure, along the McClure River in Dickenson County and near Tom's Creek, a tributary of the Guest River in Wise County. The McClure plant is near the active Jawbone seam Deep Mine No. 41. The Toms Creek Plant is near the town of Coeburn VA and accessed by state highway. Numerous small communities are present throughout the Property.

The nearest major population centers are Bristol, Virginia (65 miles south) and Roanoke, Virginia (195 miles east), and Charleston, West Virginia (165 miles north), and Lexington, KY (180 miles northwest). The property is located on the following **United States Geological Survey (*USGS*)** Quadrangles: Elkhorn, Harman, Jenkins East, Clintwood, Haysi, Prater, Vansant, Big A Mtn, Duty, Nora, Caney Ridge, Pound, Flat Gap, Wise, Coeburn, St. Paul and Carbo. The coordinate system and datum used for the model of the Virginia Mine complex and the subsequent maps were produced in the Virginia State Plane South system, NAD 83.

3.2 Titles, Claims or Leases

The property is composed of over 321,700 total acres of mineral control, nearly all of which is leased. Alpha's control is comprised of over 20 separate leases with varying expiration dates. Some leases expire over the next several years, but Alpha does not anticipate any challenges related to lease renewal. MM&A has not carried out a separate title verification for the coal properties and has not verified leases, deeds, surveys or other property control instruments pertinent to the subject resources.

Alpha has represented to MM&A that it controls the mining rights to the reserves as shown on its property maps, and MM&A has accepted these as being a true and accurate depiction of the mineral rights controlled by Alpha. The TRS assumes the Property is developed under responsible and experienced management.

3.3 Mineral Rights

Alpha supplied property control maps to MM&A related to properties for which mineral and/or surface property are controlled by Alpha. While MM&A accepted these representations as being true and accurate, through past knowledge of the Property MM&A has no knowledge of past property boundary disputes or other concerns that could impact future mining operations or development potential.

Property control in Appalachia can be intricate. Coal mining properties are typically composed of numerous property tracts which are owned and/or leased from both land holding companies and private individuals or companies. It is common to encounter severed ownership, with different entities or individuals controlling the surface and mineral rights. Mineral control in the region is typically characterized by leases or ownership of larger tracts of land, with surface control generally comprised of smaller tracts, particularly in developed areas.

Control of the surface property is necessary to conduct surface mining but is not necessary to conduct underground mining aside from relatively limited areas required for seam access or ventilation infrastructure. Alpha's executive management team has a history of mining in Central Appalachia and has conveyed to MM&A that it has been successful in acquiring surface rights where needed for past operations.

3.4 Encumbrances

No Title Encumbrances are known. By assignment, MM&A did not complete a query related to Title Encumbrances.

3.5 Other Risks

There is always risk involved in property control. As is common practice, Alpha, and its predecessors, have had their legal teams examine the deeds and title control to minimize this risk. Historically, property control has not posed any significant challenges related to Virginia's operations.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, elevation, and Vegetation

Much of topography of the area encompassed by the Virginia mine complex is typical of the Central Appalachian Plateau's physiographic province, being rugged with a dendritic drainage pattern that form

Appalachian Plateau's physiographic province, being rugged with a dendritic drainage pattern that form narrow river valleys, flanked by steep-sided upland regions. Terrain slopes in the area are mostly steep to very steep with some gently sloping with relatively narrow ridges. To the north of the Property exists Pine Mountain, a result of compressional forces and movement along the Pine Mountain thrust fault. The flanks of Pine Mountain create a trellis drainage pattern along the northern border of Dickenson County. Surface elevations near the mine complex range from approximately 1,300 feet above sea level at streams to approximately 2,400 feet at ridge tops. The area is heavily vegetated and has a significant amount of hardwood forests. The property is not situated near any major urban centers.

4.2 Access and Transport

There is general access to the Virginia property via a well-developed network of primary, secondary, and unimproved roads from U.S. interstates highways. Interstate 81 to the south and 77 to the east are the primary roads coming into the complex region. Interstate 81 connects with Bristol, Virginia to the southwest and Roanoke, Virginia to the east. Interstate 77 connects with, Charleston, West Virginia to the north and via Interstate 64 with Lexington, Kentucky, to the northwest. US Route 19 connects Interstate 81 with Lebanon, Virginia from the south, while US Route 460 connects Interstate 77 with US Route 19 from the east.

Numerous secondary and unimproved roads provide direct access to the mine property, some being federal, state, and town-maintained. These include US Route 58, via State Route 71 connecting Lebanon to Toms Creek, and State Route 80 running north-south from Pikeville to McClure. These roads typically stay open throughout the year. Within the Property, unimproved roads are utilized to access gas drainage wells and surface based deep mine infrastructure. The primary transport means of processed coal is CSX Railroad which services the McClure River Loadout located just east of McClure Virginia, and NS Railroad servicing the Tom's Creek Loadout located 2.25 miles north of Coeburn, Virginia.

4.3 Proximity to Population Centers

The Virginia Mine Complex is in south-West Virginia, north of Lebanon, Virginia and south of Pikeville, Kentucky. Several small towns reside in the complex footprint which covers much of Dickenson County and smaller portions of Buchanan, Russell, and Wise Counties. There are no large population centers within close proximity.

The nearest major population centers are Bristol, Virginia (65 miles south) and Roanoke, Virginia (195 miles east), and Charleston, West Virginia (165 miles north), and Lexington, KY (180 miles northwest).

As of the 2019 Annual County and Resident Population Estimate (www.census.gov), Dickenson County had 14,318 residents.

4.4 Climate and Length of Operating Season

The climate of the region is classified as humid continental with four distinct seasons: warm summers, cold winters, and moderate fall and spring seasons. Precipitation in the region comes throughout the year, and annually includes, approximately 46 inches of rain and 29 inches of snow. Most rain comes in spring and the early months of summer. Warmer months typically begin in late May and end in early September and range in average temperature from 48 to 82 degrees Fahrenheit. Colder months typically begin in mid to late November and run until mid to late March with average temperatures ranging from 21 to 54 degrees Fahrenheit. Precipitation in the winter typically comes in the form of snowfall or as a wintery mix (sleet and snow) with severe snowfall events occurring occasionally. Seasonal variations in climate typically do not affect underground mining in Virginia. However, weather events could potentially negatively impact efficiency of surface mine and preparation plant operations on a very limited basis and lasting less than a few days.

4.5 Infrastructure

The Virginia Mine Complex has sources of water, power, personnel, and supplies readily available for use. Personnel have historically been sourced from the surrounding communities in Dickenson, and surrounding Counties, and have proven to be adequate in numbers to conduct mining operations. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners. Water is sourced locally from public water sources or rivers, and electricity is sourced from **Appalachian Power**, a subsidiary of **American Electric Power (*AEP*)**. The service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc. Alpha's Tom's Creek Prep Plant services consumers with washed coal, which is transported via the adjacent NS rail line at the loadout. The McClure River Prep Plant services consumers with washed coal via CSX rail line accessible from the plant loadout. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to both preparation plant facilities.

5 History

5.1 Previous Operation

The Virginia property involves a complex combination of previous ownership. Coal mining in the area occurred for nearly a century. Predecessors of Alpha, namely **Alpha Natural Resources (*Alpha*)**,

Dickenson Russell Coal Company, **Dickenson-Russell Contura LLC**, **Paramont Coal Company Virginia LLC (*Paramont*), Paramont Contura LLC**, and **Clinchfield Coal Company** all previously held mining rights on most of the Property.

5.2 Previous Exploration

Extensive exploration in the form of subsurface drill efforts has been carried out on the Property by numerous entities, most of which efforts were completed prior to the inception of Alpha. Diamond

core and rotary drilling are the primary types of exploration on the Property. Data for correlation and mining conditions are derived from core descriptions and geophysical logs (e-logging). Coal sample, quality analyses were also employed during the core-exploration process. Development of this report included an assessment of over 6,600 locations of coal measurements, largely comprised of exploration drill holes which often include several coal intercepts. In mine data measurements are included also.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recent drilled holes.

6 Geological Setting, Mineralization and Deposit

6.1 Regional, Local and Property Geology

The property lies in the Central Appalachian Coal basin in the Appalachian Plateau physiographic province.

The coal deposits in the eastern U.S. are the oldest and most extensively developed coal deposits in the country. The coal deposits on the Property are Carboniferous in age, being of the Pennsylvanian system. Overall, these Carboniferous coals contain two-fifths of the US's bituminous coal deposits and extend over 900 miles from northern Alabama to Pennsylvania and are part of what is known as the *Appalachian Basin*. The Appalachian Basin is more than 250 miles wide and, in some portions, contains over 60 coal seams of varying economic significance.

Coal seams and zones of economic significance typically range between 24 and 48 inches in thickness. Southwest-Northeast trending regional faults border the Property on the Northwest and southeast sides. They include the Pine Mountain trust fault to the northwest and the St. Paul and Buffalo Mountain faults to the southeast. Additional faults on the Property have north-south or northwest-southeast trends. A few faults impact the coal deposit and resource extents such as the proximity of Russel Fork fault and the Jawbone Rider seam. Structural slopes of the Property are typically characterized by shallow dipping to the northwest.

Strata on the Property are of the Pennsylvanian-age Wise and Norton Formations. The base of the Wise formation is the Dorchester coal bed. The Gladeville Sandstone exists between the formations. The rock formations between the coal seams are characterized by sandstone and shale units.

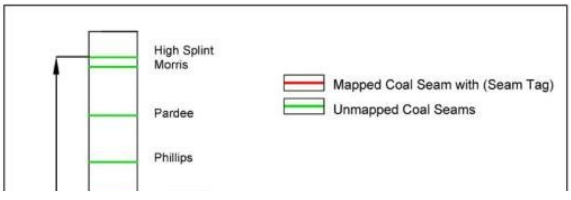
Seams with remaining reserve or resource potential include, in stratigraphically ascending order the: Tiller, Jawbone, Jawbone Rider, Raven, Aily, Kennedy, Lower Banner, Upper Banner, in the Norton Formation and Clintwood, Eagle, Lower Boling, Upper Boling, Pinhook, Lower Standiford, Upper Standiford, Taggart Marker and Taggart in the Wise Formation.

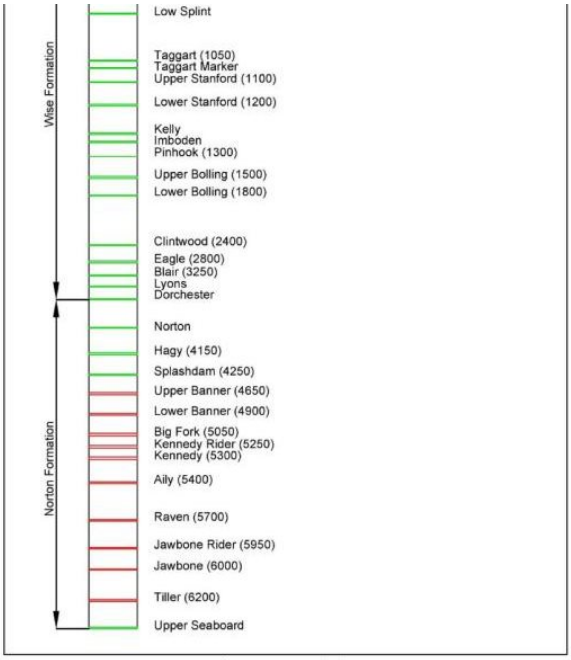
6.2 Mineralization

The generalized stratigraphic columnar section in *Figure 6-1* demonstrates the vertical relationship of the principal coal seams and rock formations on the Property.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Figure 6-1: Virginia Stratigraphic Column





(not to scale)

6.3 Deposits

The Virginia complex currently produces both High-Volatile-A bituminous coal, and a Mid-Volatile bituminous coal as primary products.

Due to the long history of mining in the region and the high value of these coking coals, all the seams have been extensively mined in the past. The coal seams reach the highest structural elevations along the southeastern margin of the Property, generally dipping toward the northwest. The seams of interest are generally situated above drainage or near and are therefore accessible via outcrop or through short slopes. The rock formations between the coal seams are characterized mainly by sandstone and shale units interspersed throughout.

7 Exploration

7.1 Nature and Extent of Exploration

The Property has been extensively explored by subsurface drilling efforts carried out by numerous entities, most of which were completed prior to ownership by Alpha.

Diamond core and rotary drilling are the primary types of exploration on the Property. Diamond core drilling produces rock core samples from the hole. Data for coal bed correlations and strata mining conditions are derived from core descriptions and geophysical logging (e-logging). Geophysical logs are produced from a probe that surveys the drill hole void. Rock stratum types are interpreted from log signatures produced from the probe which commonly include a hole caliper, rock density and gamma readings. Coal-quality analyses were also employed during the core-exploration process.

Drill records indicate that independent contract drilling operators have typically been engaged to carry out drilling on the Property. Geophysical logging was typically performed by outside logging firms. MM&A, via its Geophysical Logging Systems subsidiary, has logged a significant number of the past exploration holes, and currently logs most of the recently drilled holes.

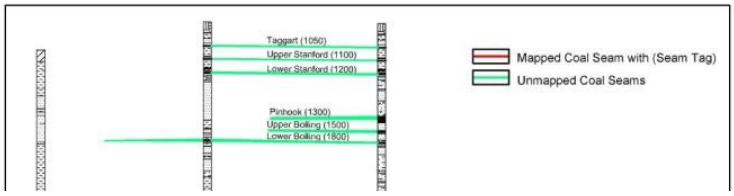
The Location of the drilling is shown on the maps included in *Appendix C.*

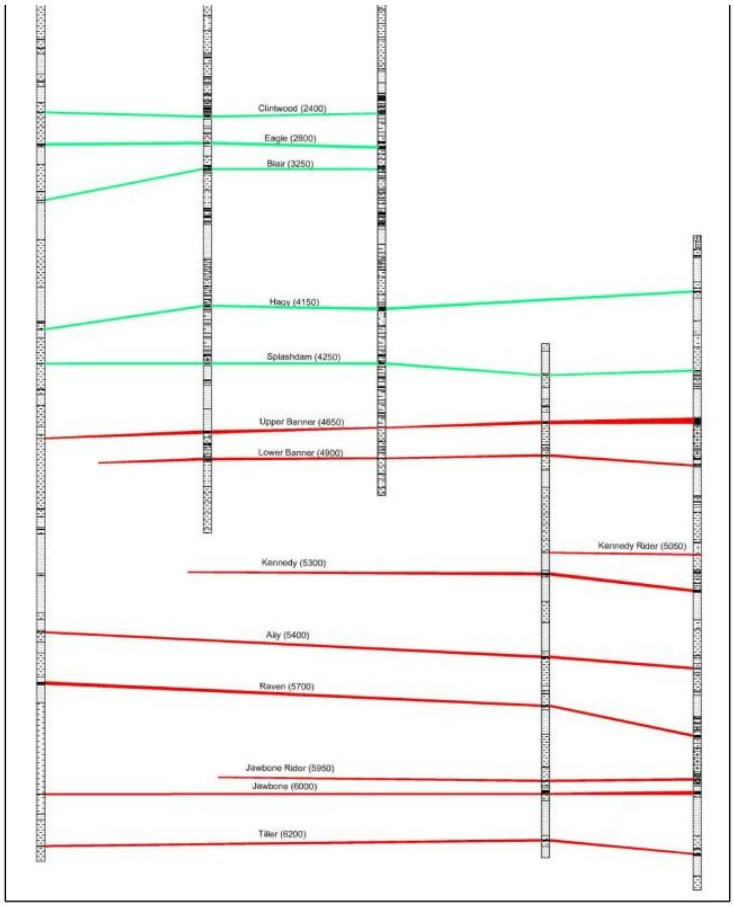
The concentration of exploration varies slightly across the Property. Drilling on the Property is typically sufficient for delineation of potential surface and highwall miner benches, and deep mineable seams. Core logging is carried out by professional geologists in cases where roof and floor strata are of particular interest and in cases where greater resolution and geologic detail are needed. However, most drill hole data come from simplified driller's logs, which lack details regarding geotechnical conditions and specific geology, making correlations and floor and roof conditions difficult to determine. Geophysical logging (e-logging) techniques, by contrast, document specific details useful for geologic interpretation and mining conditions. Given the variability of data-gathering methods employed, *definitive* mapping of future mining conditions may not be possible, but projections and assumptions can be made within a *reasonable* degree of certainty. A significant effort was put into verifying the integrity of the database. Once this was established, stratigraphic columnar sections were generated using cross-sectional analysis to establish or confirm coal seam correlations.

A typical cross-section is shown in *Figure 7-1.*

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Figure 7-1: Virginia Cross-Section





Due to the long history of exploration by various parties on the Property, a wide variety of survey techniques exist for documentation of data point locations. Many of the older exploration drill holes appear to have been located by survey and more recently completed drill holes are often located by

high-resolution Global Positioning System (*GPS*) units. However, some holes appear to have been approximately located using USGS topography maps or other methods which are less accurate. Therefore, discretion had to be used regarding the accuracy for the location and ground surface elevation of some of these older drill holes. In instances where a drill hole location (or associated coal seam elevations) appeared to be inconsistent with the overall structural trend (or surface topography for surface-mineable areas), the data point was not honored for geological modeling. Others with apparently minor variances were adjusted or then used by MM&A.

Surveying of the underground and surface mined areas has been performed by the mine operators and/or their consulting surveyors. By assignment, MM&A did not verify the accuracy or completeness of supplied mine maps but accepted this information as being the work of responsible engineers and surveyors, as required by both State and Federal Law.

MM&A compiled comprehensive topographic map files by selecting the best available aerial mapping for each area. In the case of active surface mines, digital U.S.G.S. historical topography was utilized to reference original seam outcrop positions.

7.2 Drilling Procedures

Core drilling methods utilize NX-size ($2^1/_8$ inch) or similar-sized core cylinders to recover core samples, which can be used to delineate geologic characteristics, and for coal quality testing and geotechnical logging. For the cored holes, the geophysical logs are especially useful in verifying the percent of core recovery of both the coal samples (for assurance that sample is representative of the full seam) and of the roof and floor rock samples (for evaluating ground control characteristics of deep mineable coal seams). In addition to the core holes, rotary drilled holes also exist on the Property. Data for the rotary drilled holes is mainly derived from downhole geophysical logs, which are used to interpret coal and rock thickness and depth since logging of the drill cuttings is not reliable in this application.

A wide variety of core-logging techniques exist for the Property. For many of the core holes, the primary data source is a generalized lithology description by the driller, typically supplemented by a more detailed core log completed by a geologist. These drill logs were provided to MM&A collectively as a geological database. MM&A geologists were not involved in the production of original core logs but did perform a basic check of drill records and information within the provided database. Where geophysical logs for such holes are available, they were used by MM&A geologists to verify the coal thickness and core recovery of relevant seams.

7.3 Hydrology

Hydrologic testing and forecasting are necessary parts of the permitting process and as such are routinely considered in the mine planning process.

MM&A is not aware of any significant hydrologic impacts being experienced at any three currently active deep mines or two active surface mines. Future mining is projected to occur in areas exhibiting similar hydrogeological conditions as past mining. Based upon the successful history of the operation with regards to hydrogeological features, MM&A assumes that the operation will not be hindered by such issues in the future.

7.4 Geotechnical Data

Life-of-Mine (*LOM*) Mining plans for potential underground mines were developed by MM&A through incorporation of budget maps from Alpha. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS*) program that was developed by the **National Institute for Occupational Safety and Health (*NIOSH*)**. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan. Coal and rock strengths from core testing are used to verify the empirical assumptions integral to ACPS.

8 Sample Preparation Analyses and Security

8.1 Prior to Sending to the Lab

Most of the coal samples related to exploration drilling activities have been obtained from the Property by subsurface exploration using core drilling techniques. The protocol for preparing and testing the samples has varied over time and is not well documented for the older holes drilled on the Property. Typical US coal sampling technique from core drilling is for the coal core sample, once recovered from the core barrel, to be measured and described into a log, then wrapped in a sealed plastic sleeve and placed into a covered wooden core box, which is the length of the sample so that the core can be delivered to a laboratory in relatively intact condition and with original moisture content. The core identification number and the depth are scribed on the sample box lid to identify the sample. This process has been the norm for both historical and ongoing exploration activities at Virginia.

This work is typically performed by the supervising driller, geologist, or company personnel. Samples are most often delivered to the company by the driller after each shift or acquired by company personnel or representatives. Most of the coal core samples were obtained by previous operators on the Property. MM&A did not participate in the collection, sampling, and analysis of the majority of core samples within the exploration database. However, it is reasonable to assume, given the professional level of the previous operators, that these samples were generally collected and processed under industry best-practices. This assumption is based on MM&A's familiarity with the operating companies and the companies used to perform the analysis.

Additionally, specific to Alpha's Virginia surface operations, a significant dataset was made available related to in-pit quality measurements used during the mining process as a predictive measure prior to

mining. This robust dataset is generally based upon bulk or grab samples obtained by employees of Alpha prior to the extraction of coal in surface mined pits. MM&A's review of the datasets suggest a general continuity of sampling procedures. Care was taken by MM&A to determine sampling locations which are commonly tied to both coal seam names and generalized mine locations. The information contained in the dataset does not include a surveyed location point, as the information is generally only relied upon in the short term for assistance in coal blending procedures.

8.2 Lab Procedures

Coal quality testing related to exploration drilling has been performed over many years by operating companies using different laboratories and testing regimens. Some of the samples have raw analyses and washability analysis on the full seam (with coal and rock parting layers co-mingled) and are mainly useful for characterizing the coal quality for projected production from underground and highwall mining. Other samples have coal and rock analyzed separately, the results of which can be manipulated to forecast either surface or underground mining quality. Care has been taken to use only those analyses that are representative of the coal quality parameters for the appropriate mining type for each sample.

Standard procedure upon receipt of core samples by the testing laboratory is to log the depth and thickness of the sample, then perform testing as specified by a representative of the operating company. Each sample is then analyzed in accordance with procedures defined under **American Society for Testing and Materials (*ASTM*)** standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

Specific to the aforementioned pit-quality sampling and associated datasets, laboratory analysis includes both short proximate analysis and at times, detailed metallurgical characteristics. The dataset contains a combination of raw and washed samples.

9 Data Verification

9.1 Procedures of Qualified Person

MM&A reviewed the Alpha-supplied digital geologic database which consists of data records including drill hole information for holes that lie within and adjacent to the Property along with records for numerous supplemental coal seam thickness measurements; mainly in mine measurements from underground mine maps. Once the initial integrity of the database was established, stratigraphic columnar sections were generated to use in cross-sectional analysis to establish or confirm coal seam correlations. The stratigraphic column correlation method provides a view of seam depths, lithologic strata and thickness intervals to over and underlying seams. Geophysical logs were used wherever

available to assist in confirming the seam correlation and to verify proper seam depths, thickness measurements and recovery of coal samples.

After establishing and/or verifying proper seam correlation for all seams the database was used in the geologic model process. Seam thickness, base-of-seam elevation, roof and floor lithology, and overburden maps were independently generated for use in the mine planning process. Maps with seam control data plus geological cross-sections were generated to represent the seam correlations and data integrity

integrity.

Coal quality was analyzed and summarized by MM&A's team of geologists and engineers. Quality was provided by Alpha in various database formats, laboratory data sheets, and also obtained directly from MM&A's files. Care was taken to ensure that sampled data was representative of the mineable section. In instances where minimal representative data was noted, geological tonnages were estimated based upon applying assumed densities of coal and non-coal material to thicknesses expressed in geological database files.

9.2 Limitations

As with any exploration program, localized anomalies, such as a thin coal area or poor mining conditions, cannot always be identified. The greater the density of the samples taken, the less the risk. Once an area is identified for inclusion in the mine plan, additional samples are taken to help reduce the risk in specific areas. In general, provision is made in the mine planning portion of the study to allow for localized anomalies that are typically classed more as a nuisance than a hinderance.

9.3 Opinion of Qualified Person

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Virginia Property. The Property data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

10 Mineral Processing and Metallurgical Testing

10.1 Testing Procedures

Basic chemical analyses (both raw and washed quality), petrographic data, rheological data and ash, ultimate and sulfur analysis are available but not summarized for this filing. Available coal quality data sourced from MM&A's vaults (associated with former projects for Alpha and its predecessors) was tabulated by resource area in a Microsoft® EXCEL workbook. Such data contained laboratory sheets which MM&A utilized to confirm that sampled intervals were representative of geological models and confirm that appropriate laboratory procedures were utilized to derive raw and clean coal

parameters. Additionally, Alpha provided MM&A with a database of its own in-house coal quality information which did **not** include backup laboratory information or sampled intervals. MM&A compared wash recovery values from Alpha's dataset to proximal holes with wash recovery data in MM&A's dataset and calculated estimates of wash recovery based upon the relative percentages of coal and rock from lithologic descriptions. In general, MM&A found that Alpha's dataset was representative and appropriate for inclusion in coal quality summaries. Quality tables also provide basic statistical analyses of the coal quality datasets, including average value; maximum and minimum values; and the number of samples available to represent each quality parameter of the seam. Coal samples that were deemed by MM&A geologists to be unrepresentative were not used for statistical analysis of coal quality, as documented in the tabulations.

Specific to the surface mine reserve areas, exploration quality was supplemented with historical pit sampling. Tabulations were completed based upon annual arithmetic averages on in-pit samples for washed quality. The general consistency in quality suggests confidence in the mines' ability to continue to produce a comparable metallurgical product.

The amount and areal extent of coal sampling for geological data is generally sufficient to represent the quality characteristics of the coal horizons and allow for proper market placement of the subject coal seams. For some of the coal deposits there are considerable laboratory data from core samples that are representative of the full extent of the resource area; and for others there are more limited data to represent the resource area. For example, in the active operations with considerable previous mining, there may be limited quality data within some of the remaining resource areas; however, in those cases the core sampling data can be supplemented with operational data from mining and shipped quality samples representative of the resource area.

10.2 Relationship of Tests to the Whole

The extensive sampling and testing procedures typically followed in the Coal Industry result in an excellent correlation between samples and Marketable product. Pit analyses of the coal from Virginia were reviewed to verify that the coal quality and characteristics were as expected. The Virginia Property has a long history of saleable production, under various owners, in the Mid-Volatile and High-volatile metallurgical and thermal markets, confirming exploration results.

10.3 Lab Information

Each sample is analyzed at area Laboratories that operate in accordance with procedures defined under ASTM standards including, but not limited to; washability (ASTM D4371); ash (ASTM D3174); sulfur (ASTM D4239); Btu/lb. (ASTM D5865); volatile matter (ASTM D3175); and Free Swell Index (*FSI*) (ASTM D720).

10.4 Relevant Results

No critical factors have been found that would adversely affect the recovery of the Reserve. Any quality issues that occur, either localized or generally are accounted for in the Marketing Study done for this TRS.

11 Mineral Resource Estimates

MM&A independently created geologic models to define the coal resources at Virginia. Coal resources were estimated as of December 31, 2021.

11.1 Assumptions, Parameters and Methodology

Geological data was imported into Carlson Mining® (formerly SurvCADD®) geological modelling software in the form of Microsoft® Excel files incorporating, drill hole collars, seam and thickness picks, bottom seam elevations and raw and washed coal quality. These data files were validated prior to importing into the software. Once imported, a geologic model was created, reviewed, and verified- with a key element being a gridded model of coal seam thickness. Resource tons were estimated by using the seam thickness grid based on each valid point of observation and by defining resource confidence arcs around the points of observation. Points of observation for Measured and Indicated confidence arcs were defined for all valid drill holes that intersected the seam using standards deemed acceptable by MM&A based on a detailed geologic evaluation and a statistical analysis of all drill holes within the projected reserve areas as described in *Section 11.1.1*. The geological evaluation incorporated an analysis of seam thickness related to depositional environments, adjacent roof and floor lithologies, and structural influences.

After validating coal seam data and establishing correlations, the thickness and elevation for seams of economic interest were used to generate a geologic model. Due to the relative structural simplicity of the deposits and the reasonable continuity of the tabular coal beds, the principal geological interpretation necessary to define the geometry of the coal deposits is the proper modeling of their thickness and elevation. Both coal thickness and quality data are deemed by MM&A to be reasonably sufficient within the resource areas. Therefore, there is a reasonable level of confidence in the geologic interpretations required for coal resource determination based on the available data and the techniques applied to the data.

Table 11-1 below provides the geological mapping and coal tonnage estimation criteria used for the coal resource and reserve evaluation. These cut-off parameters have been developed by MM&A based on its experience with the Alpha Property and are typical of mining operations in the Central Appalachian coal basin. This experience includes technical and economic evaluations of numerous

properties in the region for the purposes of determining the economic viability of the subject coal reserves.

Table 11-1: General Reserve & Resource Criteria

Item	Parameters	Technical Notes & Exceptions*
• **General Reserve Criteria**		
Reserve Classification	Reserve and Resource	Coal resources as reported are inclusive of coal reserves.
Reliability Categories	Reserve (Proven and Probable) Resource (Measured, Indicated & Inferred)	To better reflect geological conditions of the coal deposits, distance between points of observation is determined via statistical analysis. For surface-mineable reserves, the QPs responsible for the delineation of coal reserves have opted to classify tons in areas lacking exploration drill hole quality as 100-percent probable as opposed to basing proven and probable classifications upon relative distance from drill holes. Resource classification as stated in the tables is directly derived from drill hole spacing. The QPs have relied upon consistency in historical pit sampling as a justification for reserve delineation in such areas.
Effective Date of Resource Estimate	December 31, 2021	Coal resources were estimated based upon depletion maps with effective dates of December 31, 2021.
Effective Date of Reserve Estimate	December 31, 2021	Coal reserves were estimated based upon depletion maps with effective dates of December 31, 2021.
Seam Density	With raw seam analysis: SG = 1.25+(Raw Ash% / 100 In the absence of laboratory data, estimated by (1) assuming specific gravity of 1.30 for coal and 2.25 for rock parting	
• **Underground-Mineable Criteria**		
Map Thickness	Total seam thickness	
Minimum Seam Thickness	30 inches	Minor Exceptions for localized zones of thinner coal
Minimum Mining Thickness	54 inches	
Minimum Total Coal Thickness	27 inches	Minor Exceptions for localized zones of thinner coal
Minimum In-Seam Wash Recovery	Determined as function of seam thickness	
Wash Recovery Applied to Coal Reserves	Based on average yield for drill holes within reserve area, or in the absence of laboratory washability data, based on estimated visual recovery using specific gravities noted above and 95 percent yield on "clean" coal	
Out-of-Seam Dilution Thickness for Run-of-Mine Tons Applied to ROM tonnages	2 inches	
Mine Barrier	200-foot distance from abandoned mines and sealed or pillared areas	
Minimum Reserve Tonnage	400 thousand recoverable tons for individual area (logical mining unit)	
Minimum Overburden Depth	100 feet	
Minimum Interval to Rider Coal	Considered on a case-by-case basis, depending on interval lithology, etc.	
Minimum Interval to Overlying or Underlying Reserves	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Minimum Interval to Overlying or Underlying Mined Areas	Considered on a case-by-case basis, depending on interval lithology, extent and type of extraction, etc.	
Adjustments Applied to Coal Reserves	6.0 percent moisture increase; 5 percent preparation plant inefficiency	

Item	Parameters	Technical Notes & Exceptions*
• **Surface-mineable Criteria**		
Mining Type	Surface mining	
	Highwall mining (HWM)	
Coal Density	Used laboratory apparent specific gravity data where available. Otherwise use raw ash formula: Sp. Gr. = (% Raw Ash/100) + 1.25	
	Used estimated specific gravity based on 1.30 specific gravity for coal and 2.25 specific gravity for rock where no lab data was available.	This is also referred to as EVR or Estimated Visual Recovery method.
		EXCEPTION: Used 1800 tons per acre foot for seams with

		no quality data on surface reserve calculation
Surface Property Control	Controlled	Surface-mineable coal resource estimated where mineral and surface rights are controlled. No resource estimated if mineral rights are not controlled.
	Uncontrolled	Surface-mineable coal resource estimated where surface is uncontrolled if mineral rights are controlled.
Basis for Coal Tonnage	Thickness of recoverable coal less removable partings	Minimum thickness of removable parting for surface-mineable seam is 0.25-foot generally.
Minimum Total seam thickness for Single Cut Contour	2.0 feet (*)	
Minimum Thickness of Principal Seam in Multi-Seam Areas	1.0 foot (*)	
Minimum Thickness of Secondary Seam	0.5 foot	Secondary seam is within 2.5 feet of principal seam
Mine Strip Ratio	18:1 BCY /ton ratio for metallurgical coal & 15:1 BCY/ton for thermal coal	surface mine strip ratios are targets and can vary some by cut or job.
Minimum Total seam thickness for High Wall Miner	2.0 feet (*)	Seam thickness can vary within a panel.
Areas Considered for Surface-mineable Coal Resource	Permitted and potential permit areas provided by Alpha	

Note: Exceptions for application of these criteria to reserve estimation are made as warranted and demonstrated by either actual mining experience or detailed data that allows for empirical evaluation of mining conditions. Final classification of coal reserve is made based on the pre-feasibility evaluation.

11.1.1 Geostatistical Analysis

MM&A completed a geostatistical analysis on drill holes within the reserve boundaries to determine the applicability of the common United States classification system for measured and indicated coal resources. Historically, the United States has assumed that coal within ¼-mile (1,320 feet) of a point of observation represents a measured resource whereas coal between ¼-mile (1,320 feet and ¾-mile (3,960 feet) from a point of observation is classified as indicated. Inferred resources are commonly assumed to be located between ¾-mile (3,960 feet) and 3 miles (15,840 feet) from a point of observation. Per SEC regulations, only measured and indicated resources may be considered for reserve classification, respectively as proven and probable reserves.

MM&A performed a geostatistical analysis test of the Virginia data set using the Drill Hole Spacing Analysis (*DHSA*) method. This method attempts to quantify the uncertainty of applying a measurement from a central location to increasingly larger square blocks and provides recommendations for determining the distances between drill holes for measured, indicated, and inferred resources.

To perform DHSA the data set was processed to remove any erroneous data points, clustered data points, as well as directional trends. This was achieved through the use of histograms, as seen in *Figure*

11-1, color coded scatter plots showing the geospatial positioning of the borings, *Figure 11-2*, and trend analysis.

