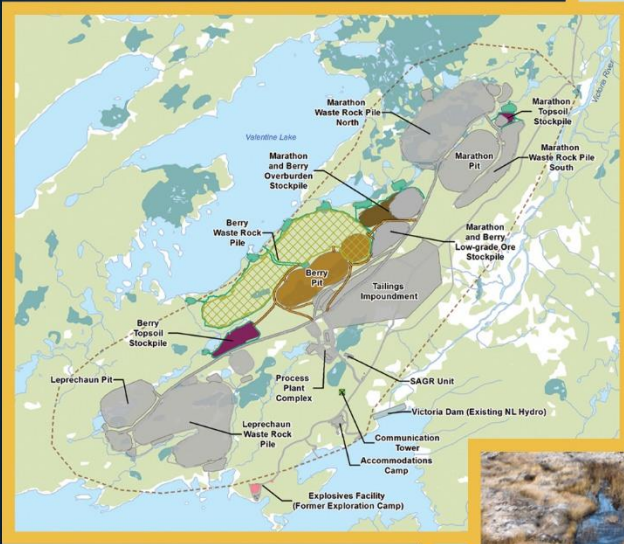


Berry Pit Expansion Environmental Registration / Environmental Assessment (Valentine Gold Project) Update

August 2023



**Berry Pit Expansion Environmental
Registration / Environmental
Assessment (Valentine Gold
Project) Update**



Marathon Gold Corporation
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August 2023

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Executive Summary

Marathon Gold Corporation (Marathon or the Company) is currently constructing an open pit gold mine (the Valentine Gold Project) near Valentine Lake, located in the central region of the Island of Newfoundland, southwest of the Town of Millertown, Newfoundland and Labrador (NL). The Valentine Gold Project was subject to both federal and provincial environmental assessment (EA) and was released with conditions in March 2022 from the provincial EA process, and in August 2022 from the federal process.

Marathon is now proposing to develop a third open pit within the mine site of the Valentine Gold Project (the Approved Project). The Berry Pit Expansion (the Project Expansion) is proposed to include an open pit (Berry pit), a new waste rock pile and topsoil stockpile, expansion of the low-grade ore (LGO) and overburden stockpiles associated with Marathon pit to accommodate Berry LGO and overburden, and additional water management infrastructure. Marathon also proposes, as part of the Project Expansion, to deposit tailings in the Berry pit from Year 10 of the mine life onwards, a change from planned deposition in the Leprechaun pit described in the Valentine Gold Project Environmental Impact Statement (Valentine Gold EIS). The explosives storage facility that is part of the Approved Project will be relocated to maintain safety setbacks from mine infrastructure.

The Project Expansion will not result in an increase in annual production rates from the mine; however, it will increase the mine life by 1.4 years. Components of the Approved Project such as the tailings impoundment area, processing mill, access road, fuel storage and distribution, power distribution infrastructure, materials shipping, gold shipment to market, and site buildings, including accommodations, will not be affected by or require modification because of the Project Expansion. The treatment of tailings impoundment effluent has been updated from the polishing pond (part of the Approved Project) to a proposed submerged attached growth reactor unit (SAGR®), which is considered a technological improvement. There will be a small increase in employment as a result of the Project Expansion and a 5-8% increase in Project-related traffic along the access road from Millertown to the mine site.

The Project Expansion is considered a new undertaking under the provincial regulatory process and this Registration document has been developed to satisfy requirements under the provincial *Environmental Assessment Regulations*. Marathon is also required to provide Approved Project updates per federal EA Release Conditions 2.16 and 2.17. As discussed with regulators, Marathon has prepared this single document, the Environmental Registration / EA Update, to meet both the provincial and federal regulatory requirements.

Engagement

Marathon is committed to operating the combined Projects within a sustainable development framework which reduces harm to the environment, contributes to local communities, respects human and Indigenous rights, and which is characterized by openness and transparency in all its dealings. One of the key principles of sustainable development is meaningful engagement with the individuals, communities,



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groups and organizations interested in or potentially affected by Marathon's activities, to build and maintain positive, long term and mutually beneficial relationships. Marathon engaged with relevant government departments and agencies and potentially affected groups and individuals (e.g., Indigenous groups, communities, business and industry organizations, outfitters) prior to drafting and submitting this document. The results of this engagement are summarized in Chapter 3 and have helped inform the scope of the EA, as well as facilitate conformance with federal EA release conditions.

Benefits of the Project Expansion

The Project Expansion is expected to extend the life of the Approved Project by 1.4 years. This extension will provide additional economic benefits and employment opportunities throughout the region and province. By extending the life of the Approved Project, the Project Expansion contributes the following economic benefits to NL and Canada:

- Increase of approximately 44 full-time equivalents (FTE) of total employment (direct, indirect and induced) over the life of the mine
- Proportional increase in income to workers and businesses in NL and Canada
- Proportional increase to NL and Canada's gross domestic product (GDP)
- Increased generation of federal government revenues
- Contribution of approximately \$38 million revenue to the treasury of NL

Scope and Methods

The environmental effects assessment has used a precautionary, conservative approach. Conservative assumptions have been made, with the objective of overestimating rather than underestimating potential adverse effects. The EA Registration / EA Update examines the effects or changes to the physical, biological and socio-economic environment that could result from the Project Expansion. The assessment focuses on valued components (VCs), which were selected based on several factors, including requirements of the NL EA process, results of engagement, the role of the VC in the ecosystem, and the importance placed on it by Indigenous groups and stakeholders. The following VCs are assessed in the EA Registration / EA Update:

- Atmospheric Environment VC
- Groundwater Resources VC
- Surface Water Resources VC
- Fish and Fish Habitat VC
- Caribou VC



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In addition to the five VCs selected for assessment, summary chapters have been prepared for the socioeconomic VCs and other terrestrial VCs assessed in the Valentine Gold EIS to verify that the Project Expansion does not change the effects assessment or mitigation measures presented in the Valentine Gold EIS. These include:

- Other Terrestrial Components: Avifauna; Other Wildlife; Vegetation, Wetlands and Soils
- Socioeconomic Components: Community Services and Infrastructure; Community Health; Employment and Economy; Land and Resource Use; Indigenous Groups

The rationale for this approach to Other Terrestrial Components is that the Valentine Gold EIS was prepared using a conservative approach that assumed all habitat within the mine site would be lost as a result of Approved Project activities. Therefore, the loss of habitat associated with the Project Expansion was already largely assessed within the Valentine Gold EIS. Although not considered a VC in this document, a summary of Project Expansion-related environmental effects and mitigation and management measures relevant to wildlife is provided in Chapter 11, Other Terrestrial Components.

The rationale for this approach with respect to Socioeconomic Components is that, although the Project Expansion will result in an approximately 20% increase in operation mining personnel from that assessed in the Valentine Gold EIS, it is predicted that there will not be an increase in demand for local housing, temporary accommodations, or local services and infrastructure. It is also predicted that there will not be a change in regional labour force, regional business, economic activities of outfitters, or economy as a result of the increase in employment. Updated and refined modelling relative to the community health assessment (i.e., air quality, noise, groundwater, and surface water components) indicated no overall change from the Approved Project effects predictions. The Valentine Gold EIS also assumed that public access to the mine site would be lost because of Approved Project activities; therefore, the loss or alteration of public access, and land and resource use associated with the Project Expansion was already largely assessed within the Valentine Gold EIS.

This document considers potential effects arising from routine activities associated with each phase of the Project Expansion (construction; operation; and decommissioning, rehabilitation and closure) and from accidental events and malfunctions, as well as potential effects of the environment on the Project Expansion (e.g., due to extreme weather and climate change). Cumulative effects resulting from combined Approved Project and Project Expansion effects with other past, present or likely future activities and projects in the area are also considered.

For each VC, the environmental effects assessment characterizes the magnitude and nature of change that routine Project Expansion activities and accidental events may have on the existing environment. To augment the understanding of existing conditions for VCs, several baseline studies were conducted between 2020-2022. These are referenced in this document and are either attached or are available on request. The assessment describes how the Project Expansion may interact with aspects of the environment to potentially result in environmental effects and characterizes the residual effects. Residual environmental effects are those that remain after the application of mitigation measures. The significance of adverse residual environmental effects is determined using criteria developed for each VC. Effects of the environment (e.g., extreme weather and climate change) on the Project Expansion are also assessed.



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For each VC, mitigation measures are proposed to reduce or eliminate potential adverse effects that may result from the Project Expansion. Many of the potential adverse environmental effects can be managed by implementing accepted mining procedures, guidelines, and best management practices. Marathon will comply with relevant environmental requirements outlined in applicable legislation, commitments made in this document, EA conditions and commitments made in relation to the Approved Project (as applicable), and conditions of EA approval and regulatory authorizations specific to the Project Expansion. Where required, EA follow-up and monitoring programs are proposed to verify key environmental effects predictions, the effectiveness of the key mitigation, and/or compliance with regulatory and permitting requirements.

Summary of Residual Effects

For each of the five VCs assessed for the Project Expansion, this document:

- Summarizes the residual effects as presented in the Valentine Gold EIS
- Determines whether the combination of the Approved Project and Project Expansion results in a change to the residual effects predictions
- Characterizes existing conditions within the spatial boundaries of each VC, including a discussion of the influences of past and present physical activities on the VC leading to the current conditions
- Employs conservative assumptions so that potential adverse effects are generally overestimated rather than underestimated
- Identifies mitigation and environmental protection measures to reduce or eliminate adverse effects
- Characterizes residual environmental effects, including a determination of their significance

The EA predicts that routine Project Expansion activities will not cause significant adverse environmental effects on any of the VCs, except for caribou. Similar results were determined for cumulative effects, where Approved Project and Project Expansion effects are considered in combination with the effects of other projects (past, present, and reasonably foreseeable future projects).

The general results of the assessment for routine Project Expansion activities are summarized below. A summary discussion for accidental events and malfunctions follows.

- **Atmospheric Environment:** Air contaminant dispersion modelling and noise modelling were updated considering activities associated with the combined Approved Project and Project Expansion. This approach was taken as it represents the worst-case scenario emissions during construction and operation of the Project Expansion. Air quality modelling showed that, in most cases, the maximum predicted concentrations resulting from releases associated with the Project Expansion in combination with the Approved Project are slightly less than, or remain similar, to those predicted for the Approved Project alone (as originally presented in the Valentine Gold EIS). While Approved Project and Project Expansion activities are predicted to result in a change in sound levels to nearby sensitive receptors, the resulting levels are below applicable guidelines and limited to the LAA / RAA. Approved Project and Project Expansion activities will result in a relatively small change in light levels to nearby sensitive receptors, however this effect will be reversed post-closure. GHG emissions were estimated based on the year with the most GHG intensive activities; the combined Approved Project



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and Project Expansion are estimated to contribute 1.5% and 0.02% CO_{2e} annually to total provincial and national GHG emissions, respectively (based on provincial and national totals in 2021).

