2/21/2020

Call with Kyle Moselle, Acting Director, Alaska DNR, Office of Project Management & Permitting

- Alaska has no interest in financial solubility of an applicant, but project has to be technically feasible and financially practicable
- They review the Preliminary Economic Assessment
  - ↳ includes plan of operation
  - ↳ Strip ratio Waste rock : ore
  - ↳ used to make financial determination on economic feasibility, will minerals pay their way out of the ground
  - ↳ Canadian companies have to meet 43101 standards - rigorous and can be relied upon.
  - ↳ better than 50% confidence level
  - ↳ makes sense for mining co & shareholders to move forward
- Based on web search (Wolfden Webpage & stock listing) Wolfden is a junior company
  - ↳ mining industry is oriented w/ 2 types of companies Juniors & Majors
  - ↳ Juniors - small business model
  - ↳ Stake claim
  - ↳ Explore site (may go to advance exploration)
  - ↳ Prove the resource
  - ↳ Low cost, high risk, high reward
  - ↳ Partner w/ or sell to a major

- Major companies are established Mining Co.
  - ↳ look for property that has been derisked
  - ↳ sites that are proven
  - ↳ won't take on risk
  - ↳ want continued return on investment

- Juniors will not be flush with resources
  - ↳ that is not their business model
  - ↳ have to be 43101 compliant

- Kyle looked @ Wolfden website
  - ↳ resource estimate on web
  - ↳ TOC looks like everything there for a PEA
  - ↳ pre-feasability study not done yet (when?)

- Can find financial disclosures on website SEDAR

- Resources
  - ↳ Mining convention short courses (3/1 - 3/4)
  - ↳ Full-service engineering & environmental consulting firms Dowl, HDR, SRK (see those @ booths @ mining convention Prospectors and Developers Assoc. of Canada)
  - ↳ Need experience of metals
  - ↳ Financial advisor (generalist okay)
  - ↳ Secretary of State review for Corporation of Good Standing?

- Pre feasibility Study - done @ permitting stage
  ↳ has more info on company financing

- welcomes a call back if any additional ?'s
  Fridays best day to call

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
LAND USE PLANNING COMMISSION
22 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0022

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

JUDY C. EAST
EXECUTIVE DIRECTOR

Memorandum

To: File, ZP 779, Wolfden Rezoning Petition

From: Stacie R. Beyer, Planning Manager

Date: October 7, 2020

Re: Site Visit, Pickett Mountain Pond

In a review memo dated September 11, 2020, the Maine Department of Inland Fisheries and Wildlife (MDIFW) identified potential habitat for the State Threatened Clayton's copper butterfly (*Lycaena dorcas claytoni*) located on the inlet, western end, of Picket Mountain Pond. MDIFW recommended investigation of the habitat for the presence or absence of the shrubby cinquefoil (*Potentilla fruticose)*, host plant for the butterfly. On October 1, 2020, Kristen Puryear, Maine Natural Areas Program; Beth Swartz, MDIFW; Stacie Beyer, LUPC; and Jeremy Ouellette, Wolfden Mt. Chase, LLC. visited the area of interest at the inlet end of Pickett Mountain Pond. No shrubby cinquefoil plants were found, and it was determined that the habitat was not suitable for shrubby cinquefoil based on the plant community present at the site.

Photos taken by Stacie Beyer, LUPC, October 1, 2020

Attachment: E-mail message from MDIF&W, dated October 2, 2020

HARLOW BUILDING, 4TH FLOOR
WWW.MAINE.GOV/DACF/LUPC

PHONE: 207-287-2631
FAX: 207-287-7439

From:	Swartz, Beth
To:	Stratton, Robert D
Cc:	Puryear, Kristen; Beyer, Stacie R; deMaynadier, Phillip; Caron, Mark
Subject:	Pickett Mountain Pond site visit
Date:	Friday, October 02, 2020 1:57:43 PM

Bob,

Yesterday, Stacie Beyer (DEP), Kristin Puryear (MNAP), and I - along with Jeremy Ouellette from Wolfden - conducted a site visit to the wetland located along the western shore and inlet stream to Pickett Mountain Pond (T6 R6 WELS) to check for presence of shrubby cinquefoil, the host plant for Clayton's copper (state-threatened). We did not find any and determined the wetland was not appropriate habitat for either the host plant or the butterfly, therefore any concerns for Clayton's copper related to the re-zoning proposal are no longer relevant.