Figure 11-1: Histogram of the Total Seam Thickness for the Jawbone Seam Present in the Virginia Complex

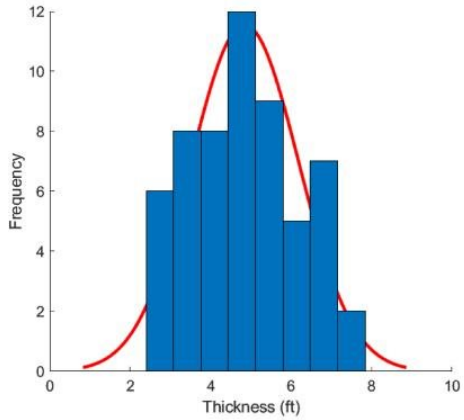
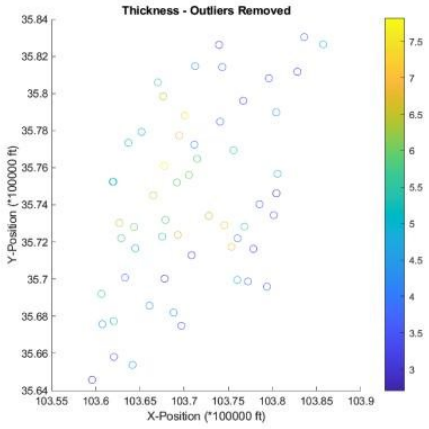


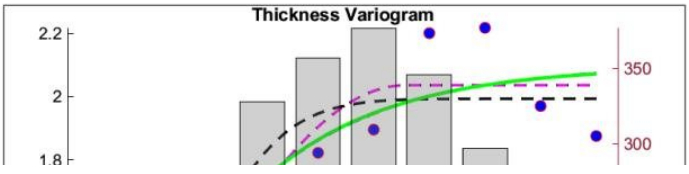
Figure 11-2: Scatter plot of the Total Seam Thickness for the Jawbone Seam Present in the Virginia Complex

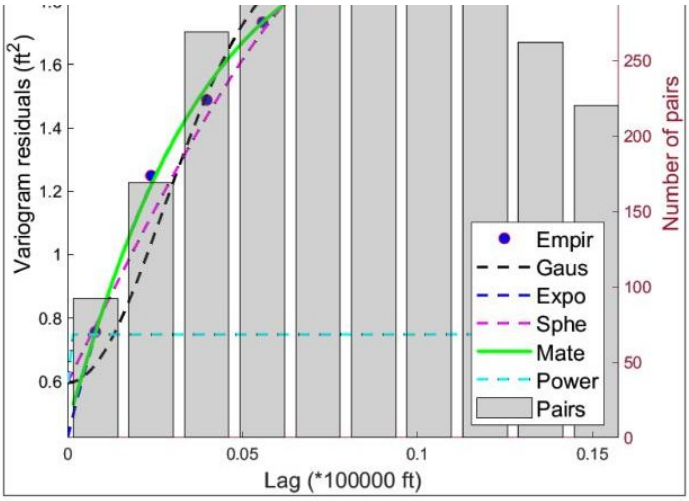


Following the completion of data processing, a variogram of the data set was created, *Figure 11-3*. The variogram plots average square difference against the separation distance between the data pairs. The separation distance is broken up into separate bins defined by a uniform lag distance (e.g., for a lag distance of 500 feet the bins would be 0 – 500 feet, 501 – 1,000 feet, etc.). Each pair of data points that are less than one lag distance apart are reported in the first bin. If the data pair is further apart than one lag distance but less than two lag distances apart, then the variance is reported in the second bin. The numerical average for differences reported for each bin is then plotted on the variogram. Care was taken to define the lag distance in such a way as to not overestimate any nugget effect present in the data set. Lastly, modeled equations, often spherical, gaussian, or exponential, are applied to the variogram in order to represent the data set across a continuous spectrum.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Figure 11-3: Variogram of the Total Seam Thickness for the Jawbone Seam Present in the Virginia Complex





The estimation variance is then calculated using information from the modeled variogram as well as charts published by Journel and Huijbregts (1978). This value estimates the variance from applying a single central measurement to increasingly larger square blocks. Care was taken to ensure any nugget effect present was added back into the data. This process was repeated for each test block size.

The final step of the process is to calculate the global estimation variance. In this step the number square blocks that would fit inside the selected study area is determined for each block size that was investigated in the previous step. The estimation variance is then divided by the number of blocks that would fit inside the study area for each test block size. Following this determination, the data is then transformed back to represent the relative error in the 95th-percentile range.

Figure 11-4 shows the results of the DHSA performed on the Jawbone seam data for the Virginia Complex. DHSA provides hole to hole spacing values, these distances need to be converted to radius from a central point in order to compare to the historical standards. A summary of the radius data is shown in *Table 11-3*. DHSA prescribes measured, indicated, and inferred drill hole spacings be determined at the 10-percent, 20-percent, and 50-percent levels of relative error, respectively.

Figure 11-4: Result of DHSA for the Jawbone Seam Present in the Virginia Complex

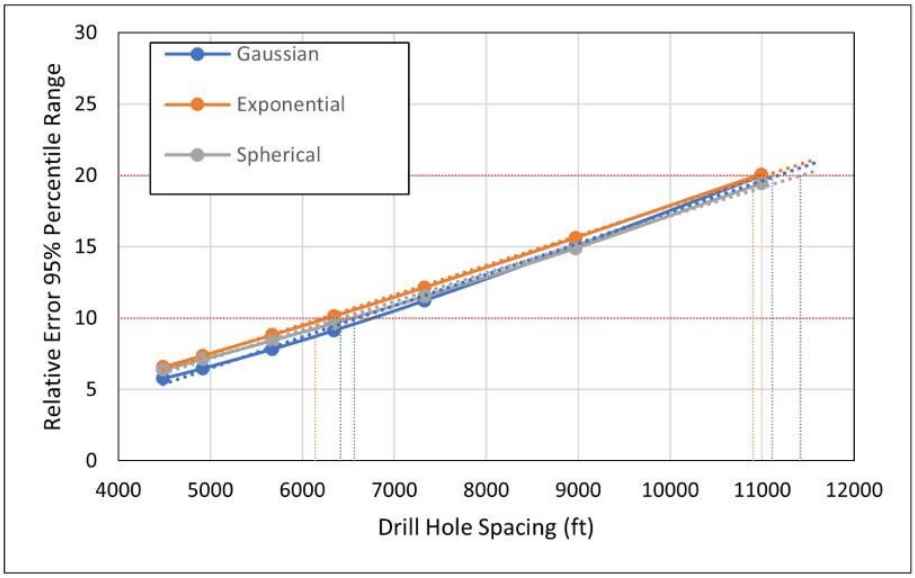


Table 11-2: DHSA Results Summary for Radius from a Central Point

Model:	Measured Radial Distance (10% Relative Error) (Miles)	Indicated Radial Distance (20% Relative Error) (Miles)	Inferred Radial Distance (50% Relative Error) (Miles)
Gaussian:	0.62	1.05	2.34
Spherical:	0.61	1.08	2.50
Exponential:	0.58	1.03	2.39

Comparing the results of the DHSA to the historical standards, it is evident that the historical standards are more conservative than even the most conservative DHSA model with regards to determining measured resources. The Exponential model recommends using a radius of 0.58 miles for measured resources compared to the historical value of 0.25 miles. With respect to indicated resources the DHSA-recommended drillhole spacing exceeds the historical standards. The Exponential model recommends using a radius 1.03 miles, while the Gaussian and Spherical models recommend a radius of 1.05 and 1.08 miles, respectively. These results have led the QP's to report the data following the historical classification standards, rather than use the results of the DHSA.

11.2 Resources Exclusive of Reserves

The Virginia Properties contain resource blocks of underground seams which were not deemed to exhibit reserve potential at the time of the study. These resources, identified as resources *exclusive* of

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

reserves, exist in the Upper Banner, Lower Banner, Jawbone Rider and Jawbone seams. Reasons which may preclude elevation of resources to reserves include, but are not limited to:

1. Limited availability of quality information to document coal seam market characteristics.
2. Block does not meet reserve criteria at this time.
    i. Upper Banner seam, Holly Creek Block HC-B1 is less than 2.5 feet total coal thickness, *Map UB-2.*

ii. Jawbone Rider Deep Mine 43 Block D2 is a high reject area, *Map JBR-7*.

3. Isolation of resource blocks in which seam access costs are cost prohibitive at the time of the study.

   i. Lower Banner seam, Ball Ridge Block BR-C (*Map LB-4*) and Rush Branch Block RB-A and BR-C (*Map LB-5*); Jawbone Rider seam, Deep Mine 43 Block C1A (*Map JBR-7*); Jawbone seam, Black Dog Block BD-E (*Map JB-9*) and Deep Mine 41, Block 41-G (*Map JB-8*) and Deep Mine 42, Block 42-E (*Map JB-9*) have all been classified as resource as they are isolated from the reserve Blocks.

4. Unfavorable economics at the PFS level, yet economics could become attractive in the future under different market conditions.

5. Exclusion from LOM planning by mining operator due to remaining resource blocks which are relatively small, isolated blocks and not currently attractive from an operational perspective.

   i. Jawbone Rider seam Deep Mine 43, Block D1 (*Map JBR-7*) and Jawbone seam, Black Dog Block BD-D (*Map JB-9*).

11.2.1 Initial Economic Assessment

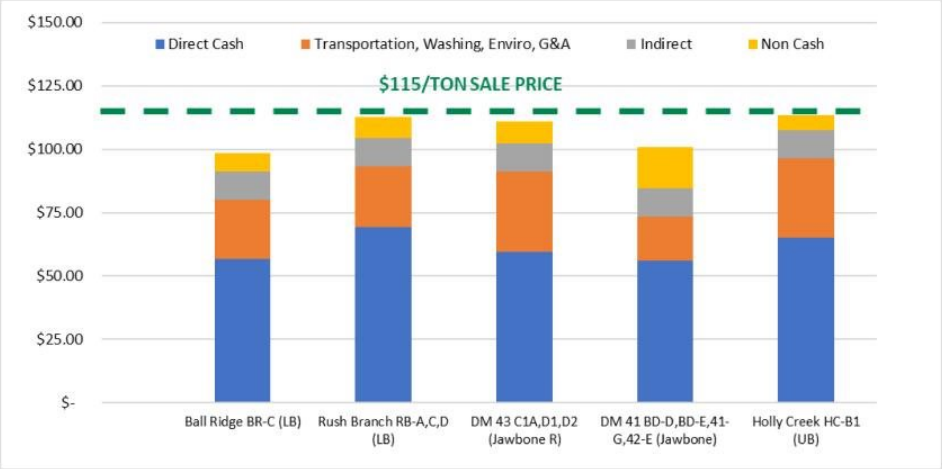
MM&A completed an initial economic assessment to determine the potential economic viability of resources exclusive of reserves. MM&A applied relevant technical factors to estimate potential saleable tons without the resource blocks, should the resources be extracted via deep, continuous mining methods. MM&A developed cash cost profiles for the resource blocks, including direct cash costs (labor, supplies, roof control, maintenance and repair, power, and other); washing, trucking, materials handling, general and administrative, and environmental costs; and indirect cash costs (royalties, production taxes, property tax, insurance). Costs were developed based off relevant cost drivers (per-ft, per-raw-ton, per-clean-ton). Additionally, MM&A estimated capital costs to access resources. Capital costs associated with mine developed were amortized across the resource's potential saleable tonnages). Additional non-cash items (depreciation of equipment and depletion) and cash costs were compared to an assumed sale price of $115 per ton netback FOB loadout (approximately $164 per ton U.S. East Coast basis) for mid-volatile markets. This resource assumed sales value was developed as a premium to the market-based reserve sales value to properly estimate the sales related expenses should these resources be extracted during higher-than-average market

conditions. Pricing used for the primary product was selected by the QP and deemed reasonable based on a review of historical average pricing for the Virginia complex coal products over the past 5 years. Results of the analysis are shown below and demonstrate potential profitability on a fully loaded cost basis. Detailed summaries are shown in *Appendix B*.

Table 11-3: Results of Initial Economic Assessment

Mine/Resource Block	Resource Block	Direct Cash	Transportation, Washing, Enviro, G&A	Indirect	Non-Cash	Total Cost	Fully Loaded P&L
Ball Ridge Block BR-C	Lower Banner	$56.85	$23.22	$11.12	$7.45	$98.64	$16.36
Rush Branch Blocks RB-A,C,D	Lower Banner	$69.38	$24.01	$11.12	$8.11	$112.62	$2.38
Jawbone Rider Blocks C1A,D1,D2	Jawbone Rider	$59.44	$31.88	$11.12	$8.68	$111.12	$3.88
Jawbone Blocks BD-D,BD-E,41-G, 42-E	Jawbone	$56.15	$17.40	$11.12	$16.12	$100.80	$14.20
Holly Creek Block HC-B1	Upper Banner	$64.97	$31.39	$11.12	$6.00	$113.47	$1.53

Figure 11-5: Results of Initial Economic Assessment



11.3 Qualified Person's Estimates

Based on the work previously described and detailed modelling of those areas along with consideration of all modifying factors, a coal resource estimate, summarized in *Table 11-4*, was prepared as of December 31, 2021, for property controlled by Alpha.

Table 11-4: Coal Resources Summary as of December 31, 2021

Area	Seam	Coal Resource (Dry Tons, In Situ) Measured	Indicated	Inferred	Total
Inclusive of Reserve					
88Strip/3Frks	Upper Banner-Tiller	12,880,000	2,154,000	0	15,034,000
Long Branch	Upper Banner 2 - Lower Banner	2,791,000	924,000	0	3,715,000
Holly Creek	Upper Banner (4650)	5,589,000	1,576,000	0	7,165,000
Bear Ridge	Upper Banner (4650)	828,000	142,000	0	970,000
Ball Ridge (Deep Mine 46)	Lower Banner (4900)	4,836,000	383,000	0	5,219,000
Long Branch (Deep Mine 45)	Lower Banner (4900)	3,448,000	383,000	0	2,369,000

Toms Creek	Lower Banner (4900)	0	0	0	0
Rush Branch	Lower Banner (4900)	3,169,000	0	0	3,169,000
Deep Mine 43	Jawbone Rider (5950)	35,456,000	24,216,000	340,000	60,012,000
Black Dog	Jawbone (6000)	16,128,000	1,948,000	0	18,076,000
Deep Mine 41	Jawbone (6000)	63,573,000	17,197,000	0	80,770,000
Deep Mine 42	Jawbone (6000)	47,710,000	12,003,000	0	59,713,000
Total Inclusive of Reserve		**196,407,000**	**60,927,000**	**340,000**	**256,212,000**
Exclusive of Reserve					
88Strip/3Frks	Upper Banner-Tiller	0	0	0	0
Long Branch	Upper Banner 2 - Lower Banner	0	0	0	0
Holly Creek	Upper Banner (4650)	5,000	579,000	0	585,000
Bear Ridge	Upper Banner (4650)	0	0	0	0
Ball Ridge (Deep Mine 46)	Lower Banner (4900)	1,003,000	32,000	0	1,035,000
Long Branch (Deep Mine 45)	Lower Banner (4900)	0	0	0	0
Toms Creek	Lower Banner (4900)	0	0	0	0
Rush Branch	Lower Banner (4900)	3,884,000	210,000	0	4,093,000
Deep Mine 43	Jawbone Rider (5950)	10,653,000	8,216,000	409,000	19,279,000
Black Dog	Jawbone (6000)	4,342,000	1,301,000	0	5,643,000
Deep Mine 41	Jawbone (6000)	1,772,000	34,000	0	1,806,000
Deep Mine 42	Jawbone (6000)	240,000	9,000	0	249,000
Total Exclusive of Reserve		**21,899,000**	**10,382,000**	**409,000**	**32,690,000**
Grand Total					
Inclusive of Reserve		196,407,000	60,927,000	340,000	256,212,000
Exclusive of Reserve		21,899,000	10,382,000	409,000	32,690,000
Grand Total		**218,307,000**	**71,309,000**	**749,000**	**288,902,000**

Note(1): Resource tons are inclusive of reserve tons since they include the in-situ tons from which recoverable coal reserves are derived.
Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

11.4 Qualified Person's Opinion

While there is some stratigraphically controlled seam-thickness variability due to seam splitting, sand channels, etc., MM&A geologists and engineers modeled the deposit and resource areas to reflect realistic mining scenarios, giving special consideration to seam thickness, floor and roof conditions, mining equipment, etc. This statistical study demonstrates that for each configuration of mineable seams, the classification system of **measured** (0 – ¼ mile), **indicated** (¼ to ¾ mile), and **inferred** (¾ to 3 miles) is reasonably adequate to predict seam thickness variation for modeling and mining purposes. Based on MM&A's geostatistical analysis, it would be possible to extend the measured, indicated and inferred arcs slightly beyond historically accepted practices due to consistent geological settings. The QP's have again elected not to extend arc distances, introducing a level of conservatism in measured and indicated coal classification.

Based on the data review, the attendant work done to verify the data integrity and the creation of an independent Geologic Model, MM&A believes this is a fair and accurate representation of the Virginia coal resources.

12 Mineral Reserve Estimates

12.1 Assumptions, Parameters and Methodology

Coal Reserves are classified as *proven* or *probable* considering "modifying factors" including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors.

- **Proven Coal Reserves** are the economically mineable part of a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.
- **Probable Coal Reserves** are the economically mineable part of an indicated coal resource, and in some circumstances a measured coal resource, adjusted for diluting materials and allowances for losses when the material is mined. It is based on appropriate assessment and studies in consideration of and adjusted for reasonably assumed modifying factors. These assessments demonstrate that extraction could be reasonably justified at the time of reporting.

Upon completion of delineation and calculation of coal resources, MM&A generated a LOM plan for Virginia. The footprint of each reserve area is shown on the maps in *Appendix C*. The Mine plan was generated based on 5-year budget mine plans provided by Alpha and supplemented with additional projections by MM&A to reflect LOM plans that honor property control limits, geologic mapping, or other factors determined during the evaluation.

Carlson Mining software was used to generate the LOM plan for Virginia. The mine plan was sequenced based on productivity schedules provided by Alpha. MM&A judged the productivity estimates and plans to be reasonable based on experience and current industry practice.

Raw, ROM production data outputs from LOM plan sequencing were processed into Microsoft® EXCEL spreadsheets and summarized on an annual basis for processing into the economic model. Average seam densities were estimated to determine raw coal tons produced from the LOM plan. Average mine recovery and wash recovery factors were applied to determine coal reserve tons.

Coal reserve tons in this evaluation are reported at a 6.0-percent moisture for underground and 4.5% for surface reserves and represent the saleable product from the Property.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Pricing data as provided by Alpha is described in *Table 16-2*. The pricing data assumes a flat-line long term realization of $144 per short ton port pricing, with an average $101 netback pricing reflective of the high- and mid -volatile product currently sold at Virginia.

The coal resource mapping and estimation process, described in the report, was used as a basis for the coal reserve estimate. Proven and probable coal reserves were derived from the defined coal resource considering relevant processing, economic (including technical estimates of capital, revenue, and cost), marketing, legal, environmental, socio-economic, and regulatory factors and are presented on a moist

marketing, legal, environmental, socio-economic, and regulatory factors and are presented on a moist, recoverable basis.

As is customary in the US, the categories for proven and probable coal reserves are based on the distances from valid points of measurement as determined by the QP for the area under consideration. For this evaluation, measured resource, which may convert to a proven reserve, is based on a ¼-mile radius from a valid point of observation.

Points of observation include exploration drill holes, and mine measurements which have been fully vetted and processed into a geologic model. The geologic model is based on seam depositional modeling, the interrelationship of overlying and underlying strata on seam mineability, seam thickness trends, the impact of seam structure, intra-seam characteristics, etc. Once the geologic model was completed, a statistical analysis, described in *Section 11.1.1* was conducted and a ¼-mile radius from a valid point of observation was selected to define Measured Resources.

Likewise, the distance between ¼ and ¾ of a mile radius was selected to define Indicated Resources. Indicated Resources may convert to Probable Reserves.

Inferred Resources (greater than a ¾-mile radius from a valid point of observation) have been excluded from Reserve consideration.

12.2 Mineral Reserves

Virginia Properties reserves were derived from multiple coal seams of *Figure 7-1* located on the Property. Reserves are estimated for both surface and underground mining. Surface reserves were derived for two sites Long Branch, and 88-Strip/Three Forks. Each account for coal reserves from multiple seams. Underground reserves were derived from four seams. The underground accessed seams include the Upper Banner seam at Holly Creek and Bear Ridge; the Lower Banner seam at Ball Ridge, Long Branch, and Rush Branch; the Jawbone Rider seam in Deep Mine #43; and the Jawbone seam in Deep Mine 41, Mine 42 and Black Dog. Demonstrated reserve tons are listed in the discussion below. *Table 12-1* shows the demonstrated tonnage by Proven and Probable status.

12.2.1 Surface Reserves

The two surface mines of the Virginia Properties are both active mines with contour and highwall miner reserve. Estimated LOM average mine ratios (BCY/Ton) do not exceed 29 to 1 for the reserve estimates. Cross sections through drill holes with lithologic records and seam correlation tie lines have been prepared for each surface reserve and are available upon request.

12.2.1.1 Long Branch Surface

Demonstrated reserve at Long Branch is comprised of 0.37 million surface mine tons and 0.92 million highwall miner tons from three seams. The active Long Branch mine includes permitted reserves to be extracted from the Upper Banner 2, Upper Banner and Lower Banner seams. Locally, previous surface mining exists in each of the three seams while previous deep mines exist in the Upper and Lower Banner. Planned mining methods are by contour strip and highwall miner mainly in new reserve blocks with little reserve in areas previously mined of the three seams.

12.2.1.2 88-Strip & Three Forks Surface

Demonstrated reserve at 88-Strip and Three Forks is comprised of 4.01 million surface mine tons and 3.04 million highwall miner tons from multiple seams for permitted and non-permitted reserve. The two mines are proximate to one another with adjacent mine permits.

The 88-Strip surface mine has a history of previous mining. Even though portions of the mine have been reclaimed, select previously mined areas are included in the reserve along with remaining reserve blocks. Reserves from 88-Strip are derived from seven seams that includes the Aily, Raven 2, Raven Upper split, Raven Lower split, Jawbone Rider, Jawbone, and Tiller. The Upper and Lower Raven splits merge into the Raven seam on the south end of the mine area (*Map 88-8*). Also, the Jawbone and Tiller seams are in proximity and known as the Thick Tiller west of the fault running through the Property (*Map 88-11*). These two seams were joined during deposition, contemporaneously with fault block movement. Elsewhere, the Jawbone and Tiller seams are separated by a sandstone unit named the Counsel sandstone. Most seams at 88-Strip are sufficiently thick to include highwall miner reserves.

Some coals included in the surface-mineable reserves lack seam-specific coal quality data. The QPs responsible for the delineation of such surface-mineable coal reserves have opted to classify tons in areas lacking exploration drillhole quality as 100-percent probable as opposed to basing proven and probable classifications upon relative distance from drillholes. Resource classification as stated in the tables is directly derived from drillhole spacing. The QPs at MM&A have relied upon consistency in historical pit sampling as a justification for reserve delineation in such areas.

Three Forks reserves are derived from the seams of 88-Strip plus the Upper Banner, Lower Banner, Big Fork and Kennedy seams which lie above the Aily seam.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

12.2.2 Underground Reserves

Underground reserves of the Property are derived from several smaller above drainage deposits in the Upper and Lower Banner seams along with larger seam deposits of the deeper Jawbone Rider and Jawbone seams. Three of the underground mines are currently active, the Rush Branch mine in the Lower Banner seam, Bear Ridge mine in the Upper Banner seam and Deep Mine 41 in the Jawbone seam. Seam sections through drill holes with roof and floor lithologic records and correlated seam ties have been prepared for each underground reserve and are available upon request.

12.2.2.1 Deep Mine 37 - Holly Creek Upper Banner

Holly Creek reserve includes 1.93 million Demonstrated tons, of which 94 percent are permitted. The delineated Holly Creek reserve is bound by a low coal zone to the west, two non-reserve areas with sandstone roof and floor and Deep Mine No. 37 to the northeast. The seam height of the reserve ranges between near 3.0 to over 6.0 feet thick. The mine has been operated and surface facilities remain. The mine is currently idle.

12.2.2.2 Bear Ridge Upper Banner

Bear Ridge is an active mine with 0.19 million tons of permitted, demonstrated reserve remaining. The average seam thickness of the Upper Banner seam at Bear Ridge ranges between 2.5 and over 3 feet thick. Previous mining of the Upper Banner seam exists in the closed underground mines that adjoin the reserve and in the Long Branch surface mine. The Bear Ridge mine extent is limited by creek drainages to the south, low coal trends to the west and east, and existing underground mines to the north. The mine is currently idle, but surface facilities remain on site.

12.2.2.3 Deep Mine 46 - Ball Ridge Lower Banner

The Ball Ridge reserve includes 1.28 million tons of demonstrated reserves from two pods of Lower Banner coal, Ball Ridge West (Block BR-A1/A2) and Ball Ridge East (Block BR-B1/B2). The coal pods are bounded to the north by stream drainages and low overburden cover but elsewhere by low coal trends. The seam pods are separated in the middle by a low cover zone above the head of Cabin Creek. Seam thickness of the reserve ranges between 2.5 and over 4.0 feet thick. The mine has not been faced up.

12.2.2.4 Deep Mine 45 - Long Branch Lower Banner

The Long Branch reserve in the Lower Banner seam includes 0.71 million demonstrated tons and is proximate to the Long Branch Surface mine. The reserve is not permitted and has an approximate average seam thickness is 2.68 feet thick. Previous underground mining of the Lower Banner seam occurred in the Roaring Fork No. 2 Mine that sits immediately adjacent to the Long Branch reserve block. The mine has not been faced up.

12.2.2.5 Deep Mine 44 - Rush Branch Lower Banner

Rush Branch is currently an active mine. The Rush Branch reserve includes 0.79 million demonstrated tons that are all permitted. Previous mining of the Lower Banner seam exists in several underground mines located south and north of the mine. Some thin coal zones divide the reserve blocks, which range in seam thickness between 2.5 and over 4.0 feet. The lateral extent of the reserve is bound by multiple stream drainages. The mine is active with two production sections operating.

12.2.2.6 Deep Mine 43 – Jawbone Rider

The Jawbone Rider seam reserve of the proposed Deep Mine 43 includes an estimated 22.03 million demonstrated tons, or 30-percent of the Virginia properties total underground reserve. This below drainage reserve is not permitted and has no previous mining locally. Coal thickness of the Jawbone Rider reserve range from about 2.33 feet to over 5.0 feet, yet most of this demonstrated reserve has an average thickness between 2.5 and 3.5 feet. There are several mapped low coal pods excluded from the reserve where drill data records indicate the total coal is less than 2.25 feet thick. The mine has not been faced up.

The Jawbone Rider reserve is bordered by two faults, the Jess Fault to the Northeast and the Russell Fork fault to the southwest and divided by the Little Paw Paw Fault in the reserve area. Two faults have a greater impact on the reserve. The Russell Fork Fault limits the lateral extent of the reserve in the southwest direction, while displacement of the Little Paw Paw Fault divides the reserve into separate west (id) and east (ID) blocks. The west block, in addition, is divided along the overlying Russell Fork River. Several adverse mineral tracts limit the reserve extent. The addition of select adverse blocks could expand the Jawbone Rider resource or reserve. Additional exploration is recommended to delineate coal thickness trends in several locations in the reserve block and in the proposed permit limits with further resource potential.

12.2.2.7 Deep Mine 41, Deep Mine 42, Black Dog – Jawbone

The Jawbone seam reserve is laterally continuous and incorporates three adjacent reserve areas: Deep Mine 41, Deep Mine 42, and the Black Dog mine. This below drainage reserve includes 44.81 million demonstrated tons, or 63-percent of the Virginia Properties total underground reserve. Approximately 90 percent of the Jawbone reserve is permitted by the three mine permits. The mineable seam thickness fluctuates across the reserve. Seam heights range from 2.5 feet to over 7.0 feet thick, with an approximate average seam thickness of 4.5 feet. Several faults run through the reserve but appear to have limited impact with mining. Previous mining exists within the permitted boundaries and also east of the Black Dog mine.

Deep Mine 41 is the largest mine in the Jawbone reserve with 22.46 million demonstrated tons. It also has a significant amount of previous mining. Deep mine 42 includes 17.16 million demonstrated reserve tons. It is currently accessed from Deep Mine 41. The Black Dog reserve includes 5.19 million demonstrated tons. It too has a significant amount of previous mining inside the permit boundary.

Proximity to the overlying Jawbone Rider coal and the underlying Jawbone Leader coal have been identified on *Maps JB-8* and *JB-9*. Locations where the Rider coal is less than 10 feet above and where the Leader coal is less than 5 feet below the Jawbone seam have been mapped for the report users benefit. Here less stable roof and floor mining conditions could exist in the reserve.

The mine is currently operating seven (7) continuous miner sections.

12.3 Qualified Person's Estimates

12.3 Qualified Person's Estimates

The coal reserves, as shown in *Table 12-1*, are based on a technical evaluation of the geology and a preliminary feasibility study of the coal deposits. The extent to which the coal reserves may be affected by any known environmental, permitting, legal, title, socio-economic, marketing, political, or other relevant issues has been reviewed rigorously. Similarly, the extent to which the estimates of coal reserves may be materially affected by mining, metallurgical, infrastructure and other relevant factors has also been considered.

The results of this TRS define an estimated 80.1 Mt of proven and probable marketable coal reserves. The maps included in *Appendix C* reflect mining depletion at the time resource/reserve calculation taken from Alpha mine maps at various points during calendar year 2021. Mine depletion tonnages were supplied by Alpha through the end of 2021, and MM&A deducted this historical production from the mapped reserves in order to estimate reserves as of December 31, 2021.

Table 12-1: Coal Reserves Summary (Marketable Sales Basis) as of December 31, 2021

	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
	By Reliability Category			By Control Type				
Seam/Area	Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%
Surface Mineable								
88 Strip/Three Forks	179,000	3,836,000	4,015,000	0	4,015,000	7	0.9	29
88 Strip/Three Forks	637,000	2,398,000	3,035,000	0	3,035,000	6	0.9	29
Long Branch	220,000	151,000	370,000	0	370,000	5	0.8	32
Long Branch	718,000	202,000	920,000	0	920,000	5	0.8	31
Total Surface Mineable	**1,754,000**	**6,587,000**	**8,341,000**	**0**	**8,341,000**	**6**	**0.8**	**31**
Underground								
Upper Banner (4650)								
Holly Creek	1,444,000	482,000	1,926,000	0	1,926,000	5	0.8	35
Bear Ridge	165,000	24,000	189,000	0	189,000	5	0.7	33
Total	**1,609,000**	**506,000**	**2,115,000**	**0**	**2,115,000**	**5**	**0.8**	**35**
Lower Banner (4900)								
Ball Ridge (Deep Mine 46)	1,190,000	92,000	1,282,000	0	1,282,000	6	0.7	29
Long Branch (Deep Mine 45)	699,000	16,000	716,000	0	716,000	6	0.7	30
Rush Branch	789,000	0	789,000	0	789,000	6	0.8	30
Total	**2,678,000**	**109,000**	**2,787,000**	**0**	**2,787,000**	**6**	**0.7**	**29**
Jawbone Rider (5950)								
Deep Mine 43	12,926,000	9,102,000	22,028,000	0	22,028,000	3	0.8	24
Total	**12,926,000**	**9,102,000**	**22,028,000**	**0**	**22,028,000**	**3**	**0.8**	**24**
Jawbone (6000)								
Black Dog	4,503,000	676,000	5,178,000	0	5,178,000	9	0.6	28
Deep Mine 41	17,796,000	4,669,000	22,465,000	0	22,465,000	9	0.8	26
Deep Mine 42	13,776,000	3,387,000	17,163,000	0	17,163,000	8	0.7	26
Total	**36,075,000**	**8,732,000**	**44,806,000**	**0**	**44,806,000**	**9**	**0.7**	**26**

Seam/Area	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)					Quality (Dry Basis)		
	By Reliability Category			By Control Type				
	Proven	Probable	Total	Owned	Leased	Ash%	Sulfur%	VM%
Total UG Mineable	53,287,000	18,448,000	71,736,000	0	71,736,000	7	0.8	26
Grand Total								
Grand Total	55,041,000	25,035,000	80,077,000	0	80,077,000	7	0.8	26

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
Totals may not add due to rounding.
See Appendix A for detailed breakdown.

12.4 Qualified Person's Opinion

The estimate of coal reserves was determined in accordance with the new SEC Guidelines which will become effective for the first fiscal year falling on or after January 1, 2021.

The LOM mining plan for Virginia was prepared to the level of preliminary feasibility. Mine projections were prepared, and timing scheduled to match production with coal seam characteristics. Production timing was carried out from current locations to depletion of the coal reserve area. Coal reserve estimates could be materially affected by the risk factors described in *Section 22.2*.

Based on the Preliminary Feasibility Study and the attendant Economic Review, MM&A believes this is a fair and accurate calculation of the Virginia coal reserves.

13 Mining Methods

Eight underground mining areas along with two surface and highwall miner areas were modeled and tested economically. Once the Resources were calculated, mine plans were created to project operating each resource area to depletion, with crews and equipment scheduled to move to subsequent mining areas as depletion occurs. Underground mine operations are projected to be exhausted in 2064, while surface and highwall mining operations are projected to be completed in 2035 and 2036, respectively. Individual mine lives range from 3 to 40 years.

13.1 Geotech and Hydrology

Mining plans for potential underground mines were developed by Alpha and MM&A. Pillar stability was tested by MM&A using the *Analysis of Coal Pillar Stability (ACPS)* program that was developed by the **National Institute for Occupational Safety and Health (*NIOSH*)**. MM&A reviewed the results from the ACPS analysis and considered it in the development of the LOM plan.

Hydrology has not been an issue of concern at Alpha's Virginia operations. Based on numerous site visits to the underground operations of the Property by the QP's, it has been determined that this is

not a significant concern. Mining of future reserves is projected to occur in areas which exhibit similar hydrogeological characteristics as those formerly mined areas.

13.2 Production Rates

Operations at the Virginia operations by Alpha and its predecessors have been on-going for many years. The mine plan and productivity expectations reflect historical performance and efforts have been made to adjust the plan to reflect future conditions. MM&A is confident that the mine plan is reasonably

representative to provide an accurate estimation of coal reserves. Mine development and operation have not been optimized within the TRS.

Carlson Mining software was used by MM&A to generate mine plans for the mineable coal seams. Mine plans were sequenced based on productivity schedules provided by Alpha, which were based on historically achieved productivity levels. All production forecasting ties assumed production rates to geological models as constructed by MM&A's team of geologists and mining engineers.

The mines feeding the McClure Preparation Plant consist of Deep Mine 41 (DM41), Deep Mine 44 (DM44) and Bear Ridge Contract Mine. There is a total of ten (10) operating continuous miner sections within these underground mines. In addition, the 88 Strip and Long Branch surface and highwall miner operations feed both the McClure and Tom's Creek plants.