The assessment of effects on the atmospheric environment (i.e., air quality, GHG emissions, noise and light levels) determined that the addition of Project Expansion activities to the Approved Project does not result in substantial changes to the residual effects of the Approved Project alone. There are no significant residual effects predicted on the atmospheric environment resulting from routine Project Expansion activities combined with Approved Project activities, or from the cumulative effects of the Approved Project and Project Expansion in combination with other past, present, or reasonably foreseeable future projects.

- **Surface Water Resources:** Mine contact water discharged from the Final Discharge Points (FDP) will comply with the *Metal and Diamond Mining Effluent Regulations* prior to entering the receiving environment, and non-contact water is expected to remain at baseline water quality conditions. Localized effects are expected in the receiving watercourses and waterbodies immediately downstream of BER-FDP-05 and are expected to extend into Valentine Lake for 300 m before water quality is predicted to return to either baseline conditions or below recommended guidelines. Mean annual flow may be reduced in some watersheds within the LAA during all phases of mine life; however, other watersheds will receive an increase in flow that may provide a positive change. If follow-up monitoring over the life of the Project confirms this prediction, passive treatment system(s) will be required to treat TMF seepage to regulated limits. The selection and design of passive treatment system(s) will be based on water chemistry, flow rate, local topography, and/or site characteristics. Overall, the EA determined there are no significant residual effects on surface water resources resulting from routine Project Expansion activities, routine Project Expansion activities combined with Approved Project activities, or from the cumulative effects of the Approved Project and Project Expansion in combination with other past, present, or reasonably foreseeable future projects.
- **Groundwater Resources:** The main adverse residual environmental effect on groundwater quality identified in this assessment is the increase in concentrations of POPCs in groundwater due to seepage from the Berry waste rock pile, the Berry / Marathon LGO stockpile, and the TMF. Groundwater quality may also be affected by the tailings deposited in the Berry pit. Overall, however, the EA determined there are no significant residual effects on groundwater resources resulting from routine Project Expansion activities, routine Project Expansion activities combined with the Approved Project, or from the cumulative effects of the Approved Project and Project Expansion in combination with other past, present, or reasonably foreseeable future projects.
- **Fish and Fish Habitat:** The EA has determined that there are no significant residual Project Expansion-related effects to fish habitat quality and fish health and survival during construction and operation. Post-closure, seepage from the TMF draining to Victoria River is conservatively predicted to exceed MDMER limits for cyanide, un-ionized ammonia, and copper, unless treated. If follow-up monitoring over the life of the Project confirms this prediction, passive treatment system(s) will be required to treat TMF seepage to regulated limits. The selection and design of passive treatment system(s) will be based on water chemistry, flow rate, local topography, and/or site characteristics. The EA predicted that, with the implementation of mitigation measures, no significant effects on fish



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and fish habitat will result from routine Project Expansion activities, or from the cumulative effects of the Approved Project and Project Expansion in combination with other past, present, or reasonably foreseeable future projects. Construction and operation of water management infrastructure will result in a loss of fish habitat in some small streams and ponds. Marathon will develop and implement a Fish Habitat Offsetting Plan in consultation with Fisheries and Oceans Canada (DFO) to offset for lost habitat.

- **Caribou:** Changes in habitat, movement, and mortality risk for caribou are characterized and assessed for the Project Expansion in combination with the Approved Project because the activities of both are interrelated functionally, spatially and temporally. The Valentine Gold EIS was prepared using a conservative approach by assuming that 100% of the habitat within the Project Area would be changed because of mine development and activities. This approach allows for refinements to the site layout, as these typically occur through detailed Project design and planning. The Project Expansion will occur largely within the boundary of the Project Area that was assessed for the Approved Project. The area of additional ground disturbance required for Project Expansion infrastructure outside of the Project Area is associated with three sedimentation ponds and accounts for 3.4 ha, or an increase of 0.1% relative to the Project Area.

With respect to change in movement, although the entire Project Area was assumed to be affected by the development of the Approved Project, there may be residual effects on change in movement from the addition of the Project Expansion through the reduced availability of alternate routes through the Project Area (i.e., reduced permeability of the Project Area). Specifically, the areas where Berry pit and the Berry waste rock pile will be located were previously assessed as being cleared, and while that clearing could affect the use of movement pathways, use of those pathways was likely to remain feasible. The Berry pit and Berry waste rock pile will create physical impediments (i.e., change in topography as a barrier) to movement along those pathways, making the use of those pathways less likely. As caribou are generally expected to avoid the mine site during construction and operation, the potential residual effects on change in movement are more likely to occur during closure and continuing post-closure.

For change in mortality risk, the Project Expansion is expected to increase traffic on the access road by approximately 5-8% in comparison to the Approved Project alone. This increase is not expected to lead to a substantial increase in mortality risk from a vehicle collision. Other potential sources for change in mortality risk are predicted to be negligible for the Project Expansion as those effects are largely tied to, and confounded with, the Approved Project.

The addition of the Project Expansion does not change the residual effects predictions made for the Approved Project in the Valentine Gold EIS. Consistent with those predictions, potential residual effects of the combined Projects on change in habitat and mortality risk are predicted to be low magnitude for all four herds. The potential residual effects for change in movement for the Gaff Topsails, Grey River, and La Poile herds is also predicted to be low in magnitude. Also consistent with the residual effects predictions for the Approved Project, the potential residual effect for change in movement for the Buchans herd is predicted to be high because of the amount of overlap of the Project Expansion and Approved Project with an existing migration corridor. As a result, the Approved



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Project and Project Expansion has the potential to affect greater than 50% of caribou migrating through this corridor (based on more than 50% of collared caribou known to be using the corridor and of relatively large counts of caribou from cameras placed in the corridor). The prediction of a significant effect for the Approved Project was established on a conservative basis. It reflected both the uncertainty in how the Approved Project activities will affect the migratory movements of the Buchans herd and what long-term effects on the herd may result, and the uncertainty of the effectiveness of proposed mitigation measures. This significance determination is also considered valid for the combined Projects.

Marathon will continue to monitor migration patterns and populations of caribou herds in the area, particularly the Buchans herd, through the Caribou Protection and Environmental Effects Monitoring Program (CPEEMP). Marathon will also continue to engage with Indigenous groups and stakeholders, and work with provincial regulators to review and update the CPEEMP as needed to avoid and reduce adverse effects from Project Expansion activities.

Updated follow-up and monitoring plans for VCs will continue to verify the accuracy of the residual effects assessment described above, determine the effectiveness of mitigation measures, and track compliance with regulatory approvals, permits and authorizations.

The Project Expansion will be planned, designed, constructed, operated and monitored to avoid accidents and malfunctions through adherence with regulations, guidelines and best practices, and will not introduce additional risk for accidental events or malfunctions beyond that assessed for the Approved Project. Specifically, the addition of the Project Expansion will not require changes to the tailings impoundment and, therefore, will not change or affect the assessment of a TMF malfunction for the Approved Project, which focused on a breach of the impoundment and resulting loss of containment of tailings and water. In the unlikely event of a worst-case industrial accident or malfunction which results in a large-scale release into the environment, there is a potential for significant residual adverse effects to VCs. However, the risk of a significant effect occurring is considered low, given the Project Expansion design, maintenance and monitoring measures that will be in place to reduce the likelihood of an accident or malfunction occurring, and the emergency response plans and contingency measures that will be in place to limit the extent and nature of potential environmental effects in the event of an accident or malfunction.

Conclusion

This Registration Document / EA Update has been prepared to satisfy the provincial and federal EA requirements for the proposed Project Expansion.

Overall, the characterization of residual effects predicted for the Approved Project during construction, operation, and decommissioning, rehabilitation and closure, remains unchanged with the addition of the Project Expansion. Consistent with the conclusions in the Valentine Gold EIS, the Registration Document / EA Update predicts that routine Project Expansion activities in combination with Approved Project activities will not result in significant adverse environmental effects on any of the VCs, with the exception of caribou. Similar results were determined for cumulative effects, where combined Project effects are



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considered in combination with the effects of other projects (past, present, and reasonably foreseeable future projects). Effects predictions for the Approved Project in the Valentine Gold EIS relative to potential accidental events and malfunctions also remain valid with the addition of the Project Expansion.

The Project Expansion will extend the life of the Valentine Gold Project, resulting in additional employment and economic benefits to the local communities, the central region of NL, and the province. By extending the life of the mine without the requirement for additional processing or tailings impoundment infrastructure, the Project Expansion also increases the efficiency of gold production at the mine with limited additional effects on the environment. Marathon is confident that the Project Expansion can be developed and operated in a manner that provides environmental protection for VCs and long-term socioeconomic benefits for the region.



Abbreviations

%HA	Percent Highly Annoyed
°C	Degrees Celsius
µg/cm ²	Micrograms Per Square Centimeter
µg/L	Micrograms Per Litre
µg/m ³	Microgram Per Cubic Metre
µS/cm	Microsiemen Per Centimetre
AAFC	Agriculture and Agrifoods Canada
AC CDC	Atlantic Canada Conservation Data Centre
ACB	Air Contaminants Benchmarks
AEP	Annual Exceedance Probability
AET	Actual Evapotranspiration
amsl	Above Mean Sea Level
AP	Acid Potential
Approved Project	Valentine Gold Project
ARD	Acid Rock Drainage
ARD/ML	Acid Rock Drainage / Metal Leaching
ARU	Autonomous Recording Unit
As	Arsenic
ASF	Atlantic Salmon Federation
ATV	All-Terrain Vehicle
Ba	Barium
BBS	Breeding Bird Survey
Be	Beryllium
bgs	Below Ground Surface
Bi	Bismuth
BIC	Benthic Invertebrate Community
BMP	Best Management Practice
BOC	Bank of Canada
BSA	Baseline Study Appendix



