



Pennsylvania Bureau of Mining Programs

Estimate of Outstanding Liability as of June 30, 2020

Issue Date: August 24, 2020

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Introduction

Purpose

Aon Global Risk Consulting (“AGRC”) was retained by Pennsylvania Bureau of Mining Programs (“PBMP”) to perform an actuarial analysis of the outstanding liabilities. The purpose of the unpaid claim estimates provided in our analysis is to determine what is required to fully fund the future trust for ABS Legacy Sites.

Scope

The scope of our assignment includes the following specific estimates:

1. An estimate of the current actuarial liability that has accrued against the Alternative Bonding System (ABS) through past bond forfeitures as well as any future liability from the forfeiture and the liability from existing permits under the ABS that are unwilling or unable to convert to Full Cost Bonding (FCB).
2. The estimate will be for the accrued liability to pay the construction costs and operation and maintenance costs associated with treating postmining pollution discharges at ABS legacy sites. The actuarial estimate will be used to determine what is required to fully fund the future trust for ABS Legacy Sites, a subaccount within Pennsylvania’s Surface Mining Conservation and Reclamation Fund to replace the Reclamation Fee O&M Trust Account as the source of funding.
3. The estimate will include costs for legacy sites pursuant to the settlement agreement in Pennsylvania Federation of Sportsmen’s Clubs, Inc. v. Quigley, Civil No. 1:99-CV-1791, dated November 2, 2016 and the amendment, subsequently approved by U.S. Office of Surface Mining Reclamation and Enforcement (OSM) on July 10, 2017 (82 FR 31715). The legacy sites are listed in the Annual Report Certifying Work Performed at Alternative Bonding System (ABS) Legacy Sites dated January 31, 2020.
4. The liability is estimated as of June 30, 2020 and based on data as of January 31, 2020.

The unpaid loss estimates presented in this report are actuarial central estimates (i.e., expected values over a range of reasonably probable outcomes). Our unpaid loss estimates are presented on an undiscounted basis unless noted otherwise.

* * * * *

Donald Riggins and Jo Ellen Cockley are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

We performed this analysis using generally accepted actuarial principles and in accordance with all relevant Actuarial Standards of Practice.

Please contact us if you have any questions regarding this report.

Respectfully submitted,

Aon Global Risk Consulting



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Conditions and Limitations

Inherent Uncertainty

Actuarial calculations produce estimates of inherently uncertain future contingent events. We believe that the estimates provided represent reasonable provisions based on the appropriate application of actuarial techniques to the available data. However, there is no guarantee that actual future payments will not differ from estimates included herein.

Extraordinary Future Emergence

Our projections make no provision for the extraordinary future emergence of losses or types of losses not sufficiently represented in the historical data or which are not yet quantifiable.

The potential short-term and long-term impact of the COVID-19 pandemic is currently unknown. Consequently, the uncertainty in our estimates is greater than it would otherwise be. Unless noted otherwise, this analysis makes no adjustment for the impact of the COVID-19 pandemic.

Data Reliance

In conducting this analysis, we relied upon the provided data without audit or independent verification; however, we reviewed it for reasonableness and consistency. Any inaccuracies in quantitative data or qualitative representations could have a significant effect on the results of our review and analysis.

Discounting

The uncertainty inherent in the discounted unpaid loss estimates is greater than the uncertainty in the undiscounted loss estimates. This is because undiscounted liabilities normally contemplate an implicit risk margin for the variability in the loss estimation process (e.g., under- or over-estimating). Discounting takes away this implicit risk margin and would subject the unpaid loss estimates to additional risks such as yields on the investment portfolio and timing risk. Future payments could occur more or less rapidly than expected due to random variations and the timing of large payments. We made no adjustment to account for these risk margins.

The interest rates used in discounting the unpaid losses were provided by PBMP. A review of the appropriateness of the discount rate is outside the scope of this analysis.

Use and Distribution

Use of this report is limited to PBMP for the specific purpose described in the Introduction section. Other uses are prohibited without an executed release with Aon.

Distribution by PBMP is unrestricted. We recognize that this report may be distributed to third parties. We request that Aon be notified of further distribution of this report. The report should only be distributed in its entirety including all supporting exhibits.

Performance Bonds

Our estimates exclude the costs of forfeitures under the Full Cost Bonding system and any permits under the Alternative Bonding System converted to Full Cost Bonding.

Potential Legislation

Our model does not consider any future potential law changes or legislative initiatives. For example, we do not include impacts from future law changes on permitting fees, penalties, operational costs or maintenance costs.

Background

From July 31, 1982 through early 2000 mine sites were permitted in Pennsylvania under an Alternate Bonding System ("ABS"). The ABS included per-acre bond rates, supplemented by a non-refundable per-acre reclamation fee. The transition from the ABS to conventional bonding took place beginning in 2001 through a conversion process where mining permits were reissued with bonds calculated based upon the full cost of reclamation, including water treatment.

In Pennsylvania, a mine operator has an obligation to treat pollution discharges for which they are responsible. Responsibility for treatment can be incurred by causing or allowing a discharge. Causation is based on the actions of the operator and requires the PBMP to make an affirmative finding of responsibility. In general, water from mining sites has very high acidity level. Allowing a discharge means having pollution that leaves the permitted area.

At most mines, pollution discharges are detected within 5 years after mining begins. Pollution discharges may continue for decades once detected and can create a long-term environmental risk and long-term obligation for mine operators.

Default by an operator occurs when they stop providing the required treatment for a pollution discharge obligation. The default can result in a bond forfeiture action for bonded sites and/or failure to comply with the consent order establishing the trust and associated obligations. Default does not require that a site be forfeited but the permittee becomes permanently ineligible to receive future mining permits.

Bond amounts and trust amounts are calculated to fund the obligation to treat post-mining pollution discharges on a long-term basis. Existing sites with post-mining discharges are required to establish these long-term financial guarantees. In some cases, a trust is established where the operator is required to make payments into the trust over time. Any of the sites permitted under the primacy ABS included in these "payment plan" trusts have the potential to become ABS legacy sites, if the operator fails to make the required payments and defaults on the obligation to treat post mining discharges.

ABS legacy sites having a post-mining pollution discharge creates an obligation for the permittee to treat water that does not meet effluent limitations and/or water quality standards. Sites with post-mining discharges are tracked in Pennsylvania through the Mine Drainage Inventory.

On November 2, 2016 a settlement agreement was reached in Pennsylvania Federation of Sportsmen's Clubs, Inc. v. Quigley, Civil No. 1:99-CV-1791, and amendment, subsequently approved by U.S. Office of Surface Mining Reclamation and Enforcement (OSM) on July 10, 2017 (82 FR 31715). The settlement agreement addresses the treatment of pollution discharges on mine sites permitted under the ABS that are unable to convert to a conventional bond and the mine operator is unable to meet its obligations to treat the pollution discharges of the mine site.

ABS legacy sites are defined in the Pennsylvania regulations: Mine sites, permitted under the Primacy Alternate Bonding System, that have a postmining pollutional discharge where the operator has defaulted on its obligation to adequately treat the discharge and, either the bond posted for the site is insufficient to cover the cost of treating the discharge, or a trust to cover the costs of treating the discharge was not fully funded and is insufficient to cover the cost of treating the discharge. (PA regulations - 25 PA. Code 86.1)

The ABS legacy sites are listed in the Annual Report Certifying Work Performed at Alternative Bonding System (ABS) Legacy Sites, the latest report is dated 1/31/2020. The annual report also lists mining sites not converted to conventional bonding that could potentially become ABS legacy sites should the definition in the regulations be satisfied. In addition, the annual report lists ABS legacy sites that need land reclamation work and ABS legacy sites that need water treatment work.

The obligation to treat pollution discharges at a mine site typically includes building and maintaining a water treatment system. There are many types of water treatment systems available for water treatment from pollution discharges at mine sites. Water treatments systems can be classified as active or passive systems. Active water treatment systems (water treatment plants) are typically more expensive and commonly use power and more hazardous chemicals (for example hydrated lime or ammonia). Passive water treatment systems use natural chemical and biological reactions (for example limestone gravel) to treat the water in a controlled environment. Passive treatment systems are typically more economical since they do not require electrical power, mechanical equipment, hazardous chemicals, buildings or daily operation & maintenance (O&M) costs. Costs for a water treatment system can be grouped into design costs, construction costs and O&M costs. Both types of treatment systems require monitoring, inspection, and maintenance, although to a lesser extent on a passive treatment system. The average life span or performance span for a system is 15-25 years.

Executive Summary

Alternative Bonding System Estimates

The estimated O&M costs represent the actuarial liability that has accrued against the Alternative Bonding System (ABS) through past bond forfeitures as well as any future liability from the forfeiture and the liability from existing permits under the ABS that are unwilling or unable to convert to Full Cost Bonding (FCB).

Total O&M costs are estimated as standard O&M costs on ABS legacy sites, recapitalization costs for ABS legacy site treatment systems, O&M Costs for the Cooney sites and design, construction and O&M costs for potential ABS sites needing future treatment.

The Cooney sites are currently listed as potential ABS legacy sites and are not fully funded. There is currently a trust fund in place and other revenues coming from the sites, from windmills, that are used to offset some of the O&M costs. The estimate includes the O&M costs associated with the 6 Cooney sites, but the revenue estimates do not include a provision for expected future revenue from the Cooney trust fund or other revenue sources from the Cooney sites.

The O&M costs are shown on a discounted and undiscounted basis as of 6/30/2020. O&M costs are discounted at the selected Short-Term Investment Pool return. The return is selected based on discussions with PBMP.

The analysis includes additional revenues to fund the total O&M costs from the following sources: reclamation fees, interest on trust accounts and civil penalties. Interest on the ABS Legacy Sites trust account is estimated using the selected Short-Term Investment Pool return.

The trust fund balance as of 6/30/2020 needed to cover the total O&M Costs for a 75 period is shown. In the analysis, the account is referred to as the future trust for ABS Legacy Sites. The 6/30/2020 balance would cover the total O&M costs each year and be credited with the additional revenues, including interest on the trust fund, each year. The trust fund would have a positive balance for 75 years while paying total annual O&M costs and being credited with the additional revenue sources.

An estimate of the operations and maintenance (O&M) costs for the Alternative Bonding System (ABS) legacy sites as of 6/30/2020 are displayed in the following table.

Pennsylvania Bureau of Mining Programs
ABS Estimates as of 06/30/2020
Summary of Results

Estimate	Low Scenario	Intermediate Scenario	High Scenario
Total Standard O&M Costs	199,874,519	269,634,396	354,306,238
Total Recapitalization Costs	34,892,770	50,889,901	72,287,800
Total Design and Construction Costs	13,995	36,526	69,976
Total Cooney Sites O&M Costs	<u>249,407,929</u>	<u>278,661,996</u>	<u>322,202,933</u>
Total O&M Costs	484,189,213	599,222,820	748,866,947
Discounted O&M Costs (at STIP Pool Rate)	240,501,833	417,059,642	661,866,086
Trust Fund Balance as of 06/30/2020 to Cover 75 Years	225,308,000	401,272,000	649,636,000
2021 Annual Costs			
Standard O&M Costs	754,475	1,015,065	1,330,245
Recapitalization Costs	131,711	191,580	271,405
Design and Construction Costs	2,636	6,880	13,180
Cooney Sites O&M Costs	<u>943,995</u>	<u>1,054,720</u>	<u>1,219,520</u>
2021 Total Annual Costs	1,832,817	2,268,245	2,834,350

The estimates are shown for low, intermediate and high scenarios. The three scenarios represent a reasonable range of estimates based on varying the cost, revenue, forfeiture rate and interest rate assumptions.

The following sections discuss the methods and underlying assumptions used to derive the ABS cost estimates and revenue sources.

Alternative Bonding System Cost Estimates

An estimate of the future costs for the Alternative Bonding System (ABS) includes standard O&M costs, recapitalization costs and design/construction costs for additional future ABS legacy sites.

Standard O&M Costs

Standard O&M costs are the annual costs associated with the operation and maintenance of a functioning water treatment facility. Examples of O&M costs include lab testing fees, labor costs for water sampling and data collection, electricity and gasoline, access road maintenance, equipment repair, limestone gravel and caustic soda. Standard O&M costs also include contracts and grants between PBMP and third-party groups or foundations for the O&M work on selected sites.

Active water treatment systems typically have a higher O&M cost than passive treatment systems. The annual O&M costs are consistent in successive years for the water testing and treatment materials. Material fluctuations for individual years at a site is not uncommon. Examples of cost fluctuations in a year at a site could be related to a weather event that restricts access to a site or causes part of a gravel drain to be repaired.

Standard O&M costs are estimated by selecting an average per site O&M cost and multiplying the cost by the number of ABS legacy sites.

The 2019 Annual Report Certifying Work Performed at ABS Legacy Sites contains 73 sites on the ABS legacy sites list that require annual operations and maintenance costs. The annual O&M cost per site is selected based on historical ABS legacy sites O&M costs from the Primacy Bond Fund Tracking systems and AMD Treat cost estimates for available ABS legacy sites.

Recapitalization Costs

Recapitalization costs are to rebuild treatment facilities at ABS legacy sites once they no longer function.

Recapitalization costs are selected based on AMD Treat estimated recapitalization costs. An average life span for a water treatment system is selected based on estimated life spans from Program Amendment estimates and discussions with PBMP. The average life span implies an annual percent depreciation for a site. A life span of 20 years implies an average depreciation of 5% of recapitalization costs. The average reconstruction cost is multiplied by the annual depreciation to get an annual recapitalization cost. The annual recapitalization cost is then multiplied by the number of ABS legacy sites to determine an annual recapitalization cost. The estimate uses an annual depreciation cost and does not estimate the current age, cost and timing for the spending on each individual treatment system.

Design and Construction Costs

Design and construction costs are to build the necessary treatment facilities for Potential ABS Legacy Sites if the mine operator were to default on its obligation to adequately treat the postmining pollution discharges from the site.

The 2019 Annual Report Certifying Work Performed at ABS Legacy Sites contains 29 sites on the Potential ABS Legacy Sites list. The 29 sites represent the potential ABS legacy sites when the settlement was reached on 11/2/2016 then amended and subsequently approved on 7/10/2017. Currently, 21 of the 29 sites are fully funded. Based on discussions with PBMP the 6 Cooney Brothers

sites on the list have a material chance of forfeiture. There is currently no information to suspect forfeiture at the other 2 sites (Dilltown Prep Plant and LCN Mine).

For the 2 non-Cooney sites a bond forfeiture rate is selected based on historical ratios. Construction and design costs are selected based on historical average costs. The selected forfeiture rate is applied to the 2 sites to determine the expected future frequency of forfeitures which is multiplied by the expected design and construction costs.

Cooney Sites O&M Costs

The Cooney sites are currently listed as potential ABS legacy sites and are not fully funded. There is currently a trust fund in place and other revenues coming from the sites, from windmills, that are used to offset some of the O&M costs. The treatment of the Cooney Brothers sites is based on discussions with PBMP.

Standard O&M costs for the 6 Cooney Brothers sites are based on current annual costs for the sites. Recapitalization costs for the Cooney Brothers sites are based on historical averages for active sites. No additional design and construction costs are anticipated for the Cooney Brothers sites. The revenue estimates do not include a provision for expected future revenue from the Cooney trust fund or other sources from the Cooney sites.

Cost estimates and ranges are reasonable estimates based on historical cost levels. The estimates do not contemplate future changes in economic conditions, law changes or other extraordinary future events not specifically listed. A cost trend factor is applied to the cost estimates to reflect future price changes. The cost trend factor is selected based on discussions with PBMP and is in line with long term changes in the consumer price index.

Alternative Bonding System Revenue Sources

An estimate of the future revenue for the Alternative Bonding System (ABS) includes the reclamation fee, interest on account funds, civil penalties and other sources.

Reclamation Fee

The Pennsylvania Department of Environmental Protection (DEP) can assess a per acre reclamation fee on applications to conduct surface mining activities on new acreage to pay for the construction costs and operation and maintenance costs (O&M) associated with treating postmining pollution discharges at ABS legacy sites.

The reclamation fee has historically been no charge per acre except for 2016 where the fee was \$100 per acre and \$117,052 was collected in reclamation fees. The reclamation fee is determined annually by the DEP and can be used to supplement funding of O&M costs for ABS legacy sites. The reclamation fee can be used in future years to insure sufficient revenues for the ABS O&M costs. The estimate assumes no reclamation fee is collected in the future.

Interest

The DEP credits interest based on funds held in the account. Funds held in the account are invested by the Treasurer as outlined in the Investment Policy Statement from the Commonwealth of Pennsylvania. Funds are held in the Short-Term Investment Pool - Pool 99 (STIP). The primary object of STIP is to preserve principal and maintain a net asset value. STIP investments consist of fixed-income securities, primarily of short duration, time deposits, money market funds, or a line of credit. STIP performance is compared to the three-month U.S. Treasury bill.

The analysis uses the ABS Legacy Sites Trust as the future holding account to pay future O&M costs. Historical returns are also shown for the ABS Legacy Sites Trust Account and the Reclamation Fee O&M Trust Account. The current trust accounts and/or additional capital funds may be combined into the trust fund for future O&M costs.

Historical performance from the Short-Term Investment Pool - Pool 99 and the three-month U.S. Treasury bill are used to select the future annual return on the ABS Legacy Sites Trust.

Interest on the ABS legacy sites Trust for future years is calculated as the fund balance at the beginning of the year times the selected rate of return.

The range of interest rates is selected based on historical STIP returns and three-month U.S. Treasury bill yields.

Civil Penalties

A portion of the civil penalties collected by the DEP have historically been made available to pay O&M costs on ABS legacy sites.

Civil penalties in future years are estimated as an average of historical civil penalties allocated to the Reclamation Fee O&M Trust Account. The current average is trended forward using the selected civil penalties trend. The civil penalties trend is selected based on discussions with PBMP.

Other Revenue Sources

The DEP may use other revenue sources, for example the interest on other funds, to pay O&M costs on ABS legacy sites. The estimate assumes no future Other Revenue Sources will be collected although they could be added to the trust fund in the future to insure sufficient revenues for the ABS O&M costs.

Revenue estimates and ranges are reasonable estimates based on historical levels and performance. The estimates do not contemplate future changes in economic conditions, investment returns, law changes or other events not specifically listed.

Assumptions

The cost estimates and revenue sources are based on the assumptions in the following table.

**Pennsylvania Bureau of Mining Programs
Summary of Modelling Assumptions
06/30/2020 Analysis**

Assumption	Low Scenario	Intermediate Scenario	High Scenario	Exhibit
O&M Costs				
<u>Active Sites</u>				
ABS Legacy Sites	20	20	20	ABS Legacy Site Count
Annual Per Site O&M Costs	30,000	40,000	50,000	Summary O&M Costs - Active
Treatments per Site	2.0	2.5	3.0	Summary O&M Costs - Active
Per Treatment Annual O&M Costs	15,000	16,000	16,667	Summary O&M Costs - Active
Recapitalization Costs	55,000	70,000	85,000	Summary O&M Costs - Active
Performance Life Span	20	18	15	Summary O&M Costs - Active
Construction Costs	100,000	125,000	150,000	Summary O&M Costs - Active
Design Costs	5,000	7,500	10,000	Summary O&M Costs - Active
<u>Passive Sites</u>				
ABS Legacy Sites	53	53	53	ABS Legacy Site Count
Annual Per Site O&M Costs	2,500	3,500	5,500	Summary O&M Costs - Passive
Treatments per Site	1.5	2.0	2.5	Summary O&M Costs - Passive
Per Treatment Annual O&M Costs	1,667	1,750	2,200	Summary O&M Costs - Passive
Recapitalization Costs	27,500	35,000	42,500	Summary O&M Costs - Passive
Performance Life Span	20	18	15	Summary O&M Costs - Passive
Construction Costs	45,000	60,000	80,000	Summary O&M Costs - Passive
Design Costs	3,500	5,000	6,500	Summary O&M Costs - Passive
Future Forfeiture Rates and Costs				
<u>Non-Cooney Brothers Sites</u>				
Potential ABS Legacy Sites	2	2	2	ABS Legacy Site Count
Potential ABS Legacy Sites Forfeiture Rate	10.0%	20.0%	30.0%	ABS Legacy Site Count
Potential ABS Legacy Sites Forfeitures	0.20	0.40	0.60	ABS Legacy Site Count
Overall Forfeiture Rate	0.4%	0.7%	1.0%	Bond Forfeiture Rates
<u>Cooney Brothers</u>				
2020 ABS Legacy Sites	6	6	6	ABS Legacy Site Count
2020 Total O&M Costs	900,000	1,000,000	1,150,000	ABS Legacy Site Count
2020 Per Site O&M Costs	150,000	166,667	191,667	ABS Legacy Site Count
Discount and Trend Rates				
Short Term Investment Pool Return and Discount Rate	1.50%	0.75%	0.25%	STIP Pool 99 Returns
O&M Cost Trend	2.00%	3.00%	4.00%	Selected
2020 Civil Penalties	300,000	250,000	200,000	Selected
Civil Penalties Trend	0.00%	0.00%	-0.50%	Selected

Cash Flow of O&M Cost Estimate

The table below summarizes the expected cash flow of the Total O&M costs for the ABS liability estimate.