As shown in *Table 13-1*, the areas planned for underground mines produce coal until 2064. Clean coal production varies directly with coal thickness and anticipated mining conditions.

Table 13-1: Virginia Complex Underground Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
DM 41-42-Black Dog (Jawbone)	958	1,921	1,782	1,766	1,703	1,693	1,692	1,696
Long Branch Deep (L. Banner)	0	0	0	185	293	238	0	0
DM44 (Lower Banner)	247	315	194	173	0.0	0	0	0
Holly Creek (Upper Banner)	0	147	244	217	216	203	203	209
DM43 (Jawbone Rider)	0	0	102	172	328	263	385	471
Ball Ridge DM46 (L. Banner)	0	0	113	290	219	274	296	90
Bear Ridge (Upper Banner)	51	73	77	6	0	0	0	0
Total	**1,257**	**2,456**	**2,512**	**2,809**	**2,758**	**2,671**	**2,576**	**2,467**

Mine Name	2029	2030	2031	2032	2033	2034	2035	2036
DM 41-42-Black Dog (Jawbone)	1,693	1,608	1,600	1,677	1,877	1,750	1,784	1,676
Long Branch Deep (L. Banner)	0	0	0	0	0	0	0	0
DM44 (Lower Banner)	0	0	0	0	0	0	0	0
Holly Creek (Upper Banner)	229	220	53	0	0	0	0	0
DM43 (Jawbone Rider)	471	481	473	465	410	485	493	508
Ball Ridge DM46 (L. Banner)	0	0	0	0	0	0	0	0
Bear Ridge (Upper Banner)	0	0	0	0	0	0	0	0
Total	**2,393**	**2,309**	**2,127**	**2,142**	**2,287**	**2,235**	**2,277**	**2,184**

Mine Name	2037	2038	2039	2040	2041	2042	2043	2044
DM 41-42-Black Dog (Jawbone)	1,572	1,599	1,565	1,471	1,406	1,370	1,437	1,545
Long Branch Deep (L. Banner)	0	0	0	0	0	0	0	0
DM44 (Lower Banner)	0	0	0	0	0	0	0	0
Holly Creek (Upper Banner)	0	0	0	0	0	0	0	0
DM43 (Jawbone Rider)	502	496	530	515	512	520	511	541
Ball Ridge DM46 (L. Banner)	0	0	0	0	0	0	0	0
Bear Ridge (Upper Banner)	0	0	0	0	0	0	0	0
Total	**2,074**	**2,095**	**2,095**	**1,987**	**1,918**	**1,890**	**1,948**	**2,086**
Mine Name	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**
DM 41-42-Black Dog (Jawbone)	1,439	1,482	1,174	965	804	440	180	27
Long Branch Deep (L. Banner)	0	0	0	0	0	0	0	0
DM44 (Lower Banner)	0	0	0	0	0	0	0	0
Holly Creek (Upper Banner)	0	0	0	0	0	0	0	0
DM43 (Jawbone Rider)	516	515	641	698	715	804	797	782
Ball Ridge DM46 (L. Banner)	0	0	0	0	0	0	0	0
Bear Ridge (Upper Banner)	0	0	0	0	0	0	0	0
Total	**1,955**	**1,998**	**1,815**	**1,662**	**1,519**	**1,244**	**977**	**809**
Mine Name	**2053**	**2054**	**2055**	**2056**	**2057**	**2058**	**2059**	**2060**
DM 41-42-Black Dog (Jawbone)	0	0	0	0	0	0	0	0
Long Branch Deep (L. Banner)	0	0	0	0	0	0	0	0
DM44 (Lower Banner)	0	0	0	0	0	0	0	0
Holly Creek (Upper Banner)	0	0	0	0	0	0	0	0
DM43 (Jawbone Rider)	777	737	712	719	717	678	555	553
Ball Ridge DM46 (L. Banner)	0	0	0	0	0	0	0	0
Bear Ridge (Upper Banner)	0	0	0	0	0	0	0	0
Total	**777**	**737**	**712**	**719**	**717**	**678**	**555**	**553**
Mine Name	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
DM 41-42-Black Dog (Jawbone)	0	0	0	0	0	0	0	0
Long Branch Deep (L. Banner)	0	0	0	0	0	0	0	0
DM44 (Lower Banner)	0	0	0	0	0	0	0	0
Holly Creek (Upper Banner)	0	0	0	0	0	0	0	0
DM43 (Jawbone Rider)	494	384	386	231	0	0	0	0
Ball Ridge DM46 (L. Banner)	0	0	0	0	0	0	0	0
Bear Ridge (Upper Banner)	0	0	0	0	0	0	0	0
Total	**494**	**384**	**386**	**231**	**0**	**0**	**0**	**0**

As shown in *Tables 13-2* and *13-3*, the areas planned for surface and highwall mines produce coal until 2035 and 2036, respectively. Clean coal production varies directly with surface mining ratios along with availability of open highwall for the highwall miner units.

Table 13-2: Virginia Complex Surface Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
Long Branch	35	72	112	111	36	16	0	0
88 Strip	439	374	488	518	502	428	373	372
Total	**473**	**446**	**601**	**628**	**538**	**443**	**373**	**372**
Mine Name	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Long Branch	0	0	0	0	0	50	9	0
88 Strip	187	187	187	187	114	0	0	0
Total	**187**	**187**	**187**	**187**	**114**	**50**	**9**	**0**

Total	187	187	187	187	114	50	9	0

Table 13-3: Virginia Complex Highwall Mine Production Schedule (x 1,000 Saleable Tons)

Mine Name	2021	2022	2023	2024	2025	2026	2027	2028
Long Branch HWM	56	127	112	151	121	24	0	0
88 Strip HWM	118	141	163	169	131	289	301	299
Total	**174**	**269**	**275**	**320**	**251**	**313**	**301**	**299**
Mine Name	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Long Branch HWM	0	0	0	0	0	141	283	35
88 Strip HWM	301	301	301	302	299	96	0	0
Total	**301**	**301**	**301**	**302**	**299**	**237**	**283**	**35**

13.3 Mining Related Requirements

13.3.1 Underground

A mine plan with sequenced mining projections was prepared for each logical mining unit. For each mine plan, the appropriate number of production units is selected for the resource area, and a productivity level assigned, expressed in feet of advance per unit-shift of production. The productivity is based on the equipment and personnel configuration, mining height and expected physical conditions.

13.4 Required Equipment and Personnel

13.4.1 Underground Mines

13.4.1.1 Deep Mine 41 (Maps #s JB-8, JB-9)

Deep Mine 41 is a well-developed underground mine that supports seven (7) production units. The mine operates in the Jawbone Seam. The mine has been in production since 2010. Full steady state production was reached in 2016 at 1,500,000 clean tons per year and averaging 1,675,000 clean tons per year over the period from 2016 to 2020.

The coal seam is accessed by a side-by-side decline slope. Personnel, supplies and equipment traverse the haul roadside of the slope to access the workings and the belt travels up the opposite side. The slope facility is located near the center of the coal property. Work areas have been developed to the

east and west of the slope bottom area. A split shaft is located at slope bottom. The shaft provides intake air, and the mine fan is mounted on the return side of the shaft in an exhausting arrangement.

The depth of cover ranges from 400 feet to 1,200 feet.

Production is scheduled for approximately 248 days each year, which represents production on Monday through Friday. On each day, production sections are scheduled to produce coal on two shifts. The sections are configured as super sections with two continuous miners operated independently on each section. Productivity is planned at the rate of 186 feet of advance per shift of operation.

Principal production equipment per section includes two continuous miners, two roof bolters, four shuttle cars, and two scoops. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stockpiled. Coal is then transported via overland conveyor belt haulage to the McClure Preparation Plant where it is processed and loaded onto Norfolk Southern rail for transport to the consumer.

The production units do perform secondary recovery where available with mobile roof support (*MRS*) units. The mine plan design includes leaving support pillars in selected areas to prevent subsidence damage to surface structures and features.

Deep Mine 41 is operational at the time of this report; all necessary infrastructure and utilities are in place; all necessary permits have been obtained. Estimated Capital Expenditures for future ventilation facilities are included within the financial model. The estimated expenditures for site closure and reclamation have been calculated and are included within the financial model as well.

As work areas are completed, the mine will see a reduction in production units starting with two units in 2047, two units in 2049, two units in 2050 and the final unit in 2052.

13.4.1.2 Deep Mine 44 Rush Branch (Map #LB-5)

Deep Mine 44 is located approximately 3.5 miles south of the McClure Preparation Plant. It is currently operational with two (2) continuous mining sections producing coal in the Lower Banner seam on leased mineral property. Deep Mine 44 is a two (2) section mine with each working section operated as a super section (two sets of mining equipment operating simultaneously and sharing a common dumping point on the same section, with each set being ventilated by a separate split on intake air). Each super section operates two (2) Continuous Miners, two (2) Roof Bolters, four (4) Shuttle Cars and two (2) scoops. The production units do perform secondary recovery where available with MRS units. The mine plan design includes leaving support pillars in selected areas to prevent subsidence damage to surface structures and features.

Similar to the Deep Mine 41 operation, coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stockpiled. Coal is then transported via highway truck haulage to the Toms Creek and McClure Preparation Plants where it is processed and loaded onto the CSX or Norfolk Southern rail system, respectively, for transport to the consumer.

Deep Mine 44 is also operational at the time of this report with all necessary infrastructure and utilities

Deep Mine 44 is also operational at the time of this report with all necessary infrastructure and utilities in place. All necessary permits have been obtained. Estimated expenditures for site closure and reclamation are included in the financial model for this site.

The Mine is scheduled to deplete its mining assignment in 2024.

13.4.1.3 Bear Ridge Contract Mine (Map #UB-1)

Active at the time of this report, Capital Coal Corporation is operating the Bear Ridge Contract Mine (formerly operated by Four-O Mining). The facility is located on Rush Branch of Roaring Fork of the McClure River approximately 8.7 miles southeast of the McClure Preparation Plant. The mine produces from the Upper Banner Seam.

Estimated depletion occurs just after the beginning of calendar year 2024. The mine produces metallurgical grade coal using one (1) active section with one (1) continuous miner, one (1) roof bolter, two (2) shuttle cars, one (1) belt feeder, and one (1) scoop per section. Coal is extracted from the production face with the continuous miners and hauled to the mine conveyor in shuttle cars. At the conveyor belt, the coal is discharged from the shuttle cars onto a feeder breaker for transfer onto the conveyor. The conveyors carry the coal to the outside, where it is stockpiled prior to being trucked to the Toms Creek and McClure Preparation Plants by highway trucks. The mine site is compact and does not have equipment to scalp rock prior to trucking to the preparation plant.

All necessary permits have been obtained. Estimated expenditures for site closure and reclamation are included in the financial model for this site.

13.4.1.4 Deep Mine 37 Holly Creek (Map #UB-2)

The Deep Mine 37 facility accesses the Upper Banner Seam approximately 5.2 miles north of the McClure Preparation Plant. The mine started production in 2009 and was idled in 2017. The mine has produced 3,000,000 clean tons during that period. A coal boundary remains available to the existing workings. The mine was developed around historical workings in the Upper Banner Seam which involved mining through areas of sandstone roof and partings. This may allow any rehabilitation to be minimal since the sandstone roof would tend to be more stable over time than a shale roof.

The mine portals are located at a lower elevation than the support facilities. Facilities remaining on site include a shop building at the portals, the powerline, an overland belt to the screening building, a raw

coal stacker belt, a scalped material stacker belt, a coarse refuse area and some office trailers. The mine site remains available to access the coal seam.

Reclamation permits remain active with renewal due in late 2021.

Resumption of production activities occurs in 2022 and continues until calendar year 2031.

13.4.1.5 Deep Mine 43 (Map #JBR-7)

Deep Mine 43 targets the Upper Jawbone Seam. Access would be gained by a haulage slope and ventilation shafts as the coal boundary is completely below drainage. The access is proposed at a location along Frying Pan Creek of Russell Fork, approximately 9.4 miles east of the McClure Preparation Plant.

The coal boundary is bisected by a northwest to southeast trending fault system. The projected plan is to drive through the fault to access the eastern portion of the coal boundary. At the crossing, a ventilation/elevator shaft has been proposed for developing the eastern boundary.

Deep Mine 43 work as a three (3) section mine and later in its assignment, a fourth production section will be added. Each working section will be operated as a super section (two sets of mining equipment operated simultaneously and sharing a common dumping point on the same section, with each set being ventilated by a separate split on intake air.) Each super section operates two (2) Continuous Miners, two (2) Roof Bolters, four (4) Shuttle Cars and two (2) scoops. The production units do perform secondary recovery where available with MRS units. The mine plan design includes leaving support pillars in selected area to prevent subsidence damage to surface structures and features. Coal will be extracted from the working face by the continuous miner, loaded into shuttle cars to be transported to the belt feeder on the section conveyor belt. Once on the conveyor belt, the product will be transported to the surface to a stockpile. Highway trucks would transport the product on public highways to the McClure Preparation Plant for a one-way distance of 19.9 miles.

The mine product is expected to average 40 percent recovery due to in-seam rock as well as out of seam dilution occurring from excavating roof or floor rock to have adequate height to operate the underground machinery. Due to the size of this reserve the option to acquire additional property to construct a small preparation plant also remains but further study of this arraignment would be necessary. This model proposes to reduce the amount of rock being hauled to the preparation plant by screening the run of mine material to reduce the rock content. The installation of a screen system and a coarse refuse disposal site on controlled surface property would reduce the weight of the hauled material by approximately twelve percent (12%), which would be realized in a cost reduction in the truck haulage costs on a clean ton basis. A similar system was used at Deep Mine 37.

Mining is projected to commence in 2023 and be completed in 2064.

13.4.1.6 Deep Mine 45 Long Branch (Map #LB-6)

This reserve area is located approximately 8.4 miles southeast of the McClure Preparation Plant and approximately 1.0 miles north of the Bear Ridge Contract Mine. The coal boundary is found in the Lower Banner Seam. An existing surface mine contour bench will be used to access the seam. Coal would be trucked to the Tom Creek and McClure Preparation Plants with highway trucks across a developed coal haul road to the county road system.

This report includes a starting date of February 2024 with a completion date of November 2026.

Deep Mine 45 will be developed as a one (1) section mine with the working section operated as a super section (two sets of mining equipment operating simultaneously and sharing a common dumping point on the same section, with each set being ventilated by a separate split on intake air). Each super section operates two (2) Continuous Miners, two (2) Roof Bolters, four (4) Shuttle Cars and two (2) scoops. The production units do perform secondary recovery where available with MRS units. The mine plan design includes leaving support pillars in selected areas to prevent subsidence damage to surface structures and features. Coal will be excavated from the working face by the continuous miner, loaded into shuttle cars to be transported the belt feeder on the section conveyor belt. Once on the conveyor belt, the product will be transported to the surface to a stockpile. Highway trucks would transport the product on public highways for a one-way distance of 13.5 miles.

Electrical power can be sourced from the Bear Ridge Contract Mine utility tap approximately 0.5 miles from the proposed site.

13.4.1.7 Deep Mine 46 Ball Ridge (Map #LB-4)

This reserve area is located approximately 4.9 miles southeast of the McClure Preparation Plant. The coal seam is the Lower Banner Seam.

Deep Mine 46 will be developed as a one (1) section mine with each working section operated as a super section (two sets of mining equipment operating simultaneously and sharing a common dumping point on the same section, with each set being ventilated by a separate split on intake air). Each super section operates two (2) Continuous Miners, two (2) Roof Bolters, four (4) Shuttle Cars and two (2) scoops. The production units do perform secondary recovery where available with MRS units. The mine plan design includes leaving support pillars in selected areas to prevent subsidence damage to surface structures and features. Coal will be excavated from the working face by the continuous miner, loaded into shuttle cars to be transported to the belt feeder on the section conveyor belt. Once on the conveyor belt, the product will be transported to the surface to a stockpile. Highway trucks would transport the product on public highways for a one-way distance of 8.1 miles to the McClure Preparation Plant.

The site will be constructed along the Lower Banner Seam outcrop. The surface facilities would be positioned along existing roads as a contour cut along the coal seam with a stockpile area located below the mine bench.

A new power substation would be required. A local utility power line is near the site. The power tap can be utilized in the future for the expansion of the southeast portion of Deep Mine 41.

Mining is projected to commence in 2023 and be completed in 2028.

13.4.2 Surface Mines

13.4.2.1 Long Branch (Map #s LBR-1 through LBR-3)

Figure 13-1: Long Branch Surface Mine Aerial View

The Long Branch reserve area consists of contour and highwall mining of three seams: the Upper Banner 2, Upper Banner, and the Lower Banner seams. Deep mining has taken place in the Upper and Lower Banner seams. Pre-law surface contouring and augering depletion exists on three seams with no evidence of highwall reclamation. The Upper Banner and Lower Banner benches north of Lick Creek are expected to contain large amounts of mined spoil that will require remining to fully expose the seams for highwall mining.

Proposed contouring is limited to areas that have highwall mining potential. Due to steep terrain

Proposed contouring is limited to areas that have highwall mining potential. Due to steep terrain, restricted spoil placement areas, and existing gas well locations, second-cut contouring is limited to areas where existing contour width is insufficient to accommodate a highwall miner. If practical, second-cut contouring will be attempted in areas of previous augering to provide solid coal for highwall mining. Unfortunately, a portion of the augering will likely remain requiring the additional steps of stowing the auger holes and/or widening highwall mining web widths effectively reducing overall highwall miner recovery.

The Long Branch reserve does not offer a great deal of flexibility in development due the large concentration of gas wells and lines that require close coordination with the gas company for their shut-in/plugging and line movement. Additionally, there is no permitted off-bench areas for final or temporary spoil placement.

Alpha presently dedicates one **Caterpillar Inc. (*CAT*)** 993 loader/785 truck spread for excavation. Track dozers are available on the job but are not expected to contribute to production and will be used primarily for reclamation. Continual highwall mining activity will be unlikely due to periods of insufficient highwall exposure. As a result, the operation benefits from multi-skilled operators capable of operating different machinery.

Due to increased highwall mining needs at 88 Strip the highwall miner at Long Branch will be moved to 88 Strip in year 2026 where it will be better utilized. The Long Branch and 88 Strip highwall miners will return to Long Branch in 2034 to mine the remaining reserves which will be exhausted in 2036. Surface mining activity will cease during the highwall miner's absence.

13.4.2.2 88 Strip/Three Forks (Map #s 88-1 through 88-11)

Figure 13-2: 88-Strip/Three Forks Surface Mine Aerial View

The 88 Strip / Three Forks mine complex is an area that has been mined for more than 50 years. Initially deep and surface mining targeted the Raven, Jawbone, and Tiller seams. In the western portion of the mining complex the Jawbone and Tiller effectively come close together to allow them to be deep mined as one seam known locally as the "Thick Tiller".

Surface mining activity wanned in the 1990s and most of the disturbed areas were reclaimed. Surface mining resumed approximately 10 years later with the recognition that the Jawbone-Tiller seams had more contour, auger and highwall mining potential.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Alpha continues to develop the Jawbone-Tiller seams, concentrating on surface mining previously deep mined areas where pillars were not removed. This effort often involves remining reclaimed spoil placed on upper Raven benches. Strip ratios for the "Thick Tiller" pits can exceed 30:1, but engineered pit/panel alignment, allocation of dozers pushing upper seam spoil into void space of the previously excavated panel and limiting loader/truck contribution to the lower seams significantly reduces the cost per yard. Blast casting of the upper burden also offers limited quick and cheap burden removal. Placement of spoil in adjacent panels requires rehandle of the spoil along the spoil-side high wall to

assure safe removal of the targeted Jawbone-Tiller pillars.

Alpha has supplemented mining with contour and highwall mining of additional seams: Jawbone Rider, Raven, and Ailey seams.

The 88 Strip mine will slowly transition out of large Thick Tiller coal production due to exhaustion of mineable pillar boundaries. Production will continue east in the previously stated seams and new seams that are primarily on the 3 Forks area of future expansion. The additional seams in the Three Forks area include the Upper Banner, Lower Banner, Big Fork, Kennedy Rider, and Kennedy, all of which are above the Ailey seam in the stratigraphic column. Most of the seams show no evidence of previous mining activity. Proposed contouring is limited to areas that have highwall mining potential. Additional areas that bridge contouring were added in selected areas.

88 Strip presently utilizes 3 – CAT 993 loader/785 truck spreads and 3 - D11 track dozers for overburden production. Historically, greater than 16 million cubic yards (CY) were mined on a yearly basis due to heavy contribution of dozers, but due to increased emphasis on new seam contouring yearly overburden volumes are expected to be between 14 and 15 million CY. Creation of highwalls will primarily involve truck haulage and not dozer pushing. Track dozers production is expected to be limited to Thick Tiller pits.

With a few exceptions contouring and highwall mining will be initiated in lower seams in areas of multi-seam planned activity to aid in reclamation. Highwall mining will target coals greater than 18 inches and average 630 ft penetration depth.

By 2026 the wall separation length between contouring and highwall miner activity will increase to the point that a CAT 993/785 spread can be parked. At the same time the Long Branch highwall miner will be moved to 88 Strip/Three Forks complex to assist in highwall mining the balance of the reserve. Contouring and highwall mining activity will cease in 2034.

14 Processing and Recovery Methods

14.1 Description or Flowsheet

The Alpha Virginia Operations currently includes the McClure River Preparation Plant and Tom's Creek Preparation Plant in addition to the mines. The plant sites include raw coal storage, clean coal storage, a railroad loadout, and refuse disposal area. Both plants have a feed rate capacity of 1,100 raw tons per hour each.

The McClure River Plant was built by Roberts and Shaefer in 1979 and received an upgrade in 2019. The plant produces a product with a typical ash content of 8.31% and typical sulfur content of0.75%%. Plant equipment includes a heavy media vessel for primary separation, low density cyclone for intermediate separation, froth flotation and spirals in the fine coal circuit. Centrifugal dryers are utilized, and a thermal dryer can be seen in the aerial imagery obtained from Google Earth. During the 2021 reporting year the McClure Plant had an average utilization of 61.42%

Coarse and fine refuse are disposed in an adjacent combined refuse area utilizing currently installed vacuum disk filters that could be augmented with new plate and frame filter presses when installation in completed. Historically slurry was injected into the adjacent McClure No. 1 Mine with an opportunity to resume this process in a limited capacity moving forward. Due to the topography of the region and limited competition for land resources a new slurry impoundment could be constructed on adjacent property following the acquisition and permitting process for additional long term refuse capacity. An aerial image of the McClure River Plant and refuse area is shown in *Figure 14-1*.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Figure 14-1: McClure River Preparation Plant and Refuse Area

The Tom's Creek Plant was built by **The Daniels Company** in 1980 and received an upgrade by **Sedgman Pty Ltd** in 2004. The plant produces a product with a typical ash content of 8.95% with s typical sulfur content of 0.80% at a utilization rate of 38.59% in 2021. Plant equipment includes a heavy media vessel for primary separation, low density and heavy media cyclones for intermediate separation, froth flotation, spirals and columns for the fine coal circuit. The plant utilizes centrifugal dryers. Coarse refuse is belted to the top of the adjacent impoundment and also includes a slurry pond. An aerial image of the Tom's Creek Plant and slurry impoundment is shown in *Figure 14-2*.

Figure 14-2: Tom's Creek Preparation Plant and Slurry Impoundment

Processes and equipment are typical of those used in the coal industry and are in use in nearly all plants in the Central Appalachian Basin.

14.2 Requirements for Energy, Water, Material and Personnel

Personnel have historically been sourced from the surrounding communities in Dickenson, Wise and Russell Counties, and have proven to be adequate in numbers to conduct mining operations. As mining is common in the surrounding areas, the workforce is generally familiar with mining practices, and many are experienced miners.

Water is sourced locally from public water sources or rivers, and electricity is sourced from **Appalachian Electric Power (*AEP*)**. The service industry in the areas surrounding the mine complex has historically provided supplies, equipment repairs and fabrication, etc.

15 Infrastructure

Alpha's Virginia preparation plants service the area with washed coal, which is transported via the CSX & NS rail lines at the plant's loadouts. Haul roads, primary roads, and conveyor belt systems account for transport from the various mine sites to the preparation plant. This practice will continue for future reserves.

As an active operation, the necessary support infrastructure for Virginia is in place.

As new areas are developed, the infrastructure requirements will change. These changes have been considered in the LOM plans and financial model.

The underground mining resource areas which are located above drainage will require an access road and mine access development along the outcrop.

Typical mine facilities include a mine office, a change house, supply facilities, mine fan and a stacker conveyor if truck haulage is required. One major advantage for the operations is that the majority of the raw coal originates from Deep Mine 41 and is transported directly to the preparation plant by conveyors which eliminates truck haulage.

Photographs of the existing facilities are shown in *Figures 15-1* and *15-2*.

Figure 15-1: McClure River Preparation Plant & Surface Facilities

Figure 15-2: Tom's Creek Preparation Plant & Surface Facilities

16 Market Studies

16.1 Market Description

The quality characteristics for the subject coal resources and coal reserves have been reviewed in detail by MM&A. The drill hole data were utilized to develop average coal quality characteristics for the mining site. These average coal quality characteristics were then utilized as the basis for determining the various markets into which the saleable coal will likely be placed.

Quality Specifications for the Virginia products as produced in 2021 are as shown in *Table 16-1*.

Table 16-1: 2021 Produced Quality

	MV	HVA
Ash (%)	8.22	7.32
Sulfur (%)	0.81	0.78
Volatile Matter (%)	25.34	30.47

The mine production serves the both the mid- and high-volatile metallurgical market.

16.2 Price Forecasts

Company-wide pricing data as provided by Alpha is described in *Table 16-2*. Note that not all products reflected in *Table 16-2* will apply to every business unit. The pricing data assumes a flat-line long term realization of $144 per short ton port pricing, with an average $101 netback pricing reflective of the high- and mid -volatile product currently sold at Virginia. These estimates are based on long term pricing published by third party sources and adjusted for quality and transportation. The netback pricing represents adjustments made to published benchmark pricing based on quality and transportation. A large majority of the coal sold by Alpha and their Virginia business group is shipped internationally as part of blended products from other business units within Alpha or sourced from other companies. These netback adjustments reflect these additional costs carried after the products leave the Virginia business unit.

Table 16-2: Price Forecasts

Coal quality	Market Pricing Per Ton (1) (2)
High-Vol. A	$138
High- Vol. B	$117
Mid-Vol.	$144
Low-Vol.	$144
Thermal	$76

(1) - Market pricing shown on U.S. East Coast basis.
(2) - Metallurgical and thermal pricing based on 10-year and 3-year average, respectively of forecasted pricing from pricing services.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

16.3 Contract Requirements

Some contracts are necessary for successful marketing of the coal. For Virginia, since all mining, preparation and marketing is done in-house, the remaining contracts required are:

> **Transportation** – Alpha contracts with the Norfolk Southern Railroad and CSX to transport coal to market

> **Sales** – Sales contracts are a mix of spot and contract sales. With the volatility of the market, long-

- **Sales** – Sales contracts are a mix of spot and contract sales. With the volatility of the market, long term contracts are not typically written.

17 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals

17.1 Results of Studies

MM&A completed an environmental review in 2011 for the Massey properties acquired by Alpha, including those operations that were active at Virginia at that time. The environmental review completed by MM&A included site inspections, reviews of historical records, database searches of State and Federal regulatory records and interviews to identify potential recognized environmental conditions (*RECs*) that may create environmental liability for the sites. While MM&A identified RECs during both studies, MM&A's opinion was that those issues would not preclude the continued or future use of the properties as a coal mining/preparation venture.

Based on this former ESA completed by MM&A, it is MM&A's opinion that Virginia has a generally typical coal industry record of compliance with applicable mining, water quality, and environmental laws. Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models.

17.2 Requirements and Plans for Waste Disposal

Coarse and fine refuse are presently placed in an adjacent combined refuse area utilizing existing vacuum disk filters that could be augmented with plate and frame filter presses when installation in completed. Initially, combined refuse was placed in the existing fills. The McClure plant has been injecting slurry into the adjacent McClure No. 1 Mine for approximately the past 14 years. There is an opportunity to resume injection in a limited capacity moving forward, and the permitting of two new injection sites is underway. Due to the topography of the region and limited land resources, a new coarse refuse/slurry impoundment could be constructed on adjacent property following the acquisition and permitting process for additional long term refuse capacity.

Based on a study completed by **Schnabel Engineering, Inc. (*Schnabel*)** in February 2021 using January 2021 updated mapping, McClure River Refuse area has disposal capacity for combined refuse through February 2029 at present production rates. The proposed new coarse disposal/impoundment site has a projected capacity of approximately 20 years. As with most operations in the region, continuing to secure additional coarse and fines capacity will be critical to execute the business plan as outlined in this TRS, a process Alpha has historically shown success in navigating. The table below outlines the current estimated capacities and permits of Virginia's fine and coarse impoundments.

Table 17-1: Virginia Refuse Disposal Summary

Refuse Facility	State SMCRA Permit Number	MSHA ID	Refuse Disposal Type	Classified as a Dam	Permit Status	Current Planned Maximum Coarse Life (Approved + Planned)	Current Planned Maximum Fines Life (Approved + Planned)	Est. Coarse/ Combined Refuse Life (Yrs.)	Est. Fine Refuse Life (Yrs.)
McClure River Refuse Area (Virginia)	1402177	1211-VA5-0124-01	Coarse Refuse	No	Active	13.1	5.6	9.7	4.6
Sallies Branch Slurry Impoundment (Virginia)	1302182	1211-VA5-0133-01A	Slurry Impoundment - Downstream and Upstream	Yes	Active	21.8	21.8	21.8	21.8

17.3 Permit Requirements and Status

All mining operations are subject to federal and state laws and must obtain permits to operate mines, coal preparation plants and related facilities, haul roads, and other incidental surface disturbances necessary for mining to occur. Permits generally require that the permittee post a performance bond in an amount established by the regulatory program to provide assurance that any disturbance or liability created during mining operations is properly restored to an approved post-mining land use and that all regulations and requirements of the permits are fully satisfied before the bond is returned to the permittee. Significant penalties exist for any permittee who fails to meet the obligations of the permits including cessation of mining operations, which can lead to potential forfeiture of the bond. Any company, and its directors, owners and officers, which are subject to bond forfeiture can be denied future permits under the program.[1]

New permits or permit revisions will occasionally be necessary to facilitate the expansion or addition of new mining areas on the Property, such as amendments to existing permits and new permits for mining of reserve areas. Exploration permits also are required. Property under lease includes provisions for exploration among the terms of the lease. New or modified mining permits are subject to a public advertisement process and comment period, and the public is provided an opportunity to raise objections to any proposed mining operation. MM&A is not aware of any specific prohibition of mining on the subject property and given sufficient time and planning, Alpha should be able to secure new permits to maintain its planned mining operations within the context of current regulations.

[1] Monitored under the Applicant Violator System (AVS) by the Federal Office of Surface Mining.

Necessary permits are in place to support current production on the Property, but future permits are required to maintain and expand production. Portions of the Property are located near local communities. Regulations prohibit mining activities within 300 feet of a residential dwelling, school, church, or similar structure unless written consent is first obtained from the owner of the structure. Where required, Alpha reports that such consents have been obtained where mining is proposed beyond the regulatory limits.

Alpha has obtained all mining and discharge permits to operate its mines and processing, loadout or

Alpha has obtained all mining and discharge permits to operate its mines and processing, loadout or related facilities. MM&A is unaware of any obvious or current Alpha permitting issues that are expected to prevent the issuance of future permits. Virginia, along with all coal producers, is subject to a level of uncertainty regarding future clean water permits due to **United States Environmental Protection Agency (*EPA*)** involvement with state programs.

The Mining permits currently held by Alpha Virginia are shown in *Table 17-2.*

Table 17-2: Virginia Mining Permits

Permit	Operation Name	Company	Current Status	Issue	Bond Method	MSHA ID	Current Permit Acreage	Expiration Date	NPDES
1102158	88 Strip	Paramont Contura, LLC	Active	10/26/2016	Pool	44-07163	2,502.15	2/10/2021 (in review)	VA0082158, VAG400983
1102161	Black Bear SM 1	Paramont Contura, LLC	Completion Report	11/17/2016	Pool	44-07100	723.54	7/9/2022	VA0082161
1102167	Kiwanis Surface Mine	Paramont Contura, LLC	Active	11/22/2016	Pool	44-06886 Pending	328.57	7/29/2023	VA0082167
1102180	Three Forks Surface Mine	Paramont Contura, LLC	Active	12/19/2016	Pool	44-07163	1,705.03	5/29/2024	VA0082180
1102181	Cabin Ridge	Paramont Contura, LLC	Completion Report	12/19/2016	Pool	44-07322	417.06	12/17/2023	VA0082181
1102186	Long Branch Auger Mine	Paramont Contura, LLC	Active	12/20/2016	Pool	44-07381	1,504.80	5/9/2023	VA0082186
1102188	Hawks Nest Surface	Paramont Contura, LLC	Completion Report	12/20/2016	Pool	44-06949	31.67	3/23/2024	VA0082188
1102197	Bold Camp Surface Mine	Paramont Contura, LLC	Active	2/7/2017	Pool	44-07274	367.70	4/26/2026	VA0082197
1102212	Red Onion Surface	Paramont Contura, LLC	Completion Report	3/22/2017	Pool	44-07190	74.58	11/30/2024	VA0082212
1102218	Trace Fork 3 Surface	Paramont Contura, LLC	Completion Report	4/6/2017	Pool	44-07092	122.93	8/10/2024	VA0082218
1102233	Butcher Knife Surface	Paramont Contura, LLC	Completion Report	6/14/2017	Pool	44-07257	139.72	1/26/2022	VA0082233
1102243	Doe Branch Strip	Paramont Contura, LLC	Active	10/11/2017	Pool	Pending	1,085.64	9/14/2020 (in review)	VA0082243
1202159	Deep Mine #37	Paramont Contura, LLC	Active	11/2/2016	Cost	44-07231	65.48	7/23/2023	VA0082159
1202160	Deep Mine #44	Paramont Contura, LLC	Active	11/3/2016	Cost	44-07308	26.96	3/18/2023	VA0082160, VA0092878
1202171	Deep Mine #41	Paramont Contura, LLC	Active	12/13/2016	Cost	44-07223	35.23	5/2/2023	VA0082171, VA0092576
1202172	Brushy Ridge DM (35)	Paramont Contura, LLC	Completion Report	12/13/2016	Cost	44-07123	21.24	3/30/2024	VA0082172
1202173	Powers Branch Deep Mine	Paramont Contura, LLC	Active	12/14/2016	Cost	Pending	48.62	1/19/2025	VA0082173
1202174	Deep Mine 25	Paramont Contura, LLC	Completion Report	12/14/2016	Cost	44-07129	44.60	11/30/2024	VA0082174
1202176	Laurel Mountain	Dickenson-Russell Contura, LLC	Completion Report	12/15/2016	Cost	44-06444	34.63	6/3/2023	VA0082176
1202179	Roaring Fork #3 & #4 DM	Dickenson-Russell Contura, LLC	Completion Report	12/19/2016	Cost	44-04937	100.21	9/13/2023	VA0082179
1202187	Deep Mine 26	Paramont Contura, LLC	Completion Report	12/20/2016	Cost	44-06929	35.97	12/3/2023	VA0082187
1202189	Toms Creek North Deep Mine	Paramont Contura, LLC	Completion Report	1/3/2017	Cost		8.50	10/14/2021	VA0082189
1202191	Bear Ridge Deep Mine	Paramont Contura, LLC	Active	1/18/2017	Cost		7.98	12/17/2022	VA0082191
1202193	Stonecoal/ Dorton Ally DM (9)	Paramont Contura, LLC	Completion Report	1/19/2017	Cost	44-07193	19.69	9/6/2021 (in review)	VA0082193
1202196	Spruce Pine DM (Jawbone)	Paramont Contura, LLC	Completion Report	1/31/2017	Cost	44-07159	49.22	10/27/2025	VA0082196
1202198	Deep Mine 42	Paramont Contura, LLC	Active	2/7/2017	Cost	Pending	27.23	6/29/2021 (in review)	VA0082198
1202217	Cherokee	Dickenson-Russell Contura, LLC	Completion Report	4/6/2017	Cost	44-00269	14.28	9/8/2023	VA0082217
1202247	Toms Creek South	Paramont Contura, LLC	Active	10/23/2017	Cost		23.10	10/23/2022	VA0082247
1202282	Long Branch Lower Banner Deep Mine	Paramont Contura, LLC	Active		Cost		24.20	11/28/2023	VA0082282
1302166	Greenbrier Dock	Dickenson-Russell Contura, LLC	Completion Report	11/22/2016	Cost	44-03328	3.36	6/18/2021 (in review)	VA0082166
1302182	Toms Creek Prep Plant	Paramont Contura, LLC	Active	12/19/2016	Pool	44-05270	501.67	12/20/2023	VA0082182, VAG400197
1302195	Moss #2 Prep Plant	Dickenson-Russell Contura, LLC	Active	1/26/2017	Cost	44-06007	127.24	12/23/2023	VA0082195
1402177	McClure Prep Plant	Dickenson-Russell Contura, LLC	Active	12/15/2016	Cost	44-04251	472.16	12/21/2023	VA0067032, VA0082177
1602175	Hughes Branch U.B. DM	Paramont Contura, LLC	Completion Report	12/14/2016	Pool	44-06268	16.25	11/25/2022	VA0082175
1802185	Nora Access Road	Paramont Contura, LLC	Active	12/20/2016	Cost		7.66	7/12/2023	VA0082185

17.4 Local Plans, Negotiations or Agreements

MM&A found no indication of agreements beyond the scope of Federal or State Regulations.