beth

~~~~~~

Beth I. Swartz, Wildlife Biologist
Reptile, Amphibian and Invertebrate Group
Maine Department of Inland Fisheries and Wildlife
650 State Street, Bangor, ME 04401
(207) 941-4476

mefishwildlife.com | facebook | twitter

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From: Shaw Weeks
To: Beyer, Stacie R
Subject: Wolfden Rezoning Petition - Penobscot County Commissioners
Date: Thursday, August 20, 2020 3:40:45 PM

Good Afternoon Stacie,

Over the last two weeks I've presented some of the basic information to the Penobscot County Commissioners regarding the Wolfden Rezoning Petition. I've also relayed information to our Sheriff's department mostly the workforce and traffic outlined in Wolfden's petition. The Sheriff and I seem to be in agreement that the project would minimally affect our Sheriff's office operation.

The County Commissioners have requested that you come before them to present the basics of the project and answer any further questions they may have. They meet weekly on Tuesday mornings from 9am usually until 10:30. We would greatly appreciate your knowledge and expertise regarding this project.

Thank you in advance.

Shaw Weeks
Director, Penobscot County
Unorganized Territory Administration
97 Hammond Street
Bangor, ME 04401

Phone: 207-942-8566
Fax: 207-561-6181

Please visit us on the web at www.ut.penobscot-county.net

SWCA®
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January 29, 2021

Stacie R. Beyer
Planning Manager
State of Maine, Department of Agriculture, Conservation & Forestry
Land Use Planning Commission
22 State House Station
Augusta, Maine 04333-0022

Re: Third-Party Review of Technical Feasibility and Financial Practicability Assessment, Pickett Mountain Mine Project, Wolfden Mt. Chase LLC Rezoning Petition / SWCA Project No. 61402

Dear Ms. Beyer:

SWCA Environmental Consultants (SWCA) has undertaken a third-party peer review for technical feasibility and financial practicability of the Wolfden Mt. Chase LLC (Wolfden) Pickett Mountain Project in support of a State of Maine Land Use Planning Commission (LUPC) application to rezone a portion of Penobscot County to allow for development of an underground mineral deposit.

This letter report presents the results of SWCA's review. Should you have any questions pertaining to the information provided, please contact me at (720) 840-4703 or via email at Andrew.Harley@swca.com.

Sincerely,

Andrew Harley, Ph.D.
Mining Director
Senior Geochemist/Senior Soil Scientist

Attachments

OBJECTIVES

The following two documents were submitted by Wolfden in support of the LUPC rezoning application.

- The petition submitted by Wolfden to LUPC.[1]
- A National Instrument 43-101-compliant Preliminary Economic Assessment (PEA).[2]

The documents were reviewed for feasibility and impacts of the mining operation. Based on the level of data associated with these reports, the documents were reviewed to identify, based on collective experience in the mining industry and working on similar projects, issues that may affect the technical and financial viability of this project. The work did not include detailed design reviews and engineering analysis but rather an assessment based on a general understanding of mining principles.

The following areas were assessed to identify potential areas that may put the project at risk.

- Mining engineering: general mining strategies were reviewed, especially those pertaining to impact to land development, including tailings management, transportation and infrastructure, and general mine development strategies.
- Mine dewatering: evaluation of available groundwater data and adequacy of water availability and impacts to processing and water treatment.
- Management of mine waters and process waters: water issues impacting mine viability include variation in predicted and actual water volumes and underestimating water treatment costs. Volcanogenic massive sulfide (VMS) can have potential contaminants of concern, especially arsenic, and potential issues related to tailings management, water management, and impact on concentrate.
- Reclamation and closure: the potential closure issues were reviewed, including water management, habitat restoration, and long-term monitoring and management.
- For financial practicability, the following potential impacts to project viability were reviewed.
    - Infrastructure costs: plans to use existing infrastructure were reviewed to ensure sufficiency and that plans for new infrastructure are realistic. Expected capital and operating costs were also reviewed to ensure that they are reasonable. Specific focus was given to water and energy as the most critical key supplies to evaluate.
    - Marketing: the economic and financial viability of the project will depend on both a) the ability of the owner to sell the products to customers, which will be determined by the quality (chemical composition) of each of the products and the logistics required to deliver to market; and b) the metal prices for those products. Data reviewed included the metal products that the project will produce, and the quality of each of the planned metal products was assessed to confirm the marketability of each.
    - Project schedule: the project schedule will depend on the petitioner coordinating and performing, directly or through contractors, the different development and construction activities necessary for the project to achieve commercial production. The mine development strategy and high-level schedule were reviewed in terms of scope of

[1] Wolfden Mt. Chase LLC (Wolfden). 2020. *Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit*. Thunder Bay, Ontario: Wolfden Mt. Chase LLC.

[2] Wolfden Mt. Chase LLC (Wolfden). 2020. *Preliminary Economic Assessment, Picket Mountain Project, Penobscot County, Maine, USA*. Thunder Bay, Ontario: A-Z Mining Professionals Ltd. Effective date September 14, 2020; filing date October 29, 2020.

activities, schedule and sequencing for the individual activities, and overall project timeline.

- Project economics: the financing plan and other evidence presented by the petitioner will indicate the expected financial practicality of the project. The macroeconomic, technical, and commercial assumptions components of the financial model were reviewed, as were the financing assumptions used by the petitioner in order to present the financial practicality of the project in the petition.
- Project financing: current conditions of the junior mining market will be used in conjunction with the requirements of the mining financing community to make an assessment of the challenges and opportunities for the petitioner to achieve either a divestment to a major mining company or to secure financing that would enable the project to become a mine.
- Socioeconomic considerations: concurrent with the review of the financial model in the project economics (above), estimates provided by the petitioner were reviewed for reasonableness in the event the project becomes a mine.

TECHNICAL TEAM AND APPROACH

The following senior-level review teams were engaged to provide review and evaluation of the project.

- SWCA Environmental Consultants (SWCA)
- Engineering Analytics, Inc.
- Linkan Engineering (Linkan)
- Montgomery & Associates
- Sunrise Americas LLC

Each team was provided with the documents to provide an assessment of the project overall and for their specific disciplines. Mining engineering strategy was reviewed primarily by Engineering Analytics. Linkan was the primary lead for water management, with support from SWCA on the geochemical and water balance. Montgomery & Associates reviewed mine dewatering with input from Linkan and SWCA regarding water balance. Sunrise Americas reviewed the financial viability of the mine.

Technical memoranda were prepared following independent review of the documents by each team and were used as a basis for this overall assessment report. Team technical memoranda are attached as follows.

- Attachment A: Review of the PEA for the Pickett Mountain Project, Engineering Analytics
- Attachment B: Wolfden Mining Rezoning Petition and Preliminary Economic Assessment Technical Review, Linkan Engineering
- Attachment C: PEA Review, Montgomery & Associates
- Attachment D: Assessment of Geochemistry, Soils, and Reclamation, Pickett Mountain Project, Wolfden Mt. Chase, SWCA
- Attachment E: Assessment of Financial Practicality, Sunrise Americas

PROJECT DESCRIPTION AND CONTEXT

Pickett Mountain is a high-grade base metal deposit primarily composed of zinc, lead, copper, silver, and gold as economic minerals of interest. The intended process is to excavate valuable in-situ minerals (ore) from underground via drilling and blasting into manageable-sized fragments that can be loaded into underground trucks and hauled to the surface to be stored on a temporary stockpile for milling (crushing and grinding to a fine dust) and concentrating. Milling and concentrating will occur continuously at a nominal rate of 1,200 tonnes per day (tpd). The concentrator will use flotation technology to separate the valuable minerals (concentrate) from the non-valuable minerals (tailings). Three concentrates will be produced in sequence—copper, lead, then zinc—with each dewatered and stored separately for transportation to a selected smelter outside the state of Maine. Transportation will be facilitated using truck and trailer combinations with optimized capacity for the amount of concentrate produced. Waste byproduct (tailings) will be dewatered and thickened for delivery via trucks and dozers to an approved Tailings Management Facility (TMF) where the tailings can be shaped and contoured. Water from the dewatering of the tailings and concentrates will be recirculated in the processing plant. The TMF will be lined in such a way as to ensure that any decant water, precipitation, or other water introductions will be collected and not allowed to come in contact with the water table below. The total footprint of the TMF is expected to be approximately 78.4 acres built in five sections sequentially over the life of the operation. Each section will be approximately 15 acres and will be operated and then closed as the next section opens in order to manage the reclamation process on an ongoing basis and minimize risks and exposure. All water collected from the TMF will be pumped back into the milling circuit described above along with some make-up water. The milling process is expected to have a net negative water balance, such that some fresh groundwater will be required to keep the entire milling and concentrating process working and none of these waters will be discharged to the environment.

Project Context with Respect to Development of Volcanogenic Massive Sulfide Deposits

VMS deposits occur in a variety of tectonic settings but are typically related to precipitation of metals from hydrothermal solutions circulating in volcanically active submarine environments. VMS deposits are major sources of zinc, copper, lead, silver, and gold, and significant sources for cobalt, tin, selenium, manganese, cadmium, indium, bismuth, tellurium, gallium, and germanium. Some also contain significant amounts of arsenic, antimony, and mercury. Because of their polymetallic content, VMS deposits continue to be one of the most desirable deposit types for security against fluctuating prices of different metals.[3] There are close to 850 known VMS deposits worldwide with geological reserves of over 200,000 tonnes, with successful mine development in a variety of environments. Successful development of VMS deposits includes the Greens Creek underground mine in Alaska.

Volcanic-associated massive sulfide deposits are among the most likely of all deposit types to have associated environmental problems, particularly acid mine drainage. VMS deposits have high iron- and base-metal-sulfide mineral contents and are hosted by rocks with low buffering capacity. These minerals are unstable under normal oxidizing near-surface conditions and represent potential sources of highly acid and metal-rich drainage, especially in areas disturbed by surface mining or tailings disposal. Associated high abundances of potentially toxic trace metals, including arsenic, bismuth, cadmium, mercury, lead, and antimony, are present in some deposits, particularly those associated with felsic volcanic or sedimentary source rocks.

[3] Galley, A.G., M.D. Hannington, and I.R. Jonasson. 2007. Volcanogenic massive sulphide deposits. In *Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods*, edited by W.D. Goodfellow. Geological Association of Canada, Mineral Deposits Division, Special Publication No. 5:141–161.

Mining methods have a large influence on the potential environmental impacts of massive sulfide deposits. Both open-pit and underground methods have been used to mine VMS deposits in historic and modern operations. Local climatic and hydrologic conditions influence the acid-generating capacity of deposits. Most massive sulfide deposits contain a large excess of iron-sulfide minerals relative to valuable base-metal sulfide minerals. The nature of ore processing and the method of deposition of the sulfide-mineral-rich tailings and waste rocks are critical parameters that influence the scope of environmental impacts associated with mining massive sulfide deposits. Fine-grained and intergrown sulfide minerals may require very fine grinding, which can result in highly reactive tailings, for beneficiation. Many modern mines discharge fine-grained sulfide-mineral-rich tailings into surface tailings ponds underlain by a number of impermeable linings. Some active underground mines are able to dispose of essentially all tailings by backfilling and cementing mined stopes; consequently, surface contamination is virtually eliminated. Base-metal sulfide minerals are typically separated by flotation; some surfactants used in the process are toxic. Most of these surfactants are recycled and relatively minor amounts are discharged to tailings ponds.

Soluble sulfate salt minerals derived from weathering and oxidation of sulfide minerals in mine dumps and tailings piles represent a potential source of metal contamination and acid generation. Extremely fine grinding required for beneficiation of VMS ore may enhance airborne transport of lead-arsenic-cadmium-antimony-bearing dust. This phenomenon is most probable in semi-arid to arid regions in which strong winds prevail.

Tailings ponds below mills are likely to contain high abundances of lead, zinc, cadmium, bismuth, antimony, and cyanide and other reactants used in flotation and recovery circuits. Highly pyritic-pyrrhotitic orebodies that are exposed to oxidation by air circulating through open adits, manways, and exploration drill holes may evolve sulfur dioxide gas; in some cases, spontaneous combustion can cause sulfide ore to burn. Tailings that contain high percentages of non-ore iron sulfide minerals have extremely high acid-generating capacity. Surficial stockpiles of high-sulfide mineral ore are also potential sources of metal-rich mine water.

Project Context with Respect to a Preliminary Economic Analysis

A preliminary economic assessment is defined as a study that includes an economic analysis of the potential viability of a project's mineral resources. Preliminary economic assessments are completed before prefeasibility and feasibility studies and are an important step in determining whether a company should develop a mineral resource project.

Generally, PEAs will include base case information on the capital costs associated with bringing a project into production, an estimate of how the mine will operate once it is built, how much metal and money it will produce and at what operating cost. The PEA helps mining companies understand risks and uncertainties associated with a project. The study can be part of exploration with both open-pit mining and underground mining and should include a mine plan. More specifically, a PEA tends to have information on pre-production capital costs, life-of-mine sustaining capital, mine life and cash flows, as well as details on processing and production methods and rates.

PROJECT TECHNICAL FEASIBILITY

The proposed development is considered in line with the technical requirements of an underground development of a VMS deposit, specifically regarding the following.

- Acceptable narrow vein mining techniques.
- Mine inflows of groundwater are manageable under normal mining conditions.

- Waste rock segregation and returning to backfill mine workings, with and without cementation depending on geotechnical needs.
- Flotation mineral processing techniques to separate and concentrate metals for sale and to remove deleterious components from tailings, and to recycle reagents as appropriate.
- Adoption of dry stacking for tailings management.
- Application of appropriate water treatment techniques suitable to anticipated water quality associated with mineral processing and waste management.

As this is a PEA-level design, there are considerable issues that require additional assessment and detailed design during feasibility level studies and during the permitting phase, including the following.

- Additional drilling will be required to update the current indicated and inferred mineral resources to measured and indicated categories (Measured & Indicated mineral resources) and, subsequently, to prepare a mineral reserve that can be used to develop a mine plan.
- Segregation of waste rock has been proposed. Additional testing will be required to develop segregation criteria, materials handling, and suitability for backfilling. These data are required to ensure suitable waste management will be temporarily stored at the surface.
- Similarly, geochemical testing of material that will be placed back underground is required to ensure that deleterious constituents will not leach into groundwater in which it is contact.
- Additional metallurgical studies will be required to optimize production which will also impact tailings management and water treatment design parameters.
- The process flow diagram is based on a packaged treatment system using generic performance data. This package system will require optimization for the site-specific water.
- Solids removal will be required prior to the ultra-filtration process to optimize water treatment performance and reduce backwash volumes. Sludge levels may be high and require an appropriate management plan.
- Reverse osmosis concentrate will require additional treatment to ensure precipitation within the storage tank.
- Cyanide management within tailings will require management possibly thought detoxification or ensuring that residual concentrations within the tailings cannot be released into the environment.
- Extremely fine grinding required for beneficiation of VMS ore may enhance airborne transport of metal-bearing dust that will require management during the dry period.
- Management of pyrite during mineral processing has been minimally discussed in the PEA. Clarification of pyrite management following mineral processing is required.