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CAAQS	Canadian Ambient Air Quality Standards
CALMET	California Meteorological
CALPUFF	California Puff
CANFEM	Canadian Foundation Engineering Management
CCME	Canadian Council of Ministers of the Environment
CD	Census Division
Cd	Cadmium
cd	Candela
CDA	Canadian Dam Association
CEA	Cumulative Effects Assessment
CEAA	<i>Canadian Environmental Assessment Act</i>
Central Health	Central Health Regional Health Authority
CEPA	<i>Canadian Environmental Protection Act</i>
CH ₄	Methane
CIE	Commission Internationale de L'Éclairage
cm	Centimetre
CNF	Central Newfoundland Forest
CNWA	<i>Canadian Navigable Waters Act</i>
Co	Cobalt
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Equivalents
CO _{2e} /Kwh	Carbon Dioxide Equivalent Per Kilowatt-Hour
CoA	Certificate of Approval
CORMIX	Cornell Mixing Zone Expert System
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPEEMP	Caribou Protection and Environmental Effects Management Plan
CPUE	Catch per Unit of Effort
Cr	Chromium
CSD	Census Subdivision
CSI	Crime Severity Index
CSQG PEL	Canadian Sediment Quality Guideline Probable Effects Limit



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Cu	Copper
CWQG	Canadian Water Quality Guidelines
CWQG-FAL	Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life
dBA	Decibel A scale
dBBMM	Dynamic Brownian Bridge Movement Model
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EA Division	Environmental Assessment Division
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
ELCA	Ecological Land Classification Area
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	<i>Environmental Protection Act</i>
EPP	Environmental Protection Plan
EPR	Environmental Preview Report
ERMA	Environmental Resources Management Association
ESMS	Environmental and Social Management System
Existing Model	Hydrogeological model created to support the Approved Project
FAL	Freshwater Aquatic Life
FDC	Flow duration curve
FDP	Final discharge point
FMD	Forest Management District
FNFNES	First Nations Food, Nutrition and Environment Study
FTE	Full-time Equivalent
GCDWQ	Guidelines for Canadian Drinking Water Quality
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GPS	Global Positioning System
GVMS	Gross Value Mineral Shipment



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GWP	Global Warming Potential
ha	Hectare
HADD	Harmful Alteration, Disruption or Destruction
HCN	Hydrogen Cyanide
HFC	Hydrofluorocarbon
Hg	Mercury
HGO	High-Grade Ore
HS	Hydrometric Station
HSMS	Health and Safety Management System
HYDAT	Hydrometric Data National Water Data Archive
IAA	<i>Impact Assessment Act</i>
IAAC	Impact Assessment Agency of Canada
ICS	Incident Command System
Idf	Intensity-Duration-Frequency
IEK	Indigenous Ecological Knowledge
IPCC	Intergovernmental Panel on Climate Change
IR	Information Requirement
Island	Island of Newfoundland
ISQG	Interim Sediment Quality Guidelines
kg	Kilogram
kL	Kilolitre
km	Kilometre
km/a	Kilometres Per Annum
km/hr	Kilometre Per Hour
km ²	Square Kilometre
KPI	Key Performance Indicator
kt	Kilotonne
kt CO ₂ e/y	Kilotonne Of CO ₂ Equivalent Per Year
kt/y	Kilotonne Per Year
kW	Kilowatt
Kz/Kxy	Ratio Of Vertical To Horizontal Hydraulic Conductivity
L/d	Litres Per Day



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LAA	Local Assessment Area
LCP	Least Cost Pathway
L_d	Daytime Sound Level
L_{dn}	Day-Night Average Sound Level
LGO	Low-Grade Ore
Li	Lithium
LiDAR	Light Detection And Ranging
L_n	Nighttime Sound Level
LOM	Life of Mine
LSD	Local Service District
lux	Illuminance
m	Metre
m/s	Metres Per Second
m^2	Square Metre
m^3	Cubic Metre
m^3/a	Cubic Metres Per Annum
m^3/d	Cubic Metres Per Day
m^3/hr	Cubic Metres Per Hour
m^3/s	Cubic Metres Per Second
MAF	Mean Annual Flow
$mag/arcsec^2$	Magnitudes Per Square Arcsecond
Marathon	Marathon Gold Corporation
masl	Metres Above Sea Level
MBCA	<i>Migratory Birds Convention Act</i>
MD	Mafic Dyke
MDMER	<i>Metal and Diamond Mining Effluent Regulations</i>
MEND	Mine Environment Neutral Drainage
MFN	Miawpukek First Nation
mg/L	Milligrams Per Litre
Miawpukek	Miawpukek First Nation
ML	Metal Leaching
mm	Millimetre



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Mm ³ /year	Million Cubic Metres Per Year
MMF	Mean Monthly Flow
N ₂ O	Nitrous Oxide
NAD	North American Datum
NBCC	National Building Code of Canada
NF ₃	Nitrogen Trifluoride
NFCC	National Fire Code of Canada
NH ₃	Ammonia
Ni	Nickle
NIR	National Inventory Report
NL	Newfoundland and Labrador
NL AQ	Newfoundland and Labrador Air Quality
NLAAQS	Newfoundland and Labrador Ambient Air Quality Standards
NLDECC	Newfoundland and Labrador Department of Environment and Climate Change
NLDFFA	Newfoundland and Labrador Department of Fisheries, Forestry and Agriculture
NLDFFA – Wildlife Division	Newfoundland and Labrador Department of Fisheries, Forestry and Agriculture – Wildlife Division
NLDIET	Newfoundland and Labrador Department of Industry, Energy, and Technology
NLDOEC	Newfoundland and Labrador Department of Environment and Conservation
NLEPA	Newfoundland and Labrador <i>Environmental Protection Act</i>
NLESA	Newfoundland and Labrador <i>Endangered Species Act</i>
NLOA	Newfoundland and Labrador Outfitters Association
NO ₂	Nitrogen Dioxide
NOC	National Occupation Classification
NON-PAG	Non-Potential Acid Generating
NO _x	Nitrogen Oxides
NP	Neutralization Potential
NPR	Neutralization Potential Ratio
NRCAN	Natural Resources Canada
NS	Nova Scotia
NSD	Net Squared Displacement



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NW	Northwest
OEEMP	Outfitters Environmental Effects Monitoring Plan
oz	Ounce
PAG	Potentially Acid Generating
Pb	Lead
PET	Potential Evapotranspiration
PFC	Perfluorocarbon
PM ₁₀	Respirable Particulate Matter with an Aerodynamic Diameter Less Than 10 µm
PM _{2.5}	Particulate Matter with an Aerodynamic Diameter Less Than 2.5 µm
POPC	Parameters Of Potential Concern
PPE	Personal Protective Equipment
PRB	Permeable Reactive Barriers
Project Expansion	Berry Pit Expansion Project
Property	Valentine Gold Property
Qalipu	Qalipu Mi'kmaq First Nation
QEPOR	Quartz Eye Porphyry
QTPV	Flat-lying, Quartz-Tourmaline-Pyrite Veins
RAA	Regional Assessment Area
RCM	Recognized Closed Mine
RCMP	Royal Canadian Mounted Police
RCP	Representative Concentration Pathway
RCP4.5	Representative Concentration Pathway 4.5
RDL	Reportable Detection Limit
ROM	Run-Of-Mine
s	Second
SAEN	Salmonid Association of Eastern Newfoundland
SAGR®	Submerged Attached Growth Reactor
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
Sb	Antimony
SCNL	Salmonid Council of NL
Se	Selenium



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SEA	Socio-Economic Agreement
SF ₆	Sulfur Hexafluoride
SFE	Shake Flask Extraction
Sn	Tin
SO ₂	Sulphur Dioxide
SOCC	Species of Conservation Concern
Sr	Strontium
SW	Southwest
t	Tonne
t CO _{2e}	Metric Tonnes Of Carbon Dioxide Equivalent
t/a	Tonnes Per Annum
t/blast	Tonnes Per Blast
t/d	Tonnes Per Day
t/day	Tonnes Per Day
t/y	Tonnes Per Year
TDS	Total Dissolved Solids
Terrane	Terrane Geoscience Inc.
TMF	Tailings Management Facility
TSP	total suspended particulate matter with an aerodynamic diameter less than 30 µm
TSS	Total Suspended Solids
UNFCCC	United Nations Framework Convention on Climate Change
Updated Model	Hydrogeological model to support the Environmental Registration/EA Update for the Project Expansion
US EPA	United States Environmental Protection Agency
USA	United States of America
UTM	Universal Transverse Mercator
Valentine Gold EIS	Valentine Gold Project Environmental Impact Statement
VC	Valued Component
VLIC	Valentine Lake Intrusive Complex
WAD	Weak Acid Dissociable
WNS	White-nose Syndrome
WSC	Water Survey of Canada



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YOY	Young of the Year
Zn	Zinc
ZOI	Zone of Influence



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1.0 INTRODUCTION

Marathon Gold Corporation (Marathon) is currently constructing an open pit gold mine (the Valentine Gold Project) near Valentine Lake, located in the central region of the Island of Newfoundland, southwest of the Town of Millertown, Newfoundland and Labrador (NL) (Figure 1-1). The Valentine Gold Project consists primarily of two open pits, associated waste rock piles, crushing and stockpiling areas, conventional milling and processing facilities (the mill), a tailings management facility (TMF), personnel accommodations, and supporting infrastructure including an upgraded access road from Millertown to the mine site, haul roads, site roads, on-site power lines, buildings, and water and effluent management facilities.

The Valentine Gold Project was subject to both federal and provincial environmental assessment (EA) under the federal *Canadian Environmental Assessment Act, 2012*, and the NL *Environmental Protection Act* (NL EPA), respectively. Marathon submitted an Environmental Impact Statement (EIS) to both regulators, federally on September 29, 2020, and provincially on November 3, 2020. Following submission of responses to a number of information requirements (IRs) and amendments, the Valentine Gold Project was released from the EA process with conditions, provincially on March 17, 2022, and federally on August 24, 2022.

Based on recent and successful geological exploration and assessment work and associated feasibility assessment, Marathon is proposing the development of a third open pit within the mine site of the Valentine Gold Project (the Approved Project). The main components of the Berry Pit Expansion (the Project Expansion) include an open pit (Berry pit) and associated haul roads, new stockpiles for waste rock and topsoil, sharing and expansion of both the low-grade ore and overburden stockpiles associated with the Marathon pit, and additional water management infrastructure.

The Project Expansion will not result in an increase in annual production rates from the mine. There will be a slight increase in mine life of 1.4 years (from 13 years to 14.4 years). Components of the Approved Project such as the tailings impoundment, processing mill, access road, power distribution infrastructure, material shipping, gold shipment to market, and site buildings including accommodations, will not be affected by, or require modification because of, the Project Expansion. There will be a small increase in employment as a result of the Project Expansion and a small increase (5 – 8%) in traffic on the access road during operation. Further information on the activities and features being proposed as part of the Project Expansion are provided in Section 1.1.2 and Chapter 2.