17.5 Mine Closure Plans

Applicable regulations require that mines be properly closed, and reclamation commenced immediately upon abandonment. In general, site reclamation includes removal of structures, backfilling, regrading, and revegetation of disturbed areas. For surface mines, the majority of the expense for backfilling and regrading is completed as part of ongoing mining operations, with only reclamation of final pits and HWM benches required at end-of-mine life. Sediment control is required during the establishment of vegetation, and bond release generally requires a minimum five-year period of site maintenance, water sampling, and sediment control following mine completion. This requirement is reduced to two years for certain operations involving re-mining. Reclamation of underground mines includes closure and sealing of mine openings such as portals and shafts in addition to the items listed above.

Estimated costs for mine closure, including water quality monitoring during site reclamation, are included in the financial models. As with all mining companies, an accretion calculation is performed annually so the necessary Asset Retirement Obligations (*ARO*) can be shown as a Liability on the Balance Sheet.

17.6 Qualified Person's Opinion

The Virginia complex is an operating facility; all necessary permits for current production have been obtained. MM&A knows of no reason that any permits revisions that may be required cannot be

obtained. Based on the Schnabel study discussed in Section 17.2, McClure has disposal capacity for combined refuse through February 2029 at present production rates. The proposed new coarse disposal/impoundment site has a projected capacity of approximately 20 years.

Estimated expenditures for site closure and reclamation are included in the financial model for this site.

18 Capital and Operating Costs

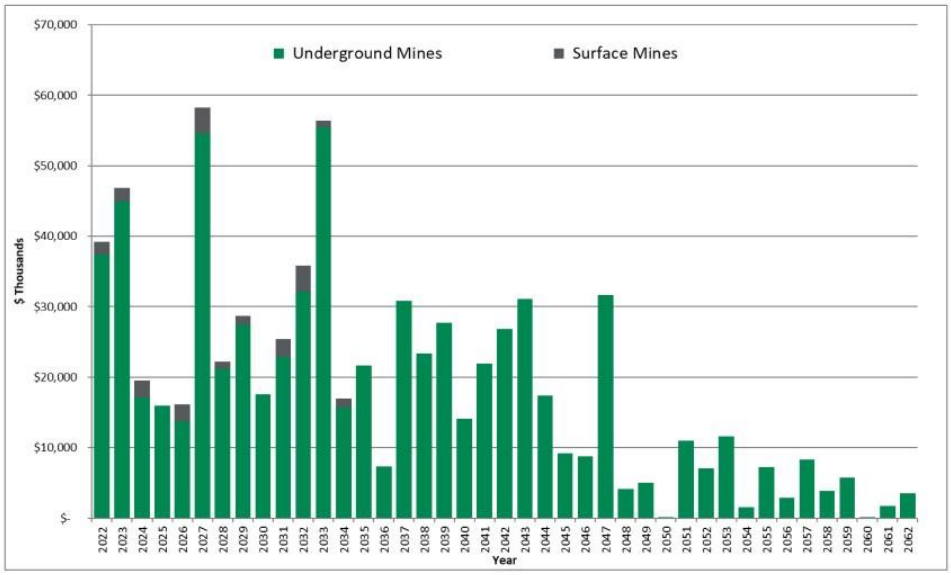
18.1 Capital Cost Estimate

The production sequence selected for a property must consider the proximity of each reserve area to coal preparation plants, river docks and/or railroad loading points, along with suitability of production equipment to coal seam conditions. The in-place infrastructure was evaluated, and any future needs were planned to a level suitable for a Preliminary Feasibility Study and included in the Capital Forecast.

Alpha provided MM&A with information related to the number of currently operating production units at Virginia. MM&A's capital schedules assume that major equipment rebuilds occur over the course of each machine's remaining assumed operating life. Replacement equipment was scheduled based on MM&A's experience and knowledge of mining equipment and industry standards with respect to the useful life of such equipment. As one mine is depleted, the equipment is moved to its replacement.

The capital expenditures tables detail costs for major equipment and infrastructure such as conveyor belt terminal groups. "Other" costs include expenditures for mine access and construction, mine extension capital and miscellaneous costs. A summary of the estimated capital for the consolidated Virginia operations is provided in *Figure 18-1* below. Total capital by mine is summarized in *Table 181*.

Figure 18-1: Projected Capital Expenditures – Consolidated Virginia Operations



Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
Virginia Complex in Accordance with
United States SEC Standards as of December 31, 2021
Central Appalachian Coal Basin
Virginia, USA

Table 18-1: Summary of Capital Expenditures Schedule by Mine

Item	Total	2021	2022	2023	2024	2025	2026	2027
DM 41-42-Black Dog (Jawbone)	**$395,658**	$0	$14,048	$16,307	$11,236	$11,212	$8,915	$23,602
Long Branch Deep (L. Banner)	**$8,121**	$0	$0	$2,984	$5,138	$0	$0	$0
DM44 (Lower Banner)	**$7,368**	$3,500	$3,524	$344	$0	$0	$0	$0
Holly Creek (Upper Banner)	**$21,379**	$3,916	$8,114	$0	$0	$1,309	$3,500	$4,540
DM43 (Jawbone Rider)	**$285,073**	$0	$0	$25,309	$0	$3,500	$1,309	$26,472
Ball Ridge DM46 (L. Banner)	**$12,521**	$0	$11,735	$0	$786	$0	$0	$0
Bear Ridge (Upper Banner)	**$0**	$0	$0	$0	$0	$0	$0	$0

88 Strip	**$22,290**	$2,460	$1,800	$960	$570	$0	$2,460	$3,600
Long Branch	**$4,560**	$1,800	$0	$960	$1,800	$0	$0	$0
Total	**$756,970**	**$11,676**	**$39,221**	**$46,864**	**$19,529**	**$16,021**	**$16,184**	**$58,214**
Item	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
DM 41-42-Black Dog (Jawbone)	$14,968	$21,385	$16,480	$14,106	$14,536	$44,979	$15,706	$12,084
Long Branch Deep (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM44 (Lower Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Holly Creek (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM43 (Jawbone Rider)	$6,285	$6,088	$1,061	$8,857	$17,675	$10,492	$0	$9,588
Ball Ridge DM46 (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Bear Ridge (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
88 Strip	$960	$1,230	$0	$2,460	$3,600	$960	$1,230	$0
Long Branch	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$22,213**	**$28,703**	**$17,541**	**$25,423**	**$35,810**	**$56,431**	**$16,936**	**$21,672**
Item	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**
DM 41-42-Black Dog (Jawbone)	$5,759	$17,671	$18,812	$16,897	$8,492	$13,059	$19,108	$18,965
Long Branch Deep (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM44 (Lower Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Holly Creek (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM43 (Jawbone Rider)	$1,571	$13,140	$4,567	$10,815	$5,589	$8,878	$7,748	$12,163
Ball Ridge DM46 (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Bear Ridge (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
88 Strip	$0	$0	$0	$0	$0	$0	$0	$0
Long Branch	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$7,330**	**$30,811**	**$23,380**	**$27,712**	**$14,080**	**$21,937**	**$26,856**	**$31,128**
Item	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**
DM 41-42-Black Dog (Jawbone)	$14,792	$3,810	$7,000	$11,728	$0	$0	$0	$0
Long Branch Deep (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM44 (Lower Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Holly Creek (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM43 (Jawbone Rider)	$2,618	$5,393	$1,743	$19,928	$4,096	$5,071	$172	$10,987
Ball Ridge DM46 (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Bear Ridge (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
88 Strip	$0	$0	$0	$0	$0	$0	$0	$0
Long Branch	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$17,410**	**$9,203**	**$8,743**	**$31,657**	**$4,096**	**$5,071**	**$172**	**$10,987**

Item	2052	2053	2054	2055	2056	2057	2058	2059
DM 41-42-Black Dog (Jawbone)	$0	$0	$0	$0	$0	$0	$0	$0
Long Branch Deep (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM44 (Lower Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Holly Creek (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM43 (Jawbone Rider)	$7,048	$11,608	$1,571	$7,286	$2,904	$8,320	$3,867	$5,744
Ball Ridge DM46 (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Bear Ridge (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
88 Strip	$0	$0	$0	$0	$0	$0	$0	$0
Long Branch	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$7,048**	**$11,608**	**$1,571**	**$7,286**	**$2,904**	**$8,320**	**$3,867**	**$5,744**

Item	2060	2061	2062	2063	2064	2065	2066	2067
DM 41-42-Black Dog (Jawbone)	$0	$0	$0	$0	$0	$0	$0	$0
Long Branch Deep (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM44 (Lower Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Holly Creek (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
DM43 (Jawbone Rider)	$172	$1,743	$3,524	$172	$0	$0	$0	$0
Ball Ridge DM46 (L. Banner)	$0	$0	$0	$0	$0	$0	$0	$0
Bear Ridge (Upper Banner)	$0	$0	$0	$0	$0	$0	$0	$0
88 Strip	$0	$0	$0	$0	$0	$0	$0	$0
Long Branch	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$172**	**$1,743**	**$3,524**	**$172**	**$0**	**$0**	**$0**	**$0**

18.2 Operating Cost Estimate

Alpha provided historical costs and budgeted projections of operating costs for its active underground mines (Deep Mine 41, Deep Mine 44, and Bear Ridge) and planned mine (Deep Mine 46) for MM&A's review, along with its active surface and highwall mines (88 Strip and Long Branch). MM&A used the historical and/or budget cost information as a reference and developed a personnel schedule for the mine. Hourly labor rates and salaries were based upon information contained in Alpha's financial summaries. Fringe benefit costs were developed for vacation and holidays, federal and state unemployment insurance, retirement, workers' compensation and pneumoconiosis, casualty and life insurance, healthcare and bonuses. A cost factor for mine supplies was developed that relates expenditures to mine advance rates for roof control costs and other mine supply costs based on the historical cost data provided by Alpha. Other factors were developed for maintenance and repair costs, rentals, mine power, outside services, drilling & blasting, coal preparation plant processing, refuse handling, coal loading, property taxes, and insurance and bonding and other direct mining costs.

Appropriate royalty rates were assigned for production from leased coal lands and sales taxes were calculated for state severance taxes, the federal black lung excise tax, and federal and state reclamation fees.

Statutory sales related costs are summarized in *Table 18-2*.

Table 18-2: Estimated Coal Production Taxes and Sales Costs

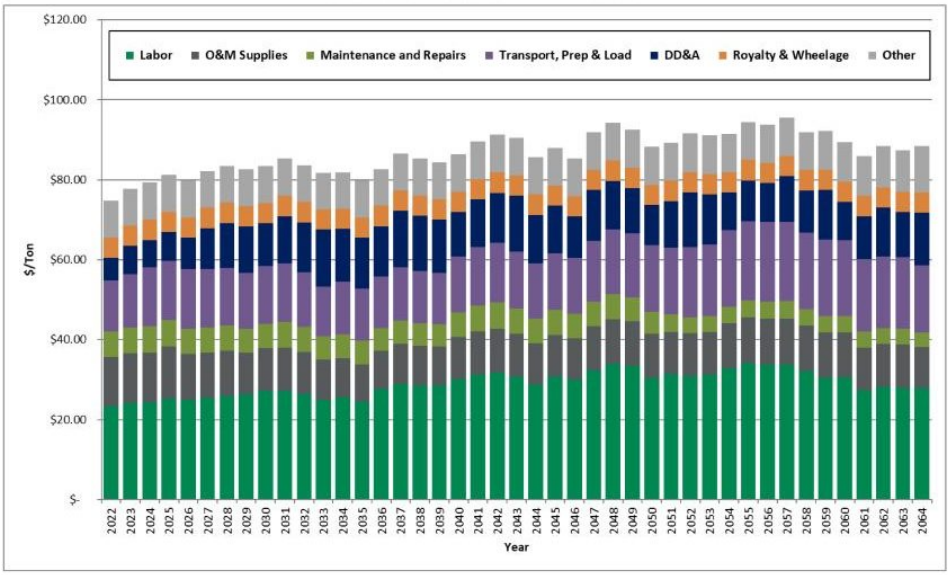
Description of Tax or Sales Cost	Basis of Assessment	Cost
Federal Black Lung Excise Tax – Underground	Per Ton	$1.10
Federal Black Lung Excise Tax – Surface/Highwall	Per Ton	$0.55
Federal Reclamation Fees – Underground	Per Ton	$0.12
Federal Reclamation Fees – Surface/Highwall	Per Ton	$0.28
Virginia Reclamation Tax – Underground	Per Ton	$0.03
Virginia Reclamation Tax – Surface/Highwall	Per Ton	$0.04
Virginia Reclamation Tax – Coal Preparation/Loadout	Per Ton	$0.15

Virginia Severance Tax	Percentage of Revenue	2%
Royalties – Underground, Surface and Highwall	Percentage of Revenue	5.0%

Notes: 1. Federal black lung excise tax is paid only on coal sold domestically.

A summary of the projected operating costs for the consolidated Virginia operations is provided in *Figure 18-2*.

Figure 18-2: Virginia Operating Costs



19 Economic Analysis

19.1 Economic Evaluation

19.1.1 Introduction

The pre-feasibility financial model prepared for this TRS was developed to test the economic viability of each coal resource area. The results of this financial model are not intended to represent a bankable feasibility study, required for financing of any current or future mining operations contemplated for the Alpha properties, but are intended to establish the economic viability of the estimated coal reserves. Cash flows are simulated on an annual basis based on projected production from the coal reserves. The discounted cash flow analysis presented herein is based on an effective date of January 1, 2022.

On an un-levered basis, the NPV of the project cash flow after taxes represents the Enterprise Value of the project. The project cash flow, excluding debt service, is calculated by subtracting direct and indirect operating expenses and capital expenditures from revenue. Direct costs include labor, operating supplies, maintenance and repairs, facilities costs for materials handling, coal preparation, refuse disposal, coal loading, reclamation and general and administrative costs. Indirect costs include statutory and legally agreed upon fees related to direct extraction of the mineral. The indirect costs are the Federal black lung tax, Federal and State reclamation taxes, property taxes, coal production royalties, and income taxes. The Alpha mines' historical costs provided a useful reference for MM&A's cost estimates.

The operations are projected on a calendar year basis. MM&A's projection of annual sales tonnage is summarized in the chart below. While all Alpha coal resources properties deemed by MM&A to have potential for classification as coal reserves were evaluated as part of the economic model, some of those resource areas were determined to be uneconomical in the current market and were therefore excluded from coal reserves as discussed below.

Alpha Metallurgical Resources, Inc.
Statement of Coal Resources and Reserves for the
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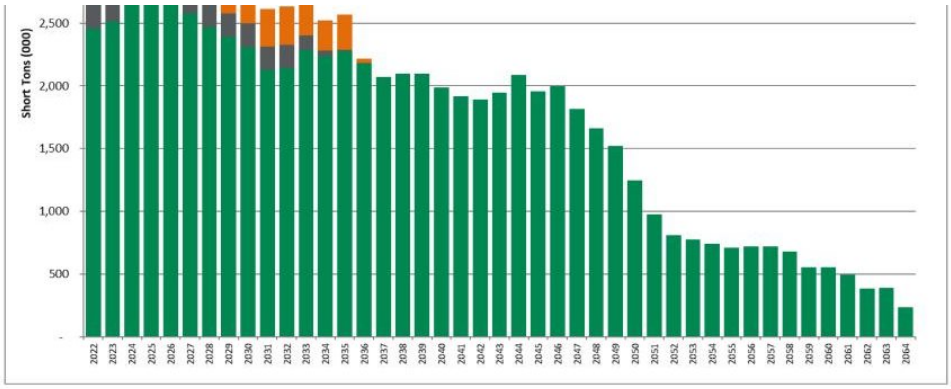
Virginia, USA

Figure 19-1: Projection of Sales Tons



Sales revenue is based on the metallurgical coal price information provided to MM&A by Alpha. Only the revenue from Alpha's captive mining operations is included in the financial model used for this TRS.

The P&L projections of the individual mines of Alpha's Virginia operations are then consolidated into a P&L and cash flow schedule for further testing of the economics. Projected debt service is excluded from the P&L and cash flow model in order to determine Enterprise Value of the aggregated entity.

The financial model expresses coal sales prices, operating costs, and capital expenditures in current day dollars without adjustment for inflation. Capital expenditures and reclamation costs are included based on engineering estimates for each mine by year. MM&A also included an estimate of administrative costs in the financial projections.

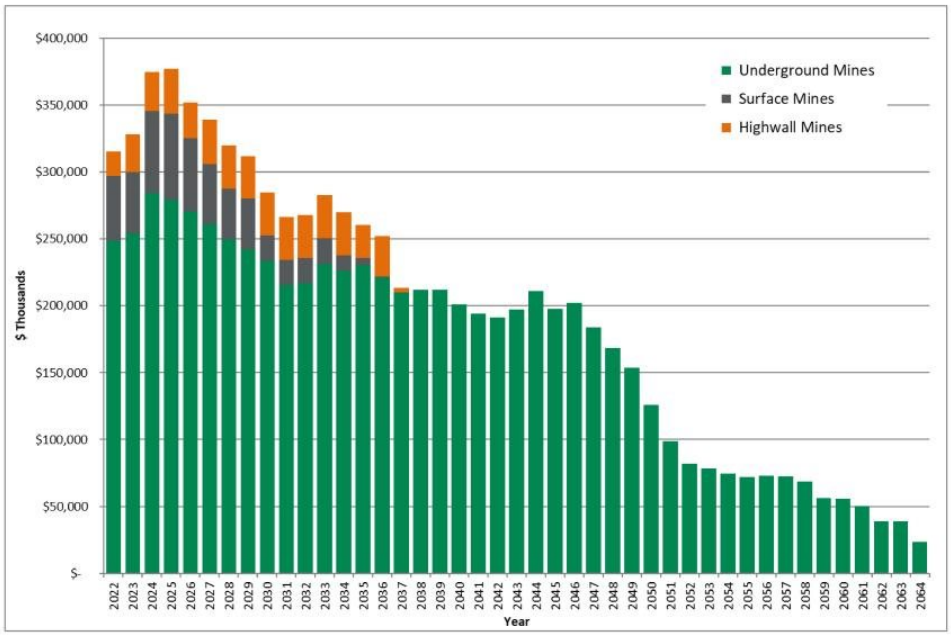
Alpha will pay royalties for the various current and projected operations. The royalty rates vary by location as provided by Alpha. The royalty rates were assumed to be 5.0% of the sales revenue.

The projection model also includes consolidated income tax calculations at Alpha's Virginia Division level, incorporating statutory depletion calculations, as well as state income taxes, and a federal tax rate of 21%. To the extent the Alpha mines generate net operating losses for tax purposes, the losses

are carried over to offset future taxable income from Alpha mines. The terms "cash flows" and "project cash flows" used in this report refer to after-tax cash flows.

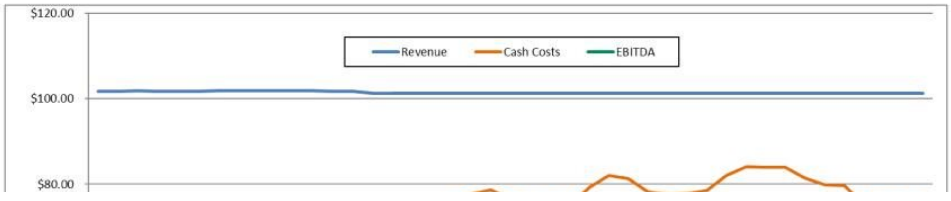
Alpha's projected consolidated annual revenue for the Virginia operations is shown in the chart below:

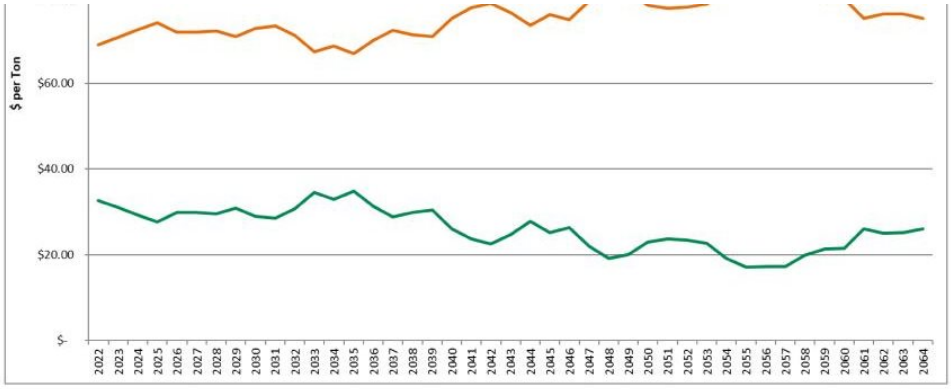
Figure 19-2: Consolidated Annual Revenue



Projected consolidated revenue, cash costs, and EBITDA for the Virginia operations are expressed in dollars per ton in the graph below.

Figure 19-3: Revenue, Cash Costs, and EBITDA





The above chart shows an assumed revenue of $101 per ton, cash costs of $67 to $84 per ton and EBITDA of $17 to $35 per ton. Positive EBITDA per ton averages $27.89 per ton over the life of the operations.

Table 19-1 shows LOM tonnage, P&L, and EBITDA for each Alpha mine at Virginia.

Table 19-1: Life-of-Mine Tonnage, P&L before Tax, and EBITDA

	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
Underground Mines					
DM 41-42-Black Dog (Jawbone)	45,353	$1,103,077	$24.32	$1,573,566	$34.70
Long Branch Deep (L. Banner)	716	$12,701	$17.74	$17,923	$25.04
DM44 (Lower Banner)	929	$2,388	$2.57	$12,948	$13.93
Holly Creek (Upper Banner)	1,942	$23,829	$12.27	$50,031	$25.77
DM43 (Jawbone Rider)	22,046	$52,422	$2.38	$367,402	$16.67
Ball Ridge DM46 (L. Banner)	1,282	$13,664	$10.66	$27,764	$21.66
Bear Ridge (Upper Banner)	208	$1,102	$5.31	$1,806	$8.70
Consolidated Deep Mines	**72,476**	**$1,209,182**	**$16.68**	**$2,051,441**	**$28.31**
Surface Mines					
Long Branch	440	($2,344)	($5.33)	$4,615	$10.50
88 Strip	4,354	$27,545	$6.33	$53,566	$12.30
Consolidated Surface Mines	**4,794**	**$25,201**	**$5.26**	**$58,182**	**$12.14**

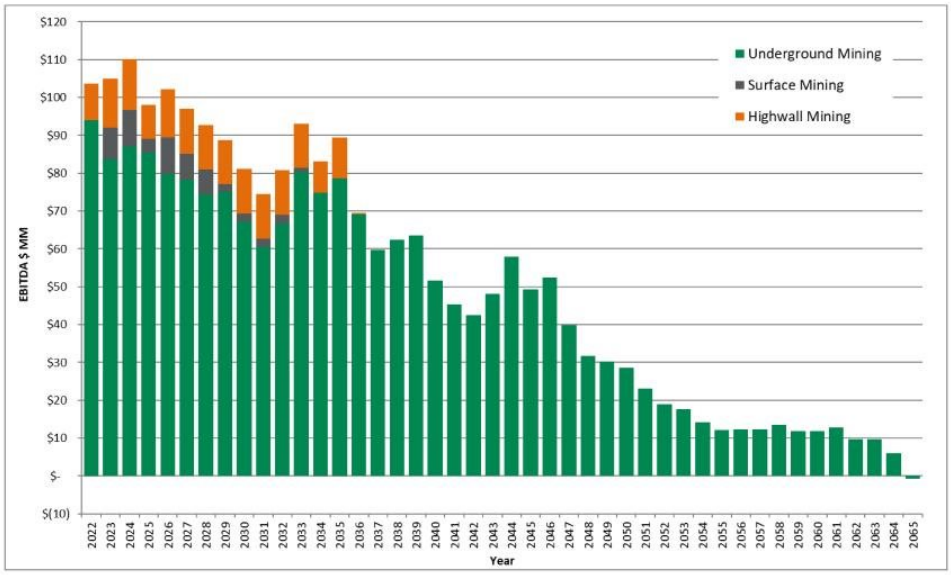
	LOM Tonnage	LOM Pre-Tax P&L	P&L Per Ton	LOM EBITDA	EBITDA Per Ton
HWM Operations					
Long Branch HWM	1,051	$26,913	$25.61	$39,500	$37.58
88 Strip HWM	3,211	$122,503	$38.15	$125,050	$38.95
Consolidated HWMs	**4,262**	**$149,416**	**$35.06**	**$164,551**	**$38.61**
Grand Total	**81,532**	**$1,383,799**	**$16.97**	**$2,274,174**	**$27.89**

Note: (1) The financial model contains 0.018 million tons of inferred coal and an additional 0.015 million tons of resource that have been excluded from reserves. LOM tonnage evaluated in the financial model includes March 2021 through December 2021 production for the active surface mines and October 2021 through December 2021 production for the active underground mines (1.4 million total clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

As shown in *Table 19-1,* all of the mines analyzed show positive EBITDA over the LOM. Overall, the Alpha consolidated Virginia operations show positive LOM P&L and EBITDA of $1.4 billion and $2.3 billion, respectively.

breakdown of projected EBITDA for the consolidated Virginia operations is shown in the chart below:

Figure 19-4: Annual EBITDA



19.1.2 Cash Flow Summary

Alpha's consolidated Virginia cash flow summary in constant dollars, excluding debt service, is shown in *Table 19-2* below.

Table 19-2: Project Cash Flow Summary (000)

	Total	YE 12/31 2021	YE 12/31 2022	YE 12/31 2023	YE 12/31 2024	YE 12/31 2025	YE 12/31 2026
Production & Sales tons	81,532	1,904	3,171	3,388	3,757	3,548	3,428
Total Revenue	$8,276,993	$193,998	$322,618	$344,774	$382,382	$360,760	$348,845
EBITDA	$2,274,174	$57,226	$103,638	$105,020	$110,094	$97,951	$102,207
Net Income	$1,129,708	$32,010	$68,607	$65,106	$67,291	$59,459	$60,553
Net Cash Provided by Operating Activities	$2,020,082	$39,443	$78,703	$90,053	$93,775	$87,792	$88,473
Purchases of Property, Plant, and Equipment	($756,970)	($11,676)	($39,221)	($46,864)	($19,529)	($16,021)	($16,184)
Net Cash Flow	$1,263,113	$27,767	$39,482	$43,189	$74,246	$71,771	$72,289

	YE 12/31 2027	YE 12/31 2028	YE 12/31 2029	YE 12/31 2030	YE 12/31 2031	YE 12/31 2032	YE 12/31 2033
Production & Sales tons	3,250	3,138	2,881	2,797	2,614	2,631	2,701
Total Revenue	$330,692	$319,409	$293,174	$284,672	$266,182	$267,911	$274,911
EBITDA	$97,011	$92,634	$88,812	$81,066	$74,401	$80,702	$93,115
Net Income	$50,049	$46,518	$46,101	$43,182	$35,327	$39,050	$42,480
Net Cash Provided by Operating Activities	$85,891	$83,974	$81,502	$75,496	$69,361	$70,101	$79,967
Purchases of Property, Plant, and Equipment	($58,214)	($22,213)	($28,703)	($17,541)	($25,423)	($35,810)	($56,431)
Net Cash Flow	$27,677	$61,760	$52,798	$57,955	$43,938	$34,291	$23,536

	YE 12/31 2034	YE 12/31 2035	YE 12/31 2036	YE 12/31 2037	YE 12/31 2038	YE 12/31 2039	YE 12/31 2040
Production & Sales tons	2,522	2,569	2,219	2,074	2,095	2,095	1,987
Total Revenue	$256,418	$261,401	$224,784	$209,929	$212,029	$212,072	$201,064
EBITDA	$83,127	$89,331	$69,456	$59,744	$62,461	$63,606	$51,651
Net Income	$42,058	$46,040	$35,023	$25,864	$27,863	$29,563	$25,311
Net Cash Provided by Operating Activities	$76,511	$78,412	$65,842	$50,224	$54,209	$56,757	$49,215
Purchases of Property, Plant, and Equipment	($16,936)	($21,672)	($7,330)	($30,811)	($23,380)	($27,712)	($14,080)
Net Cash Flow	$59,575	$56,741	$58,512	$19,413	$30,829	$29,045	$35,135

	YE 12/31 2041	YE 12/31 2042	YE 12/31 2043	YE 12/31 2044	YE 12/31 2045	YE 12/31 2046	YE 12/31 2047
Production & Sales tons	1,918	1,890	1,948	2,086	1,955	1,998	1,815
Total Revenue	$194,137	$191,326	$197,192	$211,111	$197,883	$202,196	$183,664
EBITDA	$45,323	$42,484	$48,096	$57,853	$49,243	$52,500	$39,830
Net Income	$18,375	$15,135	$16,511	$27,053	$21,743	$26,755	$13,164
Net Cash Provided by Operating Activities	$42,275	$39,698	$43,092	$51,081	$47,028	$47,252	$38,967
Purchases of Property, Plant, and Equipment	($21,937)	($26,856)	($31,128)	($17,410)	($9,203)	($8,743)	($31,657)
Net Cash Flow	$20,338	$12,841	$11,963	$33,671	$37,825	$38,510	$7,310

	YE 12/31 2048	YE 12/31 2049	YE 12/31 2050	YE 12/31 2051	YE 12/31 2052	YE 12/31 2053	YE 12/31 2054
Production & Sales tons	1,662	1,519	1,244	977	809	777	737
Total Revenue	$168,261	$153,737	$125,880	$98,889	$81,899	$78,634	$74,599
EBITDA	$31,809	$30,318	$28,595	$23,116	$18,892	$17,640	$14,156
Net Income	$9,280	$11,184	$13,718	$9,496	$6,137	$6,974	$6,569
Net Cash Provided by Operating Activities	$31,691	$29,401	$27,639	$22,919	$18,810	$14,154	$13,454
Purchases of Property, Plant, and Equipment	($4,096)	($5,071)	($172)	($10,987)	($7,048)	($11,608)	($1,571)
Net Cash Flow	$27,595	$24,330	$27,467	$11,933	$11,762	$2,546	$11,883

	YE 12/31 2055	YE 12/31 2056	YE 12/31 2057	YE 12/31 2058	YE 12/31 2059	YE 12/31 2060	YE 12/31 2061
Production & Sales tons	712	719	717	678	555	553	494
Total Revenue	$72,027	$72,801	$72,608	$68,587	$56,221	$55,925	$50,020
EBITDA	$12,164	$12,395	$12,331	$13,431	$11,882	$11,858	$12,878
Net Income	$3,887	$4,308	$3,069	$5,109	$3,969	$5,497	$6,138
Net Cash Provided by Operating Activities	$11,453	$11,441	$11,445	$12,638	$11,833	$11,324	$11,947
Purchases of Property, Plant, and Equipment	($7,286)	($2,904)	($8,320)	($3,867)	($5,744)	($172)	($1,743)
Net Cash Flow	$4,167	$8,537	$3,125	$8,771	$6,089	$11,153	$10,204

	YE 12/31 2062	YE 12/31 2063	YE 12/31 2064	YE 12/31 2065	YE 12/31 2066	YE 12/31 2067	YE 12/31 2068
Production & Sales tons	384	386	231	0	0	0	0
Total Revenue	$38,860	$39,117	$23,392	$0	$0	$0	$0
EBITDA	$9,615	$9,696	$6,016	($685)	($272)	($137)	($69)
Net Income	$3,922	$4,254	$2,403	($1,370)	($544)	($274)	($139)
Net Cash Provided by Operating Activities	$9,930	$9,215	$8,366	($7,604)	($2,535)	($1,267)	($634)
Purchases of Property, Plant, and Equipment	($3,524)	($172)	$0	$0	$0	$0	$0
Net Cash Flow	$6,406	$9,043	$8,366	($7,604)	($2,535)	($1,267)	($634)

	YE 12/31 2069	YE 12/31 2070	YE 12/31 2071	YE 12/31 2072	YE 12/31 2073	YE 12/31 2074	YE 12/31 2075
Production & Sales tons	0	0	0	0	0	0	0
Total Revenue	$0	$0	$0	$0	$0	$0	$0
EBITDA	($36)	$0	$0	$0	$0	$0	$0
Net Income	($71)	$0	$0	$0	$0	$0	$0
Net Cash Provided by Operating Activities	($634)	($0)	($0)	$0	$0	$0	$0
Purchases of Property, Plant, and Equipment	$0	$0	$0	$0	$0	$0	$0
Net Cash Flow	($634)	($0)	($0)	$0	$0	$0	$0

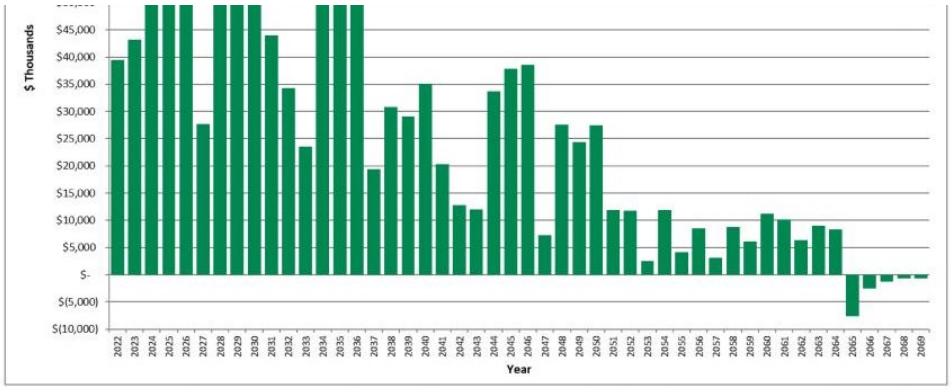
Note: (1) The financial model contains 0.018 million tons of inferred coal and an additional 0.015 million tons of resource that have been excluded from reserves. LOM tonnage evaluated in the financial model includes March 2021 through December 2021 production for the active surface mines and October 2021 through December 2021 production for the active underground mines (1.4 million total clean tons) which was subtracted from coal reserves in order to make the effective date of the reserves December 31, 2021.