**Pennsylvania Bureau of Mining Programs
ABS Cash Flow Estimates as of 06/30/2020
Summary of O&M Costs**

Year	Low Scenario	Intermediate Scenario	High Scenario
2020	888,438	1,097,750	1,369,500
2021	1,832,817	2,268,245	2,834,350
2022	1,888,302	2,337,654	2,922,093
2023	1,945,466	2,409,187	3,012,549
2024	2,004,361	2,482,907	3,105,802
2025	2,065,038	2,558,883	3,201,939
2026	2,124,496	2,629,207	3,285,770
2027	2,188,231	2,708,083	3,384,343
2028	2,253,878	2,789,325	3,485,874
2029	2,321,494	2,873,005	3,590,450
2030 to 2039	27,411,732	33,923,857	42,395,298
2040 to 2049	36,839,076	45,590,827	56,975,735
2050 to 2059	49,508,637	61,270,260	76,570,624
2060 to 2069	66,535,469	82,342,105	102,904,516
2070 to 2079	89,418,106	110,660,904	138,295,064
2080 to 2089	120,170,458	148,719,002	185,857,002
2090 to 2094	74,793,213	92,561,618	115,676,038
Total	484,189,213	599,222,820	748,866,947

Observations

- Treatment costs at individual sites have significant variance by year and between sites. Actual cost data should be monitored against expected costs to determine the impact on the required fund balance.
- The return on trust account investments and O&M cost inflation changes can vary significantly based on economic and other factors. Divergence between the rate of return and O&M cost inflation will have a material impact on the fund balance.
- The estimates include the cost estimates for the Cooney sites but do not include a provision for expected future payments from the trust fund or other revenue sources from the Cooney sites. Available trust funds or other revenue sources from the Cooney sites could be material and offset the estimated costs for the Cooney sites.

Data

In developing the projected liabilities, we have relied on the following data:

1. Annual Report Certifying Work Performed at Alternative Bonding System (ABS) Legacy Sites - reports from 2016 through 2019, published on January 31 each year certifying the progress made during the preceding calendar year toward satisfying the obligations under the ABS.
2. Reclamation Fee Fiscal Year Report from 2009 through 2019 which includes the calculation of the required amount of the per acre reclamation fee on new acreage and used to pay the construction costs and operation and maintenance costs associated with treating postmining pollution discharges at ABS legacy sites
3. Program Amendment dated 11/14/2016 to define the implementation under the approved ABS program amendment.
4. Pennsylvania short-term investment pool returns from 2008 through 2018. (POOL 99 RETURNS FY 2008-2018.xlsx)
5. Pennsylvania historical bond forfeiture rates. (BF_Frequency_Dec_2019.xlsx)
6. Cooney Brothers Coal Company history of trust balances. (Cooney Costs (Trust History).pdf)
7. Program amendment recapitalization cost estimates summary. (Att_10_Recap_Cost_Data_7-25-08)
8. Expenditures on O&M costs by type of cost. (ABS Costs.xlsx)
9. Historical annual O&M costs for select sites (PBF Fund Tracking - SHORT Form 2020-05-05 15_01_38.xlsx)
10. AMS Treat 2008 O&M cost estimates for ABS legacy sites. (AMD Treat Main Cost Form)
11. Type and number of treatments currently at current ABS legacy sites. (ABS Treatment Type.xlsx)
12. O&M cost summary for ABS legacy sites. (ABS Acid Mine Drainage Treatment Facility Costs (For Actuarial Project).docx)

Description of Exhibits

ABS Financial Summary - contains detailed revenue projections for the reclamation fee, interest and civil penalties, summary O&M costs and summary of the trust fund ending balance by year

O&M Cost Forecast Total – ABS legacy site projected count, detailed cost projections for the standard O&M costs, recapitalization costs and potential future ABS sites construction costs by year, costs are also discounted at the STIP return

O&M Cost Forecast Active - active ABS legacy site projected count, detailed active sites cost projections for the standard O&M costs, recapitalization costs and potential future ABS sites construction costs by year

O&M Cost Forecast Passive - passive ABS legacy site projected count, detailed passive sites cost projections for the standard O&M costs, recapitalization costs and potential future ABS sites construction costs by year

O&M Cost Forecast Cooney – Cooney sites detailed cost projections for the standard O&M costs and recapitalization costs by year

The financial summary and cost forecast exhibits for the high and low scenarios are contained in the appendix.

Summary O&M Costs – Active – displays summary statistics of active ABS legacy sites including O&M costs, design costs and construction costs, selections for active sites are made for annual O&M costs, recapitalization costs, design costs, construction costs and treatment system performance life span

Summary O&M Costs – Passive – displays summary statistics of passive ABS legacy sites including O&M costs, design costs and construction costs, selections for passive sites are made for annual O&M costs, recapitalization costs, design costs, construction costs and treatment system performance life span

Treatment Types by Site – displays the count of active, passive and hybrid treatments by ABS site

AMD Treat Cost Estimates – displays a summary of ABS sites treatment costs based on 2008 AMD Treat estimates for capital costs, O&M costs and major categories of O&M costs, the costs are also projected to current cost levels

PBF Fund Tracking History – annual historical O&M payments for select sites

2019 Fiscal Year Costs - historical O&M payments by type of expenditure

ABS Legacy Site Count – displays the status of sites identified in the ABS settlement agreement including count of potential ABS legacy sites, ABS legacy sites needing land reclamation work and ABS legacy sites needing treatment system work, selections are made for ABS legacy site count and additional site forfeitures

Recapitalization Costs - displays a summary of ABS sites recapitalization costs based on 2008 estimates, the costs are also projected to current cost levels

Cooney Bros. Costs – historical trust valuations for the Cooney Brothers Coal Company

Bond Forfeiture Rates – historical bond forfeiture rates and the selection of a future bond forfeiture rate

STIP Pool 99 Returns – historical Pennsylvania Short-Term Investment Pool (Pool 99) returns, the investment return on funds is selected

ABS Legacy Sites Trust Account – historical income and year-end balance of the ABS Legacy Sites Trust Account

Revenue Rec Fee O&M Trust – historical revenue sources of the Reclamation Fee O&M Trust Account including the reclamation fee, interest and civil penalties

Costs Rec Fee O&M Trust - historical expenditures of the Reclamation Fee O&M Trust Account including personnel costs, lab costs, grants, contracts and materials

Appendix - financial summary and cost forecast exhibits for the high and low scenarios

About Aon

Aon plc (NYSE:AON) is the leading global provider of risk management, insurance and reinsurance brokerage, and human resources solutions and outsourcing services. Through its more than 66,000 colleagues worldwide, Aon unites to empower results for clients in over 120 countries via innovative and effective risk and people solutions and through industry-leading global resources and technical expertise. Aon has been named repeatedly as the world's best broker, best insurance intermediary, best reinsurance intermediary, best captives manager, and best employee benefits consulting firm by multiple industry sources. Visit aon.com for more information on Aon and aon.com/manchesterunited to learn about Aon's global partnership with Manchester United.

**Pennsylvania Bureau of Mining Programs
ABS Financial Forecast as of 06/30/2020
Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Reclamation Fee	Interest - ABS Legacy Sites Trust	Civil Penalties	Other Revenue Sources	Total O&M Revenue	Total O&M Costs	Future Trust for ABS Legacy Sites - Ending Balance
06/30/2020							401,271,950
2020	0	1,504,770	125,000	0	1,629,770	1,097,750	401,803,970
2021	0	3,013,530	250,000	0	3,263,530	2,268,245	402,799,255
2022	0	3,020,994	250,000	0	3,270,994	2,337,654	403,732,595
2023	0	3,027,994	250,000	0	3,277,994	2,409,187	404,601,403
2024	0	3,034,511	250,000	0	3,284,511	2,482,907	405,403,006
2025	0	3,040,523	250,000	0	3,290,523	2,558,883	406,134,646
2026	0	3,046,010	250,000	0	3,296,010	2,629,207	406,801,449
2027	0	3,051,011	250,000	0	3,301,011	2,708,083	407,394,377
2028	0	3,055,458	250,000	0	3,305,458	2,789,325	407,910,509
2029	0	3,059,329	250,000	0	3,309,329	2,873,005	408,346,833
2030	0	3,062,601	250,000	0	3,312,601	2,959,195	408,700,239
2031	0	3,065,252	250,000	0	3,315,252	3,047,971	408,967,520
2032	0	3,067,256	250,000	0	3,317,256	3,139,410	409,145,366
2033	0	3,068,590	250,000	0	3,318,590	3,233,593	409,230,364
2034	0	3,069,228	250,000	0	3,319,228	3,330,600	409,218,991
2035	0	3,069,142	250,000	0	3,319,142	3,430,518	409,107,615
2036	0	3,068,307	250,000	0	3,318,307	3,533,434	408,892,488
2037	0	3,066,694	250,000	0	3,316,694	3,639,437	408,569,745
2038	0	3,064,273	250,000	0	3,314,273	3,748,620	408,135,398
2039	0	3,061,015	250,000	0	3,311,015	3,861,079	407,585,335
2040	0	3,056,890	250,000	0	3,306,890	3,976,911	406,915,314
2041	0	3,051,865	250,000	0	3,301,865	4,096,218	406,120,961
2042	0	3,045,907	250,000	0	3,295,907	4,219,105	405,197,763
2043	0	3,038,983	250,000	0	3,288,983	4,345,678	404,141,068
2044	0	3,031,058	250,000	0	3,281,058	4,476,048	402,946,078
2045	0	3,022,096	250,000	0	3,272,096	4,610,330	401,607,844
2046	0	3,012,059	250,000	0	3,262,059	4,748,640	400,121,263
2047	0	3,000,909	250,000	0	3,250,909	4,891,099	398,481,073
2048	0	2,988,608	250,000	0	3,238,608	5,037,832	396,681,850
2049	0	2,975,114	250,000	0	3,225,114	5,188,967	394,717,997
2050	0	2,960,385	250,000	0	3,210,385	5,344,636	392,583,746
2051	0	2,944,378	250,000	0	3,194,378	5,504,975	390,273,149
2052	0	2,927,049	250,000	0	3,177,049	5,670,124	387,780,074
2053	0	2,908,351	250,000	0	3,158,351	5,840,228	385,098,196
2054	0	2,888,236	250,000	0	3,138,236	6,015,435	382,220,998
2055	0	2,866,657	250,000	0	3,116,657	6,195,898	379,141,758
2056	0	2,843,563	250,000	0	3,093,563	6,381,775	375,853,547
2057	0	2,818,902	250,000	0	3,068,902	6,573,228	372,349,220
2058	0	2,792,619	250,000	0	3,042,619	6,770,425	368,621,415
2059	0	2,764,661	250,000	0	3,014,661	6,973,537	364,662,538
2060	0	2,734,969	250,000	0	2,984,969	7,182,744	360,464,763
2061	0	2,703,486	250,000	0	2,953,486	7,398,226	356,020,023
2062	0	2,670,150	250,000	0	2,920,150	7,620,173	351,320,001
2063	0	2,634,900	250,000	0	2,884,900	7,848,778	346,356,123
2064	0	2,597,671	250,000	0	2,847,671	8,084,241	341,119,553
2065	0	2,558,397	250,000	0	2,808,397	8,326,768	335,601,181

**Pennsylvania Bureau of Mining Programs
ABS Financial Forecast as of 06/30/2020
Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Year	Interest - ABS Legacy			Other Revenue		Total O&M Revenue	Total O&M Costs	Future Trust for ABS Legacy Sites - Ending Balance
	Reclamation Fee	Sites Trust	Civil Penalties	Sources				
2066	0	2,517,009	250,000	0	2,767,009	8,576,571	329,791,618	
2067	0	2,473,437	250,000	0	2,723,437	8,833,869	323,681,187	
2068	0	2,427,609	250,000	0	2,677,609	9,098,885	317,259,911	
2069	0	2,379,449	250,000	0	2,629,449	9,371,851	310,517,509	
2070	0	2,328,881	250,000	0	2,578,881	9,653,007	303,443,384	
2071	0	2,275,825	250,000	0	2,525,825	9,942,597	296,026,612	
2072	0	2,220,200	250,000	0	2,470,200	10,240,875	288,255,937	
2073	0	2,161,920	250,000	0	2,411,920	10,548,101	280,119,755	
2074	0	2,100,898	250,000	0	2,350,898	10,864,544	271,606,109	
2075	0	2,037,046	250,000	0	2,287,046	11,190,480	262,702,675	
2076	0	1,970,270	250,000	0	2,220,270	11,526,195	253,396,750	
2077	0	1,900,476	250,000	0	2,150,476	11,871,981	243,675,245	
2078	0	1,827,564	250,000	0	2,077,564	12,228,140	233,524,669	
2079	0	1,751,435	250,000	0	2,001,435	12,594,984	222,931,120	
2080	0	1,671,983	250,000	0	1,921,983	12,972,834	211,880,269	
2081	0	1,589,102	250,000	0	1,839,102	13,362,019	200,357,352	
2082	0	1,502,680	250,000	0	1,752,680	13,762,879	188,347,153	
2083	0	1,412,604	250,000	0	1,662,604	14,175,766	175,833,991	
2084	0	1,318,755	250,000	0	1,568,755	14,601,039	162,801,707	
2085	0	1,221,013	250,000	0	1,471,013	15,039,070	149,233,650	
2086	0	1,119,252	250,000	0	1,369,252	15,490,242	135,112,660	
2087	0	1,013,345	250,000	0	1,263,345	15,954,949	120,421,056	
2088	0	903,158	250,000	0	1,153,158	16,433,598	105,140,616	
2089	0	788,555	250,000	0	1,038,555	16,926,606	89,252,565	
2090	0	669,394	250,000	0	919,394	17,434,404	72,737,555	
2091	0	545,532	250,000	0	795,532	17,957,436	55,575,651	
2092	0	416,817	250,000	0	666,817	18,496,159	37,746,309	
2093	0	283,097	250,000	0	533,097	19,051,044	19,228,362	
2094	0	144,213	250,000	0	394,213	19,622,575	0	

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2], [4] and [5] selected
- 3) [3] = prior year [8] x STIP Return
- 3) [6] = sum [2] through [5]
- 4) [7] from O&M Cost Forecast Total
- 5) [8] = prior year [8] + [6] - [7]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	ABS Legacy Sites - Total	Total Standard O&M Costs	Total Recapitalization Costs	Total Cooney Sites O&M Costs	Total Potential ABS Sites Design and Construction Costs	Total O&M Costs	Discounted O&M Costs
2020	73	492,750	93,000	512,000	0	1,097,750	1,097,750
2021	73	1,015,065	191,580	1,054,720	6,880	2,268,245	2,251,360
2022	73.08	1,046,663	197,544	1,086,362	7,086	2,337,654	2,302,980
2023	73.16	1,079,243	203,693	1,118,952	7,299	2,409,187	2,355,783
2024	73.24	1,112,836	210,033	1,152,521	7,518	2,482,907	2,409,796
2025	73.32	1,147,473	216,570	1,187,097	7,743	2,558,883	2,465,047
2026	73.4	1,183,186	223,311	1,222,710	0	2,629,207	2,513,937
2027	73.4	1,218,682	230,010	1,259,391	0	2,708,083	2,570,080
2028	73.4	1,255,242	236,910	1,297,173	0	2,789,325	2,627,476
2029	73.4	1,292,900	244,018	1,336,088	0	2,873,005	2,686,154
2030	73.4	1,331,687	251,338	1,376,170	0	2,959,195	2,746,143
2031	73.4	1,371,637	258,878	1,417,455	0	3,047,971	2,807,471
2032	73.4	1,412,786	266,645	1,459,979	0	3,139,410	2,870,169
2033	73.4	1,455,170	274,644	1,503,779	0	3,233,593	2,934,267
2034	73.4	1,498,825	282,883	1,548,892	0	3,330,600	2,999,796
2035	73.4	1,543,790	291,370	1,595,359	0	3,430,518	3,066,789
2036	73.4	1,590,104	300,111	1,643,219	0	3,533,434	3,135,278
2037	73.4	1,637,807	309,114	1,692,516	0	3,639,437	3,205,297
2038	73.4	1,686,941	318,388	1,743,291	0	3,748,620	3,276,879
2039	73.4	1,737,549	327,939	1,795,590	0	3,861,079	3,350,060
2040	73.4	1,789,676	337,777	1,849,458	0	3,976,911	3,424,875
2041	73.4	1,843,366	347,911	1,904,942	0	4,096,218	3,501,361
2042	73.4	1,898,667	358,348	1,962,090	0	4,219,105	3,579,556
2043	73.4	1,955,627	369,099	2,020,953	0	4,345,678	3,659,496
2044	73.4	2,014,296	380,171	2,081,581	0	4,476,048	3,741,222
2045	73.4	2,074,725	391,577	2,144,029	0	4,610,330	3,824,773
2046	73.4	2,136,966	403,324	2,208,349	0	4,748,640	3,910,189
2047	73.4	2,201,075	415,424	2,274,600	0	4,891,099	3,997,514
2048	73.4	2,267,108	427,886	2,342,838	0	5,037,832	4,086,788
2049	73.4	2,335,121	440,723	2,413,123	0	5,188,967	4,178,056
2050	73.4	2,405,174	453,945	2,485,517	0	5,344,636	4,271,363
2051	73.4	2,477,330	467,563	2,560,082	0	5,504,975	4,366,753
2052	73.4	2,551,650	481,590	2,636,885	0	5,670,124	4,464,274
2053	73.4	2,628,199	496,038	2,715,991	0	5,840,228	4,563,972
2054	73.4	2,707,045	510,919	2,797,471	0	6,015,435	4,665,897
2055	73.4	2,788,256	526,246	2,881,395	0	6,195,898	4,770,098
2056	73.4	2,871,904	542,034	2,967,837	0	6,381,775	4,876,626
2057	73.4	2,958,061	558,295	3,056,872	0	6,573,228	4,985,534
2058	73.4	3,046,803	575,043	3,148,578	0	6,770,425	5,096,873
2059	73.4	3,138,207	592,295	3,243,036	0	6,973,537	5,210,699
2060	73.4	3,232,353	610,064	3,340,327	0	7,182,744	5,327,067
2061	73.4	3,329,324	628,366	3,440,536	0	7,398,226	5,446,034
2062	73.4	3,429,204	647,217	3,543,753	0	7,620,173	5,567,657
2063	73.4	3,532,080	666,633	3,650,065	0	7,848,778	5,691,997
2064	73.4	3,638,042	686,632	3,759,567	0	8,084,241	5,819,114
2065	73.4	3,747,183	707,231	3,872,354	0	8,326,768	5,949,069