- Liner and capping design is required to minimize leachate loss from these facilities. This will need to be undertaken with an updated soil survey to ensure that facilities are sited appropriately to minimize impact to water resources.
- Groundwater and surface water baseline data will be required.
- Groundwater pumping tests will need to be conducted to determine the hydraulic properties of rocks to confirm groundwater inflows.
- A strict water balance will need to be maintained to maximize use of water produced during mining.

While these issues may appear to be limiting, these are not unusual for a project of this magnitude and can be addressed by engineering controls and good management. A review of the Maine Mining Rules[4] indicates rigorous design requirements that are consistent with other state regulations within the United States, and include an Environmental Impact Assessment as per §3.9(G). These rules will ensure that the detailed design for the proposed project will conform to industry standards and minimize impacts to natural resources. Additionally, development of underground VMS deposits is well understood and examples of effective developments of similar scale include the Greens Creek and Red Dog projects in Alaska.

The site is technically viable, provided that detailed engineering designs, and waste management and operational procedures are in line with industry standards.

PROJECT FINANCIAL FEASIBILITY

The proposed development is considered in line with the financial requirements of an underground development of a VMS deposit, specifically the following.

- Neither the power nor road infrastructure are expected to present any development difficulties.
- The estimated capital expenditure for the new transmission line from the regional grid is considered reasonable based on industry benchmarks.
- Electrical power cost is generally consistent with the delivery and supply rates for industrial customers published by the state regulator, the Maine Public Utilities Commission.
- The quantities of make-up water are relatively small due to the recycling, and errors in the assumptions would not be expected to have a material impact on the economic evaluation.
- Capital estimates for the road upgrades are relatively small in the overall capital expenditures for the project.
- Smelter charges used for assumptions in the economic evaluation were based on input from major smelters including a large, diversified resource conglomerate and commodity trader, for life of mine feed at international benchmark terms.
- Wolfden has confirmed that it expects to negotiate long-term offtake agreements with smelters.
- Copper, lead, and zinc prices used to calculate incomes from the sale of concentrates are reasonable; although similar to current prices, they are at the higher end of long-term price forecasts used within the industry to evaluate projects.
- Although the PEA has not stated smelter destinations, the road and shipping transportation costs to deliver concentrates to the smelters are considered reasonable when benchmarked against other projects and mines and considering likely smelter destinations.
- Smelter charges (deductions) for processing concentrates are reasonable and in line with standard deductions and charges applied in the industry.
- The schedules indicated or implied in the PEA and Zoning Petition for the feasibility phase, and subsequent construction and commissioning phases, appear reasonable.
- The results of the economic analysis confirm that the project could be developed into a viable, small to medium-sized mining operation; the sensitivity analysis confirms that the project returns will be reasonably robust to variances in the key assumptions.

[4] Maine Department of Environmental Protection. 2017. Chapter 200: Metallic Mineral Exploration, Advanced Exploration and Mining. Available at: http://www.maine.gov/sos/cec/rules/06/096/096c200.docx. Accessed November 2020.

- Wolfden has demonstrated the ability to raise financing to fund development work, with an estimated $14 million invested into the project, including the acquisition of the property.
- The involvement of a major mining company, Kinross Gold, which currently owns 9.6% of Wolfden, can be considered a third-party endorsement of the project, and a demonstration of the ability for management to attract interest from different sources of finance.
- The strategy of Wolfden to raise new funding for the project is considered both standard and reasonable for junior mining companies.

As this is a PEA-level design, there are considerable issues that require additional assessment and detailed design during feasibility level studies, including the following.

- The environmental and other permitting requirements for water have not been considered in this assessment of financial practicality of the project.
- The assumption of the build-own-operate arrangement for the proposed water treatment plant results in a reduced capital expenditure for the construction phase; however, it will not reduce the financing requirement for the project since Wolfden will be expected to provide a corporate guarantee to the supplier for the risk of any failure to use the service.
- The PEA assumes that the concentrate will be transported to the nearest deep-water port via a local logistics contractor, however there is no reference to the location of this port, nor to the destination smelters.
- No market studies have been presented and need to be undertaken during pre-feasibility and feasibility studies.
- The PEA and Zoning Petition make no reference to the timeline for Wolfden to arrange financing for the construction and commission phases, except by implication in the Gantt chart; such financing process can begin prior to completion of the feasibility study and would be expected to continue following completion of the same study.
- The capital expenditures presented in the PEA exclude costs such as tax and duties, financing costs, and legal costs.
- The results of the economic analysis presented in the PEA exclude the royalty that would be paid to Altius Minerals.
- Potential penalties have not been included in the economic analysis since the test work is at the scoping level and is not sufficiently advanced to allow any meaningful estimates.
- Further test work will be required to more accurately determine the chemical composition of the concentrates to be produced by the project, and to confirm the suitability of the concentrates for treatment and refining at the smelters.
- These net present values are significantly higher than the market capitalization of Wolfden, reflecting the use of low discount rates in the PEA and the fact that the market has factored in the risk profile of the project.

In summary, the PEA has been relied on for assessment of infrastructure requirements, and estimates of capital and operating costs for such infrastructure; the descriptions in the PEA are considered reasonable and, since the project would benefit from existing infrastructure (roads, regional grid system) and key supply resources (water, electricity) in the proximity to the project, any errors in the assumptions would not be expected to have a material impact on the economic evaluation.

CONCLUSIONS

Several documents for the Wolfden Mt. Chase LLC Pickett Mountain Mine Project have been prepared to support the land use rezoning application, including the application itself and a preliminary economic assessment. At this stage, all project components are preliminary in nature and will become more detailed as the project develops. Given the level of effort for this stage of development, and compared with similar deposits, the proposed development is technically feasible with the understanding that significant detail is still required for the design of individual mine components in accordance with the State of Maine rules and regulations for development of this project. The estimates and assumptions presented in the rezoning application and preliminary economic assessment to support the financial practicality of the project are considered reasonable at this stage of development; more detailed evaluation, including establishing a mineral reserve, and conducting detailed engineering and negotiating firm contracts to improve the accuracy of capital and operating cost estimates, will be required during the next stages to confirm the economic viability of the project.

The principal challenges for the project to realize the values presented in the PEA are:

- confirming at a feasibility level the scoping level assumptions that have been used in the PEA, including the need to establish a mining reserve;
- successfully fulfilling permitting requirements; and
- arranging project financing and/or introducing a partner.

Finally, Wolfden continues to fund exploration drilling to target extensions to the existing deposits and new discoveries; if successful, this would be expected to improve the financial practicality of the project and make the project return more robust.

ATTACHMENT A

Review of the PEA for the Pickett Mountain Project,
Engineering Analytics, Inc.

Engineering Analytics, Inc. ▪ 1600 Specht Point Rd. ▪ Suite 209 ▪ Fort Collins, CO 80525 ▪ Ph 970.488.3111 ▪ Fax 970.488.3112

Technical Memorandum

To:	Andrew Harley, PhD.	From:	Jason Andrews, P.E.
Company:	SWCA Environmental Consultants	Date:	December 4, 2020
EA No.:	111115		
Re:	Review of the PEA for the Pickett Mountain Project		
Reviewed by:	Daniel Overton, P.E.		

1.0 INTRODUCTION

Engineering Analytics, Inc. (EA) was requested to review the mine engineering aspect of selected sections of the Preliminary Economic Assessment (PEA) for the Pickett Mountain Project. The PEA was prepared by A-Z Mining Professionals Limited for Wolfden Resources. This review was conducted in consideration of the Land Use Planning Commission (LUPC) approval criteria provided below:

- 1b - no undue adverse impact on existing uses or resources or a new district designation is more appropriate for the protection and management of existing uses and resources.
- 2a - Positive and negative impacts resulting from the change in use and development of the area. Such impacts may include, but are not limited to, impacts to regional economic viability, Maine's natural resource-based economy, local residents and property owners, ecological and natural values, recreation, and public health, safety, and general welfare.
- 2b - Positive and negative impacts upon associated transportation routes and other infrastructure
- 2c - Potential for future reclamation and beneficial use of the affected area, following closure of the site.
- 3a - Potential short and long term socioeconomic impacts, both positive and negative, upon the immediate area and communities likely to be affected by the proposed activities and resulting from the construction, operation and closure of the proposed activity
- 3b – Potential impacts on services
- 3c – Potential impacts on existing infrastructure
- 3d – Potential impacts to existing uses and natural resources

EA's reviewed the sections of the PEA provided in Table 1 were reviewed in performing our scope of work:

Table 1: PEA Sections Reviewed

4.0 Property Description and Location
5.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography
6.0 History of the Property
7.0 Geological Setting and Mineralization
7.1 Regional Geology
13.0 Mineral Processing and Metallurgical
14.0 Mineral Resource Estimate
15.0 Mineral Reserve Estimates
16.0 Mining Methods
16.2 Underground Mine Design
16.3 Geotechnical Considerations
16.4 Mine Access and Level Development
16.5 Rock Handling
16.6 Underground Services and Infrastructure
16.7 Mining Methods
16.8 Dilution and Extraction
16.9 Mining Operations
16.10 Mining Equipment
16.11 Mine Backfilling
16.12 Ventilation
16.13 Development and Production Schedules
16.14 Mine Surface Infrastructure
16.15 Grade Control
16.16 Underground Personnel
17.0 Recovery Methods
17.1 Conceptual Process Flowsheet
17.2 Process Design Criteria
17.3 Reagents
17.4 Process Make-Up Water
17.5 Material Balance
18.0 Infrastructure
18.12 Materials Pads
18.12.1 Rock Dump - Clean
18.12.2 Rock Dump - Acid Generating
18.12.3 Ore Pad and Temporary Stockpile
18.22 Tailings Management Facility
20.0 Environmental Studies, Permitting and Potential Impacts
20.1 Regulatory Framework
20.2 Mine Permitting Stages and Status
20.3 Environmental Studies and Impact Studies and Impact Assessments
25.0 Interpretation and Conclusions

EA has also reviewed the Petition to Rezone Portion of Township 6 Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit dated January 26, 2020 and revised June 30, 2020 for conformance with the PEA data.

EA's review was completed with the understanding that this PEA to support the petition to rezone and that a mine permit application will be submitted at a later date for detailed review.

EA's comments to the assigned sections are provided in Table 2 below. Only the sections that EA had comments on are provided in Table 2.

2.0 ASSESSMENT OF REASONABLENESS

EA has reviewed the PEA as it relates to mine engineering. We have determined that the information put forth in the sections we reviewed are based on reasonable estimates. The proposed facilities and technologies are similar to those used in the industry at other mines in similar climates.

3.0 ISSUES AND POTENTIAL CHALLENGES

During EA's review there are a few items that could pose challenges. The tailings management facility is a very conceptual at this stage of the project. The proposed method for dry stacking the tailings is used in the mining industry and is reasonable. However, management of tailings is an important part of the mine life cycle that requires detailed design.

The water usage and sources are discussed in general terms. The PEA indicates that they will have suffect water for mining activities and appears reasonable. Additional details for the water usage and water source will be needed for the site water usage for startup, operations and closure. The management of water consumes a lot mine operations time and efforts. A detailed water balance will be needed to determine water treatment, storage, and usage needs during the year.

4.0 CONCLUSIONS

The information put forth in the sections EA reviewed appear to be based on reasonable estimates. At this stage of the project there are additional details that would be needed for a mine permit application. However, the assumptions provided in the PEA support the concept that this project is feasible from a mine engineering standpoint.

Table 2: Comments on PEA in Support of Rezoning Petition

Comment Number	Section Number	Page Number	Comment
1.	Section 4.0 Property Description and Location	15	A discussion of nearest residences/structures would be helpful to determine impact to others. Additional discussion of the impacts and agreements regarding "surface rights leases on the south side of Pleasant Lake" should be discussed.
2.	Section 5.3 Local Resources	16	This section addresses the local resources and outlines roads, a town and rail line. It does not address how they will use the local resources and the impacts that the mine might have on those resources, including fire, police, solid waste, etc. These items should be addressed. The impact to local natural resources should be also be addressed.
3.	Section 5.4 Infrastructure	16	This section addresses the existing infrastructure that includes roads and electrical. A statement as to the capacity of the existing roads to support the additional mine traffic should be included and potential needs for road upgrades should be included. A statement regarding the ability for the existing utilities to support the mine should also be included.
4.	Section 5.5 Physiography	17	It would be useful to discuss surface water bodies and potential impacts to those structures.
5.	Section 7.1 Regional Geology	23	The resolution of Figure 7.2 is hard to read the geology of the region. Please improve the resolution.
6.	Section 15.0 Mineral Reserve Estimates	107	This section has not been completed. Please update.
7.	Section 16.5 Rock Handling	112	The rock handling section does not provide any detail about how the rock will be sorted or stored during the life of the mine. Additional detail should be provided about rock sorting and storage or provide a reference in the report to the sections that address this. Waste rock handling and associated ARD can be a problem if not managed correctly.
8.	Section 16.6 Underground Services and Infrastructure	112	The water supply section indicates that water will be obtained from a water storage pond and water pumped from the mine. The mine dewatering section indicates that they anticipate pumping about 1,420 m^3 of water from the mine each day or 518,300 m^3 per year. The service water needs are projected to be 401,000 m^3 per

Comment Number	Section Number	Page Number	Comment
			year. Thus, during full time operation the project has enough water to operate. However, additional detail should be provided to support their water source availability prior to full mine development. At full mine development it appears that they will have an excess of about 100,000 m^3 of water per year. Information should be provided to address where the source of the water before the shaft is developed and how the excess water is managed during full time operations. The control of and access to water is integral for development and operations.
9.	Section 16.14 Mine Surface Infrastructure	133	The mine surface infrastructure talks about a well for potable water needs. Some discussion should be provided regarding potable water needs and project well production levels.
10.	Section 18.3.1 Main Pad Preparation	143	The amount of drilling and blasting costs to level the pad was calculated. However, the costs to crush and place the material is not included in the costs. Please include these costs or reference where they are located.
11.	Section 18.5 Potable Water System	144	A potable water system should be identified.
12.	Section 18.12.1 Rock Dump -Clean	145	Section 18.12.2 calls out the liner thickness. Update this section to reflect the liner thickness.
13.	Section 18.22.2 Design Criteria	150	This section should include seismic design criteria.

ATTACHMENT B

Wolfden Mining Rezoning Petition and Preliminary Economic Assessment Technical Review,
Linkan Engineering

MEMORANDUM

DATE: November 24, 2020

TO: Andrew Harley, SWCA

FROM: James J. Gusek and David A. Myers

SUBJECT: Wolfden Mining Rezoning Petition and Preliminary Economic Assessment Technical Review

REFERENCE NO.: 96.01_504

INTRODUCTION

At the request of SWCA, Linkan Engineering (Linkan) reviewed two documents associated with the rezoning of a land parcel in Penobscot County, Maine for the development of an underground metal mine and its associated surface disturbances including a dry stack tailings facility. The Linkan review focused on technical issues related to the potential to contaminate ground and surface water and the mitigation plans proposed in the two documents:

- Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit, and
- Preliminary Economic Assessment (PEA) Pickett Mountain Project