Consolidated cash flows are driven by annual sales tonnage, which grows from 3.2 million tons in 2022 to a peak of 3.8 million tons in 2024. Between years 2025 and 2046, sales ranges from 1.9 million to 3.5 million tons and between years 2047-2064, sales range from 0.2 million tons to 1.8 million tons. Projected consolidated revenue grows from $322.6 million in 2021 to a peak of $382.4 million in 2024. Revenue totals $8.3 billion for the project's life.

Consolidated cash flow from operations is positive throughout the projected operating period, with the exception of post-production years, due to end-of-mine reclamation spending. Consolidated cash flow from operations peaks at $93.8 million in 2024 and totals $2.0 billion over the project life. Capital expenditures total $149.5 million during the first five years and $757.0 million over the project's life.

Consolidated Virginia net cash flow after tax, but before debt service, is shown by year in the chart below:

Figure 19-5: Net Cash Flow after Tax (Before Debt Service)



LOM Net cash flow is positive for this project. The cash flows after year 2064 are generally related to end of mine reclamation expenditures, which are accrued over the life of the mines.

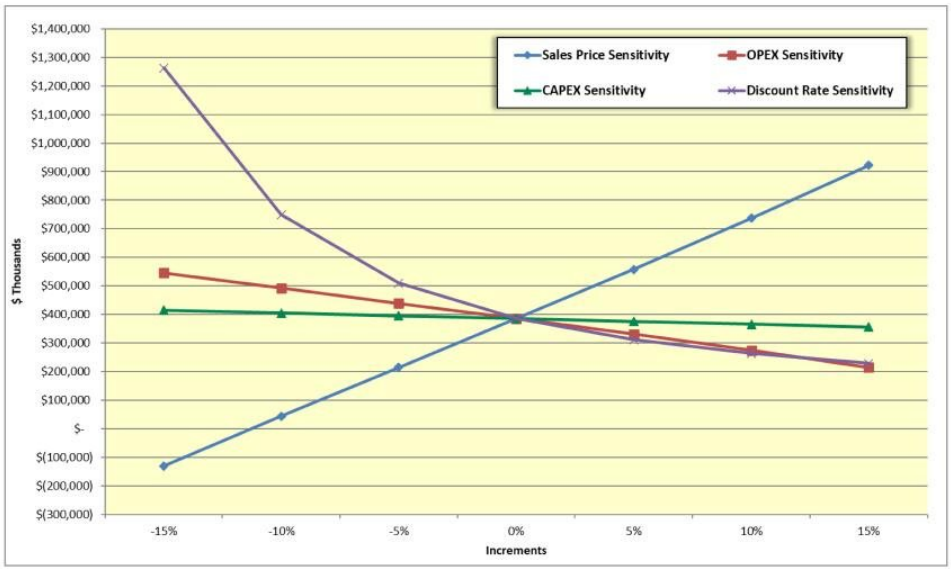
19.1.3 Discounted Cash Flow Analysis

Cash flow after tax, but before debt service, generated over the life of the project was discounted to NPV at a 14.67% discount rate, which represents MM&A's estimate of the constant dollar, risk adjusted WACC for likely market participants if the subject reserves were offered for sale. On an un-levered basis, the NPV of the project cash flows represents the Enterprise Value of the project and amounts to $385.9 million. Alpha is an active producer, and the financial model shows positive net cash flow for each year of the operating life of the Virginia reserves. The pre-feasibility financial model prepared for the TRS was developed to test the economic viability of each coal resource area. The NPV estimate was made for purposes of confirming the economics for classification of coal reserves and not for purposes of valuing Alpha or its Virginia assets. Mine plans were not optimized, and actual results of the operations may be different, but in all cases, the mine production plan assumes the properties are under competent management.

19.1.4 Sensitivity Analysis

Sensitivity of the NPV results to changes in the key drivers is presented in the chart below. The sensitivity study shows the NPV at the 14.67% discount rate when Base Case sales prices, operating costs, capital costs and discount rate are increased and decreased in increments of 5% within a +/- 15% range.

Figure 19-6: Sensitivity of NPV



As shown, NPV is quite sensitive to change in sales price and operating cost estimates, and slightly sensitive to changes in capital cost estimates.

20 Adjacent Properties

20.1 Information used

No Proprietary information associated with neighboring properties was used as part of this study.

21 Other Relevant Data and Information

MM&A performed a previous audit of all the VA Property in year 2021 for reserves effective as of December 31, 2020, for Alpha based on **U.S. Securities and Exchange Commission (*SEC*)** Industry Guide 7 standards. MM&A utilized this former audit study as the basis of an updated study which meets those standards set forth by the SEC for 2021 reserve compliance.

22 Interpretation and Conclusions

22.1 Conclusion

Sufficient data has been obtained through various exploration and sampling programs and mining operations to support the geological interpretations of seam structure and thickness for coal horizons situated on the Virginia Property. The data is of sufficient quantity and reliability to reasonably support the coal resource and coal reserve estimates in this TRS.

The geological data and preliminary feasibility study, which consider mining plans, revenue, and operating and capital cost estimates are sufficient to support the classification of coal reserves provided herein.

This geologic evaluation conducted in conjunction with the preliminary feasibility study is sufficient to conclude that the 80.1 Mt of marketable coal reserves identified on the Property are economically mineable under reasonable expectations of market prices for metallurgical coal products, estimated operation costs, and capital expenditures.

22.2 Risk Factors

Risks have been identified for operational, technical and administrative subjects addressed in the Pre-Feasibility Study. A risk matrix has been constructed to present the risk levels for all the risk factors identified and quantified in the risk assessment process. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

The purpose of the characterization of the project risk components is to inform the project stakeholders of key aspects of the Alpha projects that can be impacted by events whose consequences can affect the success of the venture. The significance of an impacted aspect of the operation is directly related to both the probability of occurrence and the severity of the consequences. The initial risk for a risk factor is herein defined as the risk level after the potential impact of the risk factor is addressed by competent and prudent management utilizing control measures readily available. Residual risk for a risk factor is

herein defined as the risk level following application of special mitigation measures if management determines that the initial risk level is unacceptable. Initial risk and residual risk can be quantified numerically, derived by the product of values assigned to probability and consequence ranging from very low risk to very high risk.

The probability and consequence parameters are subjective numerical estimates made by practiced mine engineers and managers. Both are assigned values from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and greatest consequence. The products, which define the Risk Level, are classified from very low to very high.

Risk Level Table (R = P x C)

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Risk aspects identified and evaluated during this assignment total 15. No residual risks are rated Very High. Three (3) residual risks are rated High. Six (6) of the risk aspects could be associated with Moderate residual risk. Four (4) of the risk aspects were attributed Low or Very Low residual risks.

22.2.1 Governing Assumptions

The listing of the aspects is not presumed to be exhaustive. Instead that listing is presented based on the experiences of the contributors to the TRS.

1. The probability and consequence ratings are subjectively assigned, and it is assumed that this subjectivity reasonably reflects the condition of the active and projected mine operations.
2. The Control Measures shown in the matrices presented in this chapter are not exhaustive. They represent a condensed collection of activities that the author of the risk assessment section has observed to be effective in coal mining scenarios.
3. Mitigation Measures listed for each risk factor of the operation are not exhaustive. The measures listed, however, have been observed by the author to be effective.
4. The monetary values used in ranking the consequences are generally-accepted quantities for the coal mining industry.

22.2.2 Limitations

The risk assessment proposed in this report is subject to the limitations of the information currently collected, tested, and interpreted at the time of the writing of the report.

22.2.3 Methodology

The numerical quantities (i.e., risk levels) attributable to either “initial” or “residual” risks are derived by the product of values assigned to probability and consequence ranging from very low risk to very

high risk.

$$R = P \times C$$

Where: R = Risk Level
P = Probability of Occurrence
C = Consequence of Occurrence

The Probability (P) and Consequence (C) parameters recited in the formula are subjective numerical estimates made by practiced mine engineers and managers. Both P and C are assigned integer values ranging from 1 to 5 for which the value 1 represents the lowest probability and least consequence, and the value 5 represents the highest probability and greatest consequence. The products (R = P x C) which define the Risk Level, are thereafter classified from very low to very high.

Risk Level Table

Risk Level (R)
Very Low (1 to 2)
Low (3 to 5)
Moderate (6 to 11)
High (12 to 19)
Very High (20 to 25)

Very high initial risks are considered to be unacceptable and require corrective action well in advance of project development. In short, measures must be applied to reduce very high initial risks to a tolerable level.

As shown and discussed above, after taking into account the operational, technical, and administrative actions that have been applied or are available for action when required, the residual risk can be determined. The residual risk provides a basis for the management team to determine if the residual risk level is acceptable or tolerable. If the risk level is determined to be unacceptable, further actions should be considered to reduce the residual risk to acceptable or tolerable levels to provide justification for continuation of the proposed operation.

22.2.4 Development of the Risk Matrix

Risks have been identified for the technical, operational, and administrative subjects addressed in the TRS. The risk matrix and risk assessment process are modelled to that presented in the Australian and New Zealand Standard on Risk Management (AS/NZS 4360).

22.2.4.1 Probability Level Table

Table 22-1: Probability Level Table

Category	Probability Level (P)		
1	Remote	Not likely to occur except in exceptional circumstances.	<10%
2	Unlikely	Not likely to occur; small in degree.	10 - 30%
3	Possible	Capable of occurring.	30 - 60%
4	Likely	High chance of occurring in most circumstances.	60 - 90%
5	Almost Certain	Event is expected under most circumstances; impossible to avoid.	>90%

The lowest rated probability of occurrence is assigned the value of 1 and described as remote, with a likelihood of occurrence of less than 10 percent. Increasing values are assigned to each higher probability of occurrence, culminating with the value of 5 assigned to incidents considered to be almost certain to occur.

22.2.4.2 Consequence Level Table

Table 22-2 lists the consequence levels.

Table 22-2: Consequence Level Table

Correlation of Events in Key Elements of the Project Program to Event Severity Category							
Category	Severity of the Event	Financial Impact of the Event	Unplanned Loss of Production (Impact on Commercial Operations)	Events Impacting on the Environment	Events Affecting the Program's Social and Community Relations	Resultant Regulatory / Sovereign Risk	Events Affecting Occupational Health & Safety
				Insignificant loss of habitat; no			Event recurrence avoided by corrective

1	**Insignificant**	< USD $0.5 million	≤ 12 hours	habitat; no irreversible effects on water, soil and the environment.	Occasional nuisance impact on travel.		Event recurrence avoided by corrective action through established procedures (Engineering, guarding, training).
2	**Minor**	USD $0.5 million to $2.0 million	≤ 1 day	No significant change to species populations; short-term reversible perturbation to ecosystem function.	Persistent nuisance impact on travel. Transient adverse media coverage.		**First aid – lost time.** Event recurrence avoided by corrective action thought established procedures.
3	**Moderate**	USD $2.0 million to $10.0 million	≤ 1 week	Appreciable change to species population; medium-term (≤10 years) detriment to ecosystem function.	Measurable impact on travel and water/air quality. Significant adverse media coverage / transient public outrage.	Uncertainty securing or retaining essential approval / license. Change to regulations (tax; bonds; standards).	**Medical Treatment –** permanent incapacitation Avoiding event recurrence requires modification to established corrective action procedures**.**
4	**Major**	USD $10.0 million to $50.0 million	1 to 2 weeks	Change to species population threatening viability; long-term (>10 years) detriment to ecosystem function.	Long-term, serious impact on travel and use of water resources; degradation of air quality; sustained and effective public opposition.	Suspension / long-delay in securing essential approval / license. Change to laws (tax; bonds; standards).	**Fatality.** Avoiding event recurrence requires modification to established corrective action procedures and staff retraining.
5	**Critical**	>USD $50.0 million	>1 month	Species extinction; irreversible damage to ecosystem function.	Loss of social license.	Withdraw / failure to secure essential approval / license.	**Multiple fatalities.** Avoiding event recurrence requires major overhaul of policies and procedures.

The lowest rated consequence is assigned the value of 1 and is described as Insignificant Consequence parameters include non-reportable safety incidents with zero days lost accidents, no environmental damage, loss of production or systems for less than one week and cost of less than USD $0.5 million. Increasing values are assigned to each higher consequence, culminating with the value of 5 assigned to critical consequences, the parameters of which include multiple-fatality accidents, major environmental damage, and loss of production or systems for longer than one month and cost of greater than USD $50.0 million.

Composite Risk Matrix R = P x C and Color-Code Convention

The risk level, defined as the product of probability of occurrence and consequence, ranges in value from 1 (lowest possible risk) to 25 (maximum risk level). The values are color-coded to facilitate identification of the highest risk aspects.

Table 22-3: Risk Matrix

P x C = R			Consequence (C)				
			Insignificant	Minor	Moderate	Major	Critical
			1	2	3	4	5
Probability Level (P)	Remote	1	1	2	3	4	5
	Unlikely	2	2	4	6	8	10
	Possible	3	3	6	9	**12**	**15**
	Likely	4	4	8	**12**	**16**	**20**
	Almost Certain	5	5	10	**15**	**20**	**25**

22.2.5 Categorization of Risk Levels and Color Code Convention

Very high risks are considered to be unacceptable and require corrective action. Risk reduction measures must be applied to reduce very high risks to a tolerable level.

22.2.6 Description of the Coal Property

The Virginia Mine Complex (*Virginia*) is located in located in Dickenson, Buchanan, Russell, and Wise Counties, Virginia – is an active operation with three underground mines and two Surface mines. The active underground operations within the Virginia Mine Complex (Deep Mine 41, Deep Mine 44, and Bear Ridge) utilize continuous mining production sections. The method provides continuity, preserving skilled work groups and enabling effective utilization of production equipment. The other active and

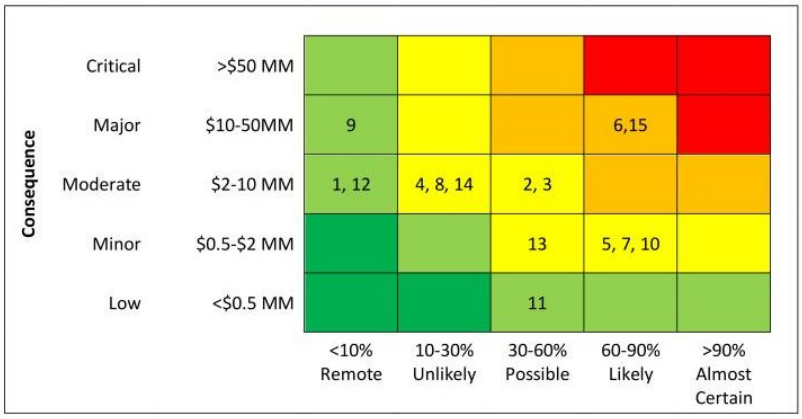
projected mines are located above drainage and as such are accessed via drifts. The two active surface mining operations include the Long Branch and 88 Strip. Deep Mine 41 is located below drainage and is accessed by a slope and shaft. Deep Mine 43 will be accessed by a slope and shaft as well.

22.2.7 Summary of Residual Risk Ratings

Each risk factor is numbered, and a risk level for each is determined by multiplying the assigned probability by the assigned consequence. The risk levels are plotted on a risk matrix to provide a

composite view of the Alpha risk profile. The average risk level is 7.4, which is defined as Moderate.

Table 22-4: Risk Assessment Matrix



22.2.8 Risk Factors

A high-level approach is utilized to characterize risk factors that are generally similar across a number of the active and proposed mining operations. Risk factors that are unique to a specific operation or are particularly noteworthy are addressed individually.

22.2.8.1 Geological and Coal Resource

Coal mining is accompanied by risk that, despite exploration efforts, mining areas will be encountered where geological conditions render extraction of the resource to be uneconomic, or that coal quality characteristics disqualify the product for sale into target markets.

Offsetting the geological and coal resource risk are the size of the controlled property which allows flexibility in the selection of mine areas away from areas where coal quality and mineability are less favorable. In addition, many of the underground mines are designed to operate with multiple production sections each, which lessens the immediate impact when one section encounters

difficulties. The large reserve areas also provide a mitigation strategy of varying the timing of development of mines to offset expected or encountered adverse conditions, thereby maintaining consistent production and quality. This flexibility requires additional extension or development cost but increases performance consistency.

The larger reserve areas will be developed with multiple production sections and the small, replacement production reserve areas provide ready access to alternative locations if geological and coal resource characteristics require abandonment of an active production area.

Table 22-5: Geological and Coal Resource Risk Assessment (Risks 1 and 2)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Recoverable coal tons recognized to be significantly less than previously estimated.	Reserve base is adequate to serve market commitments and respond to opportunities for many years. Local adverse conditions may increase frequency and cost of production unit relocations.	Previous and ongoing exploration and extensive regional mining history provide a high level of confidence of coal seam correlation, continuity of the coal seams, and coal resource tons.	1	4	4	Optimize mine plan to increase resource recovery; develop mine plan to provide readily available alternate mining locations to sustain expected production level.	1	3	3
Coal quality locally proves to be lower than initially projected.	If uncontrolled, production and sale of coal that is out of specification can result in rejection of deliveries, cancellation of coal sales agreements and damage to reputation. Clean coal quality related to surface mines is largely justified by historical trends as opposed to exploration data.	Exploration and vast experience and history in local coal seams provide confidence in coal quality; limited excursions can be managed with careful product segregation and blending.	3	5	15	Develop mine plan to provide readily available alternate mining locations to sustain expected production level; modify coal sales agreements to reflect coal quality.	3	3	9

22.2.8.2 Environmental

Water quality and other permit requirements are subject to modification and such changes could have a material impact on the capability of the operator to meet modified standards or to receive new permits and modifications to existing permits. Permit protests may result in delays or denials to permit applications.

Environmental standards and permit requirements have evolved significantly over the past 50 years and to-date, mining operators and regulatory bodies have been able to adapt successfully to evolving environmental requirements.

Table 22-6: Environmental (Risks 3 and 4)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Environmental performance standards are modified in the future.	Delays in receiving new permits and modifications to existing permits; cost of testing and treatment of water and soils	Work with regulatory agencies to understand and influence final standards; implement testing, treatment and other actions to comply	3	4	12	Modify mining and reclamation plans to improve compliance with new standards while reducing cost of	3	3	9

		with new standards.				compliance.			
New permits and permit modifications are increasingly delayed or denied.	Interruption of production and delayed implementation of replacement production from new mines.	Comply quickly with testing, treatment and other actions required; continue excellent compliance performance within existing permits.	2	4	8	Establish and maintain close and constructive working relationships with regulatory agencies, local communities and community action groups.	2	3	6

22.2.8.3 Regulatory Requirements

Federal and state health and safety regulatory agencies occasionally amend mine laws and regulations. The impact is industry wide. Mining operators and regulatory agencies have been able to adapt successfully to evolving health and safety requirements.

Table 22-7: Regulatory Requirements (Risk 5)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Federal and state mine safety and health regulatory agencies amend mine laws and regulations.	Cost of training, materials, supplies and equipment; modification of mine examination and production procedures; modification of mining plans.	Participate in hearings and workshops when possible to facilitate understanding and implementation; work cooperatively with agencies and employees to facilitate implementation of new laws and regulations.	4	3	12	Familiarity and experience with new laws and regulations results in reduced impact to operations and productivity and improved supplies and equipment options.	4	2	8

22.2.8.4 Market and Transportation

Most of the current and future production is expected to be directed to domestic and international metallurgical markets. Historically the metallurgical markets have been cyclical and highly volatile.

Table 22-8: Market and Transportation (Risk 6)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Volatile coal prices drop precipitously.	Loss of revenue adversely affects profitability; reduced cash flow may disrupt capital expenditures plan.	Cost control measures implemented; capital spending deferred.	4	5	20	High-cost operations closed, and employees temporarily furloughed.	4	4	16

Occasional delay or interruption of rail, river and terminals service may be expected. The operator can possibly minimize the impact of delays by being a preferred customer by fulfilling shipment obligations promptly and maintaining close working relationships.

Table 22-9: Market and Transportation (Risk 7)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Rail or river transport is delayed; storage and shipping access at river and ocean terminals is not available.	Fulfillment of coal sales agreements delayed; limited coal storage at mines may increase cost of rehandling; production may be temporarily idled.	Provide adequate storage capacity at mines; coordinate continuously with railroad and shipping companies to respond quickly and effectively to changing circumstances.	4	3	12	Provide back-up storage facility along with personnel, equipment and rehandle plan to sustain production and fulfill sales obligations timely.	4	2	8

22.2.8.5 Mining Plan

Occupational health and safety risks are inherent in mining operations. Comprehensive training and retraining programs, internal safety audits and examinations, regular mine inspections, safety meetings, along with support of trained fire brigades and mine rescue teams are among activities that greatly reduce accident risks. Employee health monitoring programs coupled with dust and noise monitoring and abatement reduce health risks to miners.

As underground mines are developed and extended, observation of geological, hydrogeological and geotechnical conditions lead to modification of mine plans and procedures to enable safe work within the mine environments.

Highlighted below are selected examples of safety and external factors relevant to Alpha's operations.

22.2.8.5.1 Methane Management

Coalbed methane is potentially present in coal operations however, the methane concentration in shallow coal seams is at such low levels that it can be readily managed with frequent testing and

monitoring, vigilance, and routine mine ventilation. Methane is not expected to be present in most of the Virginia property.

Table 22-10: Methane Management (Risk 8)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R

Methane hazard is present in mines operating below drainage.	Injury or loss of life; possible ignition of gas and mine explosion; potential loss of mine and equipment temporarily or permanently; additional mine fan, mine power, ventilation, monitoring and examination requirements.	Low to moderate levels can be managed with frequent examinations, testing and monitoring within the mine ventilation system. Excellent rock dust maintenance minimizes explosion propagation risk should an ignition occur.	2	5	10	Very high-level methane concentrations may require coal seam degasification and gob degasification where pillar extraction methods are employed.	2	3	6

22.2.8.5.2 Mine Fires

Mine fires, once common at mine operations, are rare today. Most active coal miners have not encountered a mine fire. Vastly improved mine power and equipment electrical systems, along with safe mine practices reduce mine fire risks. Crew training and fire brigade support and training improve response for containment and control if a fire occurs. Spontaneous combustion within coal mines, which is the source of most fires that occur today, is not expected to commonly occur at the Alpha property. When spontaneous combustion conditions are present, monitoring systems are employed for early detection and mine plans are designed to facilitate isolation, containment and rapid extinguishment.

Table 22-11: Mine Fires (Risk 9)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Mine fire at underground operation or plant stockpile fire.	Injury or loss of life; potential loss of mine temporarily or permanently; damage to equipment and mine infrastructure.	Inspection and maintenance of mine power, equipment and mine infrastructure; good housekeeping; frequent examination of conveyor belt entries; prompt removal of accumulations of combustible materials.	1	5	5	If spontaneous combustion conditions are present, enhanced monitoring and examination procedures will be implemented; mine design will incorporate features to facilitate isolation, containment and extinguishment of spontaneous combustion locations.	1	4	4

22.2.8.5.3 Ground Control

Underground mining exposes miners to the risks of roof falls and rib rolls. Ground control-based risks can be mitigated through effective roof control plans which are supplemented with a strong understanding of future geotechnical conditions. Foremen and crews should be trained to examine the roof, rib and floor conditions and identify pending and immediate hazards. Multiple publicly available software programs can be used to assess pillar sizing and stability.

Table 22-12: Ground Control (Risk 10)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Ground control issues cause roof failures, rib rolls, floor heave, etc.	Injury or loss of life; catastrophic damage to equipment; production interruption.	Regular inspection for change and signs of failure. Dynamic design of roof control plan and safety measures to honor observed conditions and exploration-based information; conservative pillar design.	4	3	12	Multiple operating sections to mitigate any lost production; availability of new working areas in case abandonment of section is required; availability of alternative roof control technologies in case of abrupt changes in mining conditions.	4	2	8

22.2.8.5.4 Availability of Supplies and Equipment

The industry has periodically experienced difficulty receiving timely delivery of mine supplies and equipment. Availability issues often accompanied increased periods for coal demand. Any future delivery of supplies and equipment delays are expected to be temporary with limited impact on production.

Table 22-13: Availability of Supplies and Equipment (Risk 11)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Disruption of availability for supplies and equipment.	Temporary interruption of production.	Force majeure provision in coal sales agreements to limit liability for delayed or lost sales.	3	2	6	Work closely with customers to assure delayed coal delivery rather than cancelled sales; monitory external conditions and increase inventory of critical supplies; accelerate delivery of equipment when possible.	3	1	3

22.2.8.5.5 Labor

Work stoppage due to labor protests are considered to be unlikely and accompanied by limited impact should it occur. Excellent employee relations and communications limit the exposure to outside protesters. Loss of supervisors and skilled employees to retirement is inevitable; the impact can be lessened with succession planning and training and training and mentorship of new employees.

Table 22-14: Labor – Work Stoppage (Risk 12)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Work stoppage due to slowdowns or secondary boycott activity.	Loss of production and coal sales; damaged customer and employee relations; reputation loss.	Maintain excellent employee relations and communications; maintain frequent customer communications.	2	3	6	Develop plan for employee communications and legal support to minimize impact of secondary boycott activities.	1	3	3

Table 22-15: Labor – Retirement (Risk 13)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Retirement of supervisors and skilled employees.	Loss of leadership and critical skills to sustain high levels of safety, maintenance and productivity.	Monitor demographics closely and maintain communications with employees who are approaching retirement age; maintain employee selection and training programs.	3	3	9	Maintain selection of candidates and implementation of in-house or third-party training for electricians and mechanics; develop employee mentoring program.	3	2	6

22.2.8.6 Comprehensive Health and Safety

While largely incorporated in mine plan-based risk factors, effective health and safety programs reduce the risk of accidents, associated loss of production and fines. Currently, coal mining and processing requires a robust health and safety team, consisting of executive level health and safety roles, regional health and safety managers, and multiple operational level health and safety coordinators.

Table 22-16: Health and Safety (Risk 14)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Failure to attain operations safety standards and associated occurrence of accidents.	Injuries and possible loss of life; damage to morale and workforce confidence; loss of production and diminished productivity; regulatory issues, closures and fines; reputation loss.	Safety and loss control awareness training to help employees recognize hazardous conditions and actions; frequent job observations and feedback; periodic employee performance reviews.	2	5	10	Senior management's active participation in safety process; utilization of motivational methods to reinforce company's values and commitment to safety; regular comprehensive safety audits to assure safety standards are maintained.	2	3	6

22.2.8.7 Refuse Disposal

Having sufficient refuse disposal capacity is critical to strategic long-term mine development. Production delays can be caused by the lengthy process associated with identifying, designing and permitting future waste disposal areas.

Alpha's Virginia complex is actively pursuing additional refuse storage areas to acquire and/or permit in order to support the LOM reserves for the Property.

Table 22-17: Refuse Disposal (Risk 15)

Aspect	Impact	Control Measures	Initial Risk Level			Mitigation Measures	Residual Risk Level		
			P	C	R		P	C	R
Failure to acquire and/or permit refuse storage areas to support reserves	Interruption of coal preparation plant operations and increased pressure on mine/plant raw coal storage capacities.	Plant design modifications to reduce refuse volumes produced; strategic property acquisition and design of future refuse storage areas.	4	5	20	Addition of plate frame filters in plant; identify, design and permit additional refuse facilities.	4	4	16

23 Recommendations

Alpha is continuing to work both internally and with outside assistance to continue to further define their Resource Base and to Optimize the LOM Plan.

24 References

Publicly available information from various State and Federal agencies was used where relevant.

JOURNEL, A.G., & HUIJBREGTS, CH, J., 1978: Mining Geostatitics, The Blackburn Press Caldwell, New Jersey.

25 Reliance on Information Provided by Registrant

For the purpose of this TRS, MM&A utilized the Geological and Coal Quality data provided by Alpha.

This information was subjected to verification of its integrity and completeness.

Historical productivity and operating costs were also supplied by Alpha. This information was combined with the experience and knowledge of the QP's to forecast the LOM plan.

Alpha supplied a long-term price forecast based on published benchmark pricing. This benchmark pricing was adjusted by Alpha to reflect the effects of quality and transportation borne after FOB plant costs were calculated.

A summary of the information provided by Alpha relied upon by MM&A for the purposes of this TRS is provided in *Table 25-1*.

Table 25-1: Information from Registrant Relied Upon by MM&A

Category	Information Provided by Alpha	Report Section
Legal	Mineral control and surface control rights as shown on maps	3.2, 3.3
Geological	Geologic data including digital databases and original source data including geologist logs, driller's logs, geophysical logs	9.1
Coal Quality	Database of coal quality information supplemented with original source laboratory sheets where available	10.1
Mining	Historical productivities and manpower from operating and future Alpha mines	13.2, 13.4
Coal Preparation	Flow sheet and other information representing current and future methods of coal processing	14.1
Marketing	Long-term price forecast used in financial projections	16.2
Waste Disposal	Engineering data and estimates representing remaining capacities for coarse and fine coal waste disposal	17.2
Environmental	Permit and bonding information	17.3
Costs	Historical and budgetary operating cost information used to derive cost drivers for reserve financial modeling	18.2

APPENDIX

A

SUMMARY TABLES

Alpha Metallurgical Resources, LLC

SEC Technical Report - Virginia Complex

Summary of Coal Resource (Short Tons) • Effective December 31, 2021

Appendix A - Table 1

		Coal Resource (Dry Tonnes, In Situ)									Quality (Dry Basis)		
		By Reliability Category					By Control Type		By Permit Status				
Mine/Area	Seam	Measured	Indicated	Total	Inferred	Grand Total	Owned	Leased	Permitted	Not Permitted	Ash%	Sulfur%	VM%
88Strip/3Frks	Upper Banner-Tiller	0	0	0	0	0	0	0	0	0	-	-	-
Long Branch	Upper Banner 2 - Lower Banner	0	0	0	0	0	0	0	0	0	-	-	-
Holly Creek	Upper Banner (4650)	5,000	579,000	585,000	0	585,000	0	585,000	555,000	29,000	23	0.8	28
Bear Ridge	Upper Banner (4650)	0	0	0	0	0	0	0	0	0	-	-	-
Ball Ridge (Deep Mine 46)	Lower Banner (4900)	1,003,000	32,000	1,035,000	0	1,035,000	0	1,035,000	1,035,000	0	25	1.2	23

Long Branch (Deep Mine 45)	Lower Banner (4900)	0	0	0	0	0	0	0	0	0	-	-	-
Toms Creek	Lower Banner (4900)	0	0	0	0	0	0	0	0	0	-	-	-
Rush Branch	Lower Banner (4900)	3,884,000	210,000	4,093,000	0	4,093,000	0	4,093,000	2,269,000	1,824,000	27	0.7	26
Deep Mine 43	Jawbone Rider (5950)	10,653,000	8,216,000	18,870,000	409,000	19,279,000	0	18,870,000	0	18,870,000	11	1.0	-
Black Dog	Jawbone (6000)	4,342,000	1,301,000	5,643,000	0	5,643,000	0	5,643,000	5,643,000	0	27	0.5	-
Deep Mine 41	Jawbone (6000)	1,772,000	34,000	1,806,000	0	1,806,000	0	1,806,000	1,806,000	0	26	0.8	27
Deep Mine 42	Jawbone (6000)	240,000	9,000	249,000	0	249,000	0	249,000	249,000	0	26	0.6	16
Grand Total	**0**	**21,899,000**	**10,382,000**	**32,281,000**	**409,000**	**32,690,000**	**0**	**32,281,000**	**11,558,000**	**20,723,000**	**18**	**0.9**	**26**

*Note(1): Resource tons are **exclusive** of reserve tons.*

Note (2): Coal resources are reported on a dry basis. Surface moisture and inherent moisture are excluded.

All resources exclusive of reserves are considered a met market

Totals may not add due to rounding.