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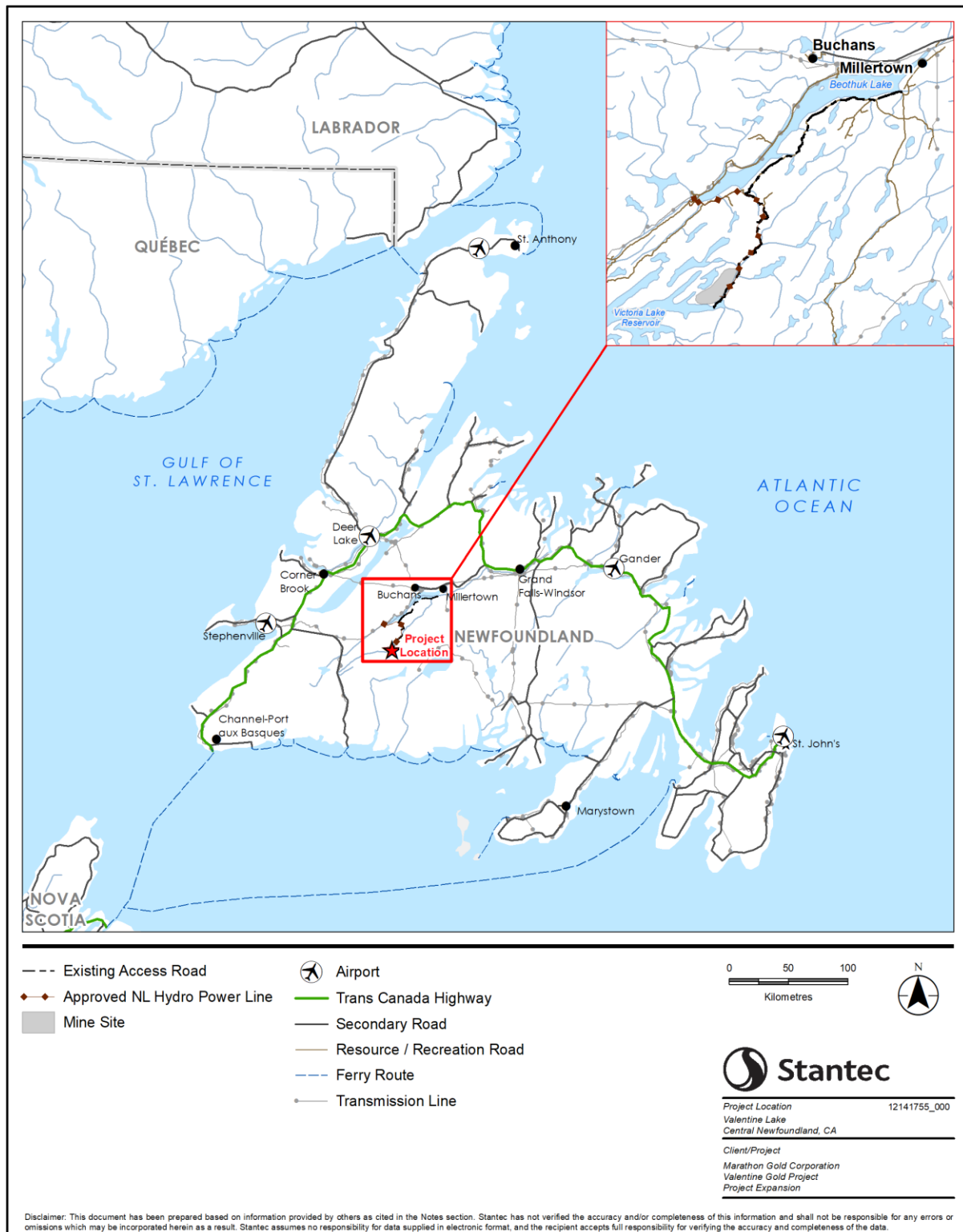


Figure 1-1 Approved Project and Project Expansion Location



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The Project Expansion was not part of the Approved Project as described in the Valentine Gold EIS and, as such, new/additional regulatory requirements must be met. As discussed with regulators, Marathon is preparing a single document to meet both the provincial and federal EA requirements. In the interest of clarity, the following terms are being used:

- **Environmental Registration / EA Update** refers to this document prepared by Marathon to meet both federal and provincial regulatory requirements
- **Valentine Gold Project Environmental Impact Statement** (Valentine Gold EIS; Marathon 2020) refers to the EIS submitted to provincial and federal regulators in 2020
- **Approved Project** refers to the Valentine Gold Project as approved and released from the EA process in 2022, with conditions
- **Project Expansion** refers to the Berry Pit Expansion
- **Project Area** refers to the area that was assessed for the Approved Project, i.e., the mine site and the access road

Federal approval of the Approved Project was subject to a number of EA Conditions of release issued by the Impact Assessment Agency of Canada (IAAC). This Environmental Registration / EA Update fulfills EA Conditions 2.16 and 2.17, subject to confirmation from IAAC that the Project Expansion constitutes a change to a designated project (i.e., a change to the Approved Project). Additional details on these EA Conditions in relation to the federal EA process are described in Section 1.4.1 of this document.

Provincially, the Project Expansion is considered a new undertaking as per the NL *Environmental Assessment Regulations*, and Marathon is submitting this document as a Registration to the Environmental Assessment Division (EA Division) of the NL Department of Environment and Climate Change (NLDECC) to assess potential effects associated with the Project Expansion. Further information on provincial EA requirements in relation to the Project Expansion are included in Section 1.4.2.

Marathon is committed to ongoing and meaningful engagement with the individuals, communities, groups and organizations interested in or potentially affected by its activities, in order to build and maintain positive, long-term and mutually beneficial relationships. Consistent with its corporate values, Marathon has implemented an inclusive engagement process which provides for the timely transmission of information, allows an opportunity for input from Indigenous groups, stakeholders and communities, and is responsive to identified issues and concerns.

Prior to submission of this Environmental Registration / EA Update, Marathon engaged with federal and provincial regulators; Qalipu First Nation and Miawpukek First Nation; communities; salmonid associations, the Newfoundland and Labrador Association of Outfitters Association, and other potentially affected stakeholders. Engagement activities have included the transmission of Project Expansion information (through technical briefs and presentations), community information sessions, meetings (both in-person and virtual), and the provision of opportunities for Indigenous groups and stakeholders to provide input and identify issues and concerns. Feedback received during these engagement efforts, along with Marathon's approach to addressing concerns, are further described in Chapter 3 and have been incorporated into this document, as applicable. All engagement efforts are recorded and tracked



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through customized software. Marathon is committed to ongoing engagement over the life of the Project, including the Project Expansion.

1.1 PROJECT EXPANSION OVERVIEW

1.1.1 Rationale for Project Expansion

Since the Valentine Gold EIS was prepared, drilling programs continued to expand understanding of the mineralization in Marathon's mineral leases, refine resource estimates, and further delineate potential resources. In addition, macro-economic impacts (e.g., inflation) have affected the economics of the Approved Project.

As a result of continued resource delineation, the mineable resources from both the Marathon and Leprechaun pits have been reduced. While this does not appreciably change the surface area of the pit or the annual production rate, it has a relatively minor reduction in the pit volume and the total resources extracted over the life of mine (LOM) (i.e., less ore extraction, lower gold production). The discovery and exploration of the Berry deposit has resulted in a positive resource estimate with a mineable resource that offsets the reduction in resources from Marathon and Leprechaun deposits, increases overall operation by more than one year (1.4 years), provides a small increase in mining personnel, and will help overcome continuing macro-economic impacts affecting the mining industry. The addition of the Berry deposit to the Approved Project improves the overall combined Projects' sustainability, LOM, employment, and economic benefits without requiring additional or altered mineral processing rates.

1.1.2 Project Expansion Components

The Approved Project includes two open pits, waste rock piles, crushing and stockpiling areas, conventional milling and processing facilities (the mill), a TMF (tailings impoundment and wastewater treatment), personnel accommodations, and supporting infrastructure, including roads, on-site power lines, buildings, and water and effluent management facilities (Figure 1-2). The mine site is accessible year-round by public, gravel access road from Millertown, and upgrades to this access road are part of the Approved Project. The construction phase for the Approved Project was estimated in the Valentine Gold EIS to take approximately 16 to 20 months, followed by an estimated mine operation life of 13 years. When mining is complete, the operation will be closed, and the components of the Approved Project will be rehabilitated and monitored according to the applicable regulations in place at the time of closure (Marathon 2020).



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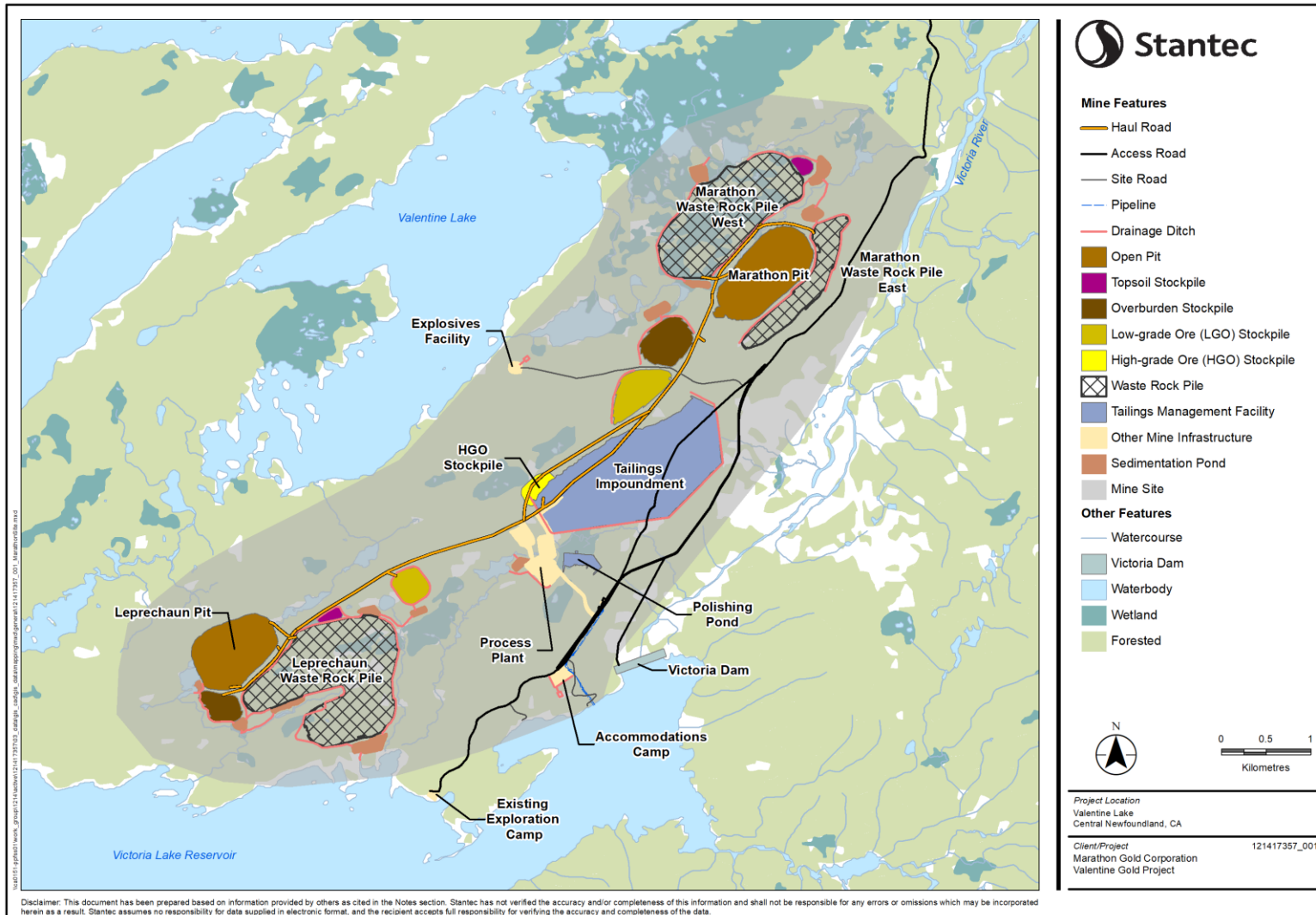