Linkan's comments follow. For convenience, the page number locations of Linkan's comments are cited below and they are also imbedded in the two Adobe Acrobat™ bookmarked PDF files that SWCA provided to Linkan. Page numbers referenced below refer to the location of the page in the total page count in the document (Adobe Acrobat™ page count) and not the page number listed at the bottom of the page (that was not consistently provided).

LINKAN ENGINEERING'S COMMENTS TO *PETITION TO REZONE PORTION OF TOWNSHIP 6, RANGE 6 PENOBSCOT COUNTY, MAINE FOR DEVELOPMENT OF AN UNDERGROUND METALLIC MINERAL DEPOSIT*

Linkan Comment #01, Page 163

There is no real basis for estimate of mine dewatering flow rate. The water management plan needs to have flexibility in case flows are higher. There does not appear to be a specific plan to deal with large storm events.

Linkan Comment #02, Page 163

The water quality of the seepage into the mine workings deteriorates over time as previously submerged or isolated sulfide rock (i.e., pyrite) is exposed to the mine atmosphere containing oxygen. This is an inevitable condition that either needs a mitigation plan to prevent it from happening or a water treatment plant capable of treating the additional loading or both.

Linkan Comment #03, Page 164

Removing the bacterial component of pyritic dissolution is also an effective strategy for preventing acid generation, but is not mentioned. Acidophilic microbes such as *Acidithiobacillus Ferrooxidans* accelerate the kinetics of pyrite oxidation and the generation of acid rock drainage (ARD) by several orders of magnitude. This aspect of ARD production has been well understood for almost 70 years (Leathen et al., 1953).

Linkan Comment #04, Page 164

Oxidation can still occur w/o Oxygen. If ferric iron (Fe^{+3}) is present in the water in contact with pyrite, oxidation can occur even though the pyrite is submerged. Ferric iron is produced in the pyrite dissolution process and can self-sustain to a degree. When the ground water rebounds after mine dewatering pumping is suspended, it might be necessary to neutralize the rising mine pool with alkalinity to minimize the presence of ferric iron in the pore spaces in contact with sulfide-bearing mine waste.

Linkan Comment #05, Page 164

Bactericides can also be effective in minimizing pyritic oxidation. Low concentrations of common anionic surfactant bactericides such as sodium lauryl sulfate, can minimize acid generation kinetic rates (Kleinmann and Ericson, 1983). Diluted milk has also been found to be an effective acidophilic bactericide (Jin, et al., 2008).

Linkan Comment #06, Page 164

The longer the acidic waste rock stays on the surface, the more acidic the backfill material might become. Preventing pyritic oxidation by removing oxygen and/or water or applying a bactericide during operations could minimize ARD generation in backstowed waste rock until closure, which would minimize the presence of ferric iron in the rising mine pool.

Linkan Comment #07, Page 164

<u>General Comment</u>

While Wolfden did not acknowledge the role of bacteria in the generation of ARD, it appears that they are cognizant of the problem and have taken appropriate measures (i.e., controlling water and air contact and addressing ARD in an active treatment plant) to deal with it both during operation and at closure. The use of ARD-preventive bactericides, a proven technology, might be a reasonable strategy to include in the plan.

Linkan Comment #08, Page 166

Tailings & waste rock co-disposal underground is a good idea. If there are reactive sulfides in the stope walls, after backstowing they would be placed in intimate contact with the very moist co-disposed tailings and that would cut off the oxygen supply. This is as close to pre-mining conditions as one could expect.

Linkan Comment #09, Page 166

Submergence of tailings is an acceptable practice, however it should be validated with some simple kinetic testing using drill core. The testing should be conducted in concert with planned acid-base accounting. Also, some residual flotation reagents are organic (such as A325, M200, and A343 [Table 17.2 in the PEA] which are xanthates and organic collectors). These will eventually turn the mine pool anoxic as they degrade. While arsenic is present in the waste rock and tailings as arsenopyrite and tetrahedrite which contains antimony, it is unlikely that these two constituents (As & Sb) would be mobilized by the anoxic conditions in the mine pool.

Linkan Comment #10, Page 166

Sub-aerial tailings deposition will encourage acid formation due to exposure to water and air. A plan for suppression of bacterial growth is needed.

Linkan Comment #11, Page 166

What happens to snowmelt? This is Maine... Consider a temporary sealant to increase runoff and avoid infiltration, especially on the 20% side slopes. A water-based polymer sealant was used successfully on a mine waste repository in Idaho at the end of the construction season to reduce infiltration. The photo is courtesy of Pacific Inter-Mountain Distribution LLC, Kalispell, Montana.

Figure 1 Spraying temporary sealant on a mine waste repository

Linkan Comment #12, Page 166

The final tailings might be finer than 400 mesh (37 microns) according to the PEA executive summary. Smooth drum rolling is an appropriate compaction method. We agree that this compacted material is likely to produce a very low permeability condition. However, dust control might be a problem during the drier months and the finer grained material is likely to contain a significant fraction of respirable dust.

Linkan Comment #13, Page 168

General Comment

An ARD mitigation plan should be in place during mine operations and not just for closure. The plan should include minimizing water and air exposure to pyritic waste rock piles such as spray-on sealant (say at the end of the fall season) and/or the inclusion of a bactericide to suppress microbial kinetics. Implementing these technologies would not add a significant cost component. As there will be a geomembrane cap as part of the closure design (i.e., complete encapsulation), the potential for ARD generation appears to be very small.

Linkan Comment #14, Page 169

Returning the RO reject back to the WTP feed tank will cause a build-up of salts and potentially gypsum to form in the system. A plan to remove sulfate is needed or a disposal plan for the brine. This is not a lot different than many larger mines…but they have very large tailings ponds to put the reject into.

Linkan Comment #15, Page 169

The proposed Process Flow Diagram seems credible (with possible exception of RO brine management – Linkan Comment #14). Linkan's experience is that well mixed round reaction tanks followed by lamella or other type of clarifiers and then Microfiltration followed by RO gives a robust system with consistent results.

Linkan Comment #16, Page 221

It is not reasonable to expect that all drainage water will no longer require treatment after 1 year. There should be a passive system to polish the final drainage water, and the WTP should be retained for a time as a contingency plan.

LINKAN ENGINEERING'S COMMENTS TO *PRELIMINARY ECONOMIC ASSESSMENT (PEA) PICKETT MOUNTAIN PROJECT*

Linkan Comment #01, Page 14

The grain sizes of the concentrates and the tailings are reported to be from 14 microns (μm) to 37 μm. This is very small compared to established norms by many mining operations. For comparison, talcum powder exhibits a "…a median diameter of 26.57 μm with a range of particle sizes from 0.399 μm to 100.237 μm" (Gilbert, et al., 2018).

The assumptions used to determine dry stacking (or sub-aerial tailings deposition) capacities and characteristics need to be vetted from experience/data with similar materials. Dry stacked tailings storage will reportedly reduce the tailings moisture content to about 20%; dust control may be an operational issue in drier seasons but there are numerous technologies available such as spray-on sealants to mitigate this potential problem. This would not be an issue at closure as the tailings storage facility (TSF) will be capped.

Linkan Comment #02, Page 18

The presence of arsenic and antimony in the concentrates infers their presence in the tailings. Immobilization of these constituents in the final tailings and presumed exposed surfaces in the underground mine workings should be a priority. This is discussed in more detail in other comments.

Linkan Comment #03, Page 19

There appears to be adequate room for locating a runoff catchment basin.

Linkan Comment #04, Page 20

Complete geochemical characterization testing is a good idea, but it should also include a microbial testing component for the presence/ absence of acidophilic bacteria in the core samples collected from the site during the exploration program. Older samples should be tested prior to more-recent core samples.

Linkan Comment #05, Page 20

As revealed elsewhere in the PEA (Linkan Comment #06), the deposit contains high concentrations of pyrite and the tailings will exhibit a very fine grain size (Linkan Comment #01). Low dry stacked tailings permeability values notwithstanding, the tailings will likely be very geochemically reactive and prone to produce acid rock drainage (ARD). Amending the closure cover design to eliminate the low permeability geomembrane component is probably not a good plan.

Linkan Comment #06, Page 38

The presence of pyrite (FeS_2) and calcite ($CaCO_3$) in the ore constitute two end points on the ARD potential spectrum. The more calcite present in the mine waste, the less likely ARD will form. This would be confirmed in follow-up testing (Linkan Comment #04).

Linkan Comment #07, Page 39

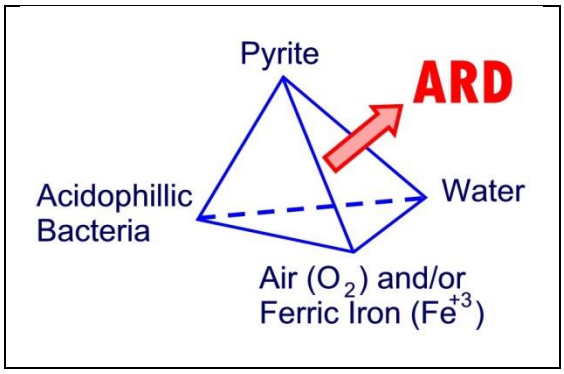
The level of pyrite in the ore (45% to 65%) will increase in the tailings when the minerals of value (chalcopyrite [Cu], galena [Pb], and sphalerite [Zn]) are recovered. By inspection, this elevated level of pyrite in the mine waste has an almost certain likelihood of generating ARD if mitigation measures (discussed elsewhere in the PEA) are not implemented. The arsenopyrite, tetrahedrite, and tennantite in the ore (and presumably the tailings) are potential sources of arsenic and antimony contamination. Mitigation measures are discussed elsewhere in the PEA.

Linkan Comment #08, Page 93

The smallest grain size distribution of the tailings sample used in this test was 325 mesh or 44 µm. Text in Section 1.4, Processing, states that regrinding to 14 µm would be necessary to produce a suitable lead concentrate. Vacuum filtration of 14 µm materials should be demonstrated. Vacuum filters with diatomaceous earth precoat are often used for very fine material.

Linkan Comment #09, Page 139

Backfilling the stopes with mine waste and tailings (Section 16.11.1) is a good idea. The technique should be called out as "co-disposal" which is the term commonly used. Surrounding coarser-grained mine development waste (which may or may not be acid generating) with tailings that presumably contain pyrite with a grain size of about 14 µm is an efficient use of space and geochemically sound as the moisture retention/field capacity of the tailings should keep the backfill moist (cutting off the oxygen supply leg of the ARD tetrahedron shown below) and have very low permeability.



Linkan Comment #10, Page 151

Table 17.2 includes sodium cyanide and multiple organic reagents such as xanthate (A325) used in the froth flotation circuit. The ultimate fate of these reagents should be discussed in the water treatment section. Are these reagents retained in the concentrates (which are shipped off site) or the tailings? It would be easy to add this information as an extra column or two in Table 17.2.

Linkan Comment #11, Page 156

This is a reasonable approach for collecting ARD. Materials above the liner might include a carbonate component to passively neutralize any ARD prior to its draining to the holding pond.

Linkan Comment #12, Page 157

The water management system (page 157) does not discuss the water quality requirements for process water. If all or some of the collected water is clean enough to be directly recycled without treatment, it could save treatment costs.

Linkan Comment #13, Page 157

Recommend that the proposed infiltration fields for excess water not be called septic fields…suggest Rapid Infiltration Basin (RIB).

Linkan Comment #14, Page 157

The WTP is designated to be designed for 120 gpm, and there does not seem to be adequate background for this number. On page 125 it says that the underground dewatering requirement is 1,420 m^3/day, or 260 gpm. On page 157 the text says, "the collected surface water, along with mine discharge water, is pumped to a raw water collection pond. This water is then treated through a water treatment facility". – this makes it seem that the WTP must be significantly larger than 120 gpm. Also, the WTP needs to be sized larger to "catch up" after rain events.

Linkan Comment #15, Page 158

Linkan's experience is that well mixed round reaction tanks followed by lamella or other type of clarifiers and then Microfiltration followed by RO gives a robust, system with consistent results.

Linkan Comment #16, Page 158

The RO reject is shown as going to "Waste/Concrete". RO reject disposal can be a severe problem, and this should be defined better.

Linkan Comment #17, Page 160

The tailings moisture will be controlled with pressure filtration, referencing Mine Paste, 2020. Did this test work use a tailing sample with a minimum grain size of 14 µm?

Linkan Comment #18, Page 161

The tailings volume is conservatively assumed to not include underground backfill.

Linkan Comment #19, Page 161

The design criteria need to include considerations for dust control. The very fine-grained dry stack tailings, even after moisture control, will quickly desiccate in dry weather and could pose a blowing dust problem. This could be managed with water sprays or a spray on water-based polymer which was discussed in Comment No.'s 9 and 10 in the Zoning Petition document.

Linkan Comment #20, Page 164

Over time, the grasses and shrubs will yield to a forest similar to the one surrounding the site. This is inevitable. The random soil layer for the root zone might be adjusted to accommodate for this.

Linkan Comment #21, Page 164

The contact water chemistry improvement timeline might be accelerated through the use of temporary sealants (see Linkan Comment #11 in the Rezoning Petition document) until the final cover is completed.

Linkan Comment #22, Page 177

Sequentially closing up to five TMF cells is a good plan; it provides an opportunity to adjust the closure of subsequent TMF cells based on the performance of earlier closure events.

REFERENCES CITED

Kleinmann, R.L.P. and P. M. Erickson. 1983. Control of acid drainage from coal refuse using anionic surfactants. Bureau of Mines RI 8847, 16 pp.

Leathen, W.W., S. Bradley Jr., and L.D. McIntyre. 1953. The role of bacteria in the formation of acid from certain sulfuritic constituents associated with bituminous coal, Part 2. Ferrous iron oxidizing bacteria. Appl. Microbiol. Vol. 1, pp.6 5-68.

Jin, S., Fallgren, P. H., Morris, J. M., and Cooper, J. S. 2008. Source Treatment of Acid Mine Drainage at a Backfilled Coal Mine Using Remote Sensing and Biogeochemistry. Water Air Soil Poll. 188:205–212.

Gilbert, Christopher R., B. R. Furman, D.J. Feller-Kopman, and P. Haouzi. 2018. Description of Particle Size, Distribution, and Behavior of Talc Preparations Commercially Available Within the United States. Journal of Bronchology and Interventional Pulmonology, 2018 Jan;25(1):25-30. doi: 10.1097/LBR.0000000000000420.

END

MEMORANDUM

DATE: December 2, 2020

TO: Andrew Harley, SWCA

FROM: James J. Gusek and David A. Myers

SUBJECT: Wolfden Mining Rezoning Petition and Preliminary Economic Assessment Technical Review

REFERENCE NO.: 96.01_504a (addendum)

INTRODUCTION

At the request of SWCA, Linkan Engineering (Linkan) reviewed one additional document and one updated version of a previously reviewed document associated with the rezoning of a land parcel in Penobscot County, Maine for the development of an underground metal mine and its associated surface disturbances including a dry stack tailings facility. The Linkan review focused on technical issues related to the water treatment mitigation plans proposed:

- New Document - Ltr_Wolfden_Responce_AdInfoRequest.pdf
- Updated Document - Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit, Revised June 30, 2020

Linkan's comments follow. Comments start at #23 as this is an addendum (addition) to the previously submitted Memorandum, same subject, dated NOV 24th, 2020, that ended with comment #22. References to the sections that pertain or connect with the reviewed document are provided for each comment.

Linkan has also provided a summary opinion on whether the information provided indicates that the mine is at least feasible for the purpose of rezoning to allow for detailed design and permitting to take place.

LINKAN'S COMMENTS TO: WOLFDEN RESPONSE INFO REQUEST

Linkan Comment #23, (Comment #7 Waste Disposal)

The process flow diagram is based on a packaged Suez treatment system using generic performance data. This package system is not optimized for the site specific water (not available yet) so there will be changes. Typically some type of solids removal step is in front of ultra-filtration (UF) process to optimize performance and reduce backwash volumes. Sludge levels could be high so more thought about sludge handling may be needed. Also a comment is made that the, "Reverse osmosis (RO) concentrate will flow to a storage tank for decant and solids removal." Some measure of additional treatment is needed for RO concentrate (brine) to precipitate. This is not included and not trivial.

Linkan Comment #24, (Comment 11 State Agency Review Comments, Answer 4 Streams and Wetlands)

The statement that, "The liner below and capping and closure of the TMF will prevent any leachate from infiltrating into the groundwater below" is a bold promise assuming industry standards. Liners and caps are almost never perfect so it is probably more correct to state that it will prevent significant infiltration. To say more than this would require justification about how this system is better than industry standard.

LINKAN'S COMMENTS TO: PETITION TO REZONE…, REVISED JUNE 30, 2020

On review of the text associated with Linkan's previous comments there is not any substantive changes that need to be made to the comments.

SUMMARY OPINION

Overall the documents were fairly well detailed for the expected level of project development. The rezoning requestor, Wolfden Mt. Chase LLC, has covered a fairly broad range of potential issues that will drive water treatment challenges during the active life of the project and after closure. We did not find any major category gaps in the documents.