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	ABS Legacy Sites - Total	Total Standard O&M Costs	Total Recapitalization Costs	Total Cooney Sites O&M Costs	Total Potential ABS Sites Design and Construction Costs	Total O&M Costs	Discounted O&M Costs
2066	73.4	3,859,599	728,448	3,988,525	0	8,576,571	6,081,927
2067	73.4	3,975,387	750,301	4,108,181	0	8,833,869	6,217,751
2068	73.4	4,094,648	772,810	4,231,426	0	9,098,885	6,356,609
2069	73.4	4,217,488	795,995	4,358,369	0	9,371,851	6,498,568
2070	73.4	4,344,012	819,875	4,489,120	0	9,653,007	6,643,698
2071	73.4	4,474,333	844,471	4,623,793	0	9,942,597	6,792,068
2072	73.4	4,608,563	869,805	4,762,507	0	10,240,875	6,943,752
2073	73.4	4,746,820	895,899	4,905,382	0	10,548,101	7,098,824
2074	73.4	4,889,224	922,776	5,052,544	0	10,864,544	7,257,358
2075	73.4	5,035,901	950,459	5,204,120	0	11,190,480	7,419,433
2076	73.4	5,186,978	978,973	5,360,244	0	11,526,195	7,585,128
2077	73.4	5,342,587	1,008,342	5,521,051	0	11,871,981	7,754,522
2078	73.4	5,502,865	1,038,592	5,686,683	0	12,228,140	7,927,700
2079	73.4	5,667,951	1,069,750	5,857,283	0	12,594,984	8,104,746
2080	73.4	5,837,990	1,101,843	6,033,002	0	12,972,834	8,285,745
2081	73.4	6,013,129	1,134,898	6,213,992	0	13,362,019	8,470,787
2082	73.4	6,193,523	1,168,945	6,400,411	0	13,762,879	8,659,960
2083	73.4	6,379,329	1,204,013	6,592,424	0	14,175,766	8,853,359
2084	73.4	6,570,709	1,240,134	6,790,196	0	14,601,039	9,051,077
2085	73.4	6,767,830	1,277,338	6,993,902	0	15,039,070	9,253,210
2086	73.4	6,970,865	1,315,658	7,203,719	0	15,490,242	9,459,857
2087	73.4	7,179,991	1,355,128	7,419,831	0	15,954,949	9,671,120
2088	73.4	7,395,390	1,395,781	7,642,426	0	16,433,598	9,887,100
2089	73.4	7,617,252	1,437,655	7,871,699	0	16,926,606	10,107,904
2090	73.4	7,845,770	1,480,785	8,107,850	0	17,434,404	10,333,639
2091	73.4	8,081,143	1,525,208	8,351,085	0	17,957,436	10,564,415
2092	73.4	8,323,577	1,570,964	8,601,618	0	18,496,159	10,800,344
2093	73.4	8,573,284	1,618,093	8,859,666	0	19,051,044	11,041,543
2094	73.4	8,830,483	1,666,636	9,125,456	0	19,622,575	11,288,129
Total		269,634,396	50,889,901	278,661,996	36,526	599,222,820	417,059,642

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] through [8] from O&M Cost Forecast Active, O&M Cost Forecast Passive and O&M Cost Forecast Cooney

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Active Sites - Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Active	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Active ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Active O&M Costs
2020	20.00	40,000	400,000	70,000	40,000	0	132,500	0	440,000
2021	20.00	41,200	824,000	72,100	82,400	0.02	136,475	2,991	909,391
2022	20.02	42,436	849,650	74,263	84,965	0.02	140,569	3,081	937,696
2023	20.04	43,709	876,098	76,491	87,610	0.02	144,786	3,173	966,881
2024	20.07	45,020	903,367	78,786	90,337	0.02	149,130	3,269	996,973
2025	20.09	46,371	931,485	81,149	93,148	0.02	153,604	3,367	1,028,000
2026	20.11	47,762	960,476	83,584	96,048	0	158,212	0	1,056,524
2027	20.11	49,195	989,290	86,091	98,929	0	162,958	0	1,088,219
2028	20.11	50,671	1,018,969	88,674	101,897	0	167,847	0	1,120,866
2029	20.11	52,191	1,049,538	91,334	104,954	0	172,882	0	1,154,492
2030	20.11	53,757	1,081,024	94,074	108,102	0	178,069	0	1,189,127
2031	20.11	55,369	1,113,455	96,896	111,345	0	183,411	0	1,224,800
2032	20.11	57,030	1,146,859	99,803	114,686	0	188,913	0	1,261,544
2033	20.11	58,741	1,181,264	102,797	118,126	0	194,581	0	1,299,391
2034	20.11	60,504	1,216,702	105,881	121,670	0	200,418	0	1,338,373
2035	20.11	62,319	1,253,203	109,058	125,320	0	206,431	0	1,378,524
2036	20.11	64,188	1,290,799	112,329	129,080	0	212,624	0	1,419,879
2037	20.11	66,114	1,329,523	115,699	132,952	0	219,002	0	1,462,476
2038	20.11	68,097	1,369,409	119,170	136,941	0	225,572	0	1,506,350
2039	20.11	70,140	1,410,491	122,745	141,049	0	232,340	0	1,551,541
2040	20.11	72,244	1,452,806	126,428	145,281	0	239,310	0	1,598,087
2041	20.11	74,412	1,496,390	130,221	149,639	0	246,489	0	1,646,029
2042	20.11	76,644	1,541,282	134,127	154,128	0	253,884	0	1,695,410
2043	20.11	78,943	1,587,521	138,151	158,752	0	261,500	0	1,746,273
2044	20.11	81,312	1,635,146	142,296	163,515	0	269,345	0	1,798,661
2045	20.11	83,751	1,684,201	146,564	168,420	0	277,426	0	1,852,621
2046	20.11	86,264	1,734,727	150,961	173,473	0	285,748	0	1,908,199
2047	20.11	88,852	1,786,768	155,490	178,677	0	294,321	0	1,965,445
2048	20.11	91,517	1,840,371	160,155	184,037	0	303,150	0	2,024,409
2049	20.11	94,263	1,895,583	164,960	189,558	0	312,245	0	2,085,141
2050	20.11	97,090	1,952,450	169,908	195,245	0	321,612	0	2,147,695
2051	20.11	100,003	2,011,024	175,006	201,102	0	331,261	0	2,212,126
2052	20.11	103,003	2,071,354	180,256	207,135	0	341,198	0	2,278,490
2053	20.11	106,093	2,133,495	185,663	213,349	0	351,434	0	2,346,844
2054	20.11	109,276	2,197,500	191,233	219,750	0	361,977	0	2,417,250
2055	20.11	112,554	2,263,425	196,970	226,342	0	372,837	0	2,489,767
2056	20.11	115,931	2,331,327	202,879	233,133	0	384,022	0	2,564,460
2057	20.11	119,409	2,401,267	208,966	240,127	0	395,543	0	2,641,394
2058	20.11	122,991	2,473,305	215,235	247,331	0	407,409	0	2,720,636
2059	20.11	126,681	2,547,504	221,692	254,750	0	419,631	0	2,802,255
2060	20.11	130,482	2,623,930	228,343	262,393	0	432,220	0	2,886,323
2061	20.11	134,396	2,702,647	235,193	270,265	0	445,187	0	2,972,912
2062	20.11	138,428	2,783,727	242,249	278,373	0	458,542	0	3,062,100
2063	20.11	142,581	2,867,239	249,516	286,724	0	472,298	0	3,153,963
2064	20.11	146,858	2,953,256	257,002	295,326	0	486,467	0	3,248,581
2065	20.11	151,264	3,041,854	264,712	304,185	0	501,061	0	3,346,039
2066	20.11	155,802	3,133,109	272,653	313,311	0	516,093	0	3,446,420
2067	20.11	160,476	3,227,102	280,833	322,710	0	531,576	0	3,549,813

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Active Sites - Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Active	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Active ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Active O&M Costs
2068	20.11	165,290	3,323,915	289,258	332,392	0	547,523	0	3,656,307
2069	20.11	170,249	3,423,633	297,935	342,363	0	563,949	0	3,765,996
2070	20.11	175,356	3,526,342	306,873	352,634	0	580,868	0	3,878,976
2071	20.11	180,617	3,632,132	316,080	363,213	0	598,294	0	3,995,345
2072	20.11	186,035	3,741,096	325,562	374,110	0	616,242	0	4,115,206
2073	20.11	191,616	3,853,329	335,329	385,333	0	634,730	0	4,238,662
2074	20.11	197,365	3,968,929	345,389	396,893	0	653,772	0	4,365,822
2075	20.11	203,286	4,087,997	355,750	408,800	0	673,385	0	4,496,796
2076	20.11	209,385	4,210,637	366,423	421,064	0	693,586	0	4,631,700
2077	20.11	215,666	4,336,956	377,416	433,696	0	714,394	0	4,770,651
2078	20.11	222,136	4,467,064	388,738	446,706	0	735,826	0	4,913,771
2079	20.11	228,800	4,601,076	400,400	460,108	0	757,900	0	5,061,184
2080	20.11	235,664	4,739,109	412,412	473,911	0	780,637	0	5,213,020
2081	20.11	242,734	4,881,282	424,785	488,128	0	804,057	0	5,369,410
2082	20.11	250,016	5,027,720	437,528	502,772	0	828,178	0	5,530,492
2083	20.11	257,517	5,178,552	450,654	517,855	0	853,024	0	5,696,407
2084	20.11	265,242	5,333,909	464,174	533,391	0	878,614	0	5,867,299
2085	20.11	273,199	5,493,926	478,099	549,393	0	904,973	0	6,043,318
2086	20.11	281,395	5,658,744	492,442	565,874	0	932,122	0	6,224,618
2087	20.11	289,837	5,828,506	507,215	582,851	0	960,086	0	6,411,357
2088	20.11	298,532	6,003,361	522,431	600,336	0	988,888	0	6,603,697
2089	20.11	307,488	6,183,462	538,104	618,346	0	1,018,555	0	6,801,808
2090	20.11	316,713	6,368,966	554,248	636,897	0	1,049,111	0	7,005,862
2091	20.11	326,214	6,560,035	570,875	656,003	0	1,080,585	0	7,216,038
2092	20.11	336,001	6,756,836	588,001	675,684	0	1,113,002	0	7,432,519
2093	20.11	346,081	6,959,541	605,641	695,954	0	1,146,392	0	7,655,495
2094	20.11	356,463	7,168,327	623,810	716,833	0	1,180,784	0	7,885,160
Total			218,881,296		21,888,130	0.11		15,881	240,785,306

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] from ABS Legacy Site Count
- 3) [3], [5] and [8] from Summary O&M Costs - Active
- 4) [4] = [2] x [3]
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Passive Sites - Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Passive	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Passive ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Passive O&M Costs
2020	53.00	3,500	92,750	35,000	53,000	0	65,000	0	145,750
2021	53.00	3,605	191,065	36,050	109,180	0.06	66,950	3,889	304,134
2022	53.06	3,713	197,013	37,132	112,579	0.06	68,959	4,005	313,597
2023	53.12	3,825	203,145	38,245	116,083	0.06	71,027	4,125	323,353
2024	53.17	3,939	209,468	39,393	119,696	0.06	73,158	4,249	333,414
2025	53.23	4,057	215,988	40,575	123,422	0.06	75,353	4,377	343,786
2026	53.29	4,179	222,710	41,792	127,263	0	77,613	0	349,973
2027	53.29	4,305	229,392	43,046	131,081	0	79,942	0	360,473
2028	53.29	4,434	236,273	44,337	135,013	0	82,340	0	371,287
2029	53.29	4,567	243,362	45,667	139,064	0	84,810	0	382,425
2030	53.29	4,704	250,662	47,037	143,236	0	87,355	0	393,898
2031	53.29	4,845	258,182	48,448	147,533	0	89,975	0	405,715
2032	53.29	4,990	265,928	49,902	151,959	0	92,674	0	417,887
2033	53.29	5,140	273,906	51,399	156,518	0	95,455	0	430,423
2034	53.29	5,294	282,123	52,941	161,213	0	98,318	0	443,336
2035	53.29	5,453	290,587	54,529	166,049	0	101,268	0	456,636
2036	53.29	5,616	299,304	56,165	171,031	0	104,306	0	470,335
2037	53.29	5,785	308,283	57,850	176,162	0	107,435	0	484,445
2038	53.29	5,959	317,532	59,585	181,447	0	110,658	0	498,978
2039	53.29	6,137	327,058	61,373	186,890	0	113,978	0	513,948
2040	53.29	6,321	336,869	63,214	192,497	0	117,397	0	529,366
2041	53.29	6,511	346,976	65,110	198,272	0	120,919	0	545,247
2042	53.29	6,706	357,385	67,064	204,220	0	124,547	0	561,605
2043	53.29	6,908	368,106	69,076	210,346	0	128,283	0	578,453
2044	53.29	7,115	379,150	71,148	216,657	0	132,132	0	595,806
2045	53.29	7,328	390,524	73,282	223,157	0	136,096	0	613,681
2046	53.29	7,548	402,240	75,481	229,851	0	140,178	0	632,091
2047	53.29	7,775	414,307	77,745	236,747	0	144,384	0	651,054
2048	53.29	8,008	426,736	80,077	243,849	0	148,715	0	670,585
2049	53.29	8,248	439,538	82,480	251,165	0	153,177	0	690,703
2050	53.29	8,495	452,724	84,954	258,700	0	157,772	0	711,424
2051	53.29	8,750	466,306	87,503	266,461	0	162,505	0	732,767
2052	53.29	9,013	480,295	90,128	274,454	0	167,380	0	754,750
2053	53.29	9,283	494,704	92,832	282,688	0	172,402	0	777,392
2054	53.29	9,562	509,545	95,617	291,169	0	177,574	0	800,714
2055	53.29	9,849	524,832	98,485	299,904	0	182,901	0	824,735
2056	53.29	10,144	540,577	101,440	308,901	0	188,388	0	849,477
2057	53.29	10,448	556,794	104,483	318,168	0	194,040	0	874,962
2058	53.29	10,762	573,498	107,617	327,713	0	199,861	0	901,211
2059	53.29	11,085	590,703	110,846	337,544	0	205,857	0	928,247
2060	53.29	11,417	608,424	114,171	347,671	0	212,032	0	956,094
2061	53.29	11,760	626,676	117,596	358,101	0	218,393	0	984,777
2062	53.29	12,112	645,477	121,124	368,844	0	224,945	0	1,014,320
2063	53.29	12,476	664,841	124,758	379,909	0	231,694	0	1,044,750
2064	53.29	12,850	684,786	128,501	391,306	0	238,644	0	1,076,093
2065	53.29	13,236	705,330	132,356	403,046	0	245,804	0	1,108,375
2066	53.29	13,633	726,490	136,327	415,137	0	253,178	0	1,141,627
2067	53.29	14,042	748,284	140,416	427,591	0	260,773	0	1,175,875

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Passive Sites - Intermediate Estimate**

(1) Year	(2) ABS Legacy Sites - Passive	(3) Per Site Standard O&M Costs	(4) Total Standard O&M Costs	(5) Per Site Recapitalization Costs	(6) Total Recapitalization Costs	(7) Additional Passive ABS Legacy Sites	(8) Per Site Design and Construction Costs	(9) Total Design and Construction Costs	(10) Total Passive O&M Costs
2068	53.29	14,463	770,733	144,629	440,419	0	268,596	0	1,211,152
2069	53.29	14,897	793,855	148,968	453,631	0	276,654	0	1,247,486
2070	53.29	15,344	817,671	153,437	467,240	0	284,954	0	1,284,911
2071	53.29	15,804	842,201	158,040	481,258	0	293,503	0	1,323,458
2072	53.29	16,278	867,467	162,781	495,695	0	302,308	0	1,363,162
2073	53.29	16,766	893,491	167,664	510,566	0	311,377	0	1,404,057
2074	53.29	17,269	920,295	172,694	525,883	0	320,718	0	1,446,178
2075	53.29	17,788	947,904	177,875	541,660	0	330,340	0	1,489,564
2076	53.29	18,321	976,341	183,211	557,909	0	340,250	0	1,534,251
2077	53.29	18,871	1,005,632	188,708	574,647	0	350,457	0	1,580,278
2078	53.29	19,437	1,035,801	194,369	591,886	0	360,971	0	1,627,687
2079	53.29	20,020	1,066,875	200,200	609,643	0	371,800	0	1,676,517
2080	53.29	20,621	1,098,881	206,206	627,932	0	382,954	0	1,726,813
2081	53.29	21,239	1,131,847	212,392	646,770	0	394,443	0	1,778,617
2082	53.29	21,876	1,165,803	218,764	666,173	0	406,276	0	1,831,976
2083	53.29	22,533	1,200,777	225,327	686,158	0	418,464	0	1,886,935
2084	53.29	23,209	1,236,800	232,087	706,743	0	431,018	0	1,943,543
2085	53.29	23,905	1,273,904	239,049	727,945	0	443,949	0	2,001,849
2086	53.29	24,622	1,312,121	246,221	749,784	0	457,267	0	2,061,905
2087	53.29	25,361	1,351,485	253,608	772,277	0	470,985	0	2,123,762
2088	53.29	26,122	1,392,029	261,216	795,445	0	485,115	0	2,187,475
2089	53.29	26,905	1,433,790	269,052	819,309	0	499,668	0	2,253,099
2090	53.29	27,712	1,476,804	277,124	843,888	0	514,658	0	2,320,692
2091	53.29	28,544	1,521,108	285,437	869,205	0	530,098	0	2,390,313
2092	53.29	29,400	1,566,741	294,001	895,281	0	546,001	0	2,462,022
2093	53.29	30,282	1,613,744	302,821	922,139	0	562,381	0	2,535,883
2094	53.29	31,191	1,662,156	311,905	949,803	0	579,253	0	2,611,959
Total			50,753,100		29,001,772	0.29		20,645	79,775,517

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] from ABS Legacy Site Count
- 3) [3], [5], and [8] from Summary O&M Costs - Passive
- 4) [4] = [2] x [3]
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Cooney Sites - Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Cooney	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Cooney ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Cooney Sites O&M Costs
2020	6.00	166,667	500,000	70,000	12,000	0	132,500	0	512,000
2021	6.00	171,667	1,030,000	72,100	24,720	0	136,475	0	1,054,720
2022	6.00	176,817	1,060,900	74,263	25,462	0	140,569	0	1,086,362
2023	6.00	182,121	1,092,727	76,491	26,225	0	144,786	0	1,118,952
2024	6.00	187,585	1,125,509	78,786	27,012	0	149,130	0	1,152,521
2025	6.00	193,212	1,159,274	81,149	27,823	0	153,604	0	1,187,097
2026	6.00	199,009	1,194,052	83,584	28,657	0	158,212	0	1,222,710
2027	6.00	204,979	1,229,874	86,091	29,517	0	162,958	0	1,259,391
2028	6.00	211,128	1,266,770	88,674	30,402	0	167,847	0	1,297,173
2029	6.00	217,462	1,304,773	91,334	31,315	0	172,882	0	1,336,088
2030	6.00	223,986	1,343,916	94,074	32,254	0	178,069	0	1,376,170
2031	6.00	230,706	1,384,234	96,896	33,222	0	183,411	0	1,417,455
2032	6.00	237,627	1,425,761	99,803	34,218	0	188,913	0	1,459,979
2033	6.00	244,756	1,468,534	102,797	35,245	0	194,581	0	1,503,779
2034	6.00	252,098	1,512,590	105,881	36,302	0	200,418	0	1,548,892
2035	6.00	259,661	1,557,967	109,058	37,391	0	206,431	0	1,595,359
2036	6.00	267,451	1,604,706	112,329	38,513	0	212,624	0	1,643,219
2037	6.00	275,475	1,652,848	115,699	39,668	0	219,002	0	1,692,516
2038	6.00	283,739	1,702,433	119,170	40,858	0	225,572	0	1,743,291
2039	6.00	292,251	1,753,506	122,745	42,084	0	232,340	0	1,795,590
2040	6.00	301,019	1,806,111	126,428	43,347	0	239,310	0	1,849,458
2041	6.00	310,049	1,860,295	130,221	44,647	0	246,489	0	1,904,942
2042	6.00	319,351	1,916,103	134,127	45,986	0	253,884	0	1,962,090
2043	6.00	328,931	1,973,587	138,151	47,366	0	261,500	0	2,020,953
2044	6.00	338,799	2,032,794	142,296	48,787	0	269,345	0	2,081,581
2045	6.00	348,963	2,093,778	146,564	50,251	0	277,426	0	2,144,029
2046	6.00	359,432	2,156,591	150,961	51,758	0	285,748	0	2,208,349
2047	6.00	370,215	2,221,289	155,490	53,311	0	294,321	0	2,274,600
2048	6.00	381,321	2,287,928	160,155	54,910	0	303,150	0	2,342,838
2049	6.00	392,761	2,356,566	164,960	56,558	0	312,245	0	2,413,123
2050	6.00	404,544	2,427,262	169,908	58,254	0	321,612	0	2,485,517
2051	6.00	416,680	2,500,080	175,006	60,002	0	331,261	0	2,560,082
2052	6.00	429,180	2,575,083	180,256	61,802	0	341,198	0	2,636,885
2053	6.00	442,056	2,652,335	185,663	63,656	0	351,434	0	2,715,991
2054	6.00	455,318	2,731,905	191,233	65,566	0	361,977	0	2,797,471
2055	6.00	468,977	2,813,862	196,970	67,533	0	372,837	0	2,881,395
2056	6.00	483,046	2,898,278	202,879	69,559	0	384,022	0	2,967,837
2057	6.00	497,538	2,985,227	208,966	71,645	0	395,543	0	3,056,872
2058	6.00	512,464	3,074,783	215,235	73,795	0	407,409	0	3,148,578
2059	6.00	527,838	3,167,027	221,692	76,009	0	419,631	0	3,243,036
2060	6.00	543,673	3,262,038	228,343	78,289	0	432,220	0	3,340,327
2061	6.00	559,983	3,359,899	235,193	80,638	0	445,187	0	3,440,536
2062	6.00	576,783	3,460,696	242,249	83,057	0	458,542	0	3,543,753
2063	6.00	594,086	3,564,517	249,516	85,548	0	472,298	0	3,650,065
2064	6.00	611,909	3,671,452	257,002	88,115	0	486,467	0	3,759,567
2065	6.00	630,266	3,781,596	264,712	90,758	0	501,061	0	3,872,354
2066	6.00	649,174	3,895,044	272,653	93,481	0	516,093	0	3,988,525
2067	6.00	668,649	4,011,895	280,833	96,285	0	531,576	0	4,108,181