Alpha Metallurgical Resources, LLC
SEC Technical Report - Virginia Complex
Summary of Coal Reserve (Short Tons) • Effective December 31, 2021
Appendix A - Table 2

Mine/Area	Seam	Demonstrated Coal Reserves (Wet Tons, Washed or Direct Shipped)											Quality (Dry Basis)		
		By Reliability Category			By Mining Type		By Control Type		By Permit Status		By Market				
		Proven	Probable	Total	Surface	UG	Owned	Leased	Permitted	Not Permitted	Thermal	Met	Ash%	Sulfur%	VM%
88 Strip/Three Forks (SM)	Upper Banner-Tiller	179,000	3,836,000	4,015,000	4,015,000	0	0	4,015,000	2,002,000	2,014,000	803,000	3,212,000	7	0.9	29
88 Strip/Three Forks (HWM)	Upper Banner-Tiller	637,000	2,398,000	3,035,000	3,035,000	0	0	3,035,000	987,000	2,049,000	607,000	2,428,000	6	0.9	29
Long Branch (SM)	Upper Banner 2 - Lower Banner	220,000	151,000	370,000	370,000	0	0	370,000	370,000	0	74,000	296,000	5	0.8	32
Long Branch (HWM)	Upper Banner 2 - Lower Banner	718,000	202,000	920,000	920,000	0	0	920,000	920,000	0	184,000	736,000	5	0.8	31
Holly Creek	Upper Banner (4650)	1,444,000	482,000	1,926,000	0	1,926,000	0	1,926,000	1,845,000	81,000	0	1,926,000	5	0.8	35
Bear Ridge	Upper Banner (4650)	165,000	24,000	189,000	0	189,000	0	189,000	189,000	0	0	189,000	5	0.7	33
Ball Ridge (Deep Mine 46)	Lower Banner (4900)	1,190,000	92,000	1,282,000	0	1,282,000	0	1,282,000	1,282,000	0	0	1,282,000	6	0.7	29
Long Branch (Deep Mine 45)	Lower Banner (4900)	699,000	16,000	716,000	0	716,000	0	716,000	0	716,000	0	716,000	6	0.7	30
Toms Creek	Lower Banner (4900)	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Rush Branch	Lower Banner (4900)	789,000	0	789,000	0	789,000	0	789,000	789,000	0	0	789,000	6	0.8	30
Deep Mine 43	Jawbone Rider (5950)	12,926,000	9,102,000	22,028,000	0	22,028,000	0	22,028,000	0	22,028,000	0	22,028,000	3	0.8	24
Black Dog	Jawbone (6000)	4,503,000	676,000	5,178,000	0	5,178,000	0	5,178,000	5,178,000	0	0	5,178,000	9	0.6	28
Deep Mine 41	Jawbone (6000)	17,796,000	4,669,000	22,465,000	0	22,465,000	0	22,465,000	19,646,000	2,818,000	0	22,465,000	9	0.8	26
Deep Mine 42	Jawbone (6000)	13,776,000	3,387,000	17,163,000	0	17,163,000	0	17,163,000	15,449,000	1,714,000	0	17,163,000	8	0.7	26
Grand Total		**55,041,000**	**25,035,000**	**80,077,000**	**8,341,000**	**71,736,000**	**0**	**80,077,000**	**48,658,000**	**31,419,000**	**1,668,000**	**78,408,000**	**7**	**0.8**	**25**

Notes: Marketable reserve tons are reported on a moist basis, including a combination of surface and inherent moisture. Coal quality is based on a weighted average of laboratory data from core holes. The combination of surface and inherent moisture is modeled at 6.0-percent. Actual product moisture is dependent upon multiple geological factors, operational factors, and product contract specifications and can exceed 8-percent. As such, the modeled moisture values provide a level of conservatism for reserve reporting.
Totals may not add due to rounding.

APPENDIX

B

INITIAL ECONOMIC ASSESSMENT, RESOURCES EXCLUSIVE OF RESERVES (PER TON)

MARSHALL MILLER
&ASSOCIATES®

Alpha Metallurgical Resources, LLC
Initial Economic Assessment, Resources Exclusive of Reserves (per Ton)
Appendix B: Virginia Complex

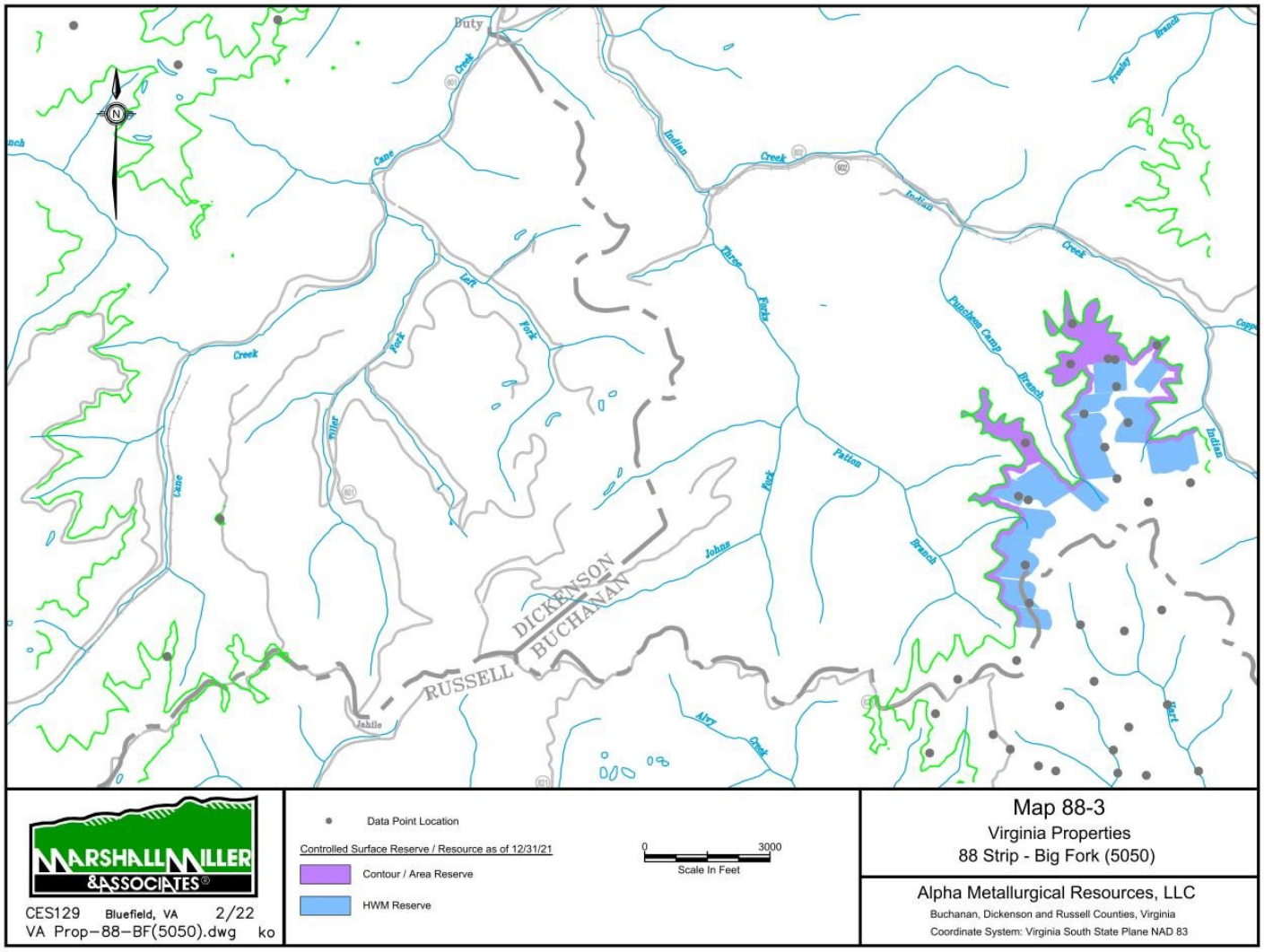
Seam:	Lower Banner Virginia	Lower Banner Virginia	Jawbone Rider Virginia	Jawbone Virginia	Upper Banner Virginia
Area:	Ball Ridge Block BR-C	Rush Branch Blocks RB-A,C,D	Jawbone Rider Blocks C1A,D1,D2	Jawbone Blocks BD-D,BD-E,41-G,42-E	Holly Creek Block HC-B1
In-Place Resource Tons	1,035,080	4,093,263	19,278,897	7,698,270	584,800
Potentially Recoverable Tons*	344,475	948,352	3,735,902	1,976,325	220,597
Mining Method	Deep - CM	Deep - CM	Deep - CM	Deep - CM	Deep - CM
Assumed Sales Realization at Plant**	$ 115	$ 115	$ 115	$ 115	$ 115
Iniital Capex Estimate to Access Resources***	$ 500,000	$ 2,000,000	$ 10,000,000	$ 20,000,000	$ -
Direct Mining Costs:					
Labor****	$ 37.69	$ 46.50	$ 39.51	$ 33.93	$ 43.09
Supplies, Excluding Roof Control	$ 5.21	$ 6.42	$ 5.46	$ 4.69	$ 5.95
Roof Control	$ 5.99	$ 7.38	$ 6.27	$ 5.39	$ 6.84
M&R	$ 4.55	$ 5.19	$ 4.69	$ 6.94	$ 5.19
Power	$ 1.14	$ 1.30	$ 1.17	$ 1.74	$ 1.30
Other	$ 2.27	$ 2.59	$ 2.34	$ 3.47	$ 2.60
Total Direct Cash Costs	$ 56.85	$ 69.38	$ 59.44	$ 56.15	$ 64.97
Transporation, Washing, Environmental & G&A Costs:					
Coal Prep*****	$ 7.96	$ 9.08	$ 8.20	$ 12.15	$ 9.08
Materials Handling	$ 1.50	$ 1.50	$ 1.50	$ 1.50	$ 1.50
Raw Coal Trucking*****	$ 10.01	$ 9.69	$ 18.43	$ -	$ 17.05
Clean Coal Trucking	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25
Enviro******	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
G&A	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00
Total Transporation, Washing, Environmental & G&A Costs:	$ 23.22	$ 24.01	$ 31.88	$ 17.40	$ 31.39
Indirect Cash Costs					
Royalty	$ 5.75	$ 5.75	$ 5.75	$ 5.75	$ 5.75
Black Lung Excise Tax	$ 0.55	$ 0.55	$ 0.55	$ 0.55	$ 0.55
SMCRA	$ 0.12	$ 0.12	$ 0.12	$ 0.12	$ 0.12
State Severance	$ 2.30	$ 2.30	$ 2.30	$ 2.30	$ 2.30
Property Tax & Insurance	$ 2.40	$ 2.40	$ 2.40	$ 2.40	$ 2.40
Total Indirect Cash Costs	$ 11.12	$ 11.12	$ 11.12	$ 11.12	$ 11.12
Non Cash Costs					
Amoritiztion of Development Capital	$ 1.45	$ 2.11	$ 2.68	$ 10.12	$ -
Depreciation of Initial Equipment and Sustaining Capital	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00
Depletion	$ 1.00	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Total Non Cash	$ 7.45	$ 8.11	$ 8.68	$ 16.12	$ 6.00
Total Cash Cost	$ 91.18	$ 104.51	$ 102.44	$ 84.68	$ 107.47
EBITDA	$ 23.82	$ 10.49	$ 12.56	$ 30.32	$ 7.53
Fully Loaded Cost	$ 98.64	$ 112.62	$ 111.12	$ 100.80	$ 113.47
Fully Loaded P&L	$ 16.36	$ 2.38	$ 3.88	$ 14.20	$ 1.53
Passes Resource Iniital Economic Assessment?	YES	YES	YES	YES	YES

*Potentially recoverable tons are calculated by applying appropriate modifying factors to in-place resource tonnages
**Sales relization represents estimated long range sales price.
***No initial capital required where resources are accessible from existing mines.
****Labor rates are driven based off of super section productivities assuming 250 to 350 feet per unit shift per section.
*****Processing assumed to occur at McClure plant.
******Environmental costs assumed to include permiting, outfall maintenance, etc.

APPENDIX

C

MAPS


Duty
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Creek
DICKENSON
BUCHANAN
RUSSELL
Jahle
Alvy
Creek
Data Point Location
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
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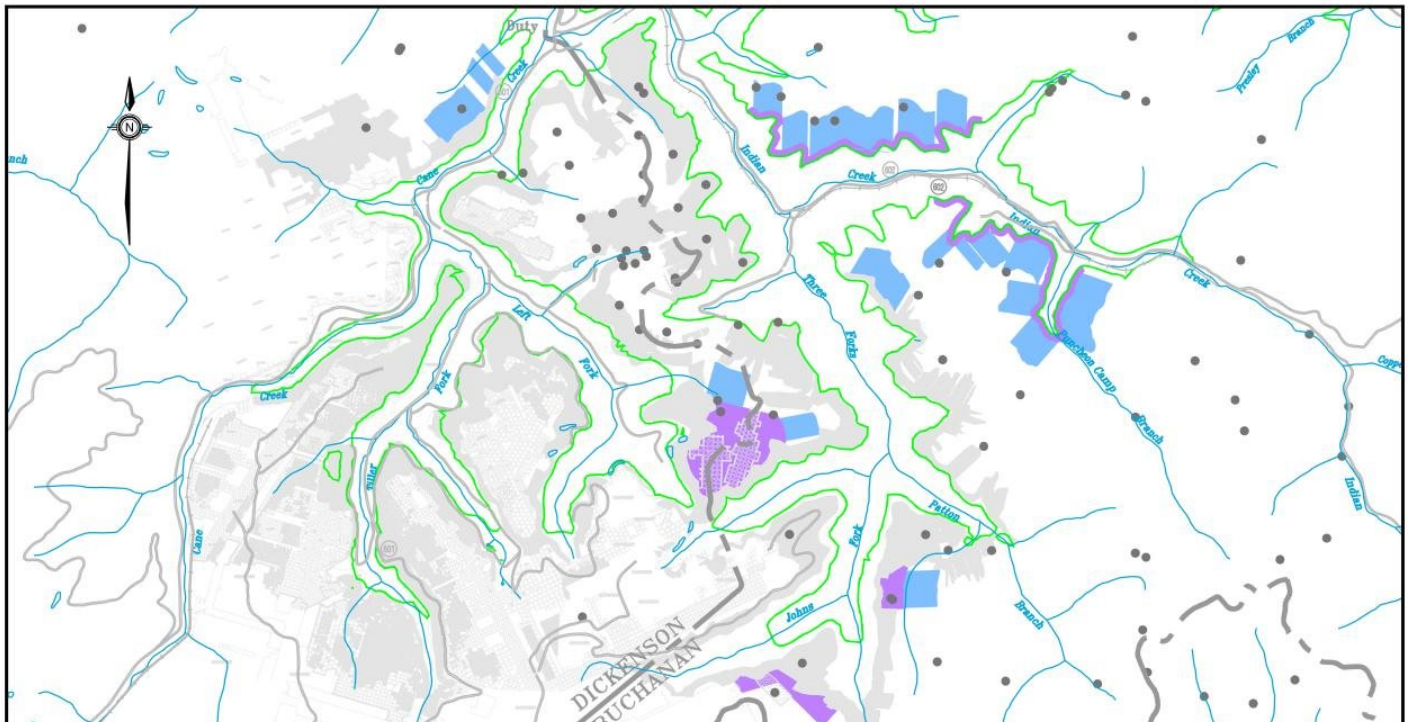
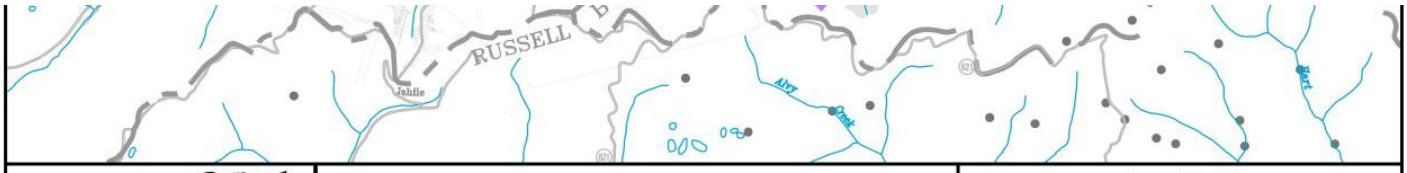
VA Prop-88-BF(5050).dwg ko
Map 88-3
Virginia Properties
88 Strip - Big Fork (5050)
Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83


Duty
Creek
Cane
Indian
Creek
Trace
Forks
Left
Fork
Creek
Miller
Cane
Patton
Fork
Johns
Branch
Puncheon Camp
Branch
Indian
Creek
DICKENSON
BUCHANAN



MARSHALL MILLER & ASSOCIATES®

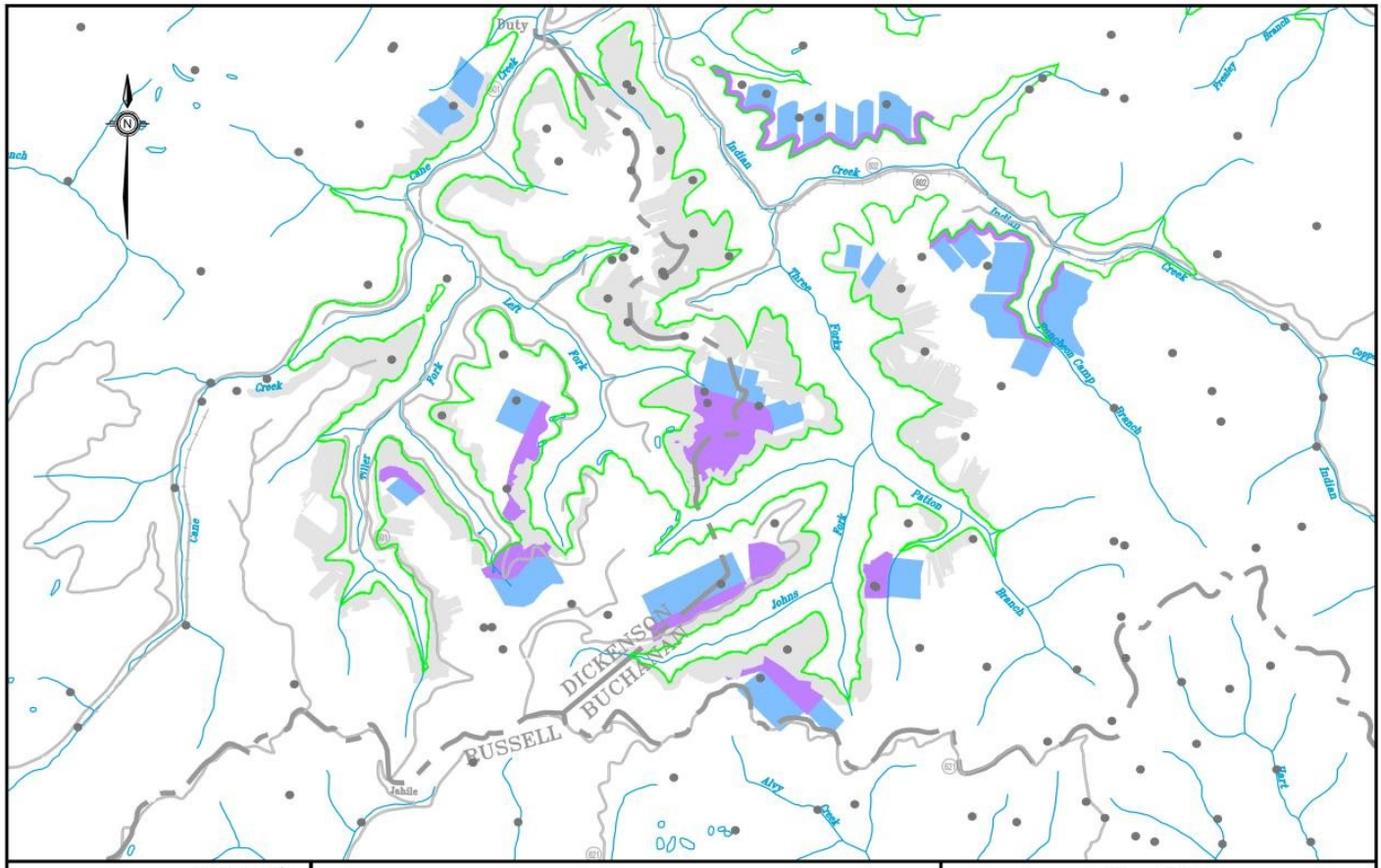
CES129 Bluefield, VA 2/22
VA Prop-88-JB(6000).dwg ko

Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

0 3000
Scale In Feet

Map 88-10
Virginia Properties
88 Strip - Jawbone (6000)

Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83



MARSHALL MILLER & ASSOCIATES®

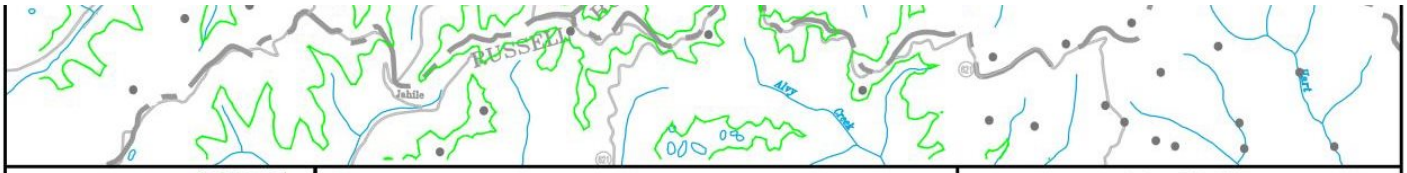
CES129 Bluefield, VA 2/22
VA Prop–88–JBR(5950).dwg ko

Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

0 3000
Scale In Feet

Map 88-9
Virginia Properties
88 Strip - Jawbone Rider (5950)

Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
VA Prop–88–Kdy(5300).dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

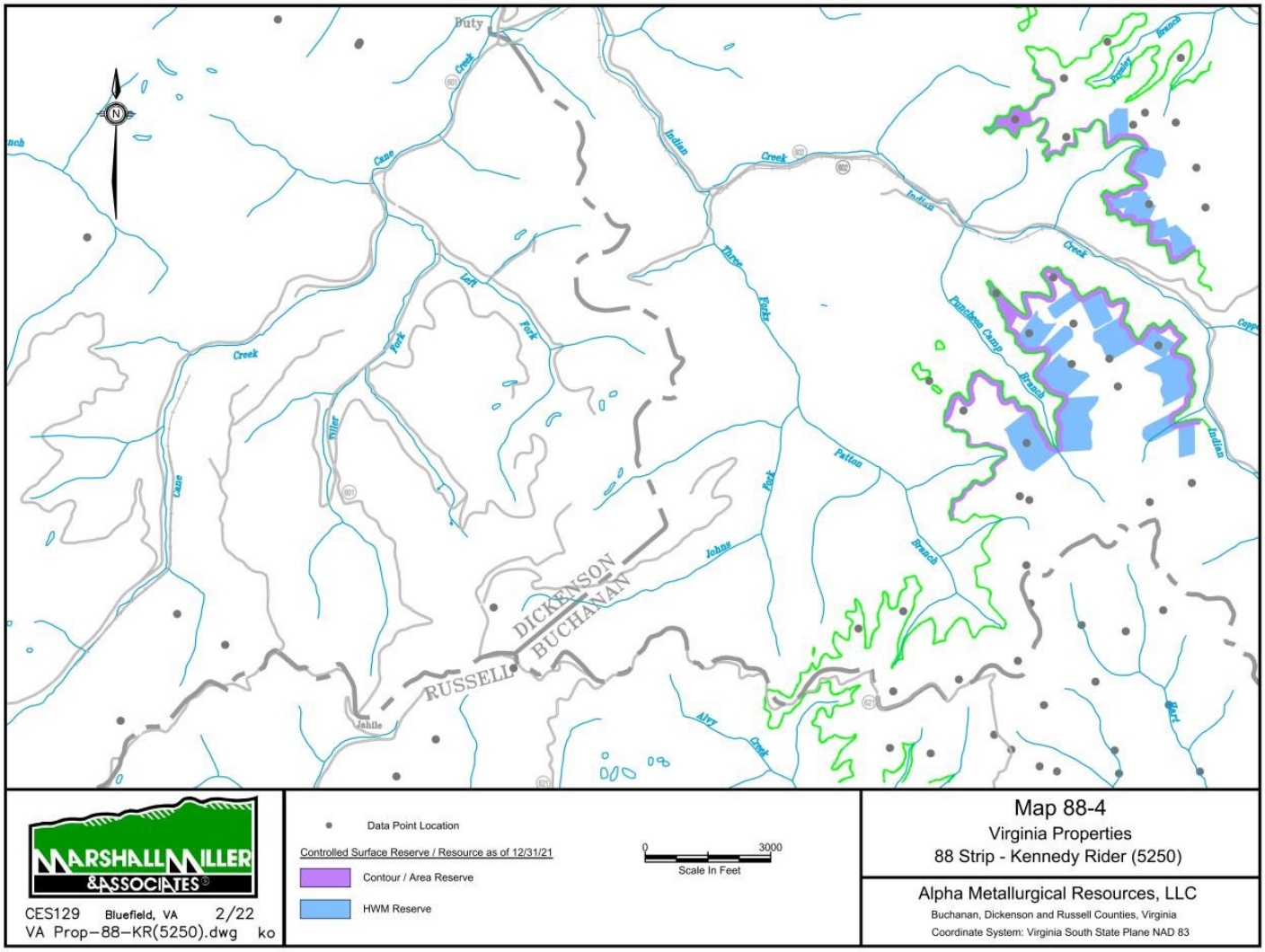
Contour / Area Reserve

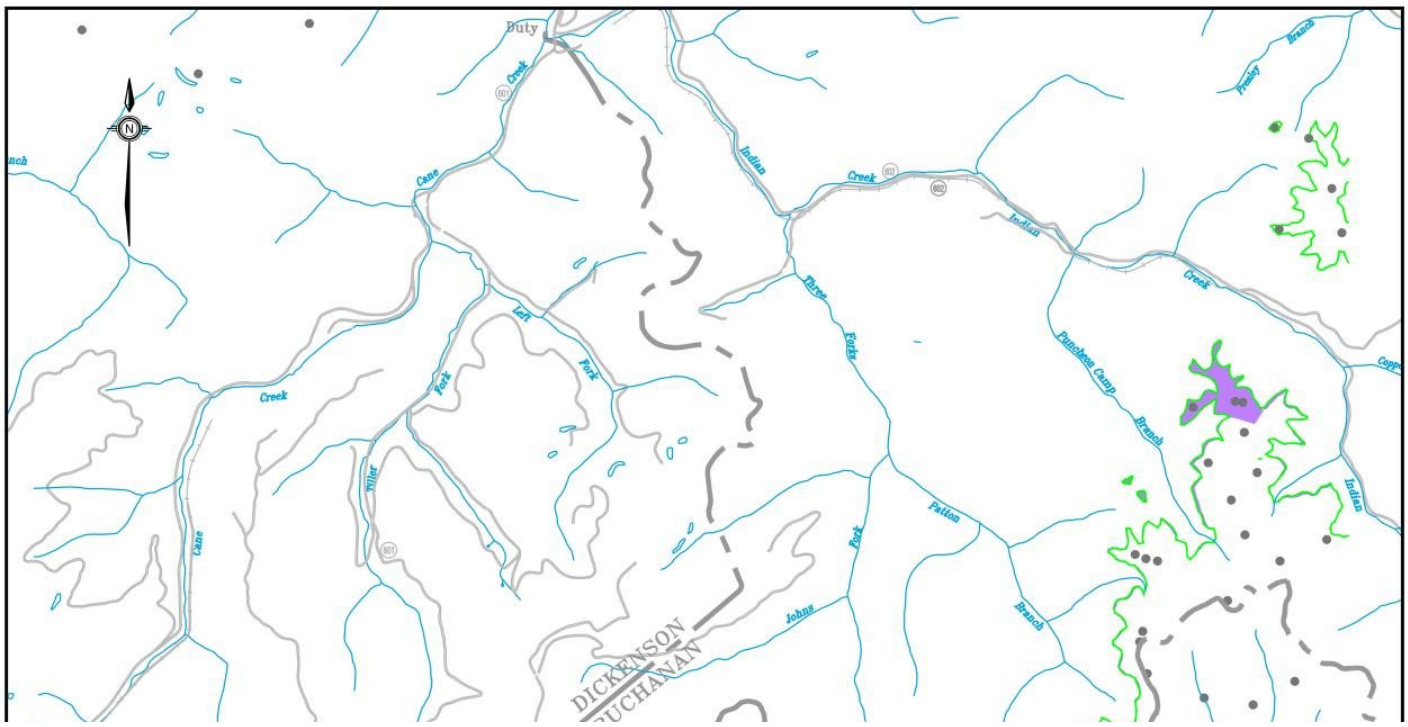
HWM Reserve

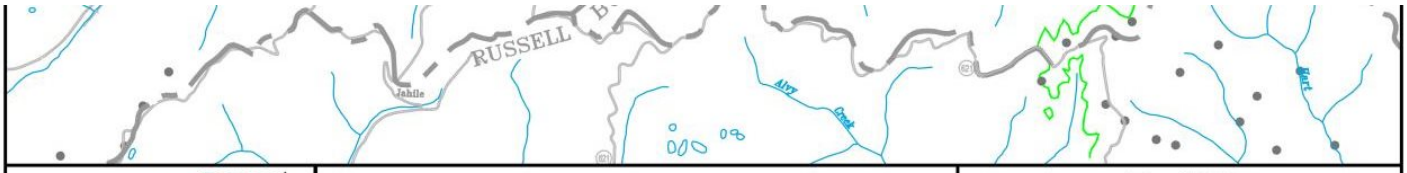
0 3000
Scale In Feet

Map 88-5
Virginia Properties
88 Strip - Kennedy (5300)

Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83


Buty
Creek
Cane
Creek
Left
Fork
Fork
Creek
Miller
Cane
Indian
Creek
Three
Forks
Indian
Creek
Puncheon Camp
Branch
Patton
Fork
Johns
Branch
DICKENSON
BUCHANAN
RUSSELL
Jahile
Alvy
Creek
Hurt
Indian
Creek
Data Point Location
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve
0
3000
Scale In Feet
MARSHALL MILLER &ASSOCIATES
CES129 Bluefield, VA 2/22
VA Prop-88-KR(5250).dwg ko
Map 88-4
Virginia Properties
88 Strip - Kennedy Rider (5250)
Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83


Buty
Creek
Cane
Creek
Left
Fork
Fork
Creek
Miller
Cane
Indian
Creek
Three
Forks
Indian
Creek
Puncheon Camp
Branch
Patton
Fork
Johns
Branch
DICKENSON
BUCHANAN



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
VA Prop–88–LB(4900).dwg ko

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

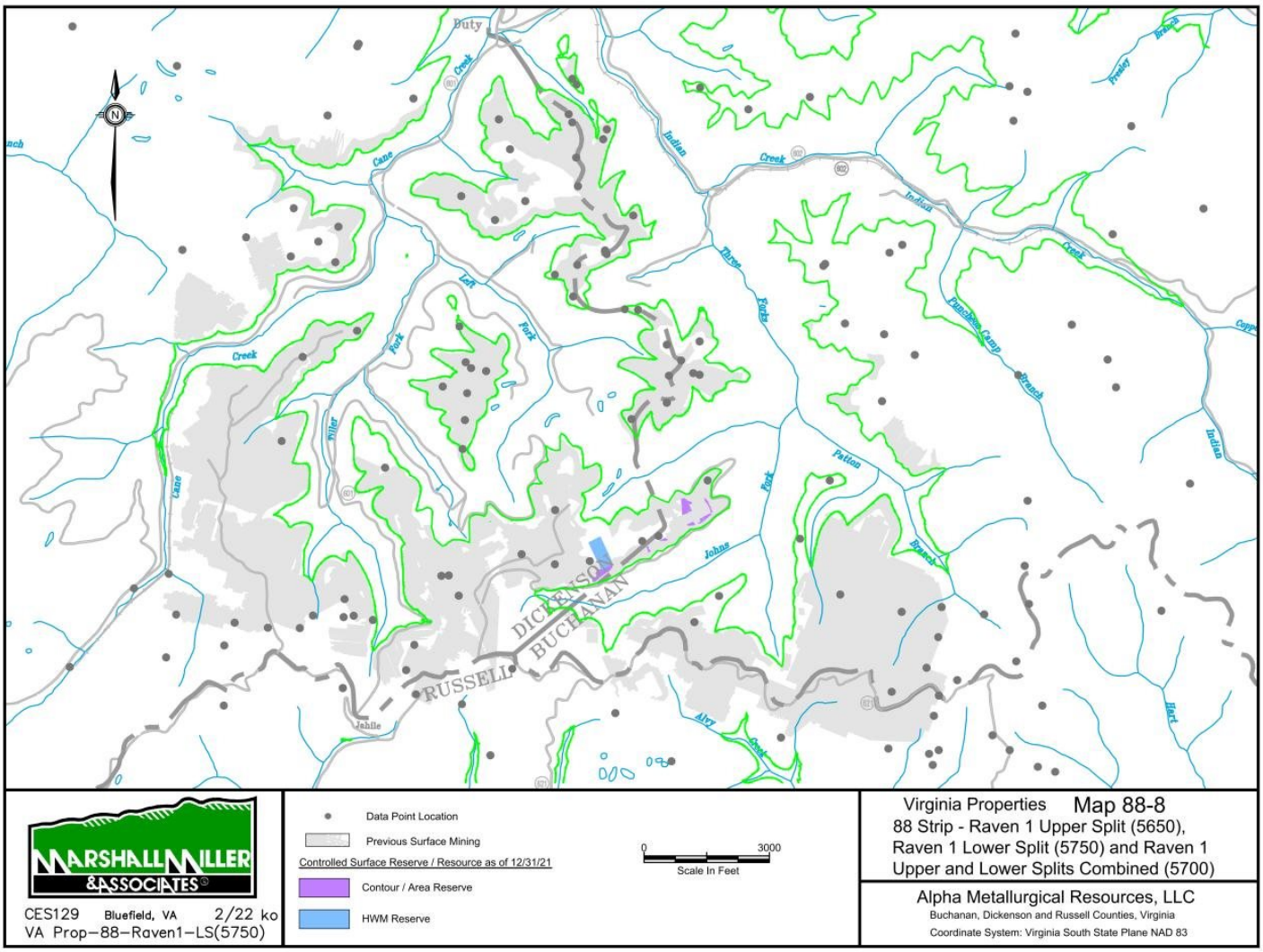
0 3000
Scale In Feet

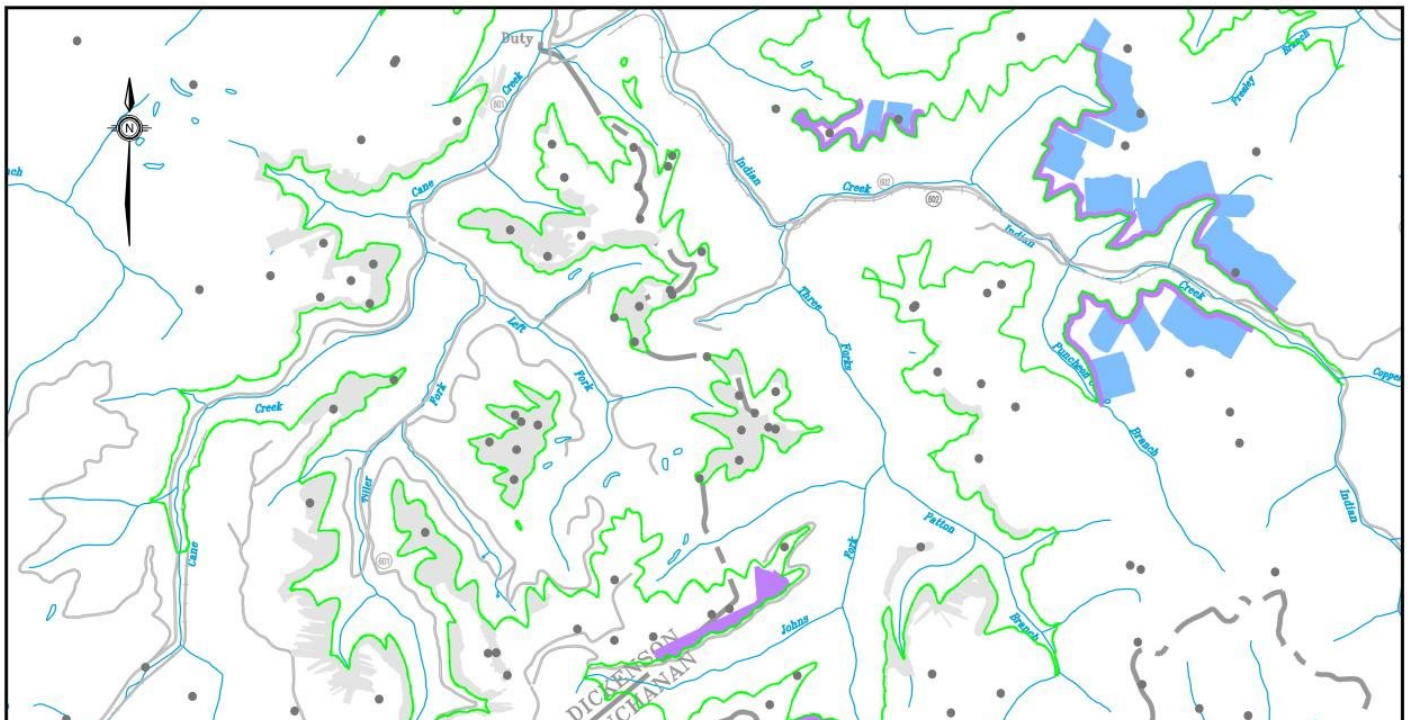
Map 88-2

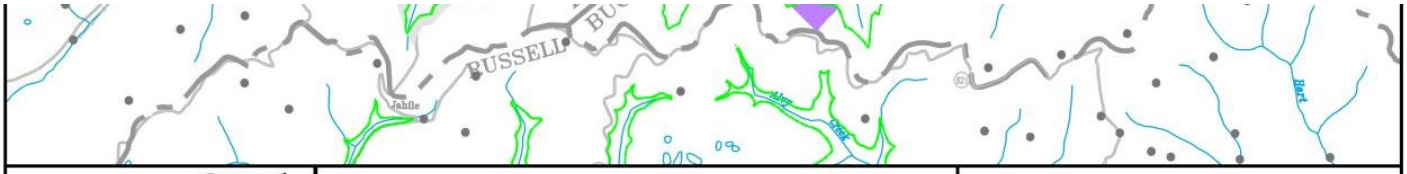
Virginia Properties
88 Strip - Lower Banner (4900)