There are many issues that still must be resolved based on more realistic water quality and flow rate predictions. This would include a more refined water treatment process that is specific to the site water (with a more definitive effluent quality), more details on how wastes will be handled (precipitates, sludges, brine, etc.), and a representative closure model that can be relied on. In this process we would assume that the issues we have discussed in our comments could be resolved.

In summary the documents that Linkan reviewed indicate that Wolfden Mt. Chase LLC, has covered the main categorical issues that will be faced with the water treatment aspects of the mining project. Both water treatment during active mining and source control measures for

closure will not be trivial especially with the no impact goals stated for discharge. We believe these issues can be mitigated and the goals met if good planning, testing/proving, engineering, and execution is done behind adequate funding and good management. Thus the water treatment aspects of the project appear feasible for the purpose of rezoning.

END

ATTACHMENT C

PEA Review,
Montgomery & Associates

MONTGOMERY & ASSOCIATES
Water Resource Consultants

Groundwater experts since 1984

TECHNICAL MEMORANDUM

DATE: November 23, 2020 **PROJECT #:** 1683.01

TO: Andrew Harley, SWCA

FROM: Chris Cottingham, Dexter Race, Paul Pettit

PROJECT: PEA Review, Wolfden Resources, Picket Mountain Project,

SUBJECT: PEA Review

Montgomery & Associates (M&A) has read the A-Z Mining Professionals, LTD, Preliminary Economic Assessment Pickets Mountain Project, Prepared for Wolfden Resources Corporation, September 14, 2020. Additionally, M&A reviewed Wolfden Mtn. Chase, LLC, Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit. M&A has reviewed these materials to assesses the following:

1. The veracity of the proposed operation.
2. The viability of the mining project and an assessment of impacts, both positive and negative.
3. A determination if there is enough information to justify a rezoning for mining.

M&A determines that there is enough information and that a professional standard has been met in the preliminary economic assessment (PEA) to justify a rezoning of the property for mining.

SPECIFIC FINDINGS

The specific findings are as follows:

Regional Geology

Geologic units from surface:

Chesuncook Dome

- Trout Valley Fm (mudstone-siltstone)
- Traveler Rhyolite
- Matagamon SS (sandstone)
- Seboomook Fm (sandstone-mudstone)

- Frost Pond Shale
- West Branch Volcanics
- Ripogenus Fm (sandstone)
- Dry Wall Volcanics

NW flank Shin Pond/Stacyville quads

- Metagaman SS (sandstone)
- Seboomook Fm. (sandstone-mudstone)
- Unnamed intermediate to mafic volcanics
- Unnamed calcareous siltstone
- Unnamed limestone
- Unnamed siltstone-sandstone
- Unnamed conglomerate-sandstone-siltstone
- Wassataquoik Chert
- Stacyville Volcanics

Cross section of the deposit and associated lithotypes

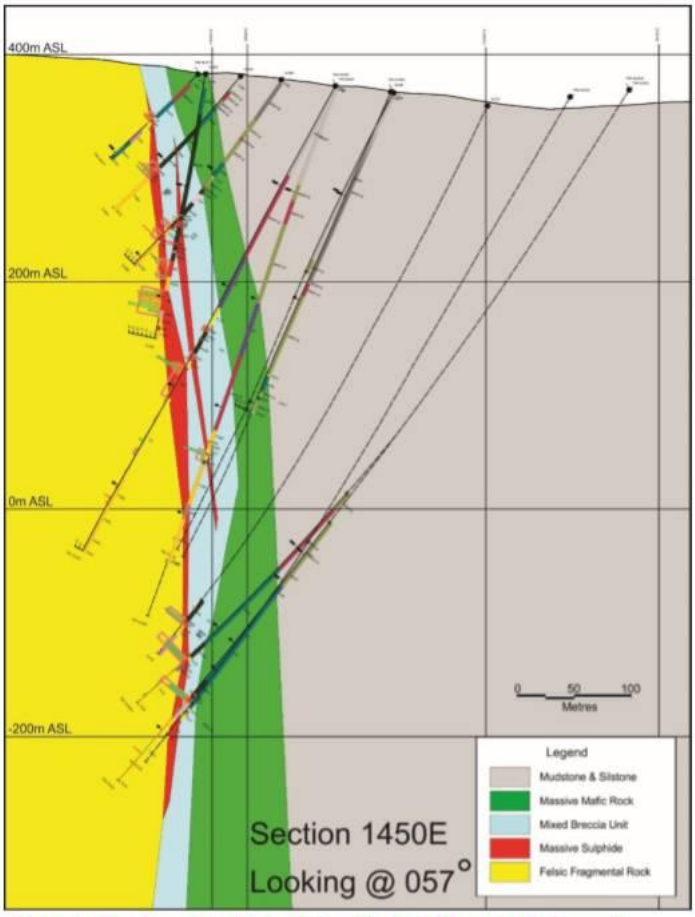


Figure 7.5 Cross Section of the Pickett Mountain Deposit

Dewatering and Water Management

Although there is little to no groundwater data provided in the material reviewed, groundwater is expected to be encountered during mining. Dewatering wells are planned for the initial phases of mining to reduce the water managed during mining prior to the completion of underground piping infrastructure. The projected water produced by underground mine development activities for the project is 1,160 cubic meters (m^3) per day or 260 gallons per minute (gpm). The service water required for the mine would be 401,000 m^3 per year or 201.55 gpm. This rate of inflow (260 gpm) is easily managed underground under normal mining conditions and would meet the service water requirements stated above.

Underground, water is planned to be managed through a series of sumps and baffles. Water will be segregated by water quality and will ultimately be pumped to the surface through a series of pipelines and stored in surface ponds for use as service water. This is a standard and acceptable water management practice.

FUTURE WORK TO BE CONDUCTED

As mentioned in the PEA, hydrologic studies need to be conducted to confirm the proposed dewatering method, evaluate the TSF site, and confirm location(s) for a supply well(s).

Specific Water Data Needs Recommendations

1. No groundwater elevation data has been provided in the PEA. This will need to be collected as part of the baseline environmental studies.

2. Pumping tests will need to be conducted to determine the hydraulic properties of the rock. This is will allow the project hydrogeologist to confirm the inflows to be experienced during mining and verify that they will be manageable and will meet the service water needs.

3. Tailings characterization has not been completed and are recommended to confirm assumptions for the underground mining method and tailings foundation stability.

4. Waste rock characterization has not been completed. The water quality implications should be studied as part of the overall baseline environmental studies.

5. No background water chemistry is included in the PEA. However, the potential for water chemistry issues is acknowledged (As, TDS etc), and a subsequent water treatment plant is mentioned.

6. The PEA recommends that all environmental baseline studies be completed as they are necessary to meet state and federal permitting requirements.

FINDINGS AND CONCLUSIONS

1. The water portion of the PEA appears to be completed to a professional standard and is based on reasonable and verifiable data as it exists to date.

2. The water management portions of the mining project appear to be viable and potential water quality or quantity impacts are acknowledged and planned to be studied.

3. The PEA meets the professional standard to justify the rezoning of the property for mining.

4. Two factors contribute to the confidence in water management at this site: 1) The need to maintain a strict water balance in order to maximize the use of water produced during mining for service water, and 2) the recognition and dedication to build a water treatment facility.

ATTACHMENT D

Assessment of Geochemistry, Soils, and Reclamation,
Pickett Mountain Project, Wolfen Mt. Chase
SWCA Environmental Consultants

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TECHNICAL MEMORANDUM

To: Michael Lychwala
SWCA Environmental Consultants
8 Science Park Road
Scarborough, Maine 04074

From: Andrew Harley, Senior Geochemist/Senior Soil Scientist

Date: December 1, 2020

Re: **Assessment of Geochemistry, Soils, and Reclamation, Pickett Mountain Project, Wolfden Mt. Chase / SWCA Project No. 61402**

SWCA Environmental Consultants (SWCA) has reviewed the following two documents submitted by Wolfden Mt. Chase LLC (Wolfden) in support of a State of Maine Land Use Planning Commission (LUPC) application to rezone a portion of Township 6, Range 6 of Penobscot County to allow for development of an underground mineral deposit known as the Picket Mountain Project.

- The petition submitted by Wolfden to LUPC (Wolfden 2020a)
- A National Instrument 43-101-compliant Preliminary Economic Assessment (PEA) (Wolfden 2020b)

SWCA has reviewed the documents to evaluate the technical feasibility of the geochemical, soils, and reclamation components of the project, given the preliminary development stage of this project. SWCA understands that additional studies are planned and that Wolfden will obtain a Maine Department of Environmental Protection (MEDEP) Metallic Mining Permit under Chapter 200 rules (MEDEP 2017) if rezoning is approved.

ENVIRONMENTAL GEOCHEMISTRY

Pre-mining geochemical characterization is of critical importance to evaluate potential impacts over the life of a mine, and to develop suitable mitigation strategies. Impacts can be physical, chemical, and biological in nature. Characterization activities include pre-mining baseline conditions and the identification of risks specifically related to the manner in which the ore will be mined and processed, how water and waste products will be managed, and the final configuration of the post-mining landscape.

Current Status and Information

The project consists of a massive sulfide deposit, described as fine-grained with potentially acid-producing minerals including pyrite (iron sulfide), sphalerite (zinc sulfide), galena (lead sulfide), and chalcopyrite (copper iron sulfide). The minerals, when exposed to air and water, react to form acidic leachate and drainage. Acidic materials can be offset through neutralizing minerals, as described in Acid-

Base Accounting (ABA) procedures. Neutralizing minerals noted in the PEA include calcite and felsic rocks. Other minerals of concern include tetrahedrite (copper antimony sulfosalt) and arsenopyrite (iron arsenic sulfide) that can potentially release antimony and arsenic into the environment. Assessment of ABA or potential metal leachate production are not reported.

Whole rock geochemistry results are based on digestion and analysis by inductively coupled plasma optical emission spectrometry (ICP OES) and are discussed in the PEA. Concentrations of zinc, lead, copper, silver, and gold are presented within the PEA. Sulfide results, commonly reported during the preliminary feasibility stage, are not mentioned in the PEA, although the data likely exist given the analytical technique.

Waste rock produced during underground development will be returned to backfill mined-out stopes to prevent caving. Primary stopes will be backfilled with cemented rockfill while secondary stopes will contain uncemented rockfill. Assessment of geochemical suitability for waste rock to be relocated below ground has not been provided.

Prior to backfilling, waste rock will be stored in two rock dumps: a clean rock dump and an acid-generating rock dump. Details regarding construction are limited, with mitigation strategies including berms, drainage collection, and in the case of the acid-generating rock dump, liners and potentially a holding pond. Similarly, stockpiles of ore will be developed with a design similar to the acid-generating rock dump. Proposed methods for segregation between the clean and acid-generating waste rock have not been discussed.

Metallurgical testing has been undertaken to evaluate processing requirements to produce a concentrate for sale. The other component of processing is the residual material from which the concentrate has been removed. This material is referred to as tailings and will be disposed in an aboveground facility as described below. Based on the geological composition of the ore, the tailings will likely contain fine-grained, reactive sulfide that can potentially produce acidic and metal leachate. A master composite sample submitted for metallurgical testing contained 27.4% total sulfur, although 21.0% of the sulfur presented as sulfate indicating that some oxidation had occurred. Floatation techniques were used to collect the remaining sulfides; however, 2.5% sulfide sulfur will remain within the tailings that will report to the tailings management facility (TMF). Additionally, reagents used in testing, including cyanide, may end up in the tailings. Characterization of reagent impacts to tailings have not been reported.

Tailings management will be via dewatering and pressure filtration to generate a filter cake to be placed into a dry stack TMF. While geochemical testing of tailings actually stored at the site has not been reported, engineering controls of any potential leachate include a containment system constructed of low permeability soil fill, a geomembrane liner, and a drainage collection layer. A berm will be constructed along the toe of the TMF to anchor the geomembrane liner and to create a collection ditch for contact water.

Water quality baseline data, both surface water and groundwater, have not been reported for the project and will be required for feasibility and permitting-level efforts.

Assessment of Reasonableness

The level of environmental geochemical testing and reporting is less than would be expected for a PEA-level document. Data of interest include sulfur data for waste rock characterization and management, geochemical characterization of tailings material, and initial water quality data. However, as these are costly programs it is understandable that the proponent has not invested in these without rezoning approval. The level of effort certainly indicates that the proponent is aware of these issues and will address these during more detailed design and permitting of the project. The proponent has invested effort

into water management and water treatment designs, again indicating an awareness of potential issues on this project. The concentration of sulfides reporting to the TMF will need to be further monitored as metallurgical testing continues.

Issues and Potential Challenges

As the project progresses, increasing levels of environmental geochemical testing will be required as per MEDEP Chapter 200 §5.20(E) with guidance such as the *Global Acid Rock Drainage Guide* (International Network for Acid Prevention 2014), and development of a Reactive Mine Waste and Designated Chemical Material Management System as per MEDEP Chapter 200 §5.20(G). Characterization will include static testing of development rock and tailings material and kinetic testing of tailings material and rock to be placed underground including cemented and uncemented components. Additionally, a water quality monitoring plan is required as per MEDEP Chapter 200 §3.9(C). As permitting will take 2 to 3 years following rezoning, this gives sufficient time to complete appropriate baseline and environmental studies.

The design and operation of a filter cake disposal facility is dependent on tailings to the specified consistency. The main challenges to tailings management include variations on tailing development that require additional reworking, drying, or re-processing before deposition and that winter conditions may impact dewatering efficiency, requiring temporary storage. Although this is of more engineering and operational concern, the geochemical nature of the material will inform operational decisions.

SOILS

Current Status and Information

A soil suitability evaluation undertaken by Wood Environment & Infrastructure Solutions, Inc. (Wood) (2020a) identified five soil suitability classes.

- Generally Suitable: Well drained (>16 inches to water table), deep (>40 inches) bedrock, slopes less than 15%.
- Limited Suitability: Poorly drained (7–16 inches to water table), moderately deep (20–40 inches), slopes less than 15%.
- Unsuitable: Poorly drained (<7 inches to water table), shallow (<10 inches) bedrock.
- Unsuitable – Wet: Hydric soils or mapped wetlands.
- Unsuitable Steep: Slopes >15%.

Based on these criteria, the site was divided into six areas based on broad landscape areas with similar soil characteristics (Wood 2020a:Figure 5).

- Area 1: This area is in the northeast portion of the site and slopes range from 3% to 10%. Soils in Area 1 are loams to silt loams, with bedrock greater than 16 inches. Soils are well drained to moderately well drained. Seasonal high-water table is generally greater than 15 inches below grade. The TMF and processed wastewater dispersal facility is to be located in Area 1.
- Area 2: The northern and northwestern section of the rezone area is characterized by gentle to moderate slopes and soils are loams to silty loams with a seasonal high-water table or restricted layer less than 16 inches. As such, the soils are poorly drained and contain long slopes with shallow groundwater during normal conditions.

- Area 3: The western section has moderate slopes and loam to silty loam, well-drained soils with bedrock approximately 10 to 20 inches deep. Development of the main pad is proposed in Area 3.
- Area 4: The central section has slopes ranging from 0% to 8% with some moderate slopes of 8% to 15%. The loam and silt loam soils over glacial till or bedrock result in poorly drained soils. Wetlands are prevalent in this area. Development in this area is proposed to consist of material storage pads including laydown areas for equipment, cold storage pad, containment pads for waste rock, low grade ore, and native topsoil and gravel from the grading of other development areas (i.e., main pad, TMF).
- Areas 5 and 6: This portion of the central section has a complex terrain with steep slopes, shallow ledges, and bedrock outcrops. Where silt loam soils are present, bedrock generally occurs at depths of 10 to 20 inches. The low-grade ore pad is proposed for Area 5.

A wetland delineation survey (Wood 2020b) identified 34 wetlands and eight vernal pools within the proposed rezoning area. Development is proposed such that no impacts will occur to vernal pools, delineated wetlands, and streams, with a 75-foot buffer observed on these resources. In the event that impacts cannot be avoided, compensation features will be developed. The final grading plan will include enhancement of these features during reclamation and closure activities.

Assessment of Reasonableness

As with any mining development, the soil assessment identified a mixture of soil types and suitability. Generally, soils that can be considered suitable for development, or with limited suitability that can be corrected through engineering design, exist within the proposed rezoning area. The soil limitations observed include shallow bedrock conditions, and areas with a seasonal high-water table. Areas of steep slopes, greater than 20%, occur in small amounts as part of the landscape and should be avoided when possible. Areas with a high-water table include jurisdictional wetlands, and the lower slope positions with somewhat poorly drained soils are also present and should be avoided when possible. Prior to any development, more detailed surveys to better identify the most appropriate areas for site development are required prior to permitting.

Issues and Potential Challenges

The most common limitations in the preliminary site plan areas are generally shallow bedrock and poorly draining soils with a high-water table at or near the surface. These poorly drained soils present limitations for roadway, parking, and laydown area construction; tailings storage facility construction and operations; building and foundation construction; and wastewater disposal construction and operations. Wood (2020a) has proposed the following hierarchy to overcome these limitations.

- Locating and maximizing development on areas with better drained soils where practical.
- Siting development areas to maximize use of the existing infrastructure including existing roads.
- When development must occur on soils that have limitations, employ the appropriate construction techniques.

Wood (2020a) has also outlined design criteria for the State of Maine to meet regulatory requirements, design criteria, and construction standards.

CLOSURE AND RECLAMATION

Current Status and Information

The proposed mine is designed to operate with a limited footprint throughout all phases of the project.

At the end of the mine life, buildings will be demolished and disposed. The underground portal will be closed to prevent access to underground workings while also allowing for bat entry and habitat. The site will be regraded to approximate original contours. Salvaged topsoil will be distributed for plant-growth media prior to revegetation.