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Cooney Sites - Intermediate Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Cooney	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Cooney ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Cooney Sites O&M Costs
2068	6.00	688,709	4,132,252	289,258	99,174	0	547,523	0	4,231,426
2069	6.00	709,370	4,256,219	297,935	102,149	0	563,949	0	4,358,369
2070	6.00	730,651	4,383,906	306,873	105,214	0	580,868	0	4,489,120
2071	6.00	752,571	4,515,423	316,080	108,370	0	598,294	0	4,623,793
2072	6.00	775,148	4,650,886	325,562	111,621	0	616,242	0	4,762,507
2073	6.00	798,402	4,790,412	335,329	114,970	0	634,730	0	4,905,382
2074	6.00	822,354	4,934,125	345,389	118,419	0	653,772	0	5,052,544
2075	6.00	847,025	5,082,149	355,750	121,972	0	673,385	0	5,204,120
2076	6.00	872,436	5,234,613	366,423	125,631	0	693,586	0	5,360,244
2077	6.00	898,609	5,391,651	377,416	129,400	0	714,394	0	5,521,051
2078	6.00	925,567	5,553,401	388,738	133,282	0	735,826	0	5,686,683
2079	6.00	953,334	5,720,003	400,400	137,280	0	757,900	0	5,857,283
2080	6.00	981,934	5,891,603	412,412	141,398	0	780,637	0	6,033,002
2081	6.00	1,011,392	6,068,351	424,785	145,640	0	804,057	0	6,213,992
2082	6.00	1,041,734	6,250,402	437,528	150,010	0	828,178	0	6,400,411
2083	6.00	1,072,986	6,437,914	450,654	154,510	0	853,024	0	6,592,424
2084	6.00	1,105,175	6,631,051	464,174	159,145	0	878,614	0	6,790,196
2085	6.00	1,138,330	6,829,983	478,099	163,920	0	904,973	0	6,993,902
2086	6.00	1,172,480	7,034,882	492,442	168,837	0	932,122	0	7,203,719
2087	6.00	1,207,655	7,245,929	507,215	173,902	0	960,086	0	7,419,831
2088	6.00	1,243,884	7,463,307	522,431	179,119	0	988,888	0	7,642,426
2089	6.00	1,281,201	7,687,206	538,104	184,493	0	1,018,555	0	7,871,699
2090	6.00	1,319,637	7,917,822	554,248	190,028	0	1,049,111	0	8,107,850
2091	6.00	1,359,226	8,155,357	570,875	195,729	0	1,080,585	0	8,351,085
2092	6.00	1,400,003	8,400,017	588,001	201,600	0	1,113,002	0	8,601,618
2093	6.00	1,442,003	8,652,018	605,641	207,648	0	1,146,392	0	8,859,666
2094	6.00	1,485,263	8,911,578	623,810	213,878	0	1,180,784	0	9,125,456
Total			272,130,856		6,531,141	0.00		0	278,661,996

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] and [3] from ABS Legacy Site Count
- 3) [4] = [2] x [3]
- 4) [5] and [8] from Summary O&M Costs - Active
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
Summary Operations and Maintenance Costs - Active Sites**

(1) District	(2) Sites	(3) Treatment Type	(4) Total Design Costs	(5) Average Design Costs	(6) Total Construction Costs	(7) Average Construction Costs	(8) Total O&M Costs	(9) Average O&M Costs
Cambria	14	Active	100,458	7,176	1,354,173	96,727	369,532	26,395
Knox	3	Active	0	0	1,250,000	416,667	101,890	33,963
Moshannon	3	Active	0	0	0	0	79,637	26,546
Total	20	Active	100,458	5,023	2,604,173	130,209	551,059	27,553

Selected - Active Treatment	(10) Design Costs	(11) Construction Costs	(12) Recapitalization Costs	(13) Per Site Annual O&M Costs	(14) Performance Life Span	(15) Treatments per Site	(16) Per Treatment Annual O&M Costs
Intermediate	7,500	125,000	70,000	40,000	17.5	2.5	16,000
Optimistic	5,000	100,000	55,000	30,000	20.0	2.0	15,000
Pessimistic	10,000	150,000	85,000	50,000	15.0	3.0	16,667

Notes

- 1) [2] through [9] : Source : ABS Acid Mine Drainage Treatment Facility Costs
- 2) [10] through [13] based on [2] through [9], AMD Treat Cost Estimates, PBF Fund Tracking History and Recapitalization Costs Exhibits
- 3) [14] based on Recapitalization Costs Exhibit
- 4) [15] based on Treatment Types by Site Exhibit
- 5) [16] = [13] / [15]

**Pennsylvania Bureau of Mining Programs
Summary Operations and Maintenance Costs - Passive Sites**

(1) District	(2) Sites	(3) Treatment Type	(4) Total Design Costs	(5) Average Design Costs	(6) Total Construction Costs	(7) Average Construction Costs	(8) Total O&M Costs	(9) Average O&M Costs
Cambria	26	Passive	145,975	5,614	1,488,951	57,267	70,564	2,714
Knox	9	Passive	0	0	1,486,052	165,117	12,480	1,387
New Stanton	9	Passive	0	0	0	0	150,000	16,667
Moshannon	9	Passive	0	0	249,500	27,722	62,165	6,907
Total	53	Passive	145,975	2,754	3,224,503	60,840	295,209	5,570
Cambria and Knox	35	Passive	145,975	4,171	2,975,003	85,000	83,044	2,373

Selected - Passive Treatment	(10) Design Costs	(11) Construction Costs	(12) Recapitalization Costs	(13) Annual O&M Costs	(14) Performance Life Span	(15) Treatments per Site	(16) Per Treatment Annual O&M Costs
Intermediate	5,000	60,000	35,000	3,500	17.5	2.0	1,750
Optimistic	3,500	45,000	27,500	2,500	20.0	1.5	1,667
Pessimistic	6,500	80,000	42,500	5,500	15.0	2.5	2,200

Notes

- 1) [2] through [9] : Source : ABS Acid Mine Drainage Treatment Facility Costs
- 2) [10] through [13] based on [2] through [9], AMD Treat Cost Estimates, PBF Fund Tracking History and Recapitalization Costs Exhibits
- 3) [14] based on Recapitalization Costs Exhibit
- 4) [15] based on Treatment Types by Site Exhibit
- 5) [16] = [13] / [15]

**Pennsylvania Bureau of Mining Programs
Select Annual ABS Legacy Sites - By Treatment Type**

(1) Mine Site	(2) Permit Number	(3) Chemical (Active) Treatments	(4) Passive Treatments	(5) Hybrid Treatments	(6) Unidentified Treatment Type
001 Strip	17810154	0	6	0	0
Addison Strip	56773136	4	0	0	0
Alder Run	17803054	5	0	0	0
Andrews Strip	65940108	0	0	0	1
Ankey Mine	56840103	0	0	0	3
Bashore Mine	56803014	1	0	0	0
Bell Woodcock	11783035	2	0	0	0
Berkey	56813054	0	1	0	0
Blair Mine	16850101	0	1	0	0
Brant Strip	56793078	0	1	0	0
Broom Strip	32823035	0	1	0	0
Burkholder Strip	56823108	2	0	0	0
Cambria 51	11850106	0	0	3	1
Carnwath	17820166	0	3	0	0
Darmac #14	3840112	0	1	0	0
Dugan 2	14663003	0	4	0	0
Dugan 4	14663004	0	3	0	0
Emrick	10940105	0	0	0	1
Hay 2	56793053	0	1	0	1
Hill Estate	16713004	0	2	0	0
Honsacker Site	26830108	0	0	0	1
Horse Hill Strip	11813019	0	1	0	0
Hostetter Mine	65830202	0	0	0	1
Isabella Mine	26931601	0	0	0	1
Jacques	10830121	0	0	0	1
James E. Long	56783046	0	0	0	1
Job 33	56840112	1	0	0	0
Kaufman	17890115	0	5	0	0
Kaufman North	17970107	0	7	0	0
King	33830117	0	1	0	0
Kowalski No. 1 Strip	65703058	0	0	0	1
Kriebel	16840103	0	2	0	0
Latherow Mine	17870114	0	3	0	0
Lewis Mine	57830101	0	1	0	0
Little Beth	17723164	3	0	0	0
Little D	17813143	0	0	0	1
Luzerne Twp. Mine	26840110	0	0	0	1
Martin Mine	61820105	0	0	0	1
Maust Mine	56763022	0	1	0	0
McDermott	11950102	0	0	0	1

**Pennsylvania Bureau of Mining Programs
Select Annual ABS Legacy Sites - By Treatment Type**

(1) Mine Site	(2) Permit Number	(3) Chemical (Active) Treatments	(4) Passive Treatments	(5) Hybrid Treatments	(6) Unidentified Treatment Type
McNatt Strip	30840102	0	1	0	0
Merola	61820102	0	2	0	0
Miller Stein	17753159	6	2	0	0
Mine #26	14663010	0	0	0	1
Moore Strip	56773084	1	0	0	1
Morris #2	17810104	4	0	0	0
Mowery Mne	33840111	0	1	0	0
Narco	18860101	0	2	0	0
No. 5	5830101	0	1	0	0
Orcutt	33803040	1	0	0	0
Pearce	17820106	0	4	0	0
Pine Glen	14803008	5	0	0	0
Racic	61783001	0	0	3	0
Ralston	17850109	0	4	0	0
Ruth	10820121	0	1	0	0
Sandturn	17803176	0	3	0	0
Silver Rock	3890108	0	1	0	0
Smail	33743044	1	0	0	0
Smith Heasley	16803030	0	2	0	0
Snyder Sertik	10860118	0	2	0	0
Sorber Mine	56960111	1	0	0	0
Stroud	11823002	0	2	0	0
Truittsburg	16820107	0	1	0	0
Victoria	17820143	0	4	0	0
Vosburg	16803011	0	1	0	0
Vought	17820114	4	0	0	0
Watkiss Mine	26753065	0	0	0	1
Total		41	79	6	20
Sites (non-zero)		15	36	2	18
Average (non-zero)		2.7	2.2	3.0	1.1

Notes

1) [2] through [6] : Source : ABS Treatment Type

**Pennsylvania Bureau of Mining Programs
AMD Treat - 2008 Cost Estimates Summary**

(1) Treatment	(2) Sites	(2) Total Capital Cost	(3) Average Capital Cost	(3) Total Annual O&M Cost	(4) Average Annual O&M Cost	(5) Average Sampling	(6) Average Labor	(7) Average Maintenance	(8) Average Chemical Cost
<u>Based on Actual Cost Estimates in 2008</u>									
All Sites	58	2,903,881	50,067	1,210,088	20,864	1,507	7,948	1,272	8,964
Active	22	667,868	30,358	916,236	41,647	2,328	14,064	737	22,231
Passive	18	824,492	45,805	57,402	3,189	768	1,225	1,121	0
Multiple Passive	9	907,546	50,419	45,522	2,529	512	552	1,282	0
Active and Passive	6	469,996	39,166	169,450	14,121	843	8,948	1,118	2,568
Unknown	3	33,979	5,663	21,478	3,580	509	2,032	148	0
<u>Projected to 2020 Cost Levels</u>									
All Sites	58	4,140,240	71,383	1,725,296	29,746	2,149	11,331	1,814	12,780
Active	22	952,220	43,283	1,306,333	59,379	3,319	20,051	1,051	31,696
Passive	18	1,175,528	65,307	81,842	4,547	1,094	1,746	1,599	0
Multiple Passive	9	1,293,944	143,772	64,903	7,211	731	787	1,827	0
Active and Passive	6	670,102	111,684	241,595	40,266	1,201	12,758	1,594	3,661
Unknown	3	48,446	16,149	30,622	10,207	725	2,897	211	0

Passive Treatments

Aerobic Wetlands
Anoxic Limestone Drain
Maganese Removal Bed
Oxic Limestone Channel
Anoxic Limestone Drain
Vertical Flow Pond

Active Treatments

Caustic Soda
Pebble Quick Lime
Hydrated Lime

Notes

1) [2] through [8] : Source : AMD Treat Main Cost Form (2008)

2) (5) through (8) display major categories of O&M Cost.

**Pennsylvania Bureau of Mining Programs
Select ABS Legacy Sites Historical O&M Costs**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Site	07/01/10	07/01/11	07/01/12	07/01/13	07/01/14	07/01/15	07/01/16	07/01/17	07/01/18	07/01/19	Total	Average
Acme Drilling - O and M			13,456	1,653	2,573	1,976	1,195	4,018	1,946	3,266	30,083	3,760
American Development - O and M			1,180	17,634	27,192	17,697	18,842	21,018	26,252	14,564	144,379	18,047
Big J Mining - O and M		14,488	18,875	10,689	11,469	12,757	12,698	15,686	44,285	8,055	149,002	16,556
C & K - Bell W	2,600	14,738	50,344	16,262							83,944	20,986
C & O Mining		25,493	1,949	8,085	654	956	572	168	740		38,617	4,827
D & E Construction			9,284	1,120	1,514	1,940	922		3,200		17,980	2,997
Delta Basehore - O & M	10,251	19,638	23,769	14,161	38,586	15,530	15,621	23,394	12,867	11,590	185,406	18,541
Delta Hay 2	3,280		4,348	1,615	754	1,686	922	168	740		13,513	1,689
Delta Maust - O and M	14,896	7,672	7,546	4,368	1,902	6,579	2,959	2,517	1,769	1,911	52,119	5,212
Earth Shapers -- Laurel Land							1,988	5,693	20,619	4,072	32,371	8,093
H and H Coal Co. - O and M	1,129	5,946	4,082	790	8,855	1,187		7,020			29,009	4,144
L and B Coal Co. - O and M	6,205	26,297	1,502								34,004	11,335
L&L Mining - O&M										500	500	500
Lion Mining - O and M		28,734	18,893	4,394	15,144	25,449	38,521	42,810	4,238	5,897	184,078	20,453
Metco Mining - O and M	3,381	1,560	1,654	1,645	1,196	1,035	850	8,189	27,969		47,478	5,275
PA Energy - O and M	9,470	14,800	26,768	3,285	2,739	2,923	13,270	1,154	853	755	76,017	7,602
Windber High Standard Coal Co.	2,407	3,172	6,911	2,213	1,746	14,619	1,018	3,580	1,350	500	37,516	3,752

Notes

- 1) [2] through [11] : Source : PBF Fund Tracking - Short Form
- 2) [12] = sum [2] through [11]
- 3) [13] = average [2] through [11]

**Pennsylvania Bureau of Mining Programs
Select Annual ABS Legacy Sites Fiscal Year 2019 O&M Costs - By Expenditure**

(1)	(2)
Expenditure	Cost
20% Caustic Soda	17,189
25% Caustic Soda	51,323
Construction	38,610
Delivery	1,322
Desludging	12,108
Diesel Fuel	2,581
Electricity	26,387
Equipment Purchase	14,577
Equipment Rental	190,557
Equipment Repair	5,399
Gasoline	229
Hydrated Lime	15,479
Hydrogen Peroxide	11,583
Insurance	273
Labor	148,504
Lime Slurry	23,699
Liquid Caustic Soda	55,742
Miscellaneous Expenses	105,413
Mobilization	300
Road Maintenance	827
Soda Ash Briquettes	7,650
Total	729,753

Notes

1) [1] and [2] Source : ABS Costs - Expenditure Codes

**Pennsylvania Bureau of Mining Programs
Status of Sites Identified in ABS Settlement Agreement**

(1) Year	(2) Report	(3) ABS Legacy Sites	(4) Potential ABS Legacy Sites	(5) ABS Legacy Sites Needing Land Reclamation Work	(6) ABS Legacy Sites Needing Treatment System Work
2017	1/31/2018	71	17	6	14
2018	1/31/2019	73	9	6	13
2019	1/31/2020	73	8	6	9

Potential ABS Legacy Sites

(7) Year	(8) Report	(9) Potential ABS Legacy Sites	(10) Fully Funded Sites	(11) Not Fully Funded Sites (Cooney Brothers)	(11) Remaining Sites (Dilltown and LCN)
2019	1/31/2020	29	21	6	2

(12) Selected	(13) Active ABS Legacy Sites	(14) Passive ABS Legacy Sites	(14) Cooney Brothers Forfeited ABS Legacy Sites	(15) Cooney Brothers 2020 Total O&M Costs	(16) Remaining Sites Forfeiture Rate	(17) Remaining Sites Forfeitures
Intermediate	20	53	6	1,000,000	20.0%	0.40
Optimistic	20	53	6	900,000	10.0%	0.20
Pessimistic	20	53	6	1,150,000	30.0%	0.60

Notes

- 1) [2] through [11] Source : Annual Report Certifying Work Performed at Alternative Bonding System (ABS) Legacy Sites
- 2) The sites in (3) through (5) are updated annually in the ABS Annual Report
- 3) [12], [13], [14], [16] and [17] Selected #N/A

**Pennsylvania Bureau of Mining Programs
2008 Recapitalization Cost Estimates Summary**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
District	Sites	Average Life Span	Total Recapitalization Cost	Average Recapitalization Cost	Annual Recapitalization Cost	Average Annual Recapitalization Cost
<u>Based on Actual Cost Estimates in 2008</u>						
Total	97	17.6	2,836,652	29,244	223,651	2,306
Cambria	33	16.7	1,027,805	31,146	114,161	3,459
Knox	18	20.0	869,002	48,278	43,450	2,414
New Stanton	18	16.2	444,820	24,712	29,334	1,630
Moshannon	28	17.8	495,025	17,679	36,706	1,311
<u>Projected to 2020 Cost Levels</u>						
Total	97	17.6	4,044,387	41,695	318,873	3,287
Cambria	33	16.7	1,465,404	44,406	162,767	4,932
Knox	18	20.0	1,238,989	68,833	61,949	3,442
New Stanton	18	16.2	634,207	35,234	41,823	2,323
Moshannon	28	17.8	705,787	25,207	52,334	1,869