Figure 1-2 Site Layout for the Approved Project



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The Project Expansion will include the following components, which include minor changes to several Approved Project features:

- New open pit (i.e., the Berry pit) and associated haul roads
- New waste rock pile
- New topsoil stockpile
- New (additional) Marathon topsoil stockpile, relocation of a sedimentation pond proposed for the Approved Project, and a temporary sedimentation pond (construction phase only)
- Combined Berry / Marathon overburden and low-grade ore (LGO) stockpiles
- Associated water management infrastructure
- Relocation of the explosives storage facility (from the planned location as described in the Valentine Gold EIS) to maintain required safety setbacks
- Tailings disposal in the mined out Berry pit (rather than in Leprechaun pit) from Year 10 to the end of operation, reducing the distance that tailings would need to be transported by pipeline
- Replacement of the polishing pond described in the Valentine Gold EIS with a smaller submerged attached growth reactor (SAGR®) unit that is more effective for treatment of nitrogen species

The layout of the mine site including both the Approved Project and the Project Expansion components is shown in Figure 1-3. The Project Expansion will not require modification or expansion of the tailings impoundment, mill, access road, power distribution, material shipping, gold shipment to market, or site buildings (including accommodations) previously approved for the Approved Project.

Marathon is proposing to replace the planned polishing pond, a component of the TMF / process water treatment system used to treat process effluent, with a SAGR® unit, which provides improved water treatment for nitrogen species. From Year 10 (2034) to the end of operation, tailings will be disposed of in the mined out southern basin of the Berry pit and flooded. In addition, beginning in 2031 and 2033, waste rock will be deposited in the mined-out central and northern basins of the Berry pit, respectively. Further information on planned Project Expansion components and activities is provided in Chapter 2.



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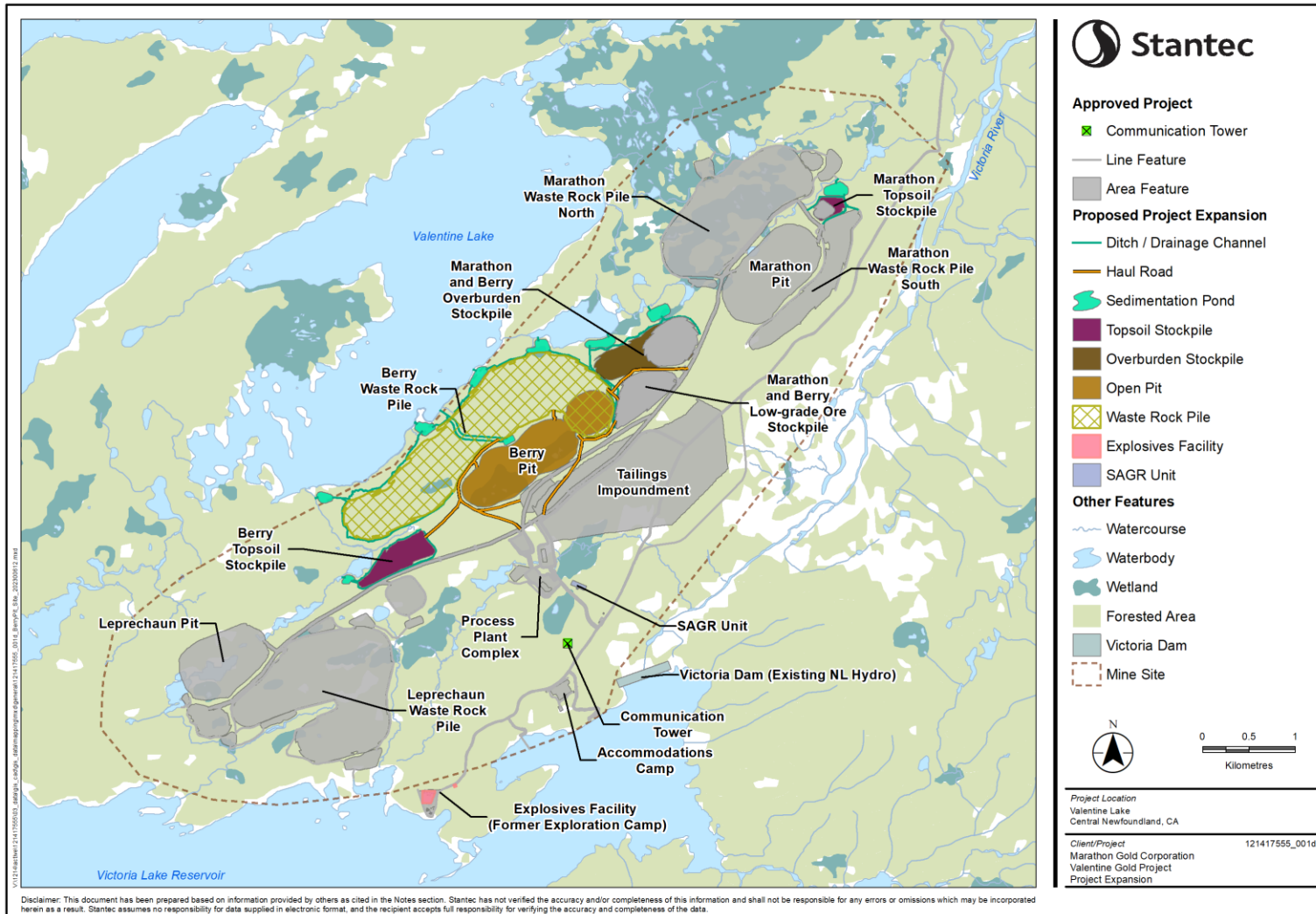


Figure 1-3 Site Layout Including Approved Project and Project Expansion



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1.2 PROPONENT INFORMATION

1.2.1 Proponent Contact Information

Marathon is a Toronto-based gold exploration company that was incorporated in 2010. Marathon has 100% ownership and ongoing management of the Approved Project and is the entity that will develop, manage and operate the Project Expansion. It is a public, development stage company whose common shares trade on the TSX Exchange (MOZ) and OTCQX (MGDPF) in the USA. Marathon also has a satellite office in Grand Falls-Windsor, NL. Contact information is contained in Table 1.1 and additional corporate information can be found at www.marathon-gold.com.

Table 1.1 Contact Details for Marathon Gold Corporation

Title	Contact Details
President and CEO	Matt Manson, Ph.D. 36 Lombard Street, Suite 600 Toronto, ON, Canada, M5C 2X3 Phone: +1 (416) 855 8200 mmanson@marathon-gold.com
VP Regulatory and Government Affairs	James Powell, M.Eng. P.Eng. 7 Queensway Grand Falls-Windsor, NL, Canada, A2B 1K9 Phone: +1 (709) 730-5046 jpowell@marathon-gold.com
Principal Contact for the Purposes of the EA	Tara Oak, B.Sc. Manager, Environmental Assessment 7 Queensway Grand Falls-Windsor, NL, Canada, A2B 1K9 Phone: +1 (902) 266-3157 toak@marathon-gold.com



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1.2.2 Marathon Gold Corporation's Management Structure

Since 2010, Marathon's work in NL has been focused on its Valentine Gold Property (the Property), progression of the Approved Project through federal and provincial regulatory processes and, currently, construction of the Approved Project. Marathon's Board of Directors has the overall responsibility of supervising the management of the business and affairs of the Company and a team of Executive Officers is responsible for the day-to-day management of the business, and execution of the Company's strategic objectives.

Marathon maintains appropriate insurance coverage for the current stage of the Approved Project development, including workers' compensation insurance, automobile liability insurance, commercial general liability insurance, and directors' and officers' liability insurance. As the Approved Project and Project Expansion progress into construction and operation phases, Marathon will acquire additional insurance coverage in scope and value commensurate with regulatory requirements and industry best practice.

Marathon's overarching Environmental and Social Management System (ESMS) is supporting the execution of the Approved Project site development in an environmentally responsible and safe manner. The Project Expansion will also be managed through the ESMS and aligned with a number of existing corporate-level operating policies related to the environment, communities, Indigenous groups, health and safety, and business governance, including but not limited to the following:

- Board Diversity Policy
- Environment Policy
- Health and Safety Policy
- Indigenous Relations Policy
- Diversity Policy
- Human Rights Policy
- Conflict of Interest Policy
- Whistleblower Policy
- Disclosure Policy
- Community Relations Policy

The most recent versions of these policies are available on Marathon's corporate website (<https://marathon-gold.com/environmental-social-and-governance/governance/>), and in Appendix 2G.



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1.3 PROJECT EXPANSION LOCATION

The Project Expansion is almost entirely contained within the Project Area assessed for the Approved Project, which consisted of the mine site and the access road (Figure 1-3). The Project Expansion occurs in the Central Uplands ecoregion of Newfoundland, northeast of the Victoria Lake Reservoir, a hydroelectric reservoir. The mine site is located approximately 49 km south (straight line distance) of the nearest community of the Town of Buchans, and approximately 60 km southwest (straight line distance) of the Town of Millertown (Table 1.2; Figure 1-1). The mine site is characterized by gentle to moderately steep hilly terrain, with several small ponds and a northeast trending ridge crossed by ephemeral streams (Figure 1-4). Further information on the environmental setting for the Project Expansion, including the environmental importance and value of the geographical setting of the Project Area and potential for resource conflicts, is provided in Chapter 4.