Closure cover for the TMF will include a composite liner system with drainage layer and soil cover for vegetation growth. The soil cover is designed with 1.5 feet of subsoil and topsoil, and replanted with small grasses and shrubs. TMF constraints include maximum height of 22 feet to be less than the height of the trees, setback from wetlands greater than 75 feet, and setback from the project boundary greater than 400 feet.

The water management system for management of site drainage water during closure and post-closure will be maintained in place until water concentrations are at acceptable levels to meet regulatory guidelines.

Assessment of Reasonableness

The preliminary closure and reclamation components are consistent with industry standards. Closure of the TMF is proposed to be progressively reclaimed which allows for evaluation of closure cover performance that can allow for modifications of the reclamation protocols as required. As concurrent closure of the TMF will occur during operations, risks to the State will also be minimized as total disturbed areas will be reduced. A final closure plan will be developed in compliance with MEDEP Chapter 200 §5.24 rules as the mining plan evolves and is finalized. The reclamation plan will include a detailed cost estimate and the associated surety bond will be filed prior to commencement of operations.

Issues and Potential Challenges

The preliminary closure and reclamation components are consistent with industry standards with the following considerations.

- Material placed underground requires testing to ensure no impact to groundwater.
- Topsoil salvage for reclamation is discussed as final soil cover for regrowth and local borrow areas have been identified for subsoil. A material balance will be required to ensure that sufficient topsoil is salvaged and borrow material is available for reclamation.
- The TMF will provide the greatest long-term risk at closure to ensure that fine-grained, highly reactive sulfide minerals are not exposed to air and/or water. Seepage and geotechnical studies will be required to ensure that the TMF is designed and constructed appropriately.
- Final design for TMF closure will be in compliance with MEDEP Chapter 200 rules and the cover design appears reasonable for grasses and shrubs. Given that the climax species in the area are trees, consideration will be required for ensuring that forest encroachment does not occur during the long term with deep-rooted vegetation disturbing liners and capping materials.

CONCLUSIONS

The review of available preliminary data has identified that several potential issues related to environmental geochemistry, soils, and reclamation and closure that will require additional investigations to ensure that the project is technically feasible. These include a robust geochemical testing program, and refined soil mapping as the facility siting is finalized. In addition, financial reclamation plans are to be refined and costed. These requirements are well documented within MEDEP Chapter 200 rules.

However, the basis of any project is to limit the negative impact to natural resources, especially water resources. While preliminary in nature, the key issues have been identified and will be developed further as detailed planning progresses to final design and permit approval. The preliminary design presented in the LUPC petition and the PEA has been developed to minimize these impacts through engineering controls such as water management and treatment, and appropriate use of liners and capping. The site will be graded to maintain, as close as possible, original contours, and the largest surface feature, the TMF, will be sited to not exceed the height of existing trees.

SWCA considers the project components received during this scope to be industry standards and that the mine can be developed such that impacts are minimized during operation, closure, and post-closure.

LITERATURE CITED

International Network for Acid Prevention. 2014. *Global Acid Rock Drainage Guide*. Available at: http://www.gardguide.com/index.php?title=Main_Page. Accessed November 2020.

Maine Department of Environmental Protection (MEDEP). 2017. Chapter 200: Metallic Mineral Exploration, Advanced Exploration and Mining. Available at: http://www.maine.gov/sos/cec/rules/06/096/096c200.docx. Accessed November 2020.

Wolfden Mt. Chase LLC (Wolfden). 2020a. *Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit*. Thunder Bay, Ontario: Wolfden Mt. Chase LLC.

———. 2020b. *Preliminary Economic Assessment, Picket Mountain Project, Penobscot County, Maine, USA*. Thunder Bay, Ontario: A-Z Mining Professionals Ltd. Effective date September 14, 2020; filing date October 29, 2020.

Wood Environment & Infrastructure Solutions, Inc. (Wood). 2020a. *Soil Suitability Evaluation for the Wolfden-Mt Chase Pickett Mt. Mine Rezoning Petition*. Prepared for Wolfden Mt. Chase, LLC.

———. 2020b. *Wetland Delineation Survey, Pickett Mountain Site, Main*. Portland, Maine: Wood Environment & Infrastructure Solutions, Inc.

ATTACHMENT E

Assessment of Financial Practicality
Sunrise Americas LLC

PICKETT MOUNTAIN PROJECT, WOLFDEN MT. CHASE LLC

ASSESSMENT OF FINANCIAL PRACTICALITY

NOVEMBER 2020

Prepared for SWCA Environmental Consultants for the purpose of including in a "Technical Feasibility & Financial Practicability Assessment" of the proposed Pickett Mountain metallic mineral mine to be submitted to the Land Use Planning Commission (LUPC) of the Department of Agriculture, Conservation and Forestry of the State of Maine.

Prepared by: Sunrise Americas LLC
Date: November 30, 2020

1 INTRODUCTION

The Pickett Mountain polymetallic mining project in northeastern Maine ("Pickett Mountain" or "Project") is owned 100% by Wolfden Mountain Chase LLC ("WMC"), a wholly-owned subsidiary of Wolfden Resources Corporation ("Wolfden"), a Canadian mining company listed on the Toronto Venture Exchange.

Getty Oil discovered the Pickett Mountain copper-lead-zinc deposit in 1979. After a succession of owners, WMC purchased the Project in late 2017 and proceeded to advance exploration and development work at the property. On September 14, 2020, Wolfden announced the results of a preliminary economic assessment ("PEA") for the Project and, on October 29, 2020, filed a technical report on the Project for the purposes of the NI 43-101 requirements of Canadian securities law.

On January 26, 2020, WMC submitted a "Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit" ("Zoning Petition") with the Land Use Planning Commission ("LUPC") of the Department of Agriculture, Conservation and Forestry of the State of Maine.

This report has been prepared for SWCA Environmental Consultants for the purpose of including in a "Technical Feasibility & Financial Practicability Assessment" of Pickett Mountain to be submitted to LUPC.

This report has relied solely on the assessments, reports, plans and reference sources submitted to-date by the petitioner, WMC, during the application process. The sources for such information were the following:

Wolfden Mt. Chase LLC - Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit - January 26, 2020 (Revised June 30, 2020);

- Wolfden Resources - Preliminary Economic Assessment, Pickett Mountain Project – Effective date: September 14, 2020; and
- Wolfden Resources – Website - www.wolfdenresources.com - Press Releases & Financial Statements.

More detailed references to the sources of the information reviewed by the author can be found in the contents of this report together with a complete list of References in Section 8.

Glossary and Abbreviations of Terms

Ag	silver
Au	gold
C$	currency of Canada
Cu	copper
g/t	grams per tonne
k	thousand
km	kilometre
m^3	cubic metre
Mt	million tonne (metric)
MW	megawatt
MWh	megawatt hour
NSR	net smelter return
oz	ounces (troy)
Pb	lead
PEA	Preliminary Economic Assessment
t	tonne (metric)
tpy	tonnes per year
US$	currency of the United States of America
USA	United States of America
WMC	Wolfden Mountain Chase LLC
Wolfden	Wolfden Resources Corporation
Zn	zinc

2 INFRASTRUCTURE & KEY SUPPLIES

2.1 Infrastructure Requirements

The Project is located in northeastern Maine, about 33 miles from the Canadian border and about 42 miles due west of the town of Woodstock, New Brunswick. Access to the Project for State Highway 11, and from State Highway 11 there are paved primary and secondary highways with access to Interstate 95 at Island Falls, about 22 miles from the Project (Source: PEA, Section 4.0).

The area is well supported by local infrastructure, including well maintained roads, highways, and access to rail in the town of Sherman Station 17 miles from the Project; as well, the (regional) electric grid runs along Highway 11 (Source: PEA, Section 5.4).

The development plan for the Project requires the availability of key infrastructure to support the construction and operation of the mine as follows:

Water The concentrator requires 3,033m^3 per day of water. After recycling 89%, the net make-up fresh water is 325m^3 (Source: PEA, Section 17.4).

Power The Project would be connected to the regional grid system (NPCC) through a new 14.6-mile transmission line that a power supplier would construct (Source: Zoning Petition, Project Description). The mine operation will require about 6MW electrical demand (Source: PEA, Section 18.4) which will be supplied by a licensed competitive supplier.

Roads The Project is located in a logged area that has access roads used by foresters to reach timber lots. The rights-of-way has been established and the roads require upgrading to meet safety standards for higher volumes of traffic that will occur with construction and operation of a mine (Source: PEA, Section 18.1). The access road from the paved Highway 11 to the mine site will need to be upgraded to ensure safe reliable access year-round (Source: PEA, Section 18.2).

Mine site infrastructure, such as the site pad for the construction and operating areas and power distribution lines that step down from the main substation, are considered part of the construction of the mining facilities required to extract and process the ore.

All other infrastructure requirements, such as the port for shipment of concentrates to smelter destinations, will rely on existing infrastructure already operated by third parties who would provide such facilities on a services basis.

2.2 Current Status of Development Work & Information Reviewed

The development work conducted to prepare the PEA included assessment of key infrastructure requirements and estimates of the capital expenditures to develop the infrastructure. The level of the evaluation is not stated however it is assumed that these are to a scoping study level, consistent with level of the PEA.

- Wolfden and its consultants have assessed the requirement for a potable water system that includes the process water system that needs to meet or exceed dissolved solids that may interfere in the extraction process. The water needs to be drawn from an authorized site by the state of Maine to a suitable tank, and from the tank be distributed after being treated for organics, total dissolved solids, as well as metal ions (Source: PEA, Section 18.5). No information is provided on the cost of the state of Maine delivering the water or on the expected quality of the water.
- Wolfden and its consultants have had discussions with Emera Power, the predecessor to power supplier Versant Power, who provided an indicative price of US$7 million to deliver 6MW electrical power to the main substation at the mine site (Source: PEA, Section 18.4). The mine will have standby diesel generators of 3MW electrical demand to ensure safety of the operation during a power disruption (Source: PEA, Section 18.19). The electrical power cost delivered to the Project is estimated at US$85/MWh (Source: PEA, Section 21.2.1). No information is provided on the scope and precision of the estimates of the power requirements.
- Wolfden and its consultants have assessed the condition of the local roads and access road, and the upgrade requirements are as described in Section 2.1.

The development plan includes construction of a water treatment facility. The structure for the development assumes a build own operate ("BOO") arrangement that would be owned by a specialist third-party developer and operator, and includes a reverse osmosis unit to ensure the water quality meets state environmental standards (Source: PEA, Section 18.17). The cost of the service is estimated at US$1.74 per tonne (Source: PEA, Section 20.2.3). No information is provided on the source of the estimated cost.

2.3 Assessment of Reasonableness

The author has relied on the PEA for description of the existing road conditions, for the assessment of the new water and power infrastructure requirements, and road upgrade requirements, and for all estimates of capital expenditures and operating costs for such infrastructure.

The estimated capital expenditure for the new transmission line from the regional grid is considered reasonable based on industry benchmarks, and the electrical power cost is generally consistent with the delivery and supply rates for industrial customers published by state regulator, the Maine Public Utilities Commission.

The quantities of make-up water are relatively small due to the recycling, and errors in the assumptions would not be expected to have a material impact on the economic evaluation. Similarly, the capital estimates for the road upgrades are relatively small in the overall capital expenditures for the Project.

The assumption of the BOO arrangement for the proposed water treatment plant results in a reduced capital expenditure for the construction phase (instead, it is assumed the Project will pay a fixed capital charge for the supplier to receive a return on its investment), however it will not reduce the financing requirement for the Project since Wolfden will be expected to provide a corporate guarantee to the supplier for the risk of any failure to use the service.

2.4 Issues & Potential Challenges

Neither the power nor road infrastructure are expected to present any development difficulties.

The environmental and other permitting requirements for water have not been considered in this assessment of financial practicality of the Project.

2.5 Conclusions

The key infrastructure requirements have been identified and capital costs to develop have been estimated by Wolfden and its consultants.

The PEA has been relied on for assessment of infrastructure requirements, and estimates of capital and operating costs for such infrastructure; the descriptions in the PEA are considered reasonable and, since the Project would benefit from existing infrastructure (roads, regional grid system) and key supply resources (water, electricity) in the proximity to the Project, any errors in the assumptions would not be expected to have a material impact on the economic evaluation.

3 MARKETING

3.1 Marketing Plan

Based on scoping level metallurgical test work, it is planned that the Project will produce three concentrates, a copper concentrate, a lead concentrate and a zinc concentrate, that will be sold to smelters handling such products. Silver and gold by-products report principally to the copper concentrates, then to the lead concentrates (Source: PEA, Section 13.3.3).

The life-of-mine production tonnages for the three base metals are stated, but the annual production of the metals and the corresponding tonnes of concentrate are not presented in the PEA; estimates of annual tonnages of: (a) metal contained in the concentrates and (b) concentrate are calculated based on assumptions used in the economic analysis (Source: Wolfden Resources, Press Release, September 15, 2020):

Copper	3,495 tonnes per year copper in concentrate 14,092 tonnes per year copper concentrate
Lead	10,278 tonnes per year lead in concentrate 20,193 tonnes per year lead concentrate
Zinc	29,928 tonnes per year zinc in concentrate 51,868 tonnes per year zinc concentrate

The concentrate products require transportation by road to a port, and subsequent transportation by shipping vessel to destination ports used by the smelters to receive concentrates.

The concentrate products will be subject to deductions and charges imposed by the smelters for smelting and refining of the concentrates, including any charges for other payable metals contained in the concentrates and penalties for certain elements considered contaminants by the smelters.

The Project will be expected to negotiate long-term offtake (delivery and sales) agreements for each of the concentrate products in order to ensure customers for the products and to satisfy the likely requirements of financiers.

3.2 Current Status of Development Work & Information Reviewed

In order to develop a preferred processing circuit for recovery of the metals, Wolfden has reviewed the test work originally performed at Lakefield Research for previous owners Getty Mining (1984) and Chevron Resources (1988), and has undertaken its own scoping level metallurgical test work during 2019 conducted by Resource Development Inc. (RDI) with the primary objective of determining metal recoveries and flotation concentrate grades from the mineralized material. The scoping level test work has indicated that a sequential flotation process will produce marketable grade copper, lead and zinc concentrates (Source: PEA, Section 13). The projected recoveries for the three metals, 80.5% for copper,77.5% for lead and 89.5% for zinc, and their respective concentrate grades, 24.8% for copper, 50.9% for lead, and 55.7% for zinc, were used to calculate the production schedules that were included in the economic evaluation (Source; PEA, Section17.5).

The PEA assumes that the concentrate will be transported to the nearest deep-water port via a local logistics contractor (Source: PEA, Section 19.2). There is no reference to the location of this port, nor to the destination smelters.

Estimates of commodity prices for the metals contained in the concentrates, and estimates for concentrate transportation costs and smelter charges have been used to prepare the mine plan and input to the economic analysis of the Project.

- The commodity prices for the metals contained in the concentrate are presented in Table 19.1 of the PEA and input to the economic analysis are based on industry consensus pricing provided by Wolfden (Source: PEA, Section 1.8). The sources and methodology used to determine these prices are not stated. No market studies were conducted (Source: PEA, Section 19.1).
- Transportation costs of US$40 per tonne of concentrate have been used for assumptions in the economic analysis to cover handling on site, transportation to a port, port handling and transport by ship to smelter (Source: PEA, Section 21.6). These services would be provided by a local logistics contractor (Source: PEA, Section 19.2). There is no reference to the source for these estimates.