Notes

1) [2] through [7] Source : Att_10_Recap_Cost_Data_7-25-08

**Pennsylvania Bureau of Mining Programs
Cooney Brothers Coal Company**

(1) Period	(2) Potential ABS Legacy Sites	(3) Annual O&M Costs	(4) Target Trust Valuation	(5) Year End Trust Valuation	(6) Year End Trust Deficit
2011	6	768,951		1,685,962	
2012	6	790,263	17,871,401	2,283,507	15,587,894
2013	6	721,435	18,399,766	3,088,024	15,311,742
2014	6	649,516	17,514,554	2,590,143	14,924,412
2015	6	594,771	16,038,928	4,836,581	11,202,347
2016	6	641,795	15,473,262	10,156,537	5,316,725
2017	6	772,083	16,492,910	11,461,644	5,031,266
2018	6	996,254	19,697,862	11,874,977	7,822,884
2019	6	913,328			

Notes

1) [2] through [5] Source : Cooney Costs - Trust History

2) [6] = [4] - [5]

**Pennsylvania Bureau of Mining Programs
Bond Forfeiture Rates**

(1) Year	(2) Forfeitures	(3) Total Units	(4) Active Units	(5) Bond Forfeiture %
1996	35	2,448	2,206	1.59%
1997	13	2,292	2,292	0.57%
1998	10	2,379	2,379	0.42%
1999	20	2,377	2,377	0.84%
2000	39	2,269	2,269	1.72%
2001	20	2,160	2,156	0.93%
2002	10	2,145	2,145	0.47%
2003	36	2,025	2,025	1.78%
2004	18	1,977	1,977	0.91%
2005	57	1,928	1,928	2.96%
2006	8	1,820	1,820	0.44%
2007	6	1,767	1,691	0.35%
2008	11	1,080	1,648	0.67%
2009	12	1,912	1,784	0.67%
2010	5	1,684	1,623	0.31%
2011	3	1,731	1,388	0.22%
2012	2	1,649	1,463	0.14%
2013	4	1,458	1,356	0.29%
2014	4	1,465	1,364	0.29%
2015	2	1,404	1,261	0.16%
2016	34	1,287	1,151	2.95%
2017	5	1,254	1,116	0.45%
2018	2	1,192	1,053	0.19%

Average 0.88%
2009-2018 Avg. 0.54%

<u>Selected Forfeiture Rate</u>	
Intermediate	0.70%
Optimistic	0.40%
Pessimistic	1.00%

Notes

- 1) [2] through [4] Source : BF_Frequency_Dec_2019
- 2) [5] = [2] / [4]

**Pennsylvania Bureau of Mining Programs
Pennsylvania Short-Term Investment Pool - Pool 99**

(1) FY (7/1)	(2) STIP Pool 99 Return	(3) 3 Month Treasury Yield - 1/1 of FY
2004		2.32%
2005		4.16%
2006		5.07%
2007		3.26%
2008	1.58%	0.08%
2009	0.29%	0.08%
2010	0.28%	0.15%
2011	0.26%	0.02%
2012	0.22%	0.08%
2013	0.17%	0.07%
2014	0.19%	0.02%
2015	0.35%	0.22%
2016	0.82%	0.53%
2017	1.55%	1.44%
2018	2.42%	2.42%
2019		1.54%
Average	0.74%	1.34%
2009-2018 Avg.	0.66%	0.50%
Selected Return		
Intermediate	0.75%	
Optimistic	1.50%	
Pessimistic	0.25%	

Notes

1) [2] Source : POOL 99 RETURNS FY 2008-2018 (net of fees)

2) [3] Source : 3 Month Treasury Yield : Treasury.gov

**Pennsylvania Bureau of Mining Programs
ABS Legacy Sites Trust Account**

(1) Year Ending	(2) Income	(3) Year-End Balance
06/30/09		5,020,004
06/30/10	343,082	5,363,085
06/30/11	296,922	5,660,007
06/30/12	14,426	5,674,432
06/30/13	12,416	5,686,848
06/30/14	9,818	5,696,666
06/30/15	10,448	5,707,114
06/30/16	17,997	5,725,111
06/30/17	44,309	5,769,420
06/30/18	82,956	5,852,375
06/30/19	140,255	5,992,630

Notes

1) [2] and [3] Source : Reclamation Fee Fiscal Year Report

**Pennsylvania Bureau of Mining Programs
Reclamation Fee O&M Trust Account - Revenue**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Year Ending</u>	<u>Reclamation Fee</u>	<u>Interest</u>	<u>Civil Penalties</u>	<u>Other Revenue</u>	<u>Total Revenue</u>	<u>Year-End Balance</u>
06/30/09	380,626	20,537	256,443	0	657,607	4,069,615
06/30/10	107,168	48,108	284,502	0	439,778	4,097,659
06/30/11	0	-21,738	282,202	0	260,464	3,669,287
06/30/12	0	9,700	293,216	0	302,916	4,077,087
06/30/13	0	8,533	247,178	5,097	260,808	3,557,623
06/30/14	0	6,187	298,650	21,962	326,799	3,311,866
06/30/15	0	6,352	165,723	23,970	196,045	3,247,671
06/30/16	36,800	10,087	177,992	342,325	567,204	3,309,951
06/30/17	80,252	28,693	500,000	606,017	1,214,962	3,654,771
06/30/18	0	54,985	232,266	206,852	494,102	3,856,933
06/30/19	0	92,000	500,000	360,683	952,683	3,353,994

Notes

1) [2] through [5], [7] Source : Reclamation Fee Fiscal Year Report

2) [6] = sum [2] through [5]

**Pennsylvania Bureau of Mining Programs
Reclamation Fee O&M Trust Account - Costs**

(1) Year Ending	(2) Personnel Costs	(3) Lab Costs	(4) Grants	(5) Contracts	(6) Materials	(7) Other Costs	(8) Total Costs	(9) Year-End Balance
06/30/09	5,676	4,282	0	0	0	0	9,958	4,069,615
06/30/10	4,412	1,861	64,146	14,206	0	0	84,625	4,097,659
06/30/11	14,260	609	26,225	66,148	0	0	107,243	3,669,287
06/30/12	7,780	6,789	50,531	103,504	0	0	168,603	4,077,087
06/30/13	22,083	2,702	623,833	172,595	0	0	821,213	3,557,623
06/30/14	13,100	7,907	284,688	193,428	0	0	499,122	3,311,866
06/30/15	16,549	5,279	193,429	153,940	0	0	369,198	3,247,671
06/30/16	19,610	853	223,470	257,426	0	0	501,358	3,309,951
06/30/17	22,618	424	106,359	354,242	0	0	483,642	3,654,771
06/30/18	31,150	0	174,515	238,266	14,909	0	443,931	3,856,933
06/30/19	19,864	956	314,509	682,959	27,995	0	1,018,286	3,353,994

Notes

1) [2] through [7], [9] Source : Reclamation Fee Fiscal Year Report

2) [8] = sum [2] through [7]

**Pennsylvania Bureau of Mining Programs
ABS Financial Forecast as of 06/30/2020
High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Reclamation Fee	Interest - ABS Legacy Sites Trust	Civil Penalties	Other Revenue Sources	Total O&M Revenue	Total O&M Costs	Future Trust for ABS Legacy Sites - Ending Balance
06/30/2020							649,636,249
2020	0	812,045	100,000	0	912,045	1,369,500	649,178,794
2021	0	1,622,947	200,000	0	1,822,947	2,834,350	648,167,391
2022	0	1,620,418	200,000	0	1,820,418	2,922,093	647,065,717
2023	0	1,617,664	200,000	0	1,817,664	3,012,549	645,870,832
2024	0	1,614,677	200,000	0	1,814,677	3,105,802	644,579,707
2025	0	1,611,449	200,000	0	1,811,449	3,201,939	643,189,217
2026	0	1,607,973	190,000	0	1,797,973	3,285,770	641,701,420
2027	0	1,604,254	190,000	0	1,794,254	3,384,343	640,111,330
2028	0	1,600,278	190,000	0	1,790,278	3,485,874	638,415,735
2029	0	1,596,039	190,000	0	1,786,039	3,590,450	636,611,324
2030	0	1,591,528	190,000	0	1,781,528	3,698,163	634,694,689
2031	0	1,586,737	190,000	0	1,776,737	3,809,108	632,662,318
2032	0	1,581,656	190,000	0	1,771,656	3,923,381	630,510,592
2033	0	1,576,276	190,000	0	1,766,276	4,041,083	628,235,786
2034	0	1,570,589	190,000	0	1,760,589	4,162,315	625,834,060
2035	0	1,564,585	190,000	0	1,754,585	4,287,185	623,301,460
2036	0	1,558,254	180,000	0	1,738,254	4,415,800	620,623,913
2037	0	1,551,560	180,000	0	1,731,560	4,548,274	617,807,199
2038	0	1,544,518	180,000	0	1,724,518	4,684,723	614,846,994
2039	0	1,537,117	180,000	0	1,717,117	4,825,264	611,738,847
2040	0	1,529,347	180,000	0	1,709,347	4,970,022	608,478,172
2041	0	1,521,195	180,000	0	1,701,195	5,119,123	605,060,244
2042	0	1,512,651	180,000	0	1,692,651	5,272,697	601,480,198
2043	0	1,503,700	180,000	0	1,683,700	5,430,878	597,733,021
2044	0	1,494,333	180,000	0	1,674,333	5,593,804	593,813,550
2045	0	1,484,534	180,000	0	1,664,534	5,761,618	589,716,466
2046	0	1,474,291	180,000	0	1,654,291	5,934,466	585,436,291
2047	0	1,463,591	170,000	0	1,633,591	6,112,500	580,957,381
2048	0	1,452,393	170,000	0	1,622,393	6,295,876	576,283,899
2049	0	1,440,710	170,000	0	1,610,710	6,484,752	571,409,857
2050	0	1,428,525	170,000	0	1,598,525	6,679,294	566,329,087
2051	0	1,415,823	170,000	0	1,585,823	6,879,673	561,035,237
2052	0	1,402,588	170,000	0	1,572,588	7,086,063	555,521,762
2053	0	1,388,804	170,000	0	1,558,804	7,298,645	549,781,921
2054	0	1,374,455	170,000	0	1,544,455	7,517,605	543,808,771
2055	0	1,359,522	170,000	0	1,529,522	7,743,133	537,595,160
2056	0	1,343,988	170,000	0	1,513,988	7,975,427	531,133,721
2057	0	1,327,834	170,000	0	1,497,834	8,214,690	524,416,866
2058	0	1,311,042	170,000	0	1,481,042	8,461,130	517,436,778
2059	0	1,293,592	160,000	0	1,453,592	8,714,964	510,175,406
2060	0	1,275,439	160,000	0	1,435,439	8,976,413	502,634,431
2061	0	1,256,586	160,000	0	1,416,586	9,245,705	494,805,312
2062	0	1,237,013	160,000	0	1,397,013	9,523,077	486,679,249
2063	0	1,216,698	160,000	0	1,376,698	9,808,769	478,247,178
2064	0	1,195,618	160,000	0	1,355,618	10,103,032	469,499,764
2065	0	1,173,749	160,000	0	1,333,749	10,406,123	460,427,390

Pennsylvania Bureau of Mining Programs
ABS Financial Forecast as of 06/30/2020
High Estimate

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Year	Reclamation Fee	Interest - ABS Legacy		Other Revenue		Total O&M Revenue	Total O&M Costs	Future Trust for ABS Legacy Sites - Ending Balance
		Sites Trust	Civil Penalties	Sources				
2066	0	1,151,068	160,000	0	1,311,068	10,718,307	451,020,152	
2067	0	1,127,550	160,000	0	1,287,550	11,039,856	441,267,847	
2068	0	1,103,170	160,000	0	1,263,170	11,371,051	431,159,965	
2069	0	1,077,900	160,000	0	1,237,900	11,712,183	420,685,682	
2070	0	1,051,714	160,000	0	1,211,714	12,063,549	409,833,848	
2071	0	1,024,585	150,000	0	1,174,585	12,425,455	398,582,977	
2072	0	996,457	150,000	0	1,146,457	12,798,219	386,931,216	
2073	0	967,328	150,000	0	1,117,328	13,182,165	374,866,379	
2074	0	937,166	150,000	0	1,087,166	13,577,630	362,375,915	
2075	0	905,940	150,000	0	1,055,940	13,984,959	349,446,896	
2076	0	873,617	150,000	0	1,023,617	14,404,508	336,066,005	
2077	0	840,165	150,000	0	990,165	14,836,643	322,219,527	
2078	0	805,549	150,000	0	955,549	15,281,742	307,893,334	
2079	0	769,733	150,000	0	919,733	15,740,195	293,072,872	
2080	0	732,682	150,000	0	882,682	16,212,400	277,743,154	
2081	0	694,358	150,000	0	844,358	16,698,772	261,888,739	
2082	0	654,722	150,000	0	804,722	17,199,736	245,493,726	
2083	0	613,734	150,000	0	763,734	17,715,728	228,541,732	
2084	0	571,354	150,000	0	721,354	18,247,200	211,015,887	
2085	0	527,540	140,000	0	667,540	18,794,616	192,888,811	
2086	0	482,222	140,000	0	622,222	19,358,454	174,152,579	
2087	0	435,381	140,000	0	575,381	19,939,208	154,788,753	
2088	0	386,972	140,000	0	526,972	20,537,384	134,778,341	
2089	0	336,946	140,000	0	476,946	21,153,505	114,101,782	
2090	0	285,254	140,000	0	425,254	21,788,110	92,738,926	
2091	0	231,847	140,000	0	371,847	22,441,754	70,669,019	
2092	0	176,673	140,000	0	316,673	23,115,006	47,870,685	
2093	0	119,677	140,000	0	259,677	23,808,457	24,321,906	
2094	0	60,805	140,000	0	200,805	24,522,710	0	

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2], [4] and [5] selected
- 3) [3] = prior year [8] x STIP Return
- 3) [6] = sum [2] through [5]
- 4) [7] from O&M Cost Forecast Total
- 5) [8] = prior year [8] + [6] - [7]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	ABS Legacy Sites - Total	Total Standard O&M Costs	Total Recapitalization Costs	Total Cooney Sites O&M Costs	Total Potential ABS Sites Design and Construction Costs	Total O&M Costs	Discounted O&M Costs
2020	73	645,750	131,750	592,000	0	1,369,500	1,369,500
2021	73	1,330,245	271,405	1,219,520	13,180	2,834,350	2,827,282
2022	73.12	1,372,405	280,007	1,256,106	13,576	2,922,093	2,907,537
2023	73.24	1,415,897	288,880	1,293,789	13,983	3,012,549	2,990,067
2024	73.36	1,460,763	298,034	1,332,602	14,403	3,105,802	3,074,937
2025	73.48	1,507,047	307,477	1,372,581	14,835	3,201,939	3,162,214
2026	73.6	1,554,793	317,219	1,413,758	0	3,285,770	3,236,912
2027	73.6	1,601,437	326,735	1,456,171	0	3,384,343	3,325,705
2028	73.6	1,649,480	336,537	1,499,856	0	3,485,874	3,416,934
2029	73.6	1,698,965	346,634	1,544,851	0	3,590,450	3,510,665
2030	73.6	1,749,934	357,033	1,591,197	0	3,698,163	3,606,968
2031	73.6	1,802,432	367,744	1,638,933	0	3,809,108	3,705,912
2032	73.6	1,856,505	378,776	1,688,101	0	3,923,381	3,807,571
2033	73.6	1,912,200	390,139	1,738,744	0	4,041,083	3,912,018
2034	73.6	1,969,566	401,843	1,790,906	0	4,162,315	4,019,330
2035	73.6	2,028,653	413,899	1,844,633	0	4,287,185	4,129,586
2036	73.6	2,089,512	426,316	1,899,972	0	4,415,800	4,242,866
2037	73.6	2,152,198	439,105	1,956,972	0	4,548,274	4,359,254
2038	73.6	2,216,764	452,278	2,015,681	0	4,684,723	4,478,835
2039	73.6	2,283,267	465,847	2,076,151	0	4,825,264	4,601,695
2040	73.6	2,351,765	479,822	2,138,436	0	4,970,022	4,727,926
2041	73.6	2,422,318	494,217	2,202,589	0	5,119,123	4,857,620
2042	73.6	2,494,987	509,043	2,268,666	0	5,272,697	4,990,872
2043	73.6	2,569,837	524,314	2,336,726	0	5,430,878	5,127,778
2044	73.6	2,646,932	540,044	2,406,828	0	5,593,804	5,268,441
2045	73.6	2,726,340	556,245	2,479,033	0	5,761,618	5,412,961
2046	73.6	2,808,130	572,932	2,553,404	0	5,934,466	5,561,447
2047	73.6	2,892,374	590,120	2,630,006	0	6,112,500	5,714,005
2048	73.6	2,979,145	607,824	2,708,906	0	6,295,876	5,870,748
2049	73.6	3,068,519	626,059	2,790,174	0	6,484,752	6,031,791
2050	73.6	3,160,575	644,841	2,873,879	0	6,679,294	6,197,252
2051	73.6	3,255,392	664,186	2,960,095	0	6,879,673	6,367,251
2052	73.6	3,353,054	684,111	3,048,898	0	7,086,063	6,541,914
2053	73.6	3,453,646	704,635	3,140,365	0	7,298,645	6,721,368
2054	73.6	3,557,255	725,774	3,234,576	0	7,517,605	6,905,745
2055	73.6	3,663,973	747,547	3,331,613	0	7,743,133	7,095,179
2056	73.6	3,773,892	769,973	3,431,562	0	7,975,427	7,289,810
2057	73.6	3,887,109	793,072	3,534,508	0	8,214,690	7,489,780
2058	73.6	4,003,722	816,865	3,640,544	0	8,461,130	7,695,235
2059	73.6	4,123,834	841,371	3,749,760	0	8,714,964	7,906,326
2060	73.6	4,247,549	866,612	3,862,253	0	8,976,413	8,123,208
2061	73.6	4,374,975	892,610	3,978,120	0	9,245,705	8,346,039
2062	73.6	4,506,224	919,388	4,097,464	0	9,523,077	8,574,983
2063	73.6	4,641,411	946,970	4,220,388	0	9,808,769	8,810,207
2064	73.6	4,780,653	975,379	4,346,999	0	10,103,032	9,051,883
2065	73.6	4,924,073	1,004,641	4,477,409	0	10,406,123	9,300,189

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	ABS Legacy Sites - Total	Total Standard O&M Costs	Total Recapitalization Costs	Total Cooney Sites O&M Costs	Total Potential ABS Sites Design and Construction Costs	Total O&M Costs	Discounted O&M Costs
2066	73.6	5,071,795	1,034,780	4,611,732	0	10,718,307	9,555,307
2067	73.6	5,223,949	1,065,823	4,750,084	0	11,039,856	9,817,422
2068	73.6	5,380,667	1,097,798	4,892,586	0	11,371,051	10,086,728
2069	73.6	5,542,087	1,130,732	5,039,364	0	11,712,183	10,363,422
2070	73.6	5,708,350	1,164,654	5,190,545	0	12,063,549	10,647,705
2071	73.6	5,879,601	1,199,593	5,346,261	0	12,425,455	10,939,787
2072	73.6	6,055,989	1,235,581	5,506,649	0	12,798,219	11,239,881
2073	73.6	6,237,668	1,272,649	5,671,848	0	13,182,165	11,548,206
2074	73.6	6,424,798	1,310,828	5,842,004	0	13,577,630	11,864,990
2075	73.6	6,617,542	1,350,153	6,017,264	0	13,984,959	12,190,464
2076	73.6	6,816,069	1,390,657	6,197,782	0	14,404,508	12,524,865
2077	73.6	7,020,551	1,432,377	6,383,715	0	14,836,643	12,868,440
2078	73.6	7,231,167	1,475,348	6,575,227	0	15,281,742	13,221,440
2079	73.6	7,448,102	1,519,609	6,772,484	0	15,740,195	13,584,123
2080	73.6	7,671,545	1,565,197	6,975,658	0	16,212,400	13,956,755
2081	73.6	7,901,692	1,612,153	7,184,928	0	16,698,772	14,339,608
2082	73.6	8,138,742	1,660,518	7,400,476	0	17,199,736	14,732,964
2083	73.6	8,382,905	1,710,333	7,622,490	0	17,715,728	15,137,110
2084	73.6	8,634,392	1,761,643	7,851,165	0	18,247,200	15,552,343
2085	73.6	8,893,423	1,814,493	8,086,700	0	18,794,616	15,978,966
2086	73.6	9,160,226	1,868,927	8,329,301	0	19,358,454	16,417,291
2087	73.6	9,435,033	1,924,995	8,579,180	0	19,939,208	16,867,641
2088	73.6	9,718,084	1,982,745	8,836,555	0	20,537,384	17,330,344
2089	73.6	10,009,626	2,042,227	9,101,652	0	21,153,505	17,805,740
2090	73.6	10,309,915	2,103,494	9,374,701	0	21,788,110	18,294,177
2091	73.6	10,619,213	2,166,599	9,655,942	0	22,441,754	18,796,012
2092	73.6	10,937,789	2,231,597	9,945,620	0	23,115,006	19,311,614
2093	73.6	11,265,923	2,298,545	10,243,989	0	23,808,457	19,841,359
2094	73.6	11,603,900	2,367,501	10,551,309	0	24,522,710	20,385,635
Total		354,306,238	72,287,800	322,202,933	69,976	748,866,947	661,866,086