Alpha Metallurgical Resources, LLC

Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83


Duty
Creek
Cane
Creek
Indian
Creek
Indian
Creek
Three
Forks
Left
Fork
Creek
Miller
Cane
Fork
Patton
Fork
Johns
Branch
Indian
Creek
Branch
Indian
DICKENSON
RUSSELL
BUCHANAN
Jahlie
Alvy
Creek
Hurt
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve
0
3000
Scale In Feet
MARSHALL MILLER & ASSOCIATES
CES129 Bluefield, VA 2/22 ko
VA Prop-88-Raven1-LS(5750)
Virginia Properties Map 88-8
88 Strip - Raven 1 Upper Split (5650),
Raven 1 Lower Split (5750) and Raven 1
Upper and Lower Splits Combined (5700)
Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83


Duty
Creek
Cane
Creek
Indian
Creek
Indian
Creek
Three
Forks
Left
Fork
Creek
Miller
Cane
Fork
Patton
Fork
Johns
Branch
Indian
Creek
Branch
Indian
DICKENSON
BUCHANAN



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22 ko
VA Prop–88–Raven2 (5550)

Data Point Location

Previous Surface Mining

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

HWM Reserve

0 3000
Scale In Feet

Map 88-7

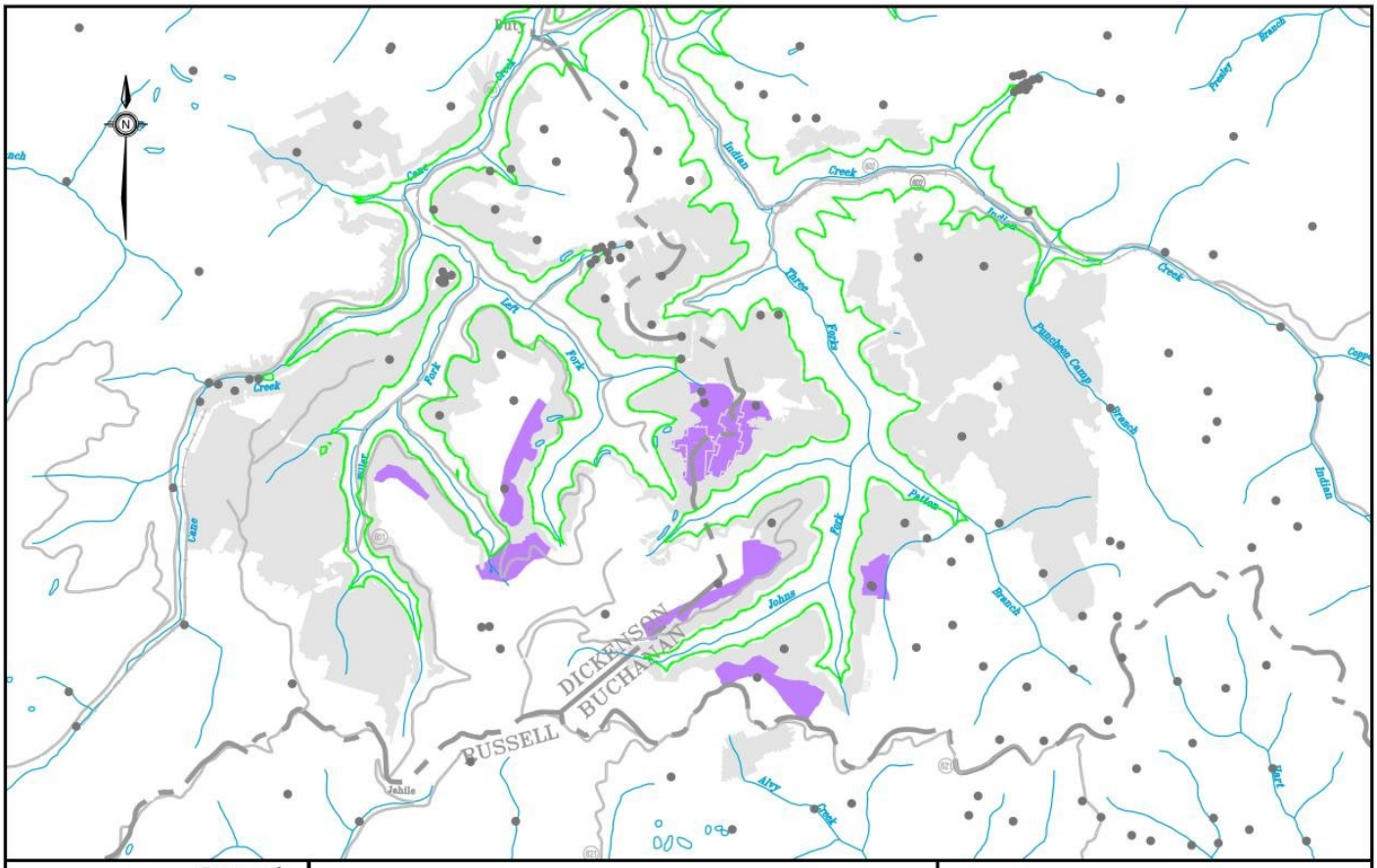
Virginia Properties

88 Strip - Raven 2 (5550)

Alpha Metallurgical Resources, LLC

Buchanan, Dickenson and Russell Counties, Virginia

Coordinate System: Virginia South State Plane NAD 83



MARSHALL MILLER & ASSOCIATES

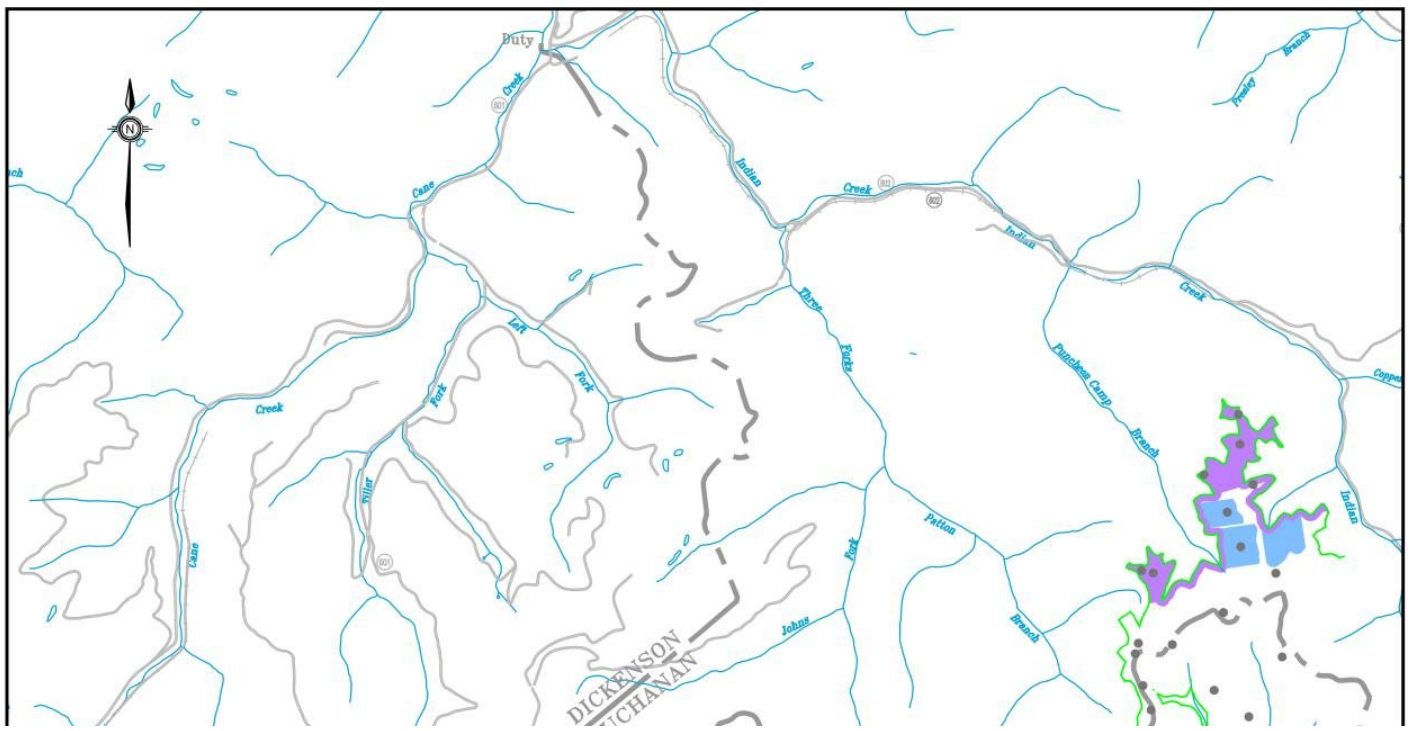
CES129 Bluefield, VA 2/22 ko
VA Prop–88–Tiller(6200)

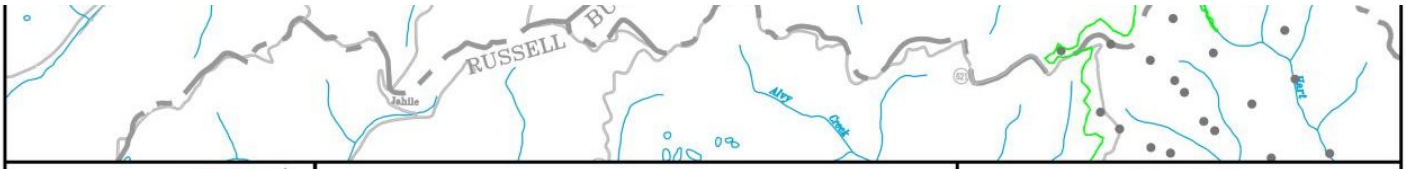
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve

0 3000
Scale In Feet

Map 88-11
Virginia Properties - 88 Strip
Tiller (6200) and Thick Tiller Seams (6250)

Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22 ko
VA Prop–88–UB(4650)

Data Point Location

Controlled Surface Reserve / Resource as of 12/31/21

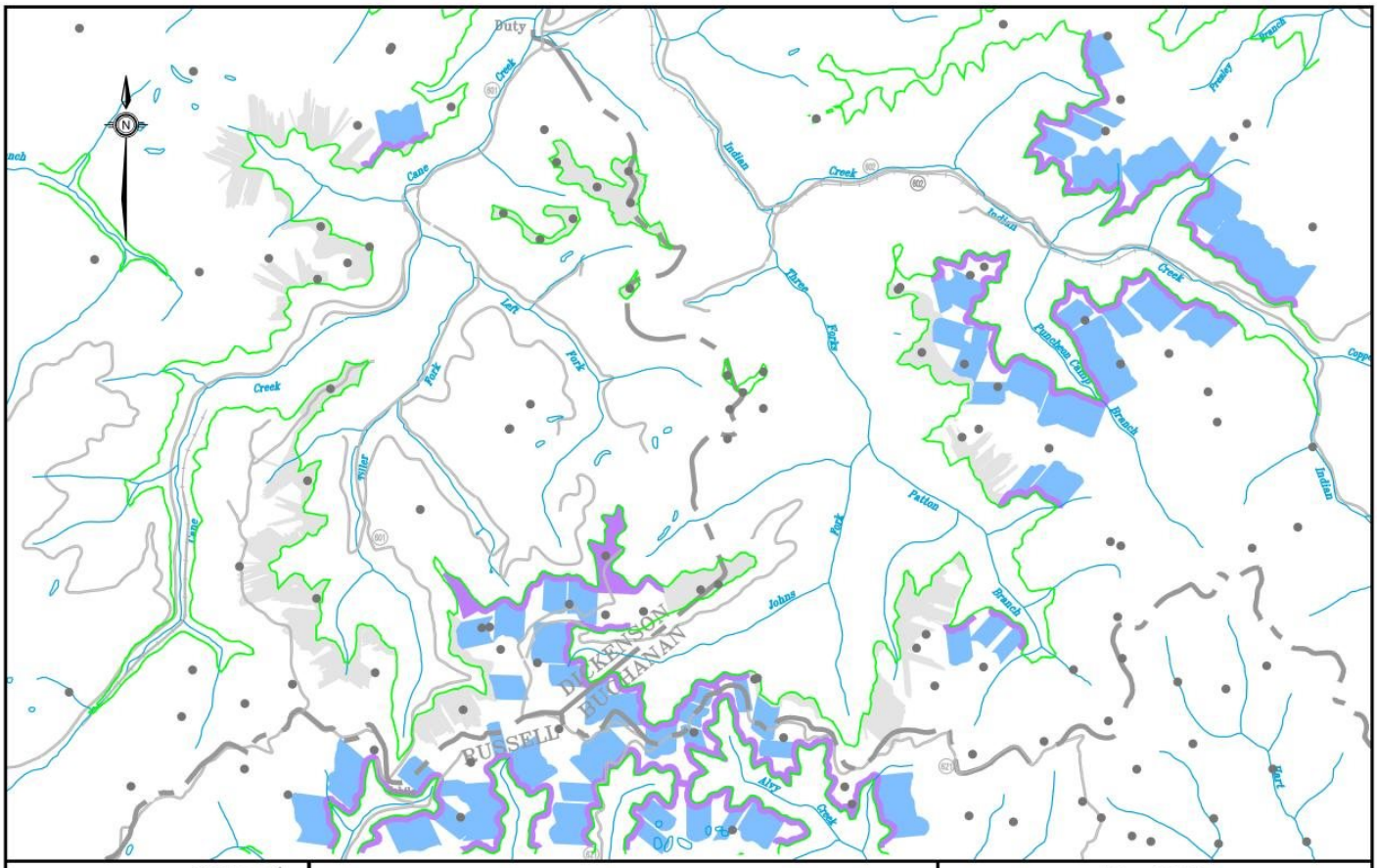
Contour / Area Reserve

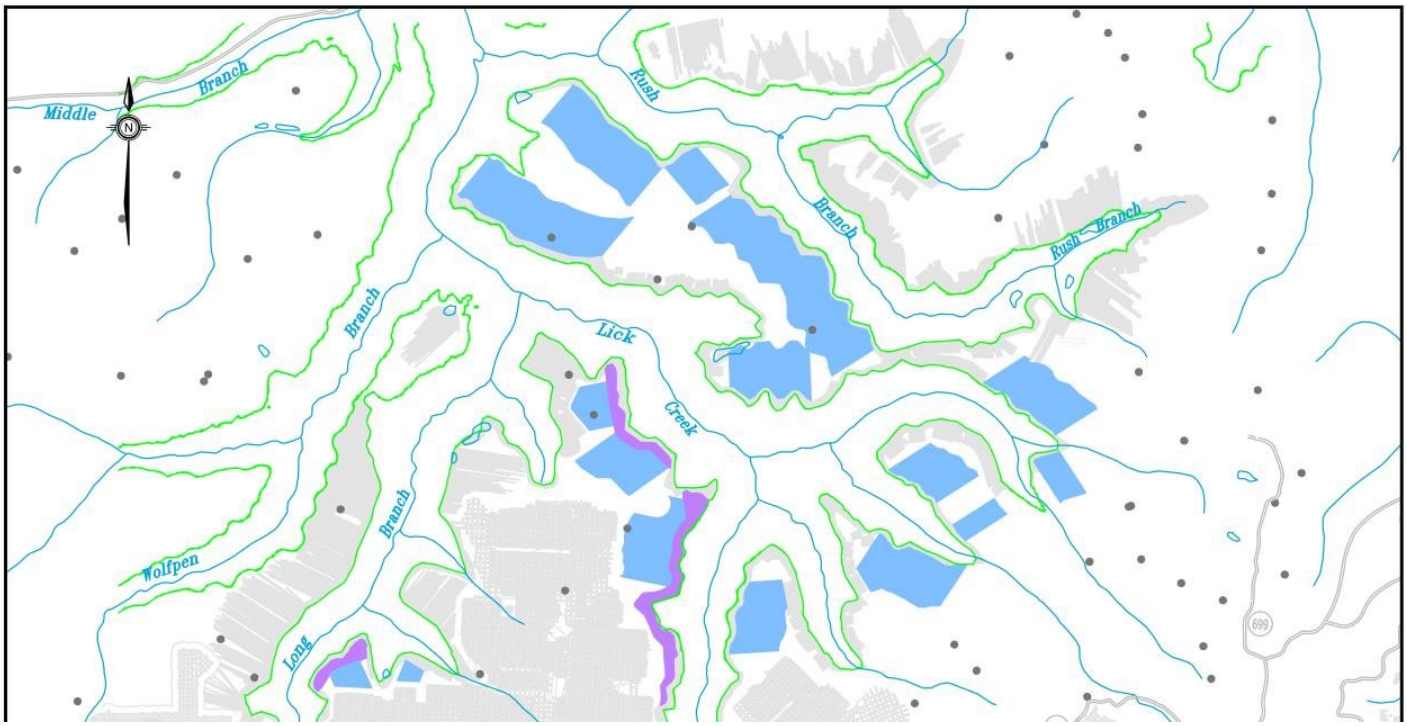
HWM Reserve

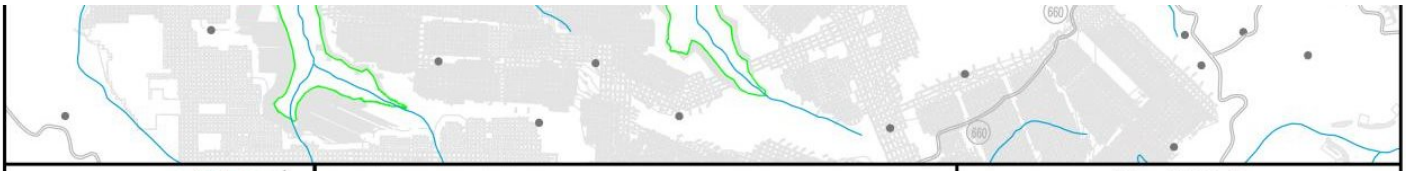
0 3000
Scale In Feet

Map 88-1
Virginia Properties
88 Strip - Upper Banner (4650)

Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83


Duty
Creek
Cane
Creek
Indian
Creek
Indian
Creek
Three Forks
Left Fork
Fork
Creek
Miller
Lane
Creek
Pathon
Fork
Johns
Branch
Indian
Creek
Copper
Creek
Branch
Frost
Branch
DICKENSON
BUCHANAN
RUSSELL
Alt
Creek
Hart
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve
0
3000
Scale In Feet
MARSHALL MILLER & ASSOCIATES
CES129 Bluefield, VA 2/22
VA Prop-88-Aily(5400).dwg ko
Map 88-6
Virginia Properties
88 Strip - Aily (5400)
Alpha Metallurgical Resources, LLC
Buchanan, Dickenson and Russell Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83


Middle
Branch
Rush
Branch
Rush Branch
Branch
Lick
Creek
Branch
Wolfpen
Long
699



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
VA Prop–LBr–Lower Banner.dwg

Data Point Location

Previous Surface Mining

Controlled Surface Reserve / Resource as of 12/31/21

Contour / Area Reserve

HWM Reserve

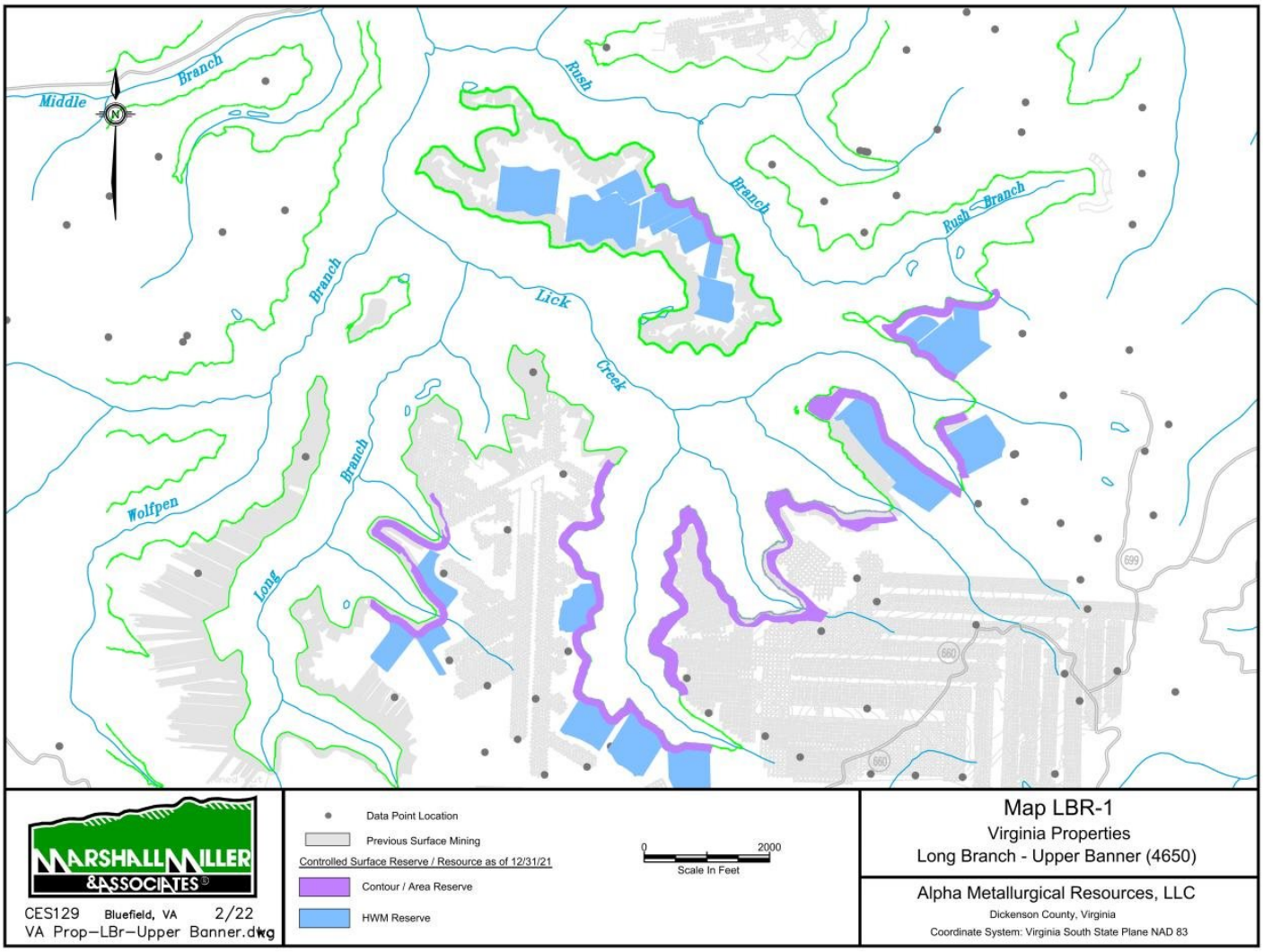
0 2000
Scale In Feet

Map LBR-3

Virginia Properties
Long Branch - Lower Banner (4900)

Alpha Metallurgical Resources, LLC

Dickenson County, Virginia
Coordinate System: Virginia South State Plane NAD 83



MARSHALL MILLER & ASSOCIATES®

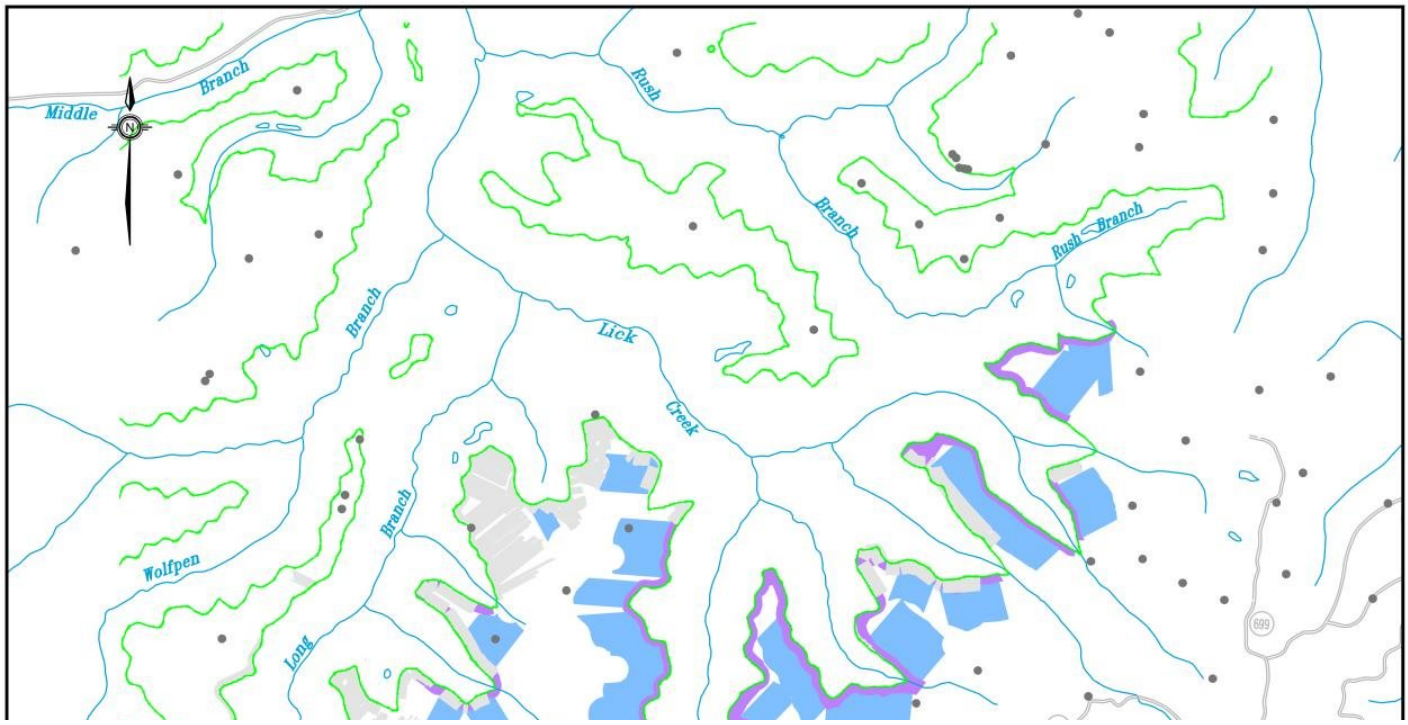
CES129 Bluefield, VA 2/22
VA Prop–LBr–Upper Banner.dwg

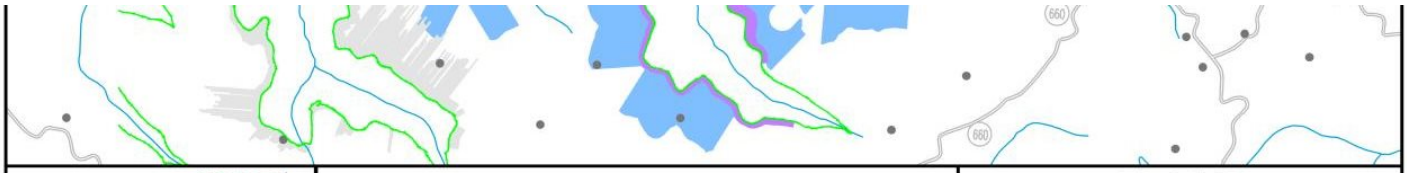
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

0 2000
Scale In Feet

Map LBR-1
Virginia Properties
Long Branch - Upper Banner (4650)

Alpha Metallurgical Resources, LLC
Dickenson County, Virginia
Coordinate System: Virginia South State Plane NAD 83





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
VA Prop–LBr–Upper Banner2 ko

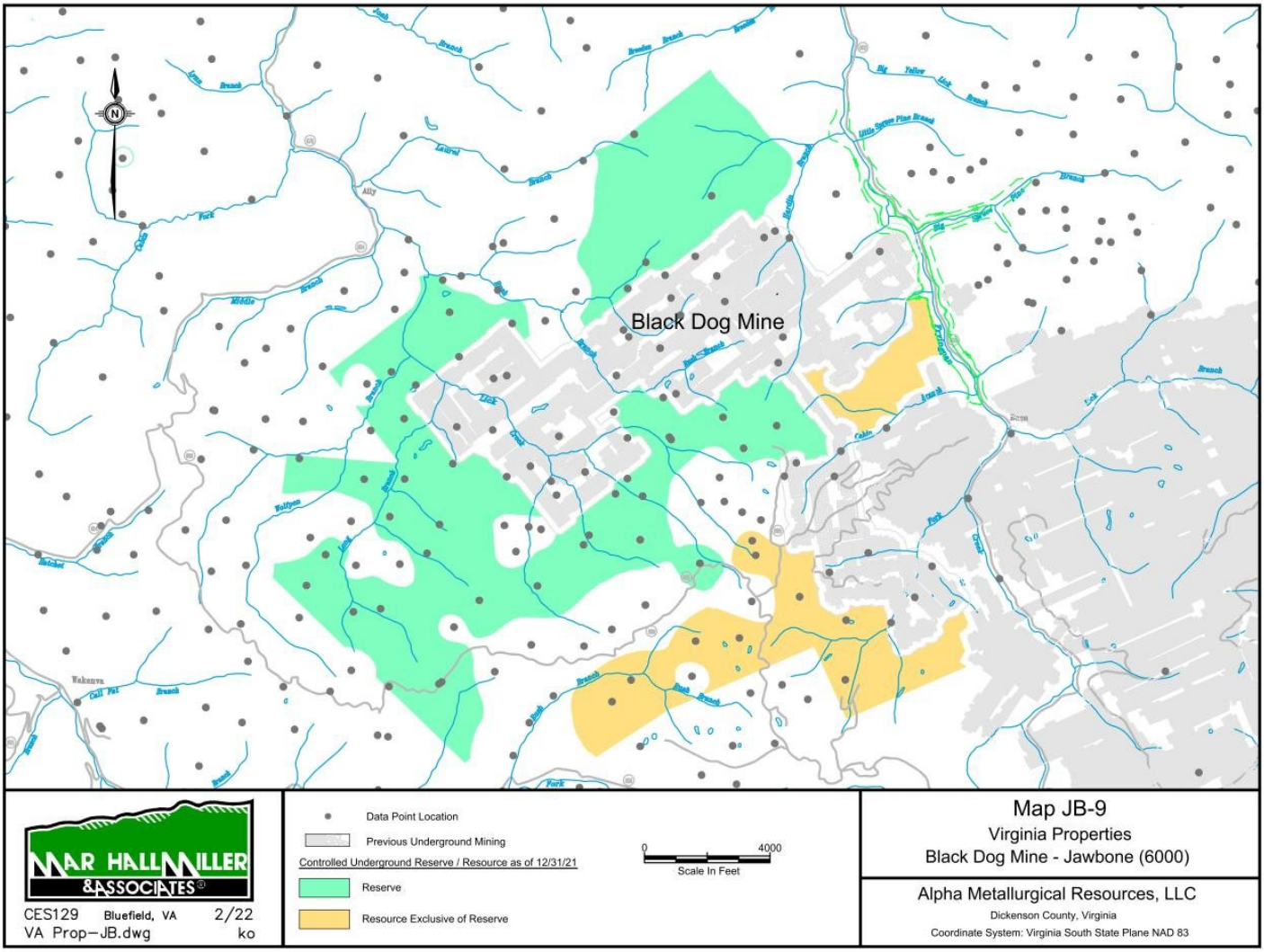
Data Point Location
Previous Surface Mining
Controlled Surface Reserve / Resource as of 12/31/21
Contour / Area Reserve
HWM Reserve