- Smelter charges used for assumptions in the economic evaluation were based on input from major smelters including a large, diversified resource conglomerate and commodity trader, for life of mine feed at international benchmark terms (Source: PEA, Section 19.2).

Wolfden has confirmed that it expects to negotiate long-term offtake agreements with smelters (Source: PEA, Section 19.2).

3.3 Assessment of Reasonableness

Based on the results of the test work used to prepare the conceptual process flowsheet (Source: PEA, Section 17.1) and material balance (Source: PEA, Section 17.5), the chemical composition of the lead concentrate and zinc concentrate, including the concentrate grades, should be suitable for treatment and refining at smelters, and would be expected to receive standard smelter charges for the products.

Based on the same test work, the concentrate grade of 24.8% copper is slightly below the typical minimum concentrate grade of 25% copper accepted by smelters. If the final process flowsheet does not increase the concentrate grade of the copper above the minimum, this does not mean that the product cannot be marketed, however it may be subject to smelter terms that are not considered international benchmark terms.

The annual tonnages of each of the concentrates are not considered significant in terms of creating challenges for road and shipping logistics, nor would they be expected to have any material impact on the availability of smelter capacity. There are smelters operating in North America for each of the three metals, and Europe and Asia could be alternative smelter destinations, although these would be expected to result in higher transportation costs.

The commodity prices for the metals contained in the concentrates, and estimates for concentrate transportation costs and smelter charges have been used to prepare the economic analysis of the Project in the PEA.

- Copper, lead and zinc prices used to calculate incomes from the sale of concentrates are reasonable; although similar to current prices, they are at the higher-end of long-term price forecasts used within the industry to evaluate projects. The sources and methodology used to determine the industry consensus pricing is not known.
- Although the PEA has not stated smelter destinations, the road and shipping transportation costs to deliver concentrates to the smelters are considered reasonable when benchmarked against other projects and mines, and considering likely smelter destinations.
- Smelter charges (deductions) for processing concentrates are reasonable and in-line with standard deductions and charges applied in the industry. Potential penalties have not been included in the economic analysis since the test work is at scoping level and not sufficiently advanced to allow any meaningful estimates.

For the purposes of ensuring customers for the concentrates and for the purposes of securing financing, it would be expected that long-term offtake contracts will be negotiated with the smelters. Wolfden has confirmed this is part of the marketing plan.

3.4 Observations & Potential Challenges

The author of the PEA has identified high levels of arsenic and antimony in the test work samples for the copper concentrate; these are considered deleterious elements by the smelters and may be subject to penalties or even result in the product not being accepted by smelters. Since the test work is at scoping level and further test work is planned that will provide additional information on the impurities, including investigation of possibilities to blend the ores from different areas of the mine to keep the impurities below penalty levels, this is highlighted but not considered a fatal flaw (Source: PEA, Section 13.4).

A recent trend is containerized transportation of concentrates, where the concentrate is placed in a container at the mine and delivered to the customer in a sealed form, thereby avoiding multiple transfer points, reducing environmental impact, and avoiding loss of product. It is expected that Wolfden will consider this option during the feasibility phase when the products are better defined and smelter destinations are identified.

3.5 Conclusions

The key factors impacting the marketing of the concentrates to be produced by the Project have been identified and assessed by Wolfden at a scoping level. Based on the information reviewed, the marketing plan and assumptions appear reasonable.

Further test work will be required to more accurately determine the chemical composition of the concentrates to be produced by the Project, and to confirm the suitability of the concentrates for treatment and refining at the smelters. Since the process flowsheet remains under review and has not been finalized, this confirmation will not be possible until further development work has been completed. At this stage, it is premature for the Project to advance any discussions with potential customers (smelters) until the final products are better understood and samples can be provided to the smelters.

4 PROJECT SCHEDULE

4.1 Development Timeline

Wolfden and its consultants have prepared a PEA which provides a scoping level assessment of the development plan to advance the Project through a feasibility phase, and subsequent construction and commissioning phases to achieve commercial operation.

The development plan is based on an underground mining operation and processing plant with a sequential flotation circuit that will process 1,200 tonne per day of ore to produce three separate metal concentrate products.

The development timeline is based on completion of a feasibility study, including establishing a mining reserve and securing all required permits, to enable a feasibility study to be completed. In addition, it will be necessary to arrange all contracts, including the EPC or EPCM contract, and secure financing for the construction and commissioning phases.

4.2 Current Status of Development Work & Information Reviewed

The Zoning Petition and PEA provide the most recent updates on the current status of the Project in terms of the development work completed.

- The final version of the Zoning Petition is dated June 30, 2020.
- The PEA was prepared effective September 14, 2020.
- Further development work will require a mining reserve to be established, all permits to be secured and a feasibility study to be completed to enable financing to be arranged and an investment decision to construct and operate a mine.

Feasibility Phase

The PEA does not provide information on the timeline to complete the feasibility work however the Zoning Petition includes a high-level Gantt chart showing a three (3) year timeline to complete approval of rezoning, baseline study work and final approval of a mining permit (Source: Zoning Petition, Project Description - Phase 4).

Wolfden has made no public statements on the timetable to advance further development work at the Project.

Construction Phase

The PEA indicates a pre-production period of 21 months (Source: PEA, Section 21.1.4). There is no information provided on the timeline for individual construction activities or the commissioning phase required to achieve commercial production. The PEA indicates that working capital estimates are based on four months of operating costs which implies a four-month period for commissioning from mechanical completion to commercial production.

The high-level Gantt chart in the Zoning Petition shows a similar two-year timeline to complete construction, including mine production ramp-up and commissioning, and achieve commercial production. Most of the construction activities have a timeline of no more than 12 months from the full notice to proceed issued to contractors for construction, except for the excavation of ventilation raise to the surface, installation of the electric substation and interconnection to the regional grid, and construction of the concentrator and supporting facilities, which the Gantt chart indicates would be completed within the two-year timeline for construction (Source; Zoning Petition, Project Description – Phase 4).

Neither the PEA nor the Zoning Petition make reference to the timeline for Wolfden to arrange financing for the construction and commission phases.

4.3 Assessment of Reasonableness

Feasibility Phase

The author of the PEA has described the need to conduct additional drilling and establish a mining reserve, to complete metallurgical and other work programs and enter into contracts that will be required to complete a feasibility study. Although no schedule is provided in the PEA for completion of these development activities, assuming funding is available, it should be possible to complete the work within the three-year timeframe indicated to secure all permits indicated in the Gantt chart in the Zoning Petition. No assessment is made in this report of the likelihood of Wolfden to secure all permits within that schedule.

The PEA and Zoning Petition make no reference to the timeline for Wolfden to arrange financing for the construction and commission phases, except by implication in the Gantt chart; such financing process can begin prior to completion of the feasibility study and would be expected to continue following completion of the same study.

Construction Phase

The PEA indicates a pre-production period of 21 months and, by inference, a further 4-month timeline for commissioning to achieve steady-state operations and commercial production. The author has relied on the PEA on for the estimated schedule however, although the Project is at an early development stage and more detailed work needs to be completed to refine the schedule, the construction and commissioning schedule appears reasonable.

4.4 Observations & Potential Challenges

All mining development projects are faced with technical, commercial, legal, permitting, financing and other challenges, which combined are unique for each project. Many of these activities are interdependent, and difficulties to meet timetables to complete the various development activities and programs will often result in delays to project schedules.

A different set of challenges are presented with the construction and commissioning of a mining project however, if a project has a completed feasibility study, arranged financing and has made an investment decision, this will be a strong indication of that the project is solid since the subsequent phases will have been reviewed in detail by third-parties, such as independent engineers, financiers and regulatory environmental and other authorities.

The Project can be considered in the same situation. A PEA has been completed which outlines the potential to develop a technically and economically viable mining operation. There are challenges to maintain the timetable, complete the feasibility study and reach an investment decision – most notably the challenges to secure all necessary permits, to secure continued funding for the development work, and to arrange financing for the construction and commissioning phases – but these are typical for a mining development project and would not be considered fatal flaws at this stage of the development schedule.

4.5 Conclusions

The schedules indicated or implied in the PEA and Zoning Petition for the feasibility phase, and subsequent construction and commissioning phases, appear reasonable.

The complexities of advancing a mining project to an investment decision, including the requirement to schedule many different interdependent development activities and programs, often result in delays to the project schedule.

5 PROJECT ECONOMICS

5.1 Assessment of Financial Practicality of a Mining Project

Assessment of the financial practicality of a mining project requires an economic evaluation, including developing an economic model using a financial computer software with inputs for key parameters and assumptions for expected macroeconomic conditions, capital expenditures, production, operating performance and costs, closure costs and bonding requirements, and tax and financing costs. In addition, the economic model will be used to assess the sensitivity of the project economics to variations in the values estimated for the key parameters and to assist in the risk assessment of the project. Inputs for the economic model will be based on internal estimates, principally using technical assumptions developed from both in-house and third-party work and reviews, and external estimates, principally for macroeconomics and commercial assumptions provided by recognized institutions, corporations or industry specialists. As a project advances towards an investment decision, inputs will include firm quotes for capital equipment, and capital and operating cost estimates derived from commercial terms in contracts entered into by the mining company.

During the feasibility phase, the mining company will continue economic evaluation of the project and, if public companies, will likely periodically report the results in regulatory filings in the form of a PEA, prefeasibility study or feasibility study. Other groups, such as analysts for brokerage houses, regulators and other parties interested in the project may make independent evaluations, which will typically be private or with restricted access.

As the mining project advances, other groups such as potential investors and/or financiers will likely make detailed due diligence and assess the financial practicality of the project. Although the results from such investigations are unlikely to become public, the decisions made by such groups based on their evaluations will provide good indications of the financial practicality as assessed by groups willing to invest into the project.

5.2 Current Status of Development Work & Information Reviewed

The PEA includes a Section 22 titled “Economic Analysis”. Although the methodology to prepare the economic evaluation is not specifically stated, the section references the calculation of expected cash flow estimates, and provides the results and financial analysis. The Zoning Petition provides a general description of the preparation of a cash flow (economic) model to evaluate the cost estimates and produce economic forecasts (Source: Zoning Petition, Appendix A-B3a).

The economic analysis includes estimates of metal prices and some key parameters for production and capital costs (Source: PEA, Section 22), which can be referenced back to estimates determined in other sections of the PEA.

Production Estimates

The potentially mineable underground resource used in the economic analysis is estimated at 4.2 million tonnes at a grade of 8.56% Zn, 1.11% Cu, 3.40% Pb, 0.79 g/t Au and 88,8 g/t Ag. The PEA relies on indicated mineral resources (approximately 48.7% of the total resource) and inferred mineral resources. The author of the PEA notes that the inferred mineral resources are considered highly speculative geologically (Source: PEA, Section 22).

Schedules for mine production and ore throughput to the processing plant were prepared for the PEA. The mine ore throughput planned is 1,200 tpd, or 432,000 tpy (Source: PEA, Section 16.13). The metallurgical recoveries, and capital and operating cost estimates are considered to be at least PEA level accuracy (Source: PEA, Section 22).

Capital & Operating Costs Estimates

The PEA states that the initial capital expenditures totaling US$147.4 million and sustaining capital totaling US$100.0 million are based on budget pricing from supplier from critical components, consultants, contractors, studies and local benchmarks, and a review of other Canadian projects. Further, that capital expenditure estimates are within +/- 40% and include working capital and contribution to the Financial Assurance Trust fund (Source: PEA, Section 21.1.11). The same section provides more specific details on the sources of the estimates for individual cost areas. It is assumed that initial underground construction, ramp-up and operation of the underground for up to 3 years will be conducted by mining contractors (Source: PEA, Section 19.2).

The working capital is estimated at US$11.5 million based on 4 months of estimate operating costs (Source: PEA, Section 21.1.9).

The all-in operating costs of US$93.08 per tonne of ore production are based on US and overseas prices from suppliers and other similar type projects for consumables and parts. The source or basis for the cost of electricity and fuels are not stated. Labor rates are based on local rates where available, and/or contractor costs in the region and country for similar types of work (Source: PEA, Section 22.1). The same section provides more specific details on the sources of the estimates for individual cost areas.

The author of the PEA states that the overall level of accuracy of the study is +/- 40% (PEA, Section 22.2).

No contracts currently exist for construction, operation, supplies or consumables, however budgetary quotations and estimates have been provided by potential candidates for input into the economic analysis (Source: PEA, Section 19.2).

Economic Evaluation – Results & Analysis

The PEA includes summary tables for the results and analysis. The expected life-of-mine returns for the Project are presented for revenues net of marketing costs (transportation and smelter charges), undiscounted cash flows, net present returns at 5% and 8% discount rate, the internal rate of return and the payback period, on a real (not inflated) pre-tax and after-tax basis (Source: PEA, Section 22.2). All results are presented in United States dollar terms.

The PEA does not include tables to illustrate the production, capital and operating costs, and cash flows for the Project on an annual basis. The Zoning Petition includes annual cash flow estimates for employment, consumables, services and energy to show the amount and schedule of expenditures within the local communities (Source: Zoning Petition, Appendix A-B3a).

The PEA includes sensitivity analysis of the impact of percentage changes to the key parameters (mining grade, recovery, smelter charges, metal prices, operating costs and capital costs) on the net present value at 8% discount rate and the internal rate of return (Source: PEA, Section 22.3).

In addition, a corporate presentation by Wolfden Resources includes an estimate of the unit revenue value of a tonne of ore produced, a standard metric used to analyze the value of a project (Source, Wolfden Resources, Corporate Presentation, October 30, 2020).

5.3 Assessment of Reasonableness

The author has relied on the PEA for the assumptions for the key technical parameters, together with any observations and concerns expressed in the same document.

The economic analysis in the PEA is not based on a mining reserves, which would require more certainty on the mineral resources (i.e., it would not include inferred mineral resources) and the technical and economic assumptions included to develop the block model for the mine plan; however, this methodology is standard and acceptable based on the current status of the Project as an early stage development project at a PEA level.