Table 1.2 Communities and Land Title Near the Project Expansion

Community Name/Land Title	Type	Distance By Road		Straight Line Distance (km)	
		To Mine Site	To Project Area	To Mine Site	To Project Area
Town of Buchans	Municipality	119	46	49	10
Town of Millertown	Municipality	82	9	60	8
Buchans Junction	Local Service District	89	16	66	13
Miawpukek First Nation reserve at Conne River	First Nations	327	254	113	113
Title held near Badger	Federal Lands	130	57	97	45
Title held in Pasadena	Federal Lands	336	263	76	62

Some small Project Expansion features will be constructed outside the Project Area for the Approved Project. Three sedimentation ponds and associated ditching/drainage channels are located partially or fully outside of the mine site, on the northern perimeter of the waste rock pile for the Berry Pit (Figure 1-5). In addition, to maintain required safety setbacks, the explosives facility location, previously assessed as part of the Approved Project, will need to be relocated outside of the Project Area and away from the Berry pit and other Project infrastructure (Figure 1-5). The new site is at the former exploration camp location, a previously disturbed site with existing access. The footprint of additional ground disturbance required for Project Expansion infrastructure located outside of the Project Area is 3.4 ha and accounts for 0.097% of the Project Area assessed for the Approved Project (3,497 ha) and, specifically, 0.106% of the mine site assessed for the Approved Project (3,196 ha).



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Figure 1-4 Location of Project Expansion



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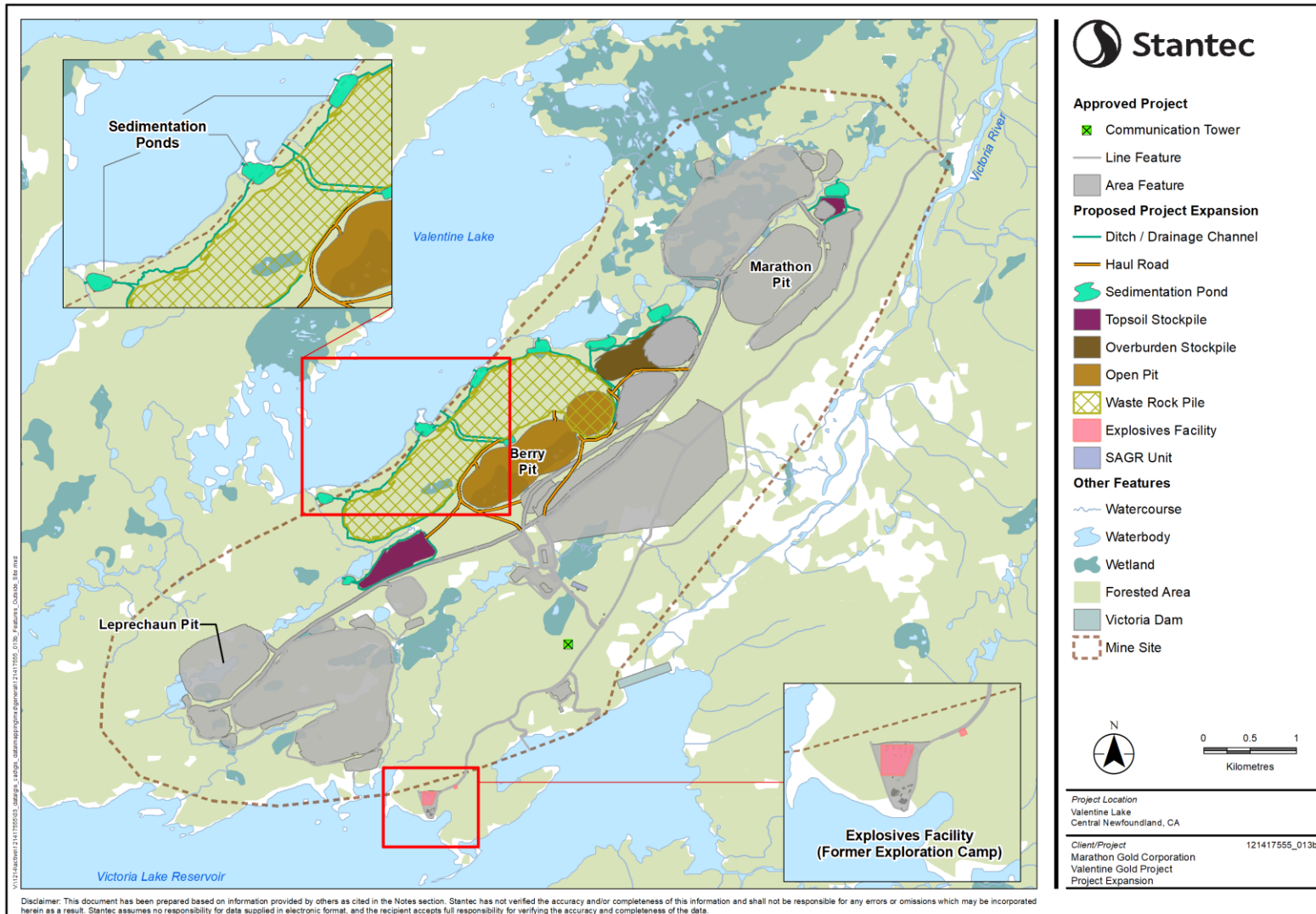


Figure 1-5 Project Expansion Features Located Outside of the Previously-Assessed Mine Site



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The center of the mine site is located at Universal Transverse Mercator (UTM) 490055 m Easting and 5358023 m Northing, Zone 21, North American Datum (NAD) 1983 (NAD83 Zone 21). It and the Project Expansion are located within National Topographic System map sheets 12A/06. The Project Area is located with National Topographic System map sheets 12A/06, 12A/10, 12A/11 and 12A/15 (Figure 1-6). Table 1.3 provides coordinates for the boundary of the mine site and the explosives facility. Table 1.3 also provides coordinates of the start and end points of the access road that is being upgraded and maintained by Marathon as part of the Approved Project, as well as coordinates of 10 km intervals along the road (Figure 1-6).

Table 1.3 Mine Site Boundary and Access Road Coordinates

ID (as shown on Figure 1-6)	Latitude UTM	Longitude UTM
1	5400765.004	529480.275
2	5399279.632	520156.0912
3	5396216.043	511269.215
4	5388921.112	507242.6041
5	5383805.915	499743.7854
6	5377533.818	498123.9331
7	5370719.997	498169.2424
8	5363997.285	494348.3653
9	5361615.793	494254.1106
10	5358803.709	493100.9922
11	5355602.51	490750.2869
12	5354543.511	486986.264
13	5355341.676	485281.976
14	5356991.394	486171.6078
15	5359241.984	489409.9001
16	5362090.283	492083.8983
Coordinates in NAD_1983_UTM_Zone_21N		

The mine site is located within 14 contiguous mineral licences (Figure 1-7; Table 1.4), for a landholding of 240 km². These mineral licences are 100% controlled by Marathon and held in good standing. The Approved Project includes mining of two gold deposits: Leprechaun and Marathon; mining of a third gold deposit, named the Berry deposit, is the focus of this assessment. Other gold prospects have been identified within Marathon's mineral claims area; however, substantial exploration work is required to determine if additional viable gold deposits exist there. The collective deposits and occurrences are located within an approximately 20 km long northeast-southwest trending zone (Figure 1-7).



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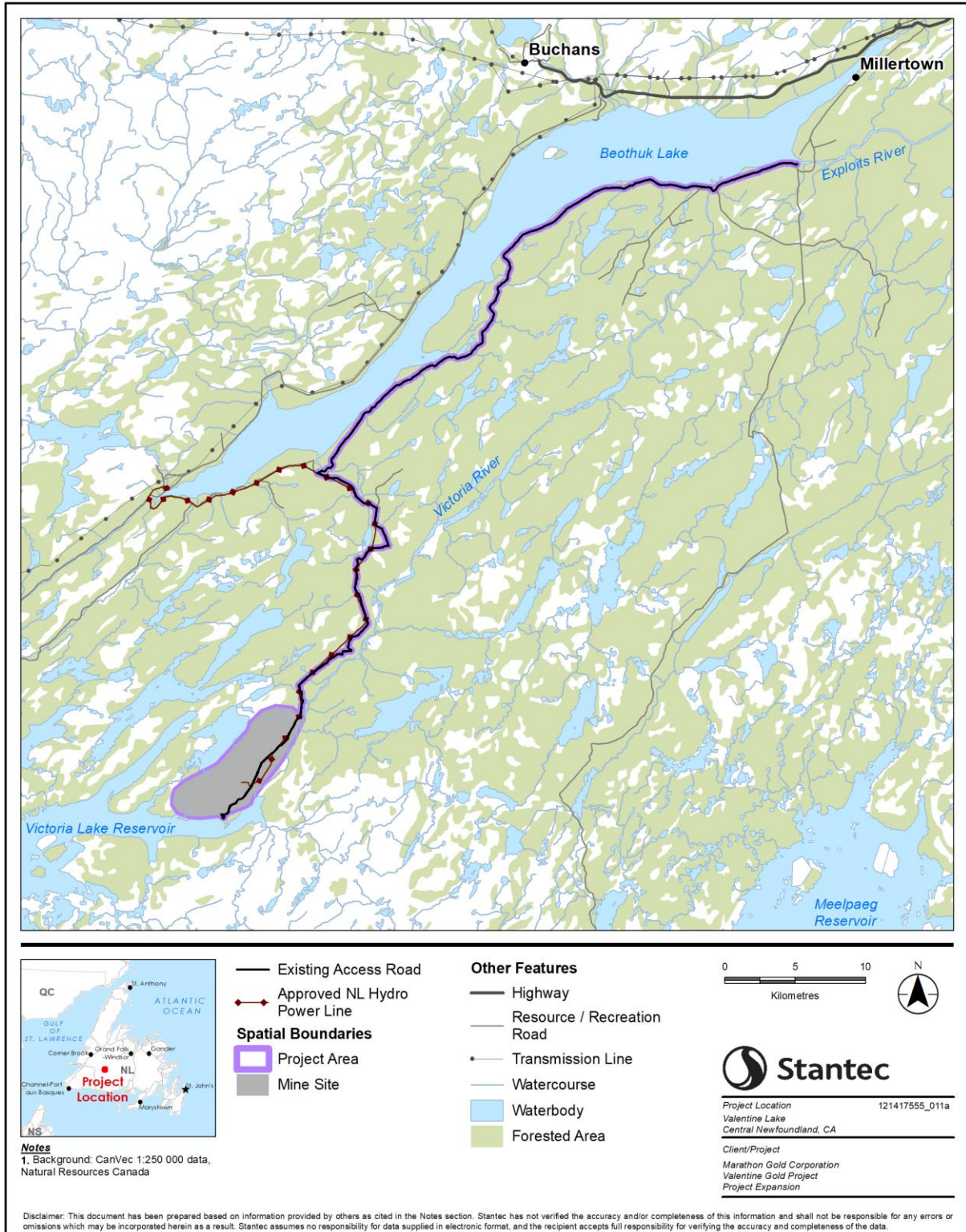