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] through [8] from O&M Cost Forecast Active, O&M Cost Forecast Passive and O&M Cost Forecast Cooney

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Active Sites - High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Active	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Active ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Active O&M Costs
2020	20.00	50,000	500,000	85,000	56,667	0	160,000	0	556,667
2021	20.00	51,500	1,030,000	87,550	116,733	0.03	164,800	5,418	1,152,151
2022	20.03	53,045	1,062,644	90,177	120,433	0.03	169,744	5,581	1,188,658
2023	20.07	54,636	1,096,320	92,882	124,250	0.03	174,836	5,748	1,226,317
2024	20.10	56,275	1,131,059	95,668	128,187	0.03	180,081	5,920	1,265,166
2025	20.13	57,964	1,166,897	98,538	132,248	0.03	185,484	6,098	1,305,243
2026	20.16	59,703	1,203,866	101,494	136,438	0	191,048	0	1,340,305
2027	20.16	61,494	1,239,982	104,539	140,531	0	196,780	0	1,380,514
2028	20.16	63,339	1,277,182	107,675	144,747	0	202,683	0	1,421,929
2029	20.16	65,239	1,315,497	110,906	149,090	0	208,764	0	1,464,587
2030	20.16	67,196	1,354,962	114,233	153,562	0	215,027	0	1,508,525
2031	20.16	69,212	1,395,611	117,660	158,169	0	221,477	0	1,553,780
2032	20.16	71,288	1,437,479	121,190	162,914	0	228,122	0	1,600,394
2033	20.16	73,427	1,480,604	124,825	167,802	0	234,965	0	1,648,406
2034	20.16	75,629	1,525,022	128,570	172,836	0	242,014	0	1,697,858
2035	20.16	77,898	1,570,773	132,427	178,021	0	249,275	0	1,748,794
2036	20.16	80,235	1,617,896	136,400	183,362	0	256,753	0	1,801,257
2037	20.16	82,642	1,666,433	140,492	188,862	0	264,456	0	1,855,295
2038	20.16	85,122	1,716,426	144,707	194,528	0	272,389	0	1,910,954
2039	20.16	87,675	1,767,918	149,048	200,364	0	280,561	0	1,968,283
2040	20.16	90,306	1,820,956	153,519	206,375	0	288,978	0	2,027,331
2041	20.16	93,015	1,875,585	158,125	212,566	0	297,647	0	2,088,151
2042	20.16	95,805	1,931,852	162,869	218,943	0	306,577	0	2,150,795
2043	20.16	98,679	1,989,808	167,755	225,512	0	315,774	0	2,215,319
2044	20.16	101,640	2,049,502	172,787	232,277	0	325,247	0	2,281,779
2045	20.16	104,689	2,110,987	177,971	239,245	0	335,004	0	2,350,232
2046	20.16	107,830	2,174,317	183,310	246,423	0	345,055	0	2,420,739
2047	20.16	111,064	2,239,546	188,810	253,815	0	355,406	0	2,493,361
2048	20.16	114,396	2,306,733	194,474	261,430	0	366,068	0	2,568,162
2049	20.16	117,828	2,375,935	200,308	269,273	0	377,050	0	2,645,207
2050	20.16	121,363	2,447,213	206,317	277,351	0	388,362	0	2,724,563
2051	20.16	125,004	2,520,629	212,507	285,671	0	400,013	0	2,806,300
2052	20.16	128,754	2,596,248	218,882	294,241	0	412,013	0	2,890,489
2053	20.16	132,617	2,674,135	225,448	303,069	0	424,374	0	2,977,204
2054	20.16	136,595	2,754,359	232,212	312,161	0	437,105	0	3,066,520
2055	20.16	140,693	2,836,990	239,178	321,526	0	450,218	0	3,158,516
2056	20.16	144,914	2,922,100	246,354	331,171	0	463,725	0	3,253,271
2057	20.16	149,261	3,009,763	253,744	341,106	0	477,636	0	3,350,869
2058	20.16	153,739	3,100,056	261,357	351,340	0	491,965	0	3,451,395
2059	20.16	158,351	3,193,057	269,197	361,880	0	506,724	0	3,554,937
2060	20.16	163,102	3,288,849	277,273	372,736	0	521,926	0	3,661,585
2061	20.16	167,995	3,387,515	285,591	383,918	0	537,584	0	3,771,433
2062	20.16	173,035	3,489,140	294,159	395,436	0	553,711	0	3,884,576
2063	20.16	178,226	3,593,814	302,984	407,299	0	570,323	0	4,001,113
2064	20.16	183,573	3,701,629	312,073	419,518	0	587,432	0	4,121,147
2065	20.16	189,080	3,812,677	321,436	432,103	0	605,055	0	4,244,781
2066	20.16	194,752	3,927,058	331,079	445,067	0	623,207	0	4,372,124
2067	20.16	200,595	4,044,870	341,011	458,419	0	641,903	0	4,503,288

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Active Sites - High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Active	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Active ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Active O&M Costs
2068	20.16	206,613	4,166,216	351,241	472,171	0	661,160	0	4,638,387
2069	20.16	212,811	4,291,202	361,779	486,336	0	680,995	0	4,777,538
2070	20.16	219,195	4,419,938	372,632	500,926	0	701,425	0	4,920,864
2071	20.16	225,771	4,552,536	383,811	515,954	0	722,468	0	5,068,490
2072	20.16	232,544	4,689,112	395,325	531,433	0	744,142	0	5,220,545
2073	20.16	239,521	4,829,786	407,185	547,376	0	766,466	0	5,377,161
2074	20.16	246,706	4,974,679	419,401	563,797	0	789,460	0	5,538,476
2075	20.16	254,107	5,123,920	431,983	580,711	0	813,144	0	5,704,631
2076	20.16	261,731	5,277,637	444,942	598,132	0	837,538	0	5,875,769
2077	20.16	269,583	5,435,966	458,290	616,076	0	862,664	0	6,052,043
2078	20.16	277,670	5,599,045	472,039	634,558	0	888,544	0	6,233,604
2079	20.16	286,000	5,767,017	486,200	653,595	0	915,200	0	6,420,612
2080	20.16	294,580	5,940,027	500,786	673,203	0	942,656	0	6,613,230
2081	20.16	303,418	6,118,228	515,810	693,399	0	970,936	0	6,811,627
2082	20.16	312,520	6,301,775	531,284	714,201	0	1,000,064	0	7,015,976
2083	20.16	321,896	6,490,828	547,223	735,627	0	1,030,066	0	7,226,455
2084	20.16	331,553	6,685,553	563,639	757,696	0	1,060,968	0	7,443,249
2085	20.16	341,499	6,886,120	580,549	780,427	0	1,092,797	0	7,666,546
2086	20.16	351,744	7,092,703	597,965	803,840	0	1,125,581	0	7,896,543
2087	20.16	362,296	7,305,484	615,904	827,955	0	1,159,349	0	8,133,439
2088	20.16	373,165	7,524,649	634,381	852,794	0	1,194,129	0	8,377,442
2089	20.16	384,360	7,750,388	653,412	878,377	0	1,229,953	0	8,628,766
2090	20.16	395,891	7,982,900	673,015	904,729	0	1,266,852	0	8,887,629
2091	20.16	407,768	8,222,387	693,205	931,871	0	1,304,857	0	9,154,257
2092	20.16	420,001	8,469,059	714,001	959,827	0	1,344,003	0	9,428,885
2093	20.16	432,601	8,723,130	735,422	988,621	0	1,384,323	0	9,711,752
2094	20.16	445,579	8,984,824	757,484	1,018,280	0	1,425,853	0	10,003,104
Total			274,337,002		31,091,527	0.16		28,765	305,457,294

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] from ABS Legacy Site Count
- 3) [3], [5] and [8] from Summary O&M Costs - Active
- 4) [4] = [2] x [3]
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Passive Sites - High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Passive	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Passive ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Passive O&M Costs
2020	53.00	5,500	145,750	42,500	75,083	0	86,500	0	220,833
2021	53.00	5,665	300,245	43,775	154,672	0.09	89,095	7,762	462,679
2022	53.09	5,835	309,761	45,088	159,574	0.09	91,768	7,995	477,330
2023	53.17	6,010	319,577	46,441	164,631	0.09	94,521	8,235	492,443
2024	53.26	6,190	329,704	47,834	169,847	0.09	97,357	8,482	508,033
2025	53.35	6,376	340,150	49,269	175,229	0.09	100,277	8,736	524,116
2026	53.44	6,567	350,927	50,747	180,781	0	103,286	0	531,708
2027	53.44	6,764	361,455	52,270	186,204	0	106,384	0	547,659
2028	53.44	6,967	372,299	53,838	191,790	0	109,576	0	564,089
2029	53.44	7,176	383,467	55,453	197,544	0	112,863	0	581,011
2030	53.44	7,392	394,972	57,116	203,470	0	116,249	0	598,442
2031	53.44	7,613	406,821	58,830	209,574	0	119,736	0	616,395
2032	53.44	7,842	419,025	60,595	215,862	0	123,328	0	634,887
2033	53.44	8,077	431,596	62,413	222,337	0	127,028	0	653,933
2034	53.44	8,319	444,544	64,285	229,007	0	130,839	0	673,551
2035	53.44	8,569	457,880	66,214	235,878	0	134,764	0	693,758
2036	53.44	8,826	471,617	68,200	242,954	0	138,807	0	714,571
2037	53.44	9,091	485,765	70,246	250,243	0	142,971	0	736,008
2038	53.44	9,363	500,338	72,353	257,750	0	147,260	0	758,088
2039	53.44	9,644	515,348	74,524	265,482	0	151,678	0	780,831
2040	53.44	9,934	530,809	76,760	273,447	0	156,229	0	804,256
2041	53.44	10,232	546,733	79,063	281,650	0	160,915	0	828,383
2042	53.44	10,539	563,135	81,434	290,100	0	165,743	0	853,235
2043	53.44	10,855	580,029	83,877	298,803	0	170,715	0	878,832
2044	53.44	11,180	597,430	86,394	307,767	0	175,837	0	905,197
2045	53.44	11,516	615,353	88,986	317,000	0	181,112	0	932,353
2046	53.44	11,861	633,813	91,655	326,510	0	186,545	0	960,323
2047	53.44	12,217	652,828	94,405	336,305	0	192,141	0	989,133
2048	53.44	12,584	672,413	97,237	346,394	0	197,906	0	1,018,807
2049	53.44	12,961	692,585	100,154	356,786	0	203,843	0	1,049,371
2050	53.44	13,350	713,362	103,159	367,490	0	209,958	0	1,080,852
2051	53.44	13,750	734,763	106,253	378,514	0	216,257	0	1,113,278
2052	53.44	14,163	756,806	109,441	389,870	0	222,745	0	1,146,676
2053	53.44	14,588	779,510	112,724	401,566	0	229,427	0	1,181,076
2054	53.44	15,025	802,896	116,106	413,613	0	236,310	0	1,216,509
2055	53.44	15,476	826,983	119,589	426,021	0	243,399	0	1,253,004
2056	53.44	15,941	851,792	123,177	438,802	0	250,701	0	1,290,594
2057	53.44	16,419	877,346	126,872	451,966	0	258,222	0	1,329,312
2058	53.44	16,911	903,666	130,678	465,525	0	265,969	0	1,369,191
2059	53.44	17,419	930,776	134,599	479,491	0	273,948	0	1,410,267
2060	53.44	17,941	958,700	138,637	493,876	0	282,166	0	1,452,575
2061	53.44	18,479	987,460	142,796	508,692	0	290,631	0	1,496,152
2062	53.44	19,034	1,017,084	147,080	523,953	0	299,350	0	1,541,037
2063	53.44	19,605	1,047,597	151,492	539,671	0	308,331	0	1,587,268
2064	53.44	20,193	1,079,025	156,037	555,861	0	317,581	0	1,634,886
2065	53.44	20,799	1,111,395	160,718	572,537	0	327,108	0	1,683,933
2066	53.44	21,423	1,144,737	165,539	589,713	0	336,921	0	1,734,451
2067	53.44	22,065	1,179,079	170,506	607,405	0	347,029	0	1,786,484

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Passive Sites - High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Passive	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Passive ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Passive O&M Costs
2068	53.44	22,727	1,214,452	175,621	625,627	0	357,440	0	1,840,079
2069	53.44	23,409	1,250,885	180,889	644,396	0	368,163	0	1,895,281
2070	53.44	24,111	1,288,412	186,316	663,727	0	379,208	0	1,952,139
2071	53.44	24,835	1,327,064	191,905	683,639	0	390,584	0	2,010,704
2072	53.44	25,580	1,366,876	197,663	704,148	0	402,302	0	2,071,025
2073	53.44	26,347	1,407,883	203,593	725,273	0	414,371	0	2,133,155
2074	53.44	27,138	1,450,119	209,700	747,031	0	426,802	0	2,197,150
2075	53.44	27,952	1,493,623	215,991	769,442	0	439,606	0	2,263,065
2076	53.44	28,790	1,538,431	222,471	792,525	0	452,794	0	2,330,956
2077	53.44	29,654	1,584,584	229,145	816,301	0	466,378	0	2,400,885
2078	53.44	30,544	1,632,122	236,020	840,790	0	480,369	0	2,472,912
2079	53.44	31,460	1,681,085	243,100	866,014	0	494,780	0	2,547,099
2080	53.44	32,404	1,731,518	250,393	891,994	0	509,624	0	2,623,512
2081	53.44	33,376	1,783,463	257,905	918,754	0	524,912	0	2,702,217
2082	53.44	34,377	1,836,967	265,642	946,317	0	540,660	0	2,783,284
2083	53.44	35,409	1,892,076	273,611	974,706	0	556,880	0	2,866,782
2084	53.44	36,471	1,948,839	281,820	1,003,947	0	573,586	0	2,952,786
2085	53.44	37,565	2,007,304	290,274	1,034,066	0	590,794	0	3,041,369
2086	53.44	38,692	2,067,523	298,982	1,065,088	0	608,517	0	3,132,611
2087	53.44	39,853	2,129,549	307,952	1,097,040	0	626,773	0	3,226,589
2088	53.44	41,048	2,193,435	317,191	1,129,951	0	645,576	0	3,323,387
2089	53.44	42,280	2,259,238	326,706	1,163,850	0	664,943	0	3,423,088
2090	53.44	43,548	2,327,015	336,507	1,198,765	0	684,892	0	3,525,781
2091	53.44	44,854	2,396,826	346,603	1,234,728	0	705,438	0	3,631,554
2092	53.44	46,200	2,468,731	357,001	1,271,770	0	726,601	0	3,740,501
2093	53.44	47,586	2,542,792	367,711	1,309,923	0	748,400	0	3,852,716
2094	53.44	49,014	2,619,076	378,742	1,349,221	0	770,852	0	3,968,297
Total			79,969,236		41,196,273			41,211	121,206,720

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] from ABS Legacy Site Count
- 3) [3], [5], and [8] from Summary O&M Costs - Passive
- 4) [4] = [2] x [3]
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Cooney Sites - High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Cooney	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Cooney ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Cooney Sites O&M Costs
2020	6.00	191,667	575,000	85,000	17,000	0	160,000	0	592,000
2021	6.00	197,417	1,184,500	87,550	35,020	0	164,800	0	1,219,520
2022	6.00	203,339	1,220,035	90,177	36,071	0	169,744	0	1,256,106
2023	6.00	209,439	1,256,636	92,882	37,153	0	174,836	0	1,293,789
2024	6.00	215,723	1,294,335	95,668	38,267	0	180,081	0	1,332,602
2025	6.00	222,194	1,333,165	98,538	39,415	0	185,484	0	1,372,581
2026	6.00	228,860	1,373,160	101,494	40,598	0	191,048	0	1,413,758
2027	6.00	235,726	1,414,355	104,539	41,816	0	196,780	0	1,456,171
2028	6.00	242,798	1,456,786	107,675	43,070	0	202,683	0	1,499,856
2029	6.00	250,082	1,500,489	110,906	44,362	0	208,764	0	1,544,851
2030	6.00	257,584	1,545,504	114,233	45,693	0	215,027	0	1,591,197
2031	6.00	265,311	1,591,869	117,660	47,064	0	221,477	0	1,638,933
2032	6.00	273,271	1,639,625	121,190	48,476	0	228,122	0	1,688,101
2033	6.00	281,469	1,688,814	124,825	49,930	0	234,965	0	1,738,744
2034	6.00	289,913	1,739,478	128,570	51,428	0	242,014	0	1,790,906
2035	6.00	298,610	1,791,663	132,427	52,971	0	249,275	0	1,844,633
2036	6.00	307,569	1,845,412	136,400	54,560	0	256,753	0	1,899,972
2037	6.00	316,796	1,900,775	140,492	56,197	0	264,456	0	1,956,972
2038	6.00	326,300	1,957,798	144,707	57,883	0	272,389	0	2,015,681
2039	6.00	336,089	2,016,532	149,048	59,619	0	280,561	0	2,076,151
2040	6.00	346,171	2,077,028	153,519	61,408	0	288,978	0	2,138,436
2041	6.00	356,556	2,139,339	158,125	63,250	0	297,647	0	2,202,589
2042	6.00	367,253	2,203,519	162,869	65,148	0	306,577	0	2,268,666
2043	6.00	378,271	2,269,624	167,755	67,102	0	315,774	0	2,336,726
2044	6.00	389,619	2,337,713	172,787	69,115	0	325,247	0	2,406,828
2045	6.00	401,307	2,407,845	177,971	71,188	0	335,004	0	2,479,033
2046	6.00	413,347	2,480,080	183,310	73,324	0	345,055	0	2,553,404
2047	6.00	425,747	2,554,482	188,810	75,524	0	355,406	0	2,630,006
2048	6.00	438,519	2,631,117	194,474	77,790	0	366,068	0	2,708,906
2049	6.00	451,675	2,710,050	200,308	80,123	0	377,050	0	2,790,174
2050	6.00	465,225	2,791,352	206,317	82,527	0	388,362	0	2,873,879
2051	6.00	479,182	2,875,092	212,507	85,003	0	400,013	0	2,960,095
2052	6.00	493,558	2,961,345	218,882	87,553	0	412,013	0	3,048,898
2053	6.00	508,364	3,050,186	225,448	90,179	0	424,374	0	3,140,365
2054	6.00	523,615	3,141,691	232,212	92,885	0	437,105	0	3,234,576
2055	6.00	539,324	3,235,942	239,178	95,671	0	450,218	0	3,331,613
2056	6.00	555,503	3,333,020	246,354	98,541	0	463,725	0	3,431,562
2057	6.00	572,168	3,433,011	253,744	101,498	0	477,636	0	3,534,508
2058	6.00	589,333	3,536,001	261,357	104,543	0	491,965	0	3,640,544
2059	6.00	607,014	3,642,081	269,197	107,679	0	506,724	0	3,749,760
2060	6.00	625,224	3,751,343	277,273	110,909	0	521,926	0	3,862,253
2061	6.00	643,981	3,863,884	285,591	114,237	0	537,584	0	3,978,120
2062	6.00	663,300	3,979,800	294,159	117,664	0	553,711	0	4,097,464
2063	6.00	683,199	4,099,194	302,984	121,194	0	570,323	0	4,220,388
2064	6.00	703,695	4,222,170	312,073	124,829	0	587,432	0	4,346,999
2065	6.00	724,806	4,348,835	321,436	128,574	0	605,055	0	4,477,409
2066	6.00	746,550	4,479,300	331,079	132,431	0	623,207	0	4,611,732
2067	6.00	768,947	4,613,679	341,011	136,404	0	641,903	0	4,750,084