The National Instrument 43-101 Standards of Disclosure for Mineral Projects issued by the Canadian Securities Administrators consider the confidence in inferred mineral resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. However, Wolfden has met the criteria to disclose the results of an economic analysis by stating that the economic assessment is preliminary in nature, that it includes inferred mineral resources

The sources of the estimates used to prepare the assumptions for the key capital and operating costs, and commercial parameters are considered standard for economic analysis in a PEA.

- As described in Section 3.3, the copper, lead and zinc prices used to calculate incomes from the sale of concentrates are reasonable; although similar to current market prices, they are at the higher-end of long-term price forecasts used within the industry to evaluate projects.
- The PEA has been relied on for the estimates for capital costs and operating costs used in the economic analysis; these are considered generally within industry benchmark ranges for an underground mine and flotation plant at the planned production levels. The relatively low infrastructure capital costs reflect the proximity and availability to key supplies such as water and power.
- As described in Section 2.3, the estimates used for transportation costs and smelter charges are considered reasonable.

The methodology used to prepare the economic analysis, including the use of real terms and discount rates, and the output measures of value (net present value, internal rate of return, payback) are considered standard for the mining industry. A minimum discount rate for a base metal project would be 8% (the PEA includes valuations at 5%), and reasonable arguments can be made that a higher discount rate should be used to reflect the risk profile of the Project.

Since annual production and cash flows are not presented in the PEA, the author has prepared a simplified financial model using the key parameters indicated in Section 2.20 of the PEA to confirm that the results of the economic analysis presented in the PEA have been correctly calculated and appear reasonable.

5.4 Observations & Potential Challenges

The capital expenditures presented in the PEA exclude costs such as tax and duties, financing costs, and legal costs. These exclusions are highlighted but, at this early stage of the development of the Project, these are not a focus and can be estimated as the development work is advanced.

The results of the economic analysis presented in the PEA exclude the royalty that would be paid to Altius Minerals (see Section 6.2).

As described in other sections, the financial practicality of the Project will depend not only on the results of the feasibility study but will depend on the ability of Wolfden to successfully fulfil permitting requirements and arrange project financing and/or introduce a partner.

5.5 Conclusions

These results of the economic analysis confirm that the Project could be developed into a viable, small to medium-sized mining operation; the sensitivity analysis confirms that the Project returns will be reasonably robust to variances in the key assumptions.

These net present values are significantly higher than the market capitalization of Wolfden, reflecting the use of low discount rates in the PEA and the fact that the market has factored in the risk profile of the Project.

The principal challenges for the Project to realize the values presented in the PEA are: (a) confirming at a feasibility level the scoping level assumptions that have been used in the PEA, including the need to establish a mining reserve, (b) successfully fulfilling permitting requirements and (c) arranging project financing and/or introduce a partner.

Finally, Wolfden continues to fund exploration drilling to target extensions to the existing deposits and new discoveries; if successful, this would be expected to improve the financial practicality of the Project, and make the Project return more robust.

6 FINANCIAL CONSIDERATIONS

6.1 Junior Mining Companies & Financing for Mining Projects

A mining development project requires funding for: (a) the feasibility phase to complete the work and studies necessary to appraise the technical and economic viability of the project and make an investment decision, and subsequently (b) the construction and commission phases of the project until it becomes a commercially operating mine.

For junior mining companies, the ability to successfully fund the development phases of a mining project will depend on many factors including, but not limited to, the quality and viability of the mining project, the relationship of management with brokerage houses, financial institutions, investments funds and other groups accustomed to investing into the mining industry, the ability of management to raise funding at specific times in the project development schedule, the market environment for both metals and the overall economy, and the general vagaries and sentiment of the investment community at any point in time. The challenges for a junior mining company to fund the development of a mining project become acutely difficult when seeking to financing the construction phase, when financiers will not only consider the economic viability of the project but will consider a wider range of criteria including the likely requirement for the company to have the financial capacity to manage issues such as project capital cost overruns, and to provide corporate guarantees in the event the mining project cannot be commissioned.

The financing plan will be further influenced by the strategy of the junior mining company; in some cases, the company will focus on its core exploration and technical skills to advance a project before seeking a partner or divesting to a company with the technical and financial capacity to develop the mine; in more rare cases, the other cases, the junior mining company can develop those capacities and seek to develop the mine itself.

6.2 Current Financial Status of Wolfden Resources & Information Reviewed

The Project was acquired by Wolfden in November 2017 from a private seller for US$8.5 million. The assets included timberland and all minerals, mining, subsurface and surface rights owned by the seller in an area referred to as the Pickett Mountain property, which included the Pickett Mountain base metal deposit. (Source: Wolfden Resources, Press Release, November 16, 2017).

The acquisition was financed through: (a) the granting of a 1.35% royalty interest in the future gross revenues from the Project for US$6 million to Altius Minerals, and (b) a non-brokered private placement (share purchase) in Wolfden made by Altius Minerals for gross proceeds of C$5.1 million, equivalent to US$4.0 million at the closing date (Source: Wolfden Resources, Press Release, November 16, 2017). The surplus of funds from these transactions was used to conduct exploration and development work on the Project during 2018 (Source: Wolfden Resources, Financial Statements, Fourth Quarter 2018).

Since the acquisition, Wolfden has been successful to raise funds to advance development work on the Project. In December 2017, the company raised C$675k (US$537k) from a non-brokered private placement; in March 2019, the company raised C$2.5 million (US$1.9 million) from a non-brokered private placement with Kinross Gold, a major Canadian gold company with mines in Nevada, and; in January 2020, the company raised an initial C$3.0 million (US$2.3 million) by selling forward timber from the Pickett Mountain property (Sources: Various Wolfden Resource Press Releases).

As of June 30, 2020, Wolfden Resources (consolidated) had a cash balance of C$2.9 million (US$2.1 million), and current assets of C$3.0 million (US$2.2 million. The company has only C$259k (US$199k) current liabilities and no debt to financial institutions. The royalty held by Altius Resources is a contingent liability payable only if and when Wolfden commences operations at the Project.

In terms of future expenditures, the Project is considered at an early development stage with further development work required to establish a mining reserve, obtain all permits required, prepare a feasibility study and make an investment decision, and subsequently to construct and commission a mine operation (see Section 26).

- The author of the PEA estimates that US$3-5 million will be required to complete a feasibility study for the Project, excluding drilling costs (Source: PEA, Section 26).

  WMC indicates the expenditure during the feasibility phase may be US$10-15 million (Source: Zoning Petition, Wolfden letter dated November 13, 2020). This second estimate is considered the most realistic.

- The author of the PEA estimates that US$147.4 million will be required for initial capital costs and working capital to achieve commercial production (Source: PEA, Section 21.1.6). Based on benchmarking of the capital costs and the unit capital cost (US$340 per tonne of annual ore production), the estimate is considered reasonable.

In the Zoning Petition, Wolfden references the requirement to continue to raise funds through further private placements and, when possible and appropriate, to consider partnering to improve the ownership capacity to finance the Project or divest the Project to a larger mining company to continue development work (Source: Zoning Petition, Exhibit H – Financial Capacity; Wolfden letter dated November 13, 2020).

As of November 24, 2020, Wolfden has 129. 9 million shares issues (148.4 million shares on a fully diluted basis, a share price of C$0.205 (US$0.16) and a market capitalization of C$26.7 million (US$20.5 million). Since the Project is substantially the principal asset of Wolfden, the current market value of the Project is approximately US$17.0-18.5 million.

6.3 Assessment of Reasonableness

Wolfden has demonstrated the ability to raise financing to fund development work, with an estimated US$14 million invested into the Project, including the acquisition of the property (Source: Wolfden Resources, Financial Statements, 2017-2020).

Further, Wolfen was able to raise US$1.9 million from Kinross Gold in March 2019 (Source: Wolfden Resources, Press Release, March 29, 2019). The involvement of a major mining company, which currently owns 9.6% of Wolfden, can be considered a third-party endorsement of the Project, and a demonstration of the ability for management to attract interest from different sources of finance.

Based on the current liquidity of Wolfden described in Section 6.2 and the future expenditure requirements estimated by the author of the PEA, Wolfden will need to secure new financing to complete a feasibility study for the Project. Although financing in the junior market space is currently challenging, especially for non-precious metal investment opportunities, base metals prices have proved resilient since the initial weeks of the COVID-19 pandemic and prices for the three base metals that would be produced by the Project have increased significantly in the past months: as of November 24, 2020, the copper price is US$3.30 per pound, the lead price is US$0.99 per pound, and the zinc price is US$1.24 per pound, representing increases of 20%, 10% and 21% respectively since December 31, 2019. These increases in prices for the base metals will have a positive impact on any financing initiative pursued by Wolfden.

The strategy of Wolfden to raise new funding for the Project, as referenced by the company in the Zoning Petition, is considered both standard and reasonable for junior mining companies; the author has not evaluated the likelihood of Wolfden to raise such funds in the future.

6.4 Observations & Potential Challenges

As described in Section 6.1, the ability of a junior mining company to fund the construction phase of a mining project is challenging. There are examples of junior mining companies, such as Bema Gold (Kupol, Russia) and Gibraltar Mines (Lomas Bayas, Chile), who have successfully funded development projects through to mine operations; others, such as Baja Mining (Boleo, Mexico) and Apex Silver (San Cristobel, Bolivia), have successfully funded development projects but failed to achieve commission of mining operations; and many others have funded development projects but failed to finance the construction of mining projects.

The challenge to finance the construction and commissioning phases of the Project is highlighted but, at this early stage of the development of the Project, no assessment can be made of the likelihood of Wolfden arranging financing and/or introducing a partner to the Project to support these future development phases.

6.5 Conclusions

Wolfden acquired the Project in late 2017, and has been successful to raise the financing necessary to advance the Project and complete a PEA (estimated expenditure to June 30, 2020, is US$14 million).

Wolfden requires an estimated US$10-15 million (WMC estimate) to complete a feasibility study and, subsequently, it will require an estimated $147 million plus financing costs to construct and commission a mine operation. No assessment can be made of the likelihood that Wolfden can raise such financings however the potential strategies to raise financing described by WMC in the Zoning Petition are considered standard and reasonable.

7 VALUE OF PROJECT FOR LOCAL COMMUNITY & STATE OF MAINE

7.1 Value of Mining Projects to Local Communities & States

It is a requirement of the rezoning petition that the petitioner provide assessment of the potential economic benefits of a project. Such application should outline details and potential impacts of the plan, including outcomes such as economics and anticipated impacts on the environment, population, economy, infrastructure.

7.2 Current Status & Information Reviewed

The Zoning Petition includes assessment prepared by WMC of the short-term and long-term socioeconomic impacts of the Project.

WMC states that the project will provide direct and substantial economic benefit to the local communities in the form of job skills training, primary wages to local employees, wages that are spent in the local economy, an increase in property tax revenue, and indirect wages at secondary jobs that help support the mining operations (mechanical equipment repair, vehicle maintenance, road maintenance, solid waste management, and other specialized services (Zoning Petition, Economic Development).

The Zoning Petition describes the preparation of a cash flow model to evaluate the cost estimates and produce economic forecasts. The cash flow model has been used to evaluate socioeconomic considerations, such as employment, consumables, services and energy, to estimate the amount and schedule of expenditures within the local communities (Source: Zoning Petition, Appendix A-B3a). Potential tax benefits are highlighted but not stated.

In the Zoning Petition, WMC has presented estimated investment in the local communities of $164.5 million, $230.6 million in the impacted counties, $413.4 million in the state of Maine and US$477.8 million in the USA. These estimates are categorized by four cost-types: employment, supplies, energy and services. Other potential indirect economic benefits of local hiring of $44.4 million are highlighted in the petition. About 25% of the estimated investment will be made during construction phase and 70% during operations.

7.3 Assessment of Reasonableness

The author has made comment on the planned infrastructure, estimated capital investments, expenditure for mine site and marketing costs, and overall projected economic returns elsewhere in this report.

The author has relied on the information provided by WMC in Zoning Petition for the estimates of economic investment in the local community, impacted counties and the state of Maine and in the USA. Based on the intention of Wolfden to prioritize the use of local employment and local services, the estimates generally appear reasonable.

The author has made no assessment of the cost-benefit of the Project, nor the tax benefits to the state of Maine and the USA, nor the strategic impact to the USA of the Project developing US-produced supply of base metals and precious metals.

7.4 Observations

The assessment by WMC in the Zoning Petition does not include estimates of potential indirect benefits that may occur with the development of a mine in northeastern Maine, such as economic multipliers.

7.5 Conclusions

The estimates of economic investment in the local community, impacted counties, the state of Maine and the USA presented by WMC in the Zoning Petition appear reasonable. These estimates would be expected to be evaluated in more detail during the preparation of the feasibility study and permitting applications.

8 REFERENCES

Wolfden Mt. Chase LLC - Petition to Rezone Portion of Township 6, Range 6 Penobscot County, Maine for Development of an Underground Metallic Mineral Deposit - January 26, 2020

Wolfden Resources - Annual Information Form for the Year Ended December 31, 2019 - April 28, 2020

Wolfden Resources - Consolidated Financial Statements for the years ended December 31, 2019 and 2018 - April 15, 2020

Wolfden Resources - Condensed Consolidated Interim Financial Statements for the three and six months ended June 30, 2020 and 2019 - August 24, 2020

Wolfden Resources - Management's Discussion & Analysis of Financial Condition and Results of Operations Form 51-102F1 for the years ended December 31, 2019
and 2018 - April 15, 2020

Wolfden Resources - Management's Discussion & Analysis of Financial Condition and Results of Operations Form 51-102F1 for the three and six months ended June 30, 2020 - August 24, 2020

Wolfden Resources - National Instrument 43-101 Technical Report - Pickett Mountain Project, Resource Estimation Report - January 7, 2019

Wolfden Resources - News Release – November 17, 2017 - Wolfden Completes Financing and Purchase of the Pickett Mountain Base-Metal Property in Penobscot County, Maine, USA

Wolfden Resources - News Release - March 29, 2019 - Wolfden Completes $2.5M Financing with Kinross Gold Corporation

Wolfden Resources - News Release - January 15, 2020 - Wolfden Secures USD 4.5M in Non-Dilutive Funding

Wolfden Resources - News Release - February 19, 2020 - Wolfden Applies for Rezoning at Pickett Mt. Project

Wolfden Resources - News Release - July 28, 2020 - Wolfden Announces Positive Update on its Pickett Mt. Project Rezoning Process

Wolfden Resources - News Release - August 11, 2020 - July 28, 2020 - Wolfden Announces Update on Pickett Mt. Exploration Program in Maine

Wolfden Resources - News Release - September 14, 2020 - Wolfden Announces Robust Preliminary Economic Assessment for Pickett Mt. Project in Maine

Wolfden Resources - News Release - November 2, 2020 - Wolfden Files NI-43-101 Technical Report for the Pickett Mt. Project in Maine

Wolfden Resources - News Release - November 5, 2020 - Wolfden Reports Encouraging Drill Results at Pickett Mt. Project in Maine

Wolfden Resources - Preliminary Economic Assessment, Pickett Mountain Project - October 29, 2020

Wolfden Resources - Presentation (November 1, 2020) - "One of America's Highest Grade Deposits"

Wolfden Resources - Website - www.wolfdenresources.com