Figure 1-6 Project Area



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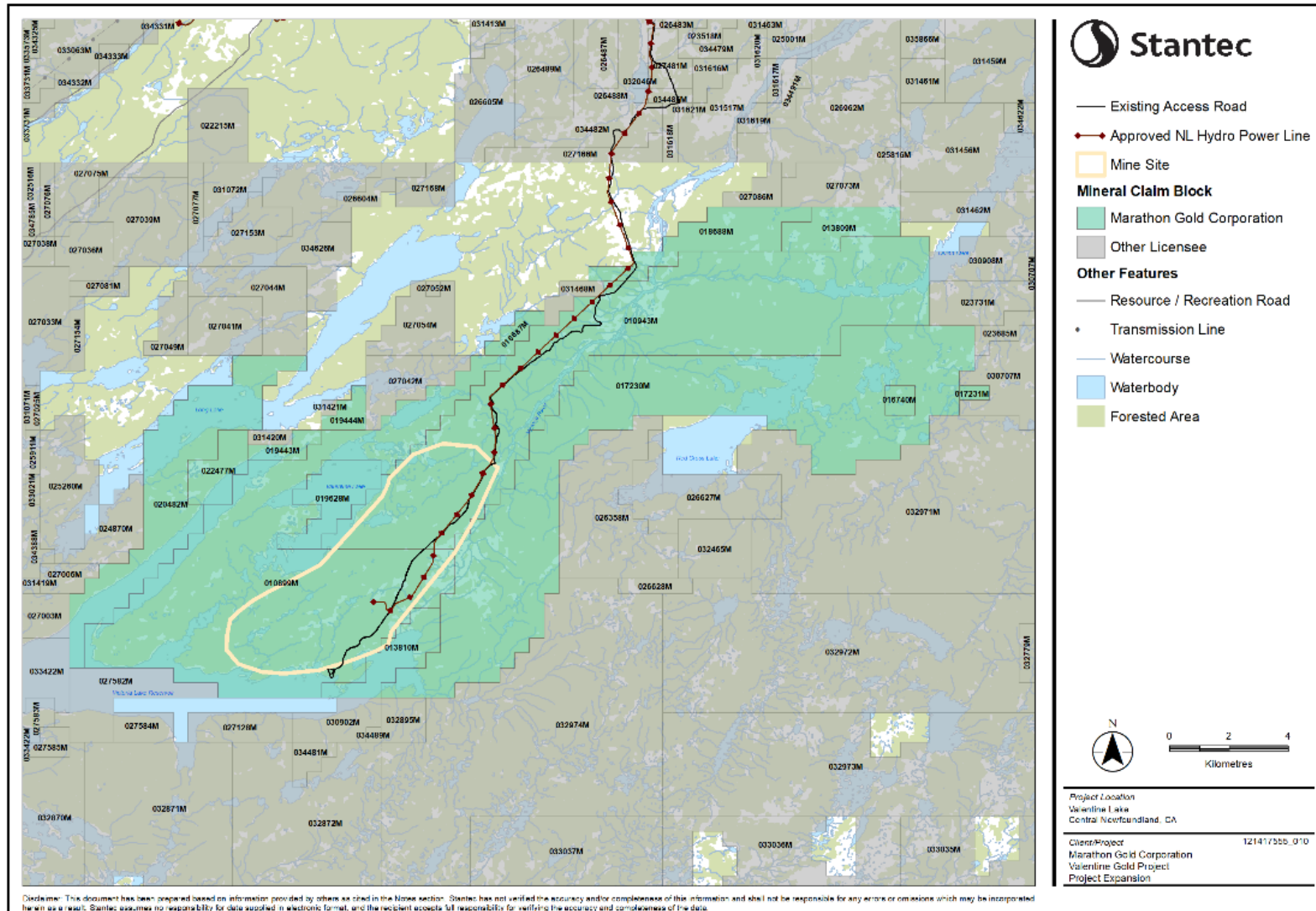


Figure 1-7 Marathon Mineral Licence Boundary and Adjacent Claims



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Table 1.4 Valentine Property Licence Summary

Licence ID	Issuance Date	Years Held	Renewal Date	No. Claims	Area km ²	Expenditure Due Date
010899M	27-Apr-04	19	27-Apr-24	246	61.50	27-Apr-25
010943M	27-Apr-04	19	27-Apr-24	256	64.00	27-Apr-25
013809M	6-Sep-07	16	06-Sep-27	18	4.50	6-Sep-26
013810M	6-Sep-07	16	06-Sep-27	19	4.75	6-Sep-25
016740M	26-Nov-09	13	26-Nov-26	4	1.00	26-Nov-29
017230M	9-Feb-10	13	09-Feb-25	256	64.00	9-Feb-29
017231M	9-Feb-10	13	09-Feb-25	2	0.50	9-Feb-28
018687M	29-Mar-11	12	30-Mar-26	6	1.50	29-Mar-29
018688M	29-Mar-11	12	30-Mar-26	29	7.25	29-Mar-29
019443M	17-Oct-11	11	19-Oct-26	6	1.50	17-Oct-29
019444M	17-Oct-11	11	19-Oct-26	6	1.50	17-Oct-29
019628M	29-Dec-11	11	29-Dec-26	21	5.25	29-Dec-31
020482M	8-Oct-12	11	08-Oct-27	77	19.25	08-Oct-28
022477M	6-Nov-14	9	06-Nov-24	14	3.50	6-Nov-30
Totals				960	240	
Sources: Ausenco 2022, Feasibility Study						

The Project Expansion and the Approved Project areas are accessed by public road via Millertown, with provincial highways connecting Millertown and Buchans to the Trans-Canada Highway. Most materials, equipment and supplies will be brought to the mine site by public road from larger communities (e.g., Gander, Grand Falls-Windsor) on the Island of Newfoundland, the same as for the Approved Project. It is anticipated that the Project Expansion will result in a small increase (5-8 % increase) in truck trips as, for the most part, the Project Expansion will use the same equipment that is being employed in developing and operating the Approved Project.

Materials are typically brought to the Island via Marine Atlantic-operated ferries, which connect North Sydney, Nova Scotia with Port-aux-Basques on the west coast of the Island, approximately 540 km distance by road from the Project Area, and Argentia on the Avalon Peninsula, approximately 480 km by road, as well as through the Port of St. John's via Oceanex. Other nearby, smaller ports may also be considered, including South Brook, Botwood and Lewisporte. The Project Area is located approximately 210 km from the Gander airport and approximately 320 km from the Deer Lake airport. The Project Area is 113 km (254 km by road) from the Miawpukek First Nation reserve at Conne River (Table 1.2). There are no federal lands located within 45 km of the Project Area.



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1.4 REGULATORY FRAMEWORK

Marathon's proposed Project Expansion is subject to various provincial and regulatory requirements, including approvals and authorizations as outlined in the following sections. This information is indicative for planning purposes and is not intended to present an exhaustive list of legal and regulatory requirements.

1.4.1 Federal Regulatory Requirements

The Approved Project was subject to assessment under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). However, CEAA 2012 has been repealed and replaced by the new *Impact Assessment Act* (IAA) (S.C. 2019, c. 28, s. 1), and new projects subject to the federal EA process would now be assessed pursuant to the IAA.

Federally, an expansion to an existing project can be considered either:

- a new designated project requiring impact assessment under IAA; or
- a change to an existing designated project under CEAA 2012, requiring the proponent to satisfy requirements as laid out in the project-specific decision statement issued by IAAC when the project was approved.

To be considered a new designated project, the physical activities associated with the Project Expansion would need to meet or exceed the conditions and thresholds in the *Physical Activities Regulations* attendant to the IAA. Section 19(c) of the *Physical Activities Regulations* requires an impact assessment for:

19 *The expansion of an existing*

(c) in the case of an existing metal mine, other than a rare earth element mine, placer mine or uranium mine, if the expansion would result in an increase in the area of mining operations of 50% or more and the total ore production capacity would be 5 000 t/day or more after the expansion;

The Project Expansion will not require an increase to the total ore production capacity of the Approved Project, which is already above 5,000 t/day. The area of mine operations is defined within the *Physical Activity Regulations* as, "the area at ground level occupied by any open-pit or underground workings, mill complex or storage area for overburden, waste rock, tailings or ore." Using this definition, the Project Expansion will result in a 39.79% increase in the area of mine operations. This percentage is based on the detailed evaluation provided in Table 1.5.



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Table 1.5 Increase in Mine Area of the Approved Project as a Result of the Project Expansion

Component	Approved Project (km ²)	Approved Project + Project Expansion (km ²)	Net Change in Mine Area
Tailings Impoundment	1.7835	1.7835	-
Water Treatment Plant	0.0007	0	-0.0007
Process Plant	0.1948	0.1948	-
Polishing Pond	0.0555	-	-0.0555
SAGR Unit	-	0.00838	0.00838
Leprechaun Low Grade Stockpile	0.1223	0.1223	-
Leprechaun Overburden Stockpile	0.1216	0.1216	-
Leprechaun Pit	0.5705	0.5705	-
Leprechaun Topsoil Stockpile	0.0261	0.0261	0
Leprechaun Waste Rock Pile	1.5919	1.5919	-
Marathon Pit	0.6977	0.6977	-
Marathon Waste Rock Pile South	0.4211	0.4211	-
Marathon Waste Rock Pile North	1.2399	1.2399	-
Marathon Topsoil Stockpile North	0.035	0.035	0
Marathon Topsoil Stockpile South	-	0.0600	0.0600
Berry / Marathon Overburden Stockpile	0.2352	0.4190	0.1838
Berry / Marathon Low Grade Stockpile	0.2346	0.2347	0.0001
HGO Stockpile	0.0976	0.0976	-
Berry Topsoil Stockpile	-	0.1922	0.1922
Berry Pit and Waste Rock Pile	-	2.5674	2.5674
TOTAL MINE AREA	7.4280	10.3837	2.9557
% INCREASE IN MINE AREA	39.79%		

While the Project Expansion does not appear to constitute a new designated project requiring assessment under the IAA, subject to confirmation by IAAC, it would be considered a change to an existing designated project, requiring the proponent to satisfy requirements as laid out in the Project-specific decision statement issued by IAAC for the Approved Project. Specifically, the Project Expansion is subject to EA Conditions 2.16 and 2.17 of the federal Decision Statement, issued on August 23, 2022, under Section 54 of CEAA, 2012:

2.16: *If the Proponent is proposing to carry out the Designated Project in a manner other than described in condition 1.8, the Proponent shall notify the Agency in writing in advance of carrying out those proposed activities. As part of the notification, the Proponent shall provide:*

2.16.1: *a description of the proposed change(s) to the Designated Project and the environmental effects that may result from the change(s);*



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2.16.2: any modified or additional measure to mitigate any environmental effect that may result from the change(s) and any modified or additional follow-up requirement; and
2.16.3: an explanation of how, taking into account any modified or additional mitigation measure referred to in condition 2.16.2, the environmental effects that may result from the change(s) may differ from the environmental effects of the Designated Project identified during the environmental assessment.