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Cooney Sites - High Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Cooney	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Cooney ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Cooney Sites O&M Costs
2068	6.00	792,015	4,752,090	351,241	140,497	0	661,160	0	4,892,586
2069	6.00	815,775	4,894,652	361,779	144,711	0	680,995	0	5,039,364
2070	6.00	840,249	5,041,492	372,632	149,053	0	701,425	0	5,190,545
2071	6.00	865,456	5,192,737	383,811	153,524	0	722,468	0	5,346,261
2072	6.00	891,420	5,348,519	395,325	158,130	0	744,142	0	5,506,649
2073	6.00	918,162	5,508,974	407,185	162,874	0	766,466	0	5,671,848
2074	6.00	945,707	5,674,244	419,401	167,760	0	789,460	0	5,842,004
2075	6.00	974,078	5,844,471	431,983	172,793	0	813,144	0	6,017,264
2076	6.00	1,003,301	6,019,805	444,942	177,977	0	837,538	0	6,197,782
2077	6.00	1,033,400	6,200,399	458,290	183,316	0	862,664	0	6,383,715
2078	6.00	1,064,402	6,386,411	472,039	188,816	0	888,544	0	6,575,227
2079	6.00	1,096,334	6,578,003	486,200	194,480	0	915,200	0	6,772,484
2080	6.00	1,129,224	6,775,344	500,786	200,315	0	942,656	0	6,975,658
2081	6.00	1,163,101	6,978,604	515,810	206,324	0	970,936	0	7,184,928
2082	6.00	1,197,994	7,187,962	531,284	212,514	0	1,000,064	0	7,400,476
2083	6.00	1,233,933	7,403,601	547,223	218,889	0	1,030,066	0	7,622,490
2084	6.00	1,270,951	7,625,709	563,639	225,456	0	1,060,968	0	7,851,165
2085	6.00	1,309,080	7,854,480	580,549	232,219	0	1,092,797	0	8,086,700
2086	6.00	1,348,352	8,090,115	597,965	239,186	0	1,125,581	0	8,329,301
2087	6.00	1,388,803	8,332,818	615,904	246,362	0	1,159,349	0	8,579,180
2088	6.00	1,430,467	8,582,803	634,381	253,752	0	1,194,129	0	8,836,555
2089	6.00	1,473,381	8,840,287	653,412	261,365	0	1,229,953	0	9,101,652
2090	6.00	1,517,583	9,105,495	673,015	269,206	0	1,266,852	0	9,374,701
2091	6.00	1,563,110	9,378,660	693,205	277,282	0	1,304,857	0	9,655,942
2092	6.00	1,610,003	9,660,020	714,001	285,601	0	1,344,003	0	9,945,620
2093	6.00	1,658,303	9,949,820	735,422	294,169	0	1,384,323	0	10,243,989
2094	6.00	1,708,053	10,248,315	757,484	302,994	0	1,425,853	0	10,551,309
Total			312,950,484		9,252,449	0.00		0	322,202,933

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] and [3] from ABS Legacy Site Count
- 3) [4] = [2] x [3]
- 4) [5] and [8] from Summary O&M Costs - Active
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
ABS Financial Forecast as of 06/30/2020
Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Reclamation Fee	Interest - ABS Legacy Sites Trust	Civil Penalties	Other Revenue Sources	Total O&M Revenue	Total O&M Costs	Future Trust for ABS Legacy Sites - Ending Balance
06/30/2020							225,307,757
2020	0	1,689,808	150,000	0	1,839,808	888,438	226,259,128
2021	0	3,393,887	300,000	0	3,693,887	1,832,817	228,120,197
2022	0	3,421,803	300,000	0	3,721,803	1,888,302	229,953,699
2023	0	3,449,305	300,000	0	3,749,305	1,945,466	231,757,538
2024	0	3,476,363	300,000	0	3,776,363	2,004,361	233,529,540
2025	0	3,502,943	300,000	0	3,802,943	2,065,038	235,267,445
2026	0	3,529,012	300,000	0	3,829,012	2,124,496	236,971,961
2027	0	3,554,579	300,000	0	3,854,579	2,188,231	238,638,309
2028	0	3,579,575	300,000	0	3,879,575	2,253,878	240,264,006
2029	0	3,603,960	300,000	0	3,903,960	2,321,494	241,846,471
2030	0	3,627,697	300,000	0	3,927,697	2,391,139	243,383,029
2031	0	3,650,745	300,000	0	3,950,745	2,462,873	244,870,901
2032	0	3,673,064	300,000	0	3,973,064	2,536,760	246,307,205
2033	0	3,694,608	300,000	0	3,994,608	2,612,862	247,688,950
2034	0	3,715,334	300,000	0	4,015,334	2,691,248	249,013,036
2035	0	3,735,196	300,000	0	4,035,196	2,771,986	250,276,246
2036	0	3,754,144	300,000	0	4,054,144	2,855,145	251,475,244
2037	0	3,772,129	300,000	0	4,072,129	2,940,800	252,606,573
2038	0	3,789,099	300,000	0	4,089,099	3,029,024	253,666,648
2039	0	3,805,000	300,000	0	4,105,000	3,119,894	254,651,754
2040	0	3,819,776	300,000	0	4,119,776	3,213,491	255,558,039
2041	0	3,833,371	300,000	0	4,133,371	3,309,896	256,381,513
2042	0	3,845,723	300,000	0	4,145,723	3,409,193	257,118,043
2043	0	3,856,771	300,000	0	4,156,771	3,511,469	257,763,345
2044	0	3,866,450	300,000	0	4,166,450	3,616,813	258,312,983
2045	0	3,874,695	300,000	0	4,174,695	3,725,317	258,762,360
2046	0	3,881,435	300,000	0	4,181,435	3,837,077	259,106,719
2047	0	3,886,601	300,000	0	4,186,601	3,952,189	259,341,131
2048	0	3,890,117	300,000	0	4,190,117	4,070,755	259,460,493
2049	0	3,891,907	300,000	0	4,191,907	4,192,877	259,459,523
2050	0	3,891,893	300,000	0	4,191,893	4,318,664	259,332,753
2051	0	3,889,991	300,000	0	4,189,991	4,448,223	259,074,521
2052	0	3,886,118	300,000	0	4,186,118	4,581,670	258,678,968
2053	0	3,880,185	300,000	0	4,180,185	4,719,120	258,140,033
2054	0	3,872,100	300,000	0	4,172,100	4,860,694	257,451,439
2055	0	3,861,772	300,000	0	4,161,772	5,006,515	256,606,696
2056	0	3,849,100	300,000	0	4,149,100	5,156,710	255,599,086
2057	0	3,833,986	300,000	0	4,133,986	5,311,411	254,421,661
2058	0	3,816,325	300,000	0	4,116,325	5,470,754	253,067,233
2059	0	3,796,008	300,000	0	4,096,008	5,634,876	251,528,365
2060	0	3,772,925	300,000	0	4,072,925	5,803,923	249,797,367
2061	0	3,746,961	300,000	0	4,046,961	5,978,040	247,866,288
2062	0	3,717,994	300,000	0	4,017,994	6,157,382	245,726,900
2063	0	3,685,904	300,000	0	3,985,904	6,342,103	243,370,701
2064	0	3,650,561	300,000	0	3,950,561	6,532,366	240,788,895
2065	0	3,611,833	300,000	0	3,911,833	6,728,337	237,972,392

Pennsylvania Bureau of Mining Programs
ABS Financial Forecast as of 06/30/2020
Low Estimate

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Year	Reclamation Fee	Interest - ABS Legacy		Other Revenue		Total O&M Revenue	Total O&M Costs	Future Trust for ABS Legacy Sites - Ending Balance
		Sites Trust	Civil Penalties	Sources				
2066	0	3,569,586	300,000	0	3,869,586	6,930,187	234,911,790	
2067	0	3,523,677	300,000	0	3,823,677	7,138,093	231,597,375	
2068	0	3,473,961	300,000	0	3,773,961	7,352,236	228,019,100	
2069	0	3,420,286	300,000	0	3,720,286	7,572,803	224,166,583	
2070	0	3,362,499	300,000	0	3,662,499	7,799,987	220,029,096	
2071	0	3,300,436	300,000	0	3,600,436	8,033,986	215,595,546	
2072	0	3,233,933	300,000	0	3,533,933	8,275,006	210,854,473	
2073	0	3,162,817	300,000	0	3,462,817	8,523,256	205,794,034	
2074	0	3,086,911	300,000	0	3,386,911	8,778,954	200,401,991	
2075	0	3,006,030	300,000	0	3,306,030	9,042,322	194,665,698	
2076	0	2,919,985	300,000	0	3,219,985	9,313,592	188,572,092	
2077	0	2,828,581	300,000	0	3,128,581	9,593,000	182,107,673	
2078	0	2,731,615	300,000	0	3,031,615	9,880,790	175,258,498	
2079	0	2,628,877	300,000	0	2,928,877	10,177,213	168,010,162	
2080	0	2,520,152	300,000	0	2,820,152	10,482,530	160,347,785	
2081	0	2,405,217	300,000	0	2,705,217	10,797,006	152,255,996	
2082	0	2,283,840	300,000	0	2,583,840	11,120,916	143,718,920	
2083	0	2,155,784	300,000	0	2,455,784	11,454,543	134,720,160	
2084	0	2,020,802	300,000	0	2,320,802	11,798,180	125,242,783	
2085	0	1,878,642	300,000	0	2,178,642	12,152,125	115,269,299	
2086	0	1,729,039	300,000	0	2,029,039	12,516,689	104,781,650	
2087	0	1,571,725	300,000	0	1,871,725	12,892,190	93,761,185	
2088	0	1,406,418	300,000	0	1,706,418	13,278,955	82,188,648	
2089	0	1,232,830	300,000	0	1,532,830	13,677,324	70,044,154	
2090	0	1,050,662	300,000	0	1,350,662	14,087,644	57,307,172	
2091	0	859,608	300,000	0	1,159,608	14,510,273	43,956,507	
2092	0	659,348	300,000	0	959,348	14,945,581	29,970,273	
2093	0	449,554	300,000	0	749,554	15,393,949	15,325,879	
2094	0	229,888	300,000	0	529,888	15,855,767	0	

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2], [4] and [5] selected
- 3) [3] = prior year [8] x STIP Return
- 3) [6] = sum [2] through [5]
- 4) [7] from O&M Cost Forecast Total
- 5) [8] = prior year [8] + [6] - [7]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	ABS Legacy Sites -	Total Standard	Total	Total Cooney Sites	Total Potential ABS	Total O&M Costs	Discounted O&M
	Total	O&M Costs	Recapitalization Costs	O&M Costs	Sites Design and Construction Costs		Costs
2020	73	366,250	63,938	458,250	0	888,438	888,438
2021	73	754,475	131,711	943,995	2,636	1,832,817	1,805,731
2022	73.04	777,535	135,737	972,315	2,715	1,888,302	1,832,902
2023	73.08	801,300	139,886	1,001,484	2,796	1,945,466	1,860,482
2024	73.12	825,790	144,161	1,031,529	2,880	2,004,361	1,888,477
2025	73.16	851,029	148,567	1,062,475	2,967	2,065,038	1,916,893
2026	73.2	877,040	153,108	1,094,349	0	2,124,496	1,942,941
2027	73.2	903,351	157,701	1,127,179	0	2,188,231	1,971,655
2028	73.2	930,451	162,432	1,160,995	0	2,253,878	2,000,793
2029	73.2	958,365	167,305	1,195,825	0	2,321,494	2,030,361
2030	73.2	987,116	172,324	1,231,699	0	2,391,139	2,060,366
2031	73.2	1,016,729	177,494	1,268,650	0	2,462,873	2,090,815
2032	73.2	1,047,231	182,819	1,306,710	0	2,536,760	2,121,714
2033	73.2	1,078,648	188,303	1,345,911	0	2,612,862	2,153,069
2034	73.2	1,111,008	193,952	1,386,288	0	2,691,248	2,184,888
2035	73.2	1,144,338	199,771	1,427,877	0	2,771,986	2,217,177
2036	73.2	1,178,668	205,764	1,470,713	0	2,855,145	2,249,943
2037	73.2	1,214,028	211,937	1,514,835	0	2,940,800	2,283,194
2038	73.2	1,250,449	218,295	1,560,280	0	3,029,024	2,316,935
2039	73.2	1,287,962	224,844	1,607,088	0	3,119,894	2,351,176
2040	73.2	1,326,601	231,589	1,655,301	0	3,213,491	2,385,922
2041	73.2	1,366,399	238,537	1,704,960	0	3,309,896	2,421,182
2042	73.2	1,407,391	245,693	1,756,109	0	3,409,193	2,456,963
2043	73.2	1,449,613	253,064	1,808,792	0	3,511,469	2,493,273
2044	73.2	1,493,101	260,656	1,863,056	0	3,616,813	2,530,119
2045	73.2	1,537,894	268,475	1,918,947	0	3,725,317	2,567,510
2046	73.2	1,584,031	276,530	1,976,516	0	3,837,077	2,605,454
2047	73.2	1,631,552	284,826	2,035,811	0	3,952,189	2,643,958
2048	73.2	1,680,499	293,370	2,096,886	0	4,070,755	2,683,031
2049	73.2	1,730,914	302,171	2,159,792	0	4,192,877	2,722,682
2050	73.2	1,782,841	311,237	2,224,586	0	4,318,664	2,762,919
2051	73.2	1,836,326	320,574	2,291,324	0	4,448,223	2,803,750
2052	73.2	1,891,416	330,191	2,360,063	0	4,581,670	2,845,185
2053	73.2	1,948,158	340,097	2,430,865	0	4,719,120	2,887,232
2054	73.2	2,006,603	350,299	2,503,791	0	4,860,694	2,929,900
2055	73.2	2,066,801	360,808	2,578,905	0	5,006,515	2,973,199
2056	73.2	2,128,805	371,633	2,656,272	0	5,156,710	3,017,138
2057	73.2	2,192,669	382,782	2,735,960	0	5,311,411	3,061,726
2058	73.2	2,258,450	394,265	2,818,039	0	5,470,754	3,106,974
2059	73.2	2,326,203	406,093	2,902,580	0	5,634,876	3,152,889
2060	73.2	2,395,989	418,276	2,989,658	0	5,803,923	3,199,484
2061	73.2	2,467,869	430,824	3,079,347	0	5,978,040	3,246,767
2062	73.2	2,541,905	443,749	3,171,728	0	6,157,382	3,294,749
2063	73.2	2,618,162	457,061	3,266,880	0	6,342,103	3,343,440
2064	73.2	2,696,707	470,773	3,364,886	0	6,532,366	3,392,850
2065	73.2	2,777,608	484,896	3,465,833	0	6,728,337	3,442,991

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	ABS Legacy Sites - Total	Total Standard O&M Costs	Total Recapitalization Costs	Total Cooney Sites O&M Costs	Total Potential ABS Sites Design and Construction Costs	Total O&M Costs	Discounted O&M Costs
2066	73.2	2,860,936	499,443	3,569,808	0	6,930,187	3,493,872
2067	73.2	2,946,764	514,427	3,676,902	0	7,138,093	3,545,506
2068	73.2	3,035,167	529,859	3,787,209	0	7,352,236	3,597,902
2069	73.2	3,126,222	545,755	3,900,825	0	7,572,803	3,651,073
2070	73.2	3,220,009	562,128	4,017,850	0	7,799,987	3,705,030
2071	73.2	3,316,609	578,992	4,138,385	0	8,033,986	3,759,784
2072	73.2	3,416,108	596,361	4,262,537	0	8,275,006	3,815,348
2073	73.2	3,518,591	614,252	4,390,413	0	8,523,256	3,871,732
2074	73.2	3,624,148	632,680	4,522,125	0	8,778,954	3,928,950
2075	73.2	3,732,873	651,660	4,657,789	0	9,042,322	3,987,013
2076	73.2	3,844,859	671,210	4,797,523	0	9,313,592	4,045,934
2077	73.2	3,960,205	691,346	4,941,449	0	9,593,000	4,105,727
2078	73.2	4,079,011	712,087	5,089,692	0	9,880,790	4,166,402
2079	73.2	4,201,381	733,449	5,242,383	0	10,177,213	4,227,975
2080	73.2	4,327,423	755,453	5,399,654	0	10,482,530	4,290,457
2081	73.2	4,457,246	778,116	5,561,644	0	10,797,006	4,353,863
2082	73.2	4,590,963	801,460	5,728,493	0	11,120,916	4,418,206
2083	73.2	4,728,692	825,504	5,900,348	0	11,454,543	4,483,499
2084	73.2	4,870,553	850,269	6,077,358	0	11,798,180	4,549,758
2085	73.2	5,016,669	875,777	6,259,679	0	12,152,125	4,616,996
2086	73.2	5,167,169	902,050	6,447,470	0	12,516,689	4,685,227
2087	73.2	5,322,184	929,112	6,640,894	0	12,892,190	4,754,467
2088	73.2	5,481,850	956,985	6,840,120	0	13,278,955	4,824,730
2089	73.2	5,646,305	985,695	7,045,324	0	13,677,324	4,896,032
2090	73.2	5,815,694	1,015,265	7,256,684	0	14,087,644	4,968,387
2091	73.2	5,990,165	1,045,723	7,474,384	0	14,510,273	5,041,811
2092	73.2	6,169,870	1,077,095	7,698,616	0	14,945,581	5,116,321
2093	73.2	6,354,966	1,109,408	7,929,574	0	15,393,949	5,191,931
2094	73.2	6,545,615	1,142,690	8,167,462	0	15,855,767	5,268,659
Total		199,874,519	34,892,770	249,407,929	13,995	484,189,213	240,501,833

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] through [8] from O&M Cost Forecast Active, O&M Cost Forecast Passive and O&M Cost Forecast Cooney