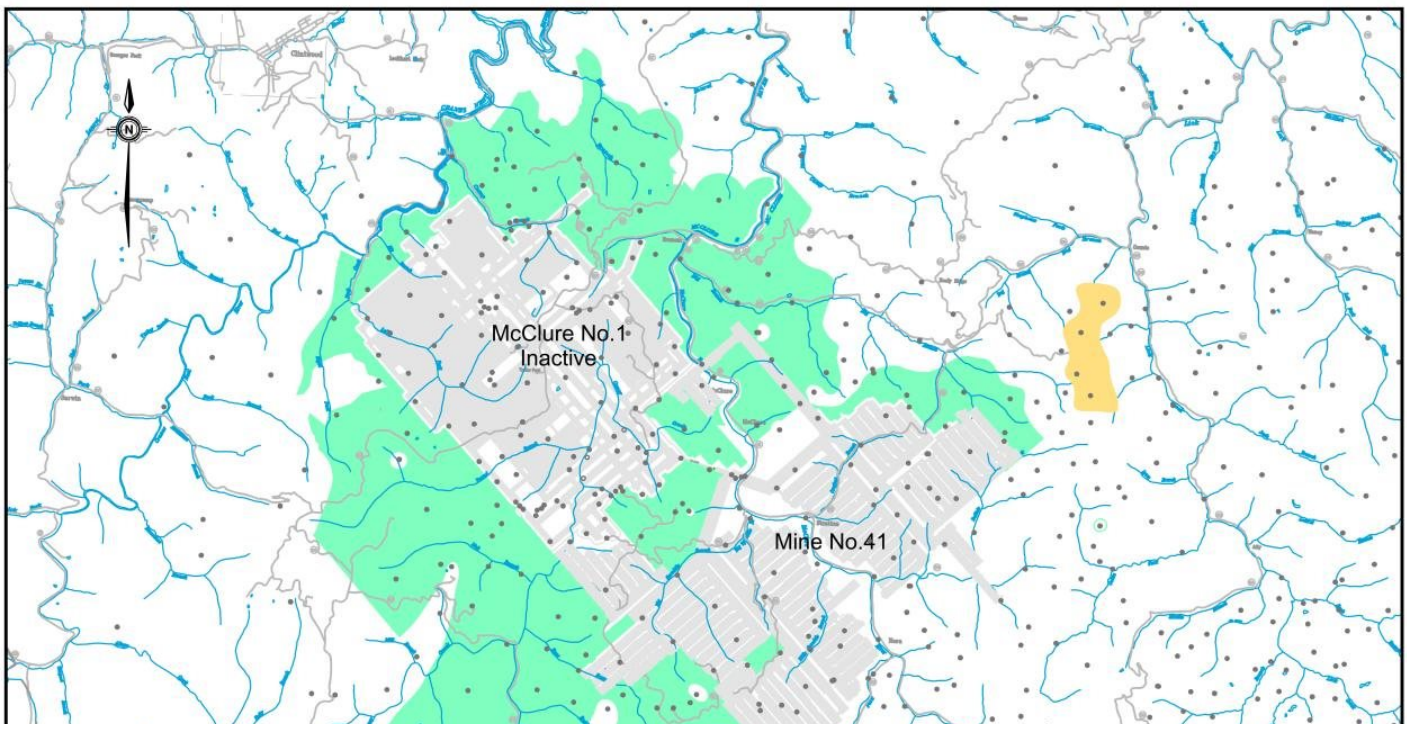
0 2000
Scale In Feet

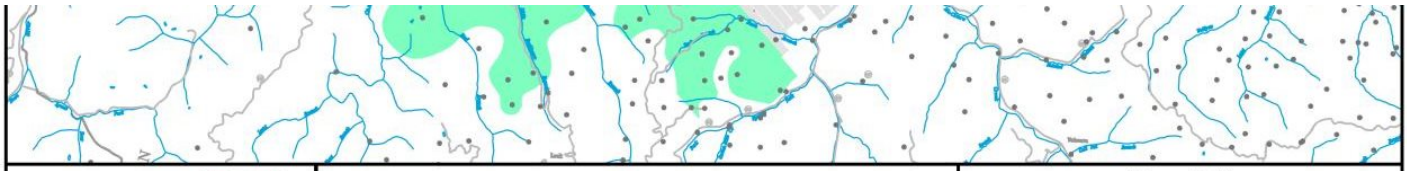
Map LBR-2

Virginia Properties
Long Branch -Upperr Banner 2 (4500)

Alpha Metallurgical Resources, LLC
Dickenson County, Virginia
Coordinate System: Virginia South State Plane NAD 83


Black Dog Mine
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0
4000
Scale In Feet
MAR HALL MILLER &ASSOCIATES®
CES129 Bluefield, VA 2/22
VA Prop–JB.dwg ko
Map JB-9
Virginia Properties
Black Dog Mine - Jawbone (6000)
Alpha Metallurgical Resources, LLC
Dickenson County, Virginia
Coordinate System: Virginia South State Plane NAD 83


McClure No.1
Inactive
Mine No.41



MAR HALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
VA Prop–JB.dwg ko

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 7000
Scale In Feet

Map JB-7

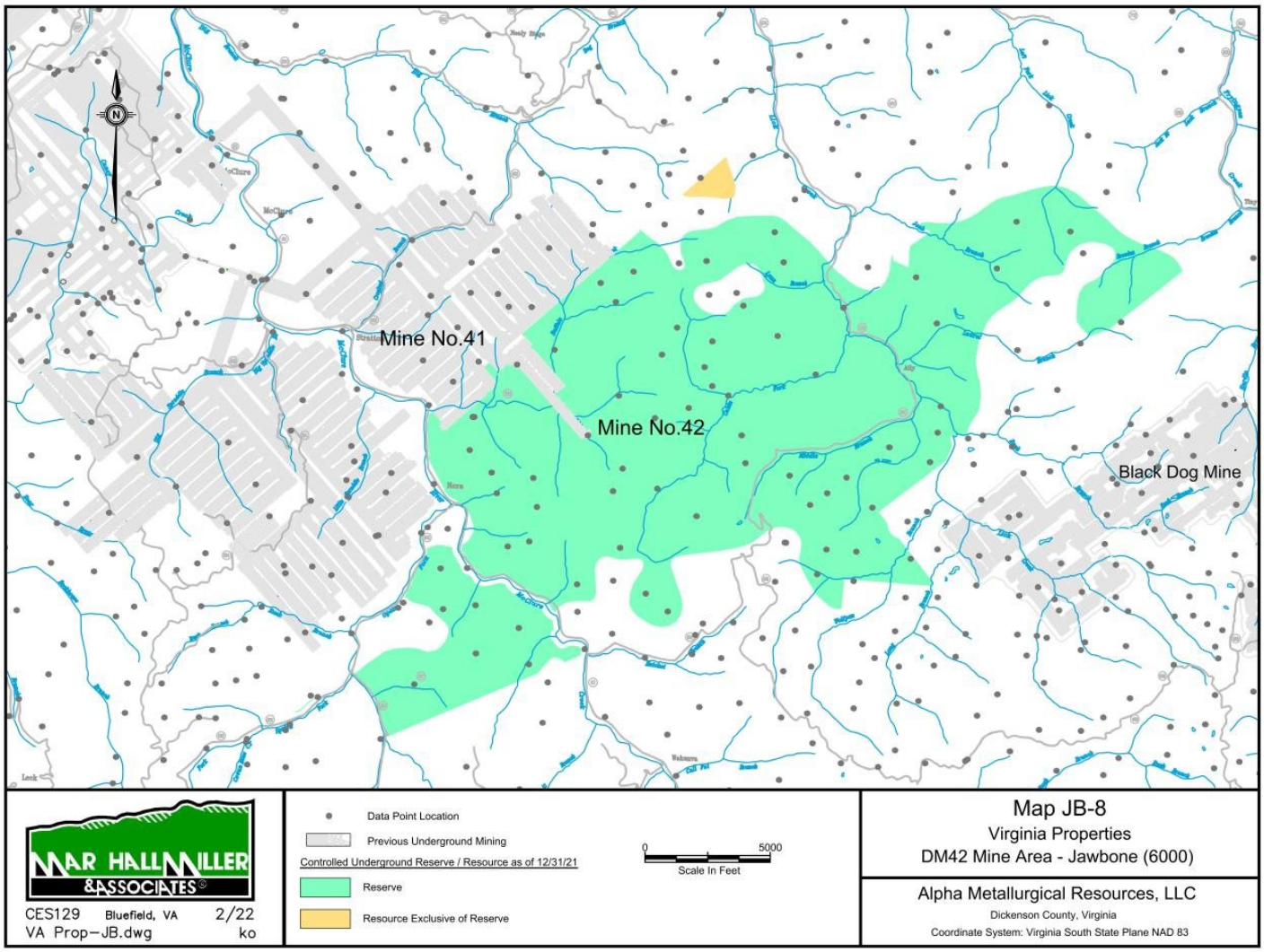
Virginia Properties

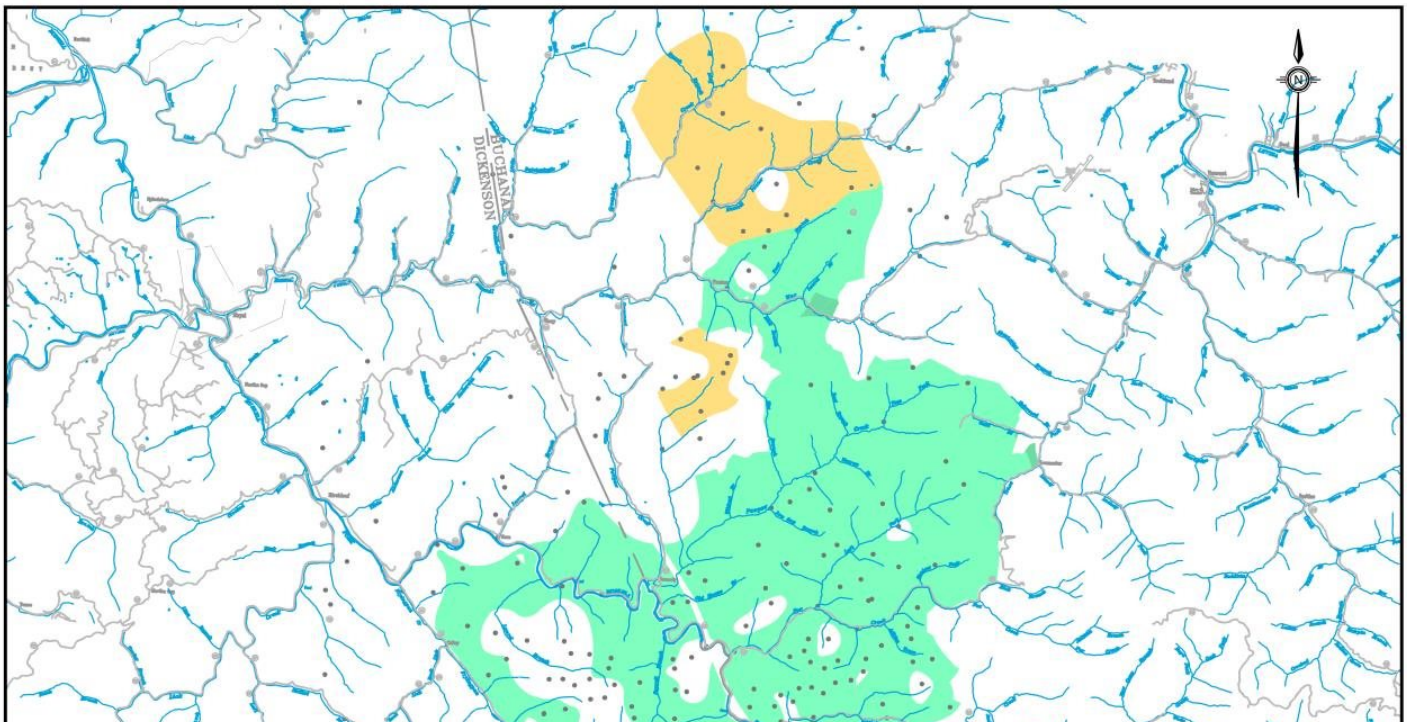
DM41 Mine Area - Jawbone (6000)

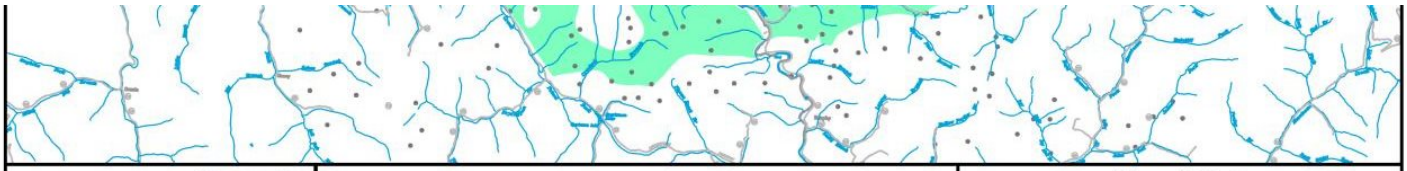
Alpha Metallurgical Resources, LLC

Dickenson County, Virginia

Coordinate System: Virginia South State Plane NAD 83


Mine No.41
Mine No.42
Black Dog Mine
Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve
0
5000
Scale In Feet
MAR HALL MILLER &ASSOCIATES
CES129 Bluefield, VA 2/22
VA Prop-JB.dwg ko
Map JB-8
Virginia Properties
DM42 Mine Area - Jawbone (6000)
Alpha Metallurgical Resources, LLC
Dickenson County, Virginia
Coordinate System: Virginia South State Plane NAD 83


BUCHANAN
DICKENSON



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
VA Prop–JBR.dwg ko

Data Point Location

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

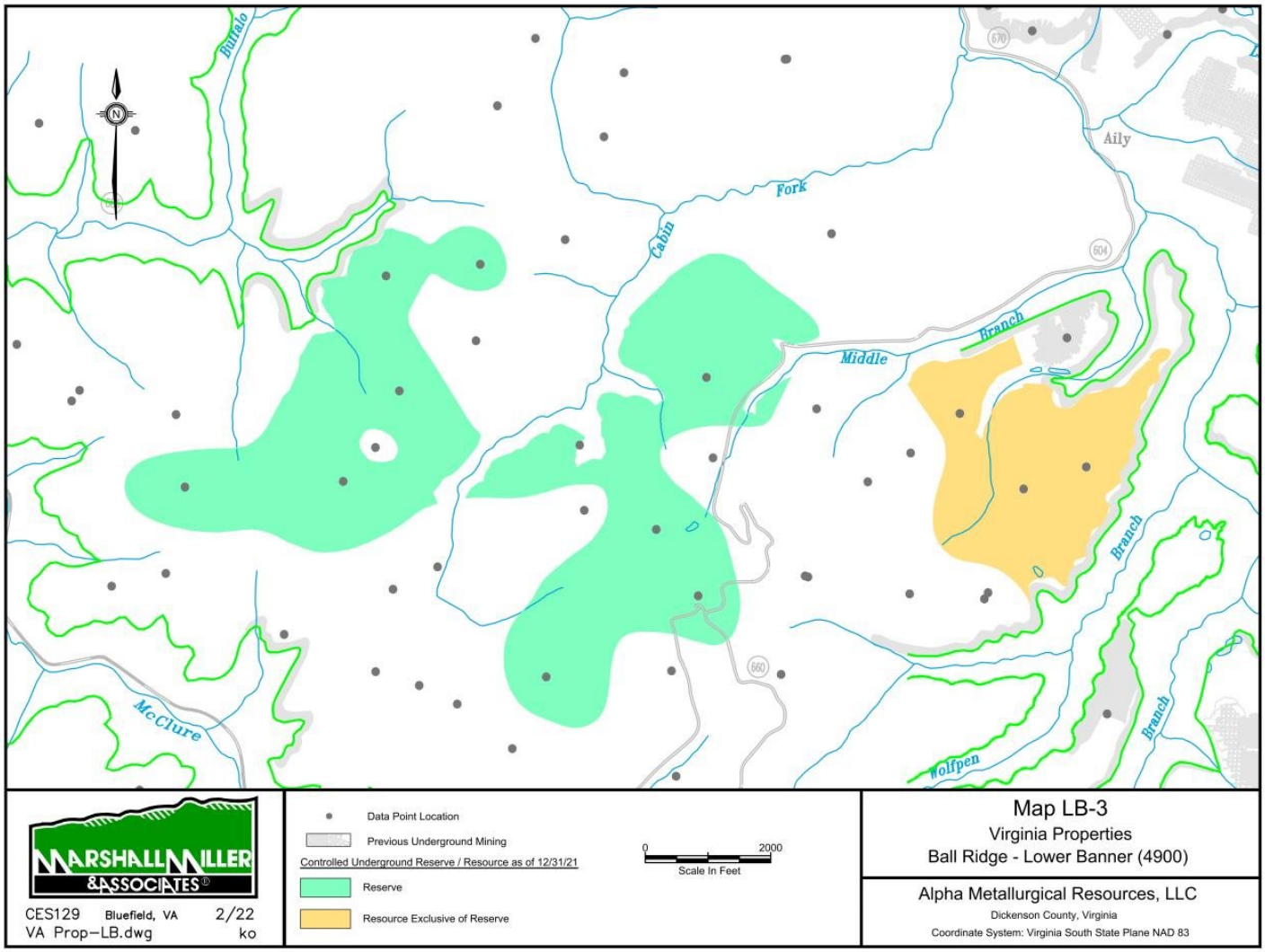
0 8000
Scale In Feet

Map JBR-6

Virginia Properties
DM43 Jawbone Rider (5950)

Alpha Metallurgical Resources, LLC

Dickenson and Buchanan Counties, Virginia
Coordinate System: Virginia South State Plane NAD 83



MARSHALL MILLER & ASSOCIATES®

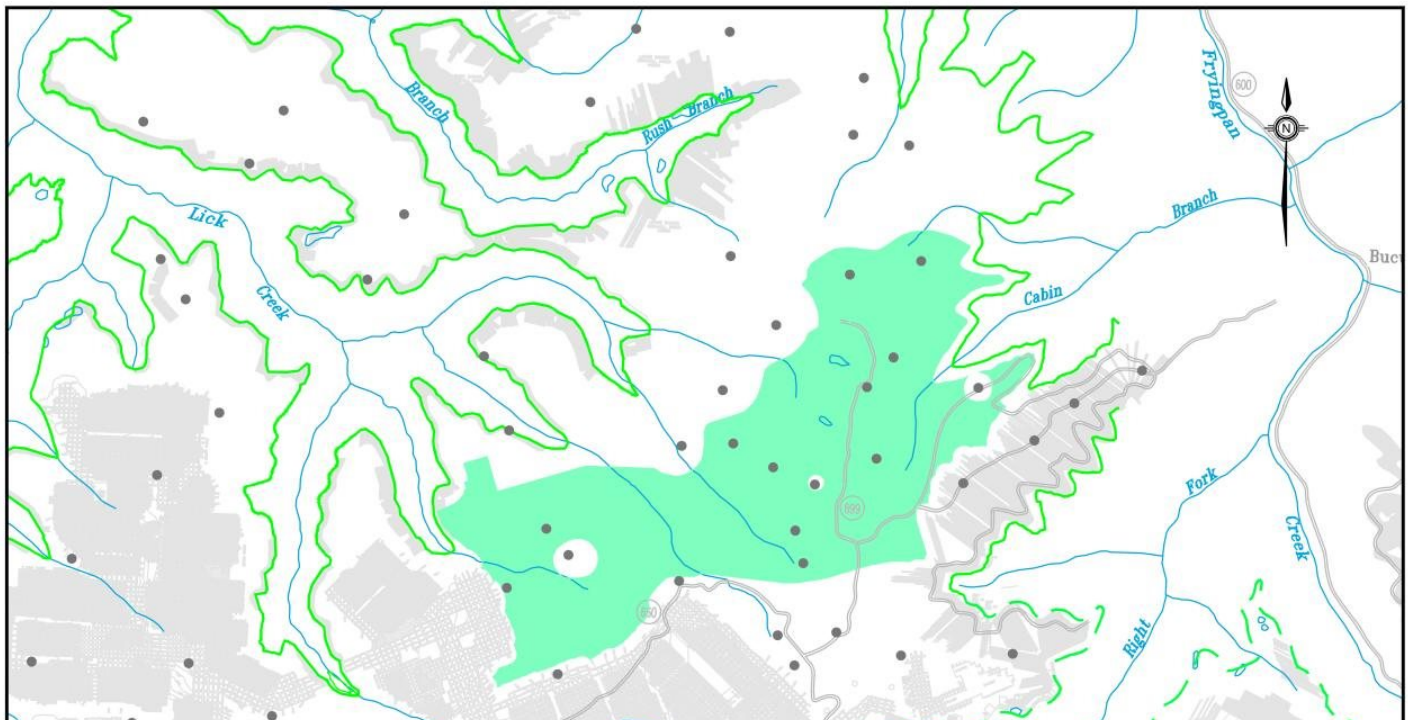
CES129 Bluefield, VA 2/22
VA Prop–LB.dwg ko

Data Point Location
Previous Underground Mining
Controlled Underground Reserve / Resource as of 12/31/21
Reserve
Resource Exclusive of Reserve

0 2000
Scale In Feet

Map LB-3
Virginia Properties
Ball Ridge - Lower Banner (4900)

Alpha Metallurgical Resources, LLC
Dickenson County, Virginia
Coordinate System: Virginia South State Plane NAD 83



MARSHALL MILLER & ASSOCIATES

CES129 Bluefield, VA 2/22
VA Prop–LB.dwg ko

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

0 2000
Scale In Feet

Map LB-5

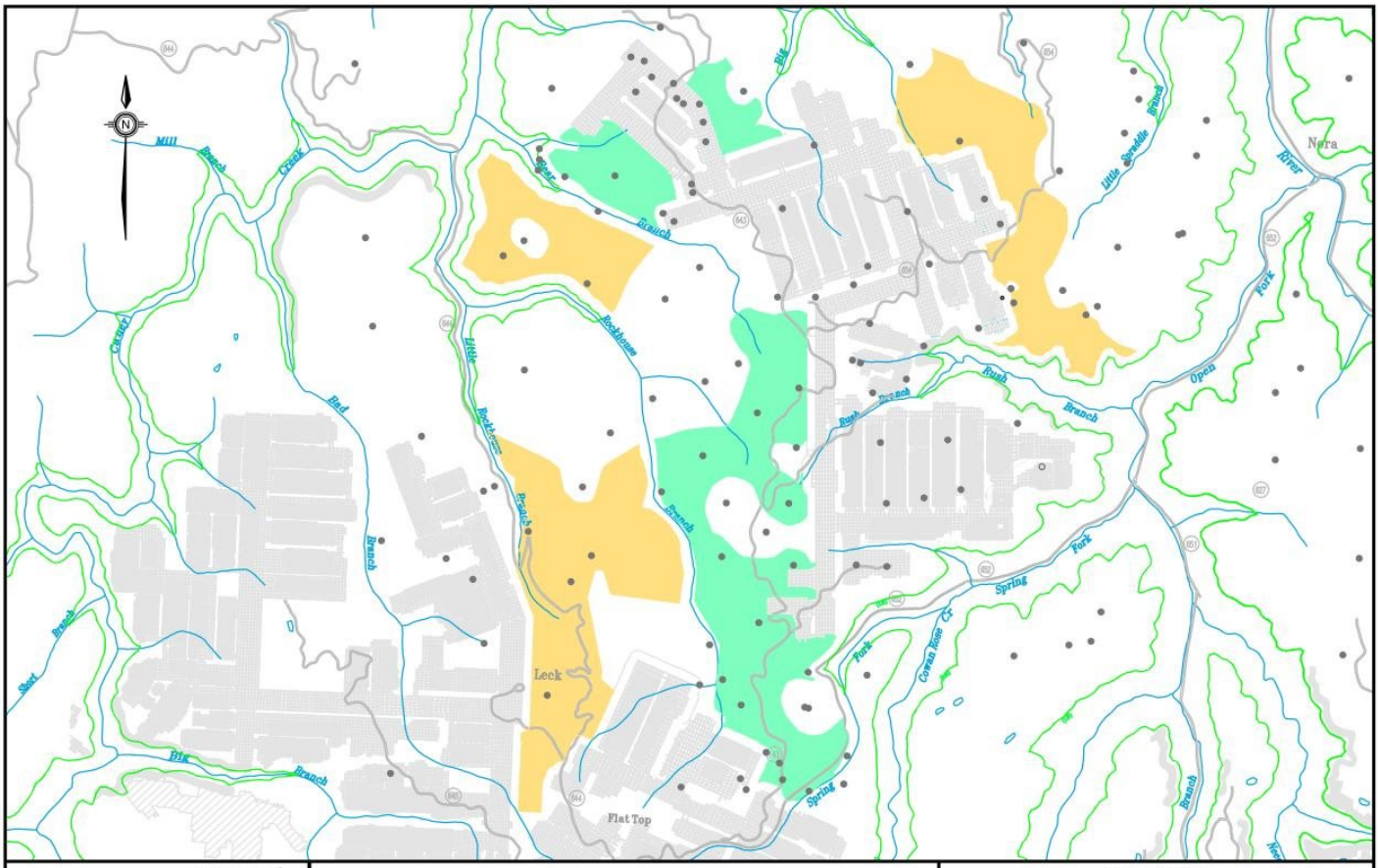
Virginia Properties

Long Branch DM45 Mine - Lower Banner (4900)

Alpha Metallurgical Resources, LLC

Dickenson County, Virginia

Coordinate System: Virginia South State Plane NAD 83



MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
VA Prop–LB.dwg ko

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

Resource Exclusive of Reserve

0 3000
Scale In Feet

Map LB-4

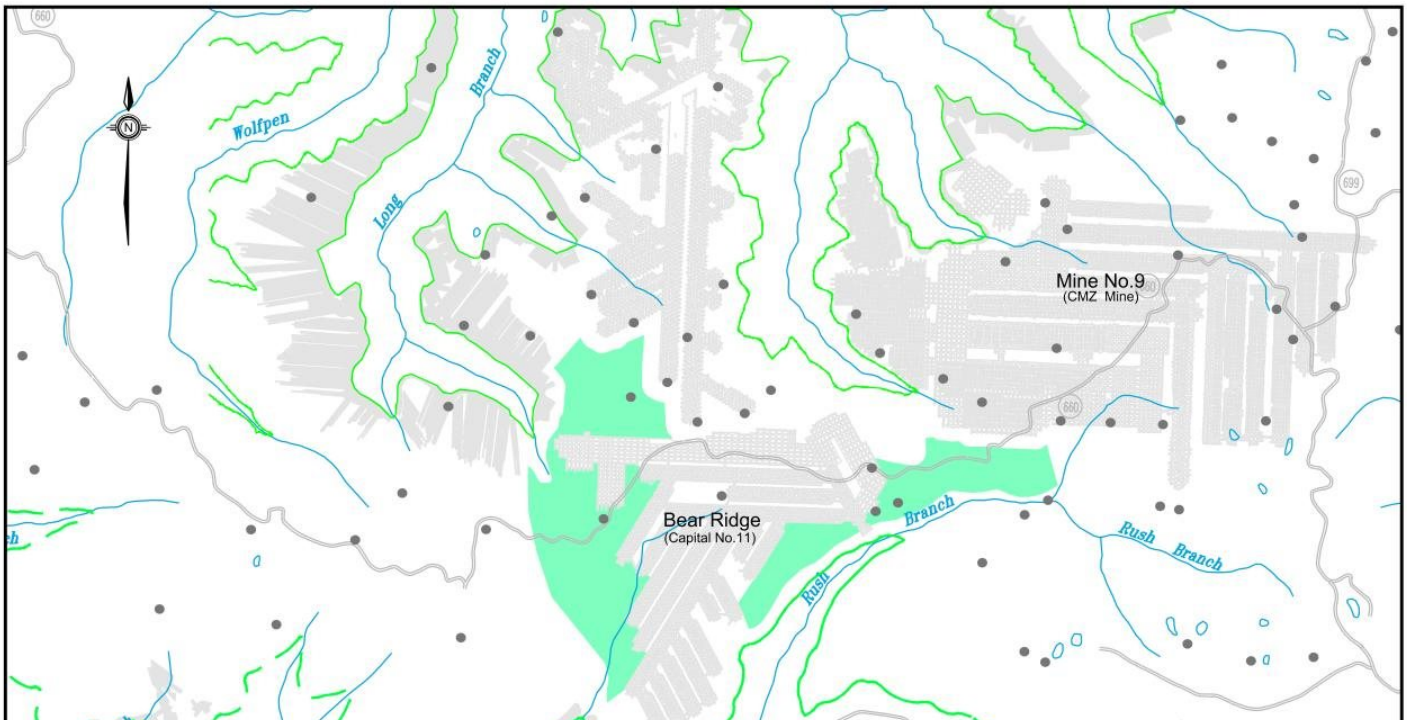
Virginia Properties

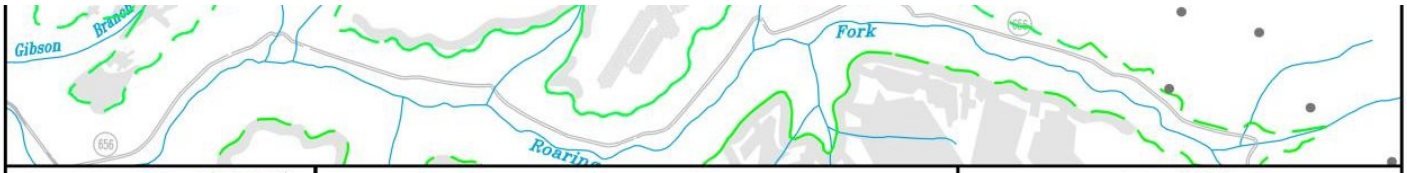
DM44 Rush Branch - Lower Banner (4900)

Alpha Metallurgical Resources, LLC

Dickenson County, Virginia

Coordinate System: Virginia South State Plane NAD 83





MARSHALL MILLER & ASSOCIATES®

CES129 Bluefield, VA 2/22
VA–Prop–UB.dwg ko

Data Point Location

Previous Underground Mining

Controlled Underground Reserve / Resource as of 12/31/21

Reserve

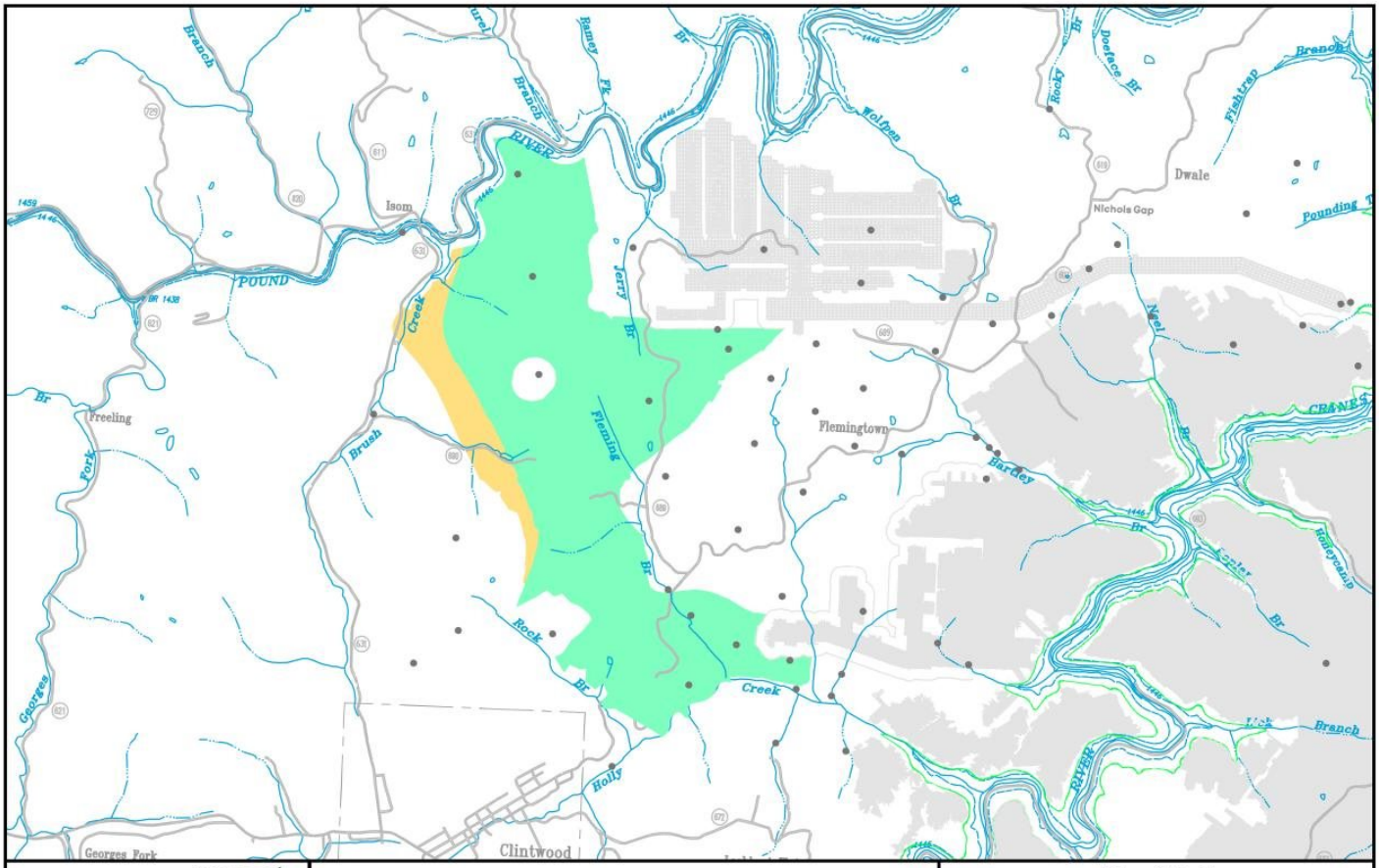
0 2000
Scale In Feet

Map UB-1

Virginia Properties
Bear Ridge - Upper Banner (4650)

Alpha Metallurgical Resources, LLC

Dickenson County, Virginia
Coordinate System: Virginia South State Plane NAD 83


Isom
Dwale
Nichols Gap
Flemingtown
Freeling
Clintwood
Georges Fork
Jerry Br
Fleming Br
Rock Br
Creek
Holly
Barley
Br
Creek
Brush
Fork
Br
Branch
RIVER
POUND
Pounding
CRANES
Kingsdale
Laster
Wolfpen
Fleetrap
Branch
Rocky
Br
Doefoot
Br
Neel
Br
Barney Fk
Br
Br
Br