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Active Sites - Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Active	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Active ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Active O&M Costs
2020	20.00	30,000	300,000	55,000	27,500	0	105,000	0	327,500
2021	20.00	30,900	618,000	56,650	56,650	0.01	108,150	1,185	675,835
2022	20.01	31,827	636,889	58,350	58,381	0.01	111,395	1,221	696,491
2023	20.02	32,782	656,355	60,100	60,166	0.01	114,736	1,257	717,778
2024	20.03	33,765	676,415	61,903	62,005	0.01	118,178	1,295	739,715
2025	20.04	34,778	697,089	63,760	63,900	0.01	121,724	1,334	762,323
2026	20.05	35,822	718,394	65,673	65,853	0	125,375	0	784,247
2027	20.05	36,896	739,946	67,643	67,828	0	129,137	0	807,774
2028	20.05	38,003	762,144	69,672	69,863	0	133,011	0	832,008
2029	20.05	39,143	785,009	71,763	71,959	0	137,001	0	856,968
2030	20.05	40,317	808,559	73,915	74,118	0	141,111	0	882,677
2031	20.05	41,527	832,816	76,133	76,341	0	145,345	0	909,157
2032	20.05	42,773	857,800	78,417	78,632	0	149,705	0	936,432
2033	20.05	44,056	883,534	80,769	80,991	0	154,196	0	964,525
2034	20.05	45,378	910,040	83,192	83,420	0	158,822	0	993,461
2035	20.05	46,739	937,341	85,688	85,923	0	163,587	0	1,023,264
2036	20.05	48,141	965,462	88,259	88,501	0	168,494	0	1,053,962
2037	20.05	49,585	994,426	90,907	91,156	0	173,549	0	1,085,581
2038	20.05	51,073	1,024,258	93,634	93,890	0	178,755	0	1,118,149
2039	20.05	52,605	1,054,986	96,443	96,707	0	184,118	0	1,151,693
2040	20.05	54,183	1,086,636	99,336	99,608	0	189,642	0	1,186,244
2041	20.05	55,809	1,119,235	102,316	102,597	0	195,331	0	1,221,831
2042	20.05	57,483	1,152,812	105,386	105,674	0	201,191	0	1,258,486
2043	20.05	59,208	1,187,396	108,547	108,845	0	207,227	0	1,296,241
2044	20.05	60,984	1,223,018	111,804	112,110	0	213,443	0	1,335,128
2045	20.05	62,813	1,259,709	115,158	115,473	0	219,847	0	1,375,182
2046	20.05	64,698	1,297,500	118,613	118,937	0	226,442	0	1,416,437
2047	20.05	66,639	1,336,425	122,171	122,506	0	233,235	0	1,458,930
2048	20.05	68,638	1,376,518	125,836	126,181	0	240,232	0	1,502,698
2049	20.05	70,697	1,417,813	129,611	129,966	0	247,439	0	1,547,779
2050	20.05	72,818	1,460,348	133,499	133,865	0	254,863	0	1,594,213
2051	20.05	75,002	1,504,158	137,504	137,881	0	262,508	0	1,642,039
2052	20.05	77,252	1,549,283	141,630	142,018	0	270,384	0	1,691,300
2053	20.05	79,570	1,595,761	145,878	146,278	0	278,495	0	1,742,039
2054	20.05	81,957	1,643,634	150,255	150,666	0	286,850	0	1,794,300
2055	20.05	84,416	1,692,943	154,762	155,186	0	295,456	0	1,848,129
2056	20.05	86,948	1,743,731	159,405	159,842	0	304,319	0	1,903,573
2057	20.05	89,557	1,796,043	164,187	164,637	0	313,449	0	1,960,681
2058	20.05	92,244	1,849,925	169,113	169,576	0	322,852	0	2,019,501
2059	20.05	95,011	1,905,422	174,186	174,664	0	332,538	0	2,080,086
2060	20.05	97,861	1,962,585	179,412	179,904	0	342,514	0	2,142,489
2061	20.05	100,797	2,021,462	184,794	185,301	0	352,789	0	2,206,763
2062	20.05	103,821	2,082,106	190,338	190,860	0	363,373	0	2,272,966
2063	20.05	106,936	2,144,570	196,048	196,586	0	374,274	0	2,341,155
2064	20.05	110,144	2,208,907	201,930	202,483	0	385,502	0	2,411,390
2065	20.05	113,448	2,275,174	207,988	208,558	0	397,068	0	2,483,731
2066	20.05	116,851	2,343,429	214,227	214,814	0	408,980	0	2,558,243
2067	20.05	120,357	2,413,732	220,654	221,259	0	421,249	0	2,634,991

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Active Sites - Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Active	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Active ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Active O&M Costs
2068	20.05	123,968	2,486,144	227,274	227,897	0	433,886	0	2,714,040
2069	20.05	127,687	2,560,728	234,092	234,733	0	446,903	0	2,795,462
2070	20.05	131,517	2,637,550	241,115	241,775	0	460,310	0	2,879,325
2071	20.05	135,463	2,716,677	248,348	249,029	0	474,119	0	2,965,705
2072	20.05	139,527	2,798,177	255,799	256,500	0	488,343	0	3,054,676
2073	20.05	143,712	2,882,122	263,473	264,195	0	502,993	0	3,146,317
2074	20.05	148,024	2,968,586	271,377	272,120	0	518,083	0	3,240,706
2075	20.05	152,464	3,057,643	279,518	280,284	0	533,626	0	3,337,927
2076	20.05	157,038	3,149,373	287,904	288,692	0	549,634	0	3,438,065
2077	20.05	161,750	3,243,854	296,541	297,353	0	566,123	0	3,541,207
2078	20.05	166,602	3,341,169	305,437	306,274	0	583,107	0	3,647,443
2079	20.05	171,600	3,441,405	314,600	315,462	0	600,600	0	3,756,867
2080	20.05	176,748	3,544,647	324,038	324,926	0	618,618	0	3,869,573
2081	20.05	182,051	3,650,986	333,759	334,674	0	637,177	0	3,985,660
2082	20.05	187,512	3,760,516	343,772	344,714	0	656,292	0	4,105,230
2083	20.05	193,137	3,873,331	354,085	355,055	0	675,981	0	4,228,386
2084	20.05	198,932	3,989,531	364,708	365,707	0	696,260	0	4,355,238
2085	20.05	204,899	4,109,217	375,649	376,678	0	717,148	0	4,485,895
2086	20.05	211,046	4,232,494	386,919	387,979	0	738,663	0	4,620,472
2087	20.05	217,378	4,359,468	398,526	399,618	0	760,823	0	4,759,086
2088	20.05	223,899	4,490,252	410,482	411,606	0	783,647	0	4,901,859
2089	20.05	230,616	4,624,960	422,796	423,955	0	807,157	0	5,048,915
2090	20.05	237,535	4,763,709	435,480	436,673	0	831,371	0	5,200,382
2091	20.05	244,661	4,906,620	448,545	449,774	0	856,312	0	5,356,394
2092	20.05	252,001	5,053,819	462,001	463,267	0	882,002	0	5,517,085
2093	20.05	259,561	5,205,433	475,861	477,165	0	908,462	0	5,682,598
2094	20.05	267,347	5,361,596	490,137	491,480	0	935,716	0	5,853,076
Total			163,719,743		15,007,643	0.05		6,292	178,733,678

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] from ABS Legacy Site Count
- 3) [3], [5] and [8] from Summary O&M Costs - Active
- 4) [4] = [2] x [3]
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Passive Sites - Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Passive	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Passive ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Passive O&M Costs
2020	53.00	2,500	66,250	27,500	36,438	0	48,500	0	102,688
2021	53.00	2,575	136,475	28,325	75,061	0.03	49,955	1,451	212,987
2022	53.03	2,652	140,646	29,175	77,355	0.03	51,454	1,494	219,496
2023	53.06	2,732	144,945	30,050	79,720	0.03	52,997	1,539	226,204
2024	53.09	2,814	149,375	30,951	82,156	0.03	54,587	1,585	233,117
2025	53.12	2,898	153,940	31,880	84,667	0.03	56,225	1,633	240,241
2026	53.15	2,985	158,645	32,836	87,255	0	57,912	0	245,900
2027	53.15	3,075	163,405	33,822	89,873	0	59,649	0	253,277
2028	53.15	3,167	168,307	34,836	92,569	0	61,438	0	260,876
2029	53.15	3,262	173,356	35,881	95,346	0	63,281	0	268,702
2030	53.15	3,360	178,557	36,958	98,206	0	65,180	0	276,763
2031	53.15	3,461	183,913	38,066	101,152	0	67,135	0	285,066
2032	53.15	3,564	189,431	39,208	104,187	0	69,149	0	293,618
2033	53.15	3,671	195,114	40,385	107,313	0	71,224	0	302,426
2034	53.15	3,781	200,967	41,596	110,532	0	73,361	0	311,499
2035	53.15	3,895	206,996	42,844	113,848	0	75,561	0	320,844
2036	53.15	4,012	213,206	44,129	117,263	0	77,828	0	330,470
2037	53.15	4,132	219,602	45,453	120,781	0	80,163	0	340,384
2038	53.15	4,256	226,190	46,817	124,405	0	82,568	0	350,595
2039	53.15	4,384	232,976	48,221	128,137	0	85,045	0	361,113
2040	53.15	4,515	239,965	49,668	131,981	0	87,596	0	371,946
2041	53.15	4,651	247,164	51,158	135,940	0	90,224	0	383,105
2042	53.15	4,790	254,579	52,693	140,019	0	92,931	0	394,598
2043	53.15	4,934	262,217	54,274	144,219	0	95,719	0	406,436
2044	53.15	5,082	270,083	55,902	148,546	0	98,591	0	418,629
2045	53.15	5,234	278,186	57,579	153,002	0	101,548	0	431,188
2046	53.15	5,391	286,531	59,306	157,592	0	104,595	0	444,123
2047	53.15	5,553	295,127	61,085	162,320	0	107,733	0	457,447
2048	53.15	5,720	303,981	62,918	167,190	0	110,964	0	471,170
2049	53.15	5,891	313,100	64,806	172,205	0	114,293	0	485,306
2050	53.15	6,068	322,493	66,750	177,371	0	117,722	0	499,865
2051	53.15	6,250	332,168	68,752	182,693	0	121,254	0	514,861
2052	53.15	6,438	342,133	70,815	188,173	0	124,892	0	530,307
2053	53.15	6,631	352,397	72,939	193,818	0	128,638	0	546,216
2054	53.15	6,830	362,969	75,127	199,633	0	132,497	0	562,602
2055	53.15	7,035	373,858	77,381	205,622	0	136,472	0	579,480
2056	53.15	7,246	385,074	79,703	211,791	0	140,566	0	596,865
2057	53.15	7,463	396,626	82,094	218,144	0	144,783	0	614,771
2058	53.15	7,687	408,525	84,557	224,689	0	149,127	0	633,214
2059	53.15	7,918	420,781	87,093	231,429	0	153,601	0	652,210
2060	53.15	8,155	433,404	89,706	238,372	0	158,209	0	671,776
2061	53.15	8,400	446,406	92,397	245,523	0	162,955	0	691,930
2062	53.15	8,652	459,798	95,169	252,889	0	167,844	0	712,688
2063	53.15	8,911	473,592	98,024	260,476	0	172,879	0	734,068
2064	53.15	9,179	487,800	100,965	268,290	0	178,065	0	756,090
2065	53.15	9,454	502,434	103,994	276,339	0	183,407	0	778,773
2066	53.15	9,738	517,507	107,114	284,629	0	188,910	0	802,136
2067	53.15	10,030	533,032	110,327	293,168	0	194,577	0	826,200

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Passive Sites - Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Passive	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Passive ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Passive O&M Costs
2068	53.15	10,331	549,023	113,637	301,963	0	200,414	0	850,986
2069	53.15	10,641	565,494	117,046	311,022	0	206,427	0	876,516
2070	53.15	10,960	582,459	120,557	320,352	0	212,619	0	902,811
2071	53.15	11,289	599,933	124,174	329,963	0	218,998	0	929,896
2072	53.15	11,627	617,931	127,899	339,862	0	225,568	0	957,793
2073	53.15	11,976	636,469	131,736	350,058	0	232,335	0	986,526
2074	53.15	12,335	655,563	135,688	360,559	0	239,305	0	1,016,122
2075	53.15	12,705	675,230	139,759	371,376	0	246,484	0	1,046,606
2076	53.15	13,087	695,486	143,952	382,518	0	253,879	0	1,078,004
2077	53.15	13,479	716,351	148,270	393,993	0	261,495	0	1,110,344
2078	53.15	13,884	737,842	152,719	405,813	0	269,340	0	1,143,654
2079	53.15	14,300	759,977	157,300	417,987	0	277,420	0	1,177,964
2080	53.15	14,729	782,776	162,019	430,527	0	285,743	0	1,213,303
2081	53.15	15,171	806,259	166,880	443,443	0	294,315	0	1,249,702
2082	53.15	15,626	830,447	171,886	456,746	0	303,144	0	1,287,193
2083	53.15	16,095	855,361	177,043	470,448	0	312,239	0	1,325,809
2084	53.15	16,578	881,021	182,354	484,562	0	321,606	0	1,365,583
2085	53.15	17,075	907,452	187,825	499,099	0	331,254	0	1,406,551
2086	53.15	17,587	934,676	193,459	514,072	0	341,192	0	1,448,747
2087	53.15	18,115	962,716	199,263	529,494	0	351,428	0	1,492,210
2088	53.15	18,658	991,597	205,241	545,379	0	361,970	0	1,536,976
2089	53.15	19,218	1,021,345	211,398	561,740	0	372,829	0	1,583,085
2090	53.15	19,795	1,051,986	217,740	578,592	0	384,014	0	1,630,578
2091	53.15	20,388	1,083,545	224,272	595,950	0	395,535	0	1,679,495
2092	53.15	21,000	1,116,052	231,000	613,828	0	407,401	0	1,729,880
2093	53.15	21,630	1,149,533	237,930	632,243	0	419,623	0	1,781,776
2094	53.15	22,279	1,184,019	245,068	651,211	0	432,212	0	1,835,230
Total			36,154,776		19,885,127			7,702	56,047,606

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] from ABS Legacy Site Count
- 3) [3], [5], and [8] from Summary O&M Costs - Passive
- 4) [4] = [2] x [3]
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Cooney Sites - Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Cooney	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Cooney ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Cooney Sites O&M Costs
2020	6.00	150,000	450,000	55,000	8,250	0	105,000	0	458,250
2021	6.00	154,500	927,000	56,650	16,995	0	108,150	0	943,995
2022	6.00	159,135	954,810	58,350	17,505	0	111,395	0	972,315
2023	6.00	163,909	983,454	60,100	18,030	0	114,736	0	1,001,484
2024	6.00	168,826	1,012,958	61,903	18,571	0	118,178	0	1,031,529
2025	6.00	173,891	1,043,347	63,760	19,128	0	121,724	0	1,062,475
2026	6.00	179,108	1,074,647	65,673	19,702	0	125,375	0	1,094,349
2027	6.00	184,481	1,106,886	67,643	20,293	0	129,137	0	1,127,179
2028	6.00	190,016	1,140,093	69,672	20,902	0	133,011	0	1,160,995
2029	6.00	195,716	1,174,296	71,763	21,529	0	137,001	0	1,195,825
2030	6.00	201,587	1,209,525	73,915	22,175	0	141,111	0	1,231,699
2031	6.00	207,635	1,245,810	76,133	22,840	0	145,345	0	1,268,650
2032	6.00	213,864	1,283,185	78,417	23,525	0	149,705	0	1,306,710
2033	6.00	220,280	1,321,680	80,769	24,231	0	154,196	0	1,345,911
2034	6.00	226,888	1,361,331	83,192	24,958	0	158,822	0	1,386,288
2035	6.00	233,695	1,402,171	85,688	25,706	0	163,587	0	1,427,877
2036	6.00	240,706	1,444,236	88,259	26,478	0	168,494	0	1,470,713
2037	6.00	247,927	1,487,563	90,907	27,272	0	173,549	0	1,514,835
2038	6.00	255,365	1,532,190	93,634	28,090	0	178,755	0	1,560,280
2039	6.00	263,026	1,578,155	96,443	28,933	0	184,118	0	1,607,088
2040	6.00	270,917	1,625,500	99,336	29,801	0	189,642	0	1,655,301
2041	6.00	279,044	1,674,265	102,316	30,695	0	195,331	0	1,704,960
2042	6.00	287,416	1,724,493	105,386	31,616	0	201,191	0	1,756,109
2043	6.00	296,038	1,776,228	108,547	32,564	0	207,227	0	1,808,792
2044	6.00	304,919	1,829,515	111,804	33,541	0	213,443	0	1,863,056
2045	6.00	314,067	1,884,400	115,158	34,547	0	219,847	0	1,918,947
2046	6.00	323,489	1,940,932	118,613	35,584	0	226,442	0	1,976,516
2047	6.00	333,193	1,999,160	122,171	36,651	0	233,235	0	2,035,811
2048	6.00	343,189	2,059,135	125,836	37,751	0	240,232	0	2,096,886
2049	6.00	353,485	2,120,909	129,611	38,883	0	247,439	0	2,159,792
2050	6.00	364,089	2,184,536	133,499	40,050	0	254,863	0	2,224,586
2051	6.00	375,012	2,250,072	137,504	41,251	0	262,508	0	2,291,324
2052	6.00	386,262	2,317,574	141,630	42,489	0	270,384	0	2,360,063
2053	6.00	397,850	2,387,102	145,878	43,764	0	278,495	0	2,430,865
2054	6.00	409,786	2,458,715	150,255	45,076	0	286,850	0	2,503,791
2055	6.00	422,079	2,532,476	154,762	46,429	0	295,456	0	2,578,905
2056	6.00	434,742	2,608,450	159,405	47,822	0	304,319	0	2,656,272
2057	6.00	447,784	2,686,704	164,187	49,256	0	313,449	0	2,735,960
2058	6.00	461,218	2,767,305	169,113	50,734	0	322,852	0	2,818,039
2059	6.00	475,054	2,850,324	174,186	52,256	0	332,538	0	2,902,580
2060	6.00	489,306	2,935,834	179,412	53,824	0	342,514	0	2,989,658
2061	6.00	503,985	3,023,909	184,794	55,438	0	352,789	0	3,079,347
2062	6.00	519,104	3,114,626	190,338	57,101	0	363,373	0	3,171,728
2063	6.00	534,678	3,208,065	196,048	58,815	0	374,274	0	3,266,880
2064	6.00	550,718	3,304,307	201,930	60,579	0	385,502	0	3,364,886
2065	6.00	567,239	3,403,436	207,988	62,396	0	397,068	0	3,465,833
2066	6.00	584,257	3,505,539	214,227	64,268	0	408,980	0	3,569,808
2067	6.00	601,784	3,610,706	220,654	66,196	0	421,249	0	3,676,902

**Pennsylvania Bureau of Mining Programs
Operations and Maintenance Costs Forecast as of 06/30/2020
Cooney Sites - Low Estimate**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	ABS Legacy Sites - Cooney	Per Site Standard O&M Costs	Total Standard O&M Costs	Per Site Recapitalization Costs	Total Recapitalization Costs	Additional Cooney ABS Legacy Sites	Per Site Design and Construction Costs	Total Design and Construction Costs	Total Cooney Sites O&M Costs
2068	6.00	619,838	3,719,027	227,274	68,182	0	433,886	0	3,787,209
2069	6.00	638,433	3,830,597	234,092	70,228	0	446,903	0	3,900,825
2070	6.00	657,586	3,945,515	241,115	72,334	0	460,310	0	4,017,850
2071	6.00	677,313	4,063,881	248,348	74,504	0	474,119	0	4,138,385
2072	6.00	697,633	4,185,797	255,799	76,740	0	488,343	0	4,262,537
2073	6.00	718,562	4,311,371	263,473	79,042	0	502,993	0	4,390,413
2074	6.00	740,119	4,440,712	271,377	81,413	0	518,083	0	4,522,125
2075	6.00	762,322	4,573,934	279,518	83,855	0	533,626	0	4,657,789
2076	6.00	785,192	4,711,152	287,904	86,371	0	549,634	0	4,797,523
2077	6.00	808,748	4,852,486	296,541	88,962	0	566,123	0	4,941,449
2078	6.00	833,010	4,998,061	305,437	91,631	0	583,107	0	5,089,692
2079	6.00	858,000	5,148,003	314,600	94,380	0	600,600	0	5,242,383
2080	6.00	883,740	5,302,443	324,038	97,211	0	618,618	0	5,399,654
2081	6.00	910,253	5,461,516	333,759	100,128	0	637,177	0	5,561,644
2082	6.00	937,560	5,625,362	343,772	103,132	0	656,292	0	5,728,493
2083	6.00	965,687	5,794,122	354,085	106,226	0	675,981	0	5,900,348
2084	6.00	994,658	5,967,946	364,708	109,412	0	696,260	0	6,077,358
2085	6.00	1,024,497	6,146,984	375,649	112,695	0	717,148	0	6,259,679
2086	6.00	1,055,232	6,331,394	386,919	116,076	0	738,663	0	6,447,470
2087	6.00	1,086,889	6,521,336	398,526	119,558	0	760,823	0	6,640,894
2088	6.00	1,119,496	6,716,976	410,482	123,145	0	783,647	0	6,840,120
2089	6.00	1,153,081	6,918,485	422,796	126,839	0	807,157	0	7,045,324
2090	6.00	1,187,673	7,126,040	435,480	130,644	0	831,371	0	7,256,684
2091	6.00	1,223,303	7,339,821	448,545	134,563	0	856,312	0	7,474,384
2092	6.00	1,260,003	7,560,016	462,001	138,600	0	882,002	0	7,698,616
2093	6.00	1,297,803	7,786,816	475,861	142,758	0	908,462	0	7,929,574
2094	6.00	1,336,737	8,020,420	490,137	147,041	0	935,716	0	8,167,462
Total			244,917,770		4,490,159	0.00		0	249,407,929

Notes

- 1) Current year is prorated from 06/30/2020
- 2) [2] and [3] from ABS Legacy Site Count
- 3) [4] = [2] x [3]
- 4) [5] and [8] from Summary O&M Costs - Active
- 5) [6] = [2] x [5] prorated by Performance Life Span
- 6) [7] from ABS Legacy Site Count allocated to select years
- 7) [9] = prior year [7] x [8]