2.17 The Proponent shall submit to the Agency any additional information required by the Agency about the proposed change(s) referred to in condition 2.16, which may include the results of consultation with Indigenous groups and relevant authorities on the proposed change(s) and environmental effects referred to in condition 2.16.1 and the modified or additional mitigation measures and follow-up requirements referred to in condition 2.16.2.

This document provides detailed information that serves to satisfy EA Conditions 2.16 and 2.17 of the federal Decision Statement, as described in Table 1.6.

Table 1.6 Concordance with Federal Decision Statement Requirements

Section Number	Sub-Section Number	How and Where Requirement is Addressed in this EA Update
2.16	--	This EA Update constitutes Marathon's advance notice to IAAC in writing.
	2.16.1	A description of the proposed changes to the Designated Project are found in Chapter 2.
		A description of the environmental effects that may result from the proposed changes are found in Sections 6.5.2, 7.5.2, 8.5.2, 9.5.2, 10.6.2, 11.3, 12.3 and summarized in Section 15.3 for the VCs assessed.
	2.16.2	Modified or additional mitigation measure are described in Table 3 of, Appendix 2E.
		Modification or additional follow-up programs are described in Section 2.9, Table 2.13.
2.16.3	A description of any difference in environmental effects from that identified during the EA of the Designated Project is summarized in Section 15.3.	
2.17	--	The results of consultation with Indigenous groups and relevant authorities on the proposed, changes, environmental effects, and modified or additional mitigations measures and follow-up programs are described in Chapter 3.

1.4.2 Provincial Environmental Assessment Requirements

Under the NL *Environmental Assessment Regulations, 2003*, the Project Expansion is captured under section 33(2) and therefore requires that a Registration document be submitted to the NL EA Division.

33(2) An undertaking that will be engaged in the mining, beneficiating and preparing of a mineral as defined in the Mineral Act whether or not these operations are to be performed in conjunction with a mine or at mills that will be operated separately shall be registered.



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Based on guidance from the NL EA Division, a table of concordance with requirements for the Environmental Registration is included as Table 1.7.

Table 1.7 Concordance with Requirements for an Environmental Registration

Registration Requirement	Reference Location
Name of the Undertaking	Section 1.0
Proponent Information	Section 1.2
Purpose / Rationale / Need for the Undertaking	Section 1.1.1
Description of the Undertaking (Project Description), including:	
• Geographic location	Section 1.3
• Physical and biological environment	Section 4.1
• Construction phase activities, including waste streams and potential “resource conflicts”	Activities – Section 2.4 Waste streams – Section 2.9 Resource conflicts – Section 4.2
• Operation/maintenance phase activities, including waste streams and potential “resource conflicts”	Activities – Section 2.5 Waste streams – Section 2.9 Resource conflicts – Section 4.2
• Alternative means to carrying out the project	Section 2.11
Project Expansion-related documents	Appendices 2,5,6,7,8,9,10, Reference Sections for VC chapters and Table 1.8
Occupations for construction and operation phases	Sections 2.8 and 2.9
Approval of the Undertaking (i.e., required permits, approvals that the Project Expansion may require)	Section 1.4.3, Table 1.9
Schedule	Tables 2.2 and 2.3
Funding (source of Project Expansion funding)	Section 1.5

While this document has been prepared to meet the requirements identified above, the Final EIS Guidelines for the Approved Project were also consulted and used to identify and prepare additional EA information that regulators are likely to require when evaluating the Project Expansion and its potential effects.

With respect to the Project Expansion, this Environmental Registration/EA Update has been prepared to address the regulatory requirements of both the federal and provincial governments.

1.4.3 Approved Project EA Document History

Throughout this Environmental Registration / EA Update, studies prepared to support the EA for the Approved Project have been referred to as appropriate. To aid in retrieval of information relative to the EA for the Approved Project, Table 1.8 provides a summary of documents and where they can be accessed online.



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Table 1.8 Valentine Gold Project Environmental Assessment Document History

Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
Original EIS Submission (September 2020)	
Provincial EIS Guidelines	
Environmental Impact Statement Guidelines for the Valentine Gold Project – Final (January 2020)	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-2015-eis-guidelines-january-2020.pdf
Main Document	
Valentine Gold Project: Environmental Impact Statement - Table of Contents / Executive Summary	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-TOC_ExecSummary_final_Sept2020.pdf
Valentine Gold Project: Summary of the Environmental Impact Statement	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Summary_of_EIS_final_Sept2020.pdf
Valentine Gold Project: Environmental Impact Statement – Chapters 1-3 <ul style="list-style-type: none"> • Chapter 1: Introduction • Chapter 2: Project Description • Chapter 3: Regulatory, Indigenous and Stakeholder Consultation and Engagement 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Chapter-1-3_final_Sept2020.pdf
Valentine Gold Project: Environmental Impact Statement – Chapters 4-6 <ul style="list-style-type: none"> • Chapter 4: Environmental Effects Assessment Scope and Methods • Chapter 5: Atmospheric Environment • Chapter 6: Groundwater Resources 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Chapter-4-6_final_Sept2020.pdf
Valentine Gold Project: Environmental Impact Statement – Chapter 7: Surface Water Resources	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Chapter-7_final_Sept2020.pdf
Valentine Gold Project: Environmental Impact Statement – Chapters 8-12 <ul style="list-style-type: none"> • Chapter 8: Fish and Fish Habitat • Chapter 9: Vegetation, Wetlands, Terrain and Soils • Chapter 10: Avifauna • Chapter 11: Caribou • Chapter 12: Other Wildlife 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Chapter-8-12_final_Sept2020.pdf



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Table 1.8 Valentine Gold Project Environmental Assessment Document History

Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
Valentine Gold Project: Environmental Impact Statement – Chapters 13-19 <ul style="list-style-type: none"> • Chapter 13: Community Services and Infrastructure • Chapter 14: Community Health • Chapter 15: Employment and Economy • Chapter 16: Land and Resource Use • Chapter 17: Indigenous Groups • Chapter 18: Historic Resources • Chapter 19: Dam Infrastructure 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Chapter-13-19_final_Sept2020.pdf
Valentine Gold Project: Environmental Impact Statement – Chapters 20-23 <ul style="list-style-type: none"> • Chapter 20: Cumulative Effects Assessment • Chapter 21: Accidental Events • Chapter 22: Effects of The Environment on The Project • Chapter 23: Summary and Conclusions 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Chapter-20-23_final_Sept2020.pdf
Appendices	
Valentine Gold Project: Environmental Impact Statement – APPENDIX 1 <ul style="list-style-type: none"> • 1A: Federal EIS Guidelines • 1B: Provincial EIS Guidelines • 1C: Marathon Gold Corporation Policies • 1D: Table of Key Personnel 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH1_appendices.pdf
Valentine Gold Project: Environmental Impact Statement – APPENDIX 2 <ul style="list-style-type: none"> • 2A: Water Management Plan (Stantec) • 2B: Prefeasibility Study for Tailings Disposal at the Valentine Gold Project, Newfoundland (Golder) • 2C: Pre-feasibility Geotechnical Investigation: Marathon & Leprechaun Pits • 2D: Stream Crossings Along Access Road • 2E: Site Photographs 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-Ch2_Appendices.pdf
Valentine Gold Project: Environmental Impact Statement – APPENDIX 3 <ul style="list-style-type: none"> • 3A: Engagement Tables • 3B: Project Review Report • 3C: Community Survey Report 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH3_appendices.pdf



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Table 1.8 Valentine Gold Project Environmental Assessment Document History

Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
Valentine Gold Project: Environmental Impact Statement – APPENDIX 5 <ul style="list-style-type: none"> • 5A: Light Assessment Guidelines • 5B: Dispersion Modelling Strategy • 5C: Air Quality Emission Inventory for Project Construction • 5D: Air Quality Release Estimates – Sample Calculations • 5E: Air Quality Emission Inventory for Project Operation • 5F: Contour Plots • 5G: GHG Sample Calculations and Supporting Data • 5H: Sound Sources • 5I: Example Calculation - % Highly Annoyed 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH5_appendices.pdf
Valentine Gold Project: Environmental Impact Statement – APPENDIX 6 <ul style="list-style-type: none"> • 6A: Hydrogeology Modelling Report 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH6_appendix.pdf
Valentine Gold Project: Environmental Impact Statement – APPENDIX 7 <ul style="list-style-type: none"> • 7A: Water Quantity and Water Quality Modelling Report: Leprechaun Complex and Processing Plant & TMF Complex • 7B: Water Quantity and Water Quality Modelling Report: Marathon Complex • 7C: Assimilative Capacity Assessment Report 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH7_appendices.pdf
Valentine Gold Project: Environmental Impact Statement – APPENDIX 10 <ul style="list-style-type: none"> • 10A: Committee on the Status of Endangered Wildlife in Canada and <i>Species at Risk Act</i> Wildlife Species Status Categories • 10B: Avifauna Species Observed During Forest Breeding Bird Surveys Conducted in 2011 and 2019 • 10C: Avifauna Species reported Within or near the Project Area and LAA by the Various Data Sources 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH10_appendices.pdf
Valentine Gold Project: Environmental Impact Statement – APPENDIX 17 <ul style="list-style-type: none"> • 17A: The Collection of Current Land Use and Aboriginal Traditional Knowledge 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH17_appendix.pdf
Valentine Gold Project: Environmental Impact Statement – APPENDIX 21 <ul style="list-style-type: none"> • 21A: Fate and Behavior Modelling of Hazardous Materials Spill Report 	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-CH21_appendix.pdf



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Table 1.8 Valentine Gold Project Environmental Assessment Document History

Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
Baseline Studies	
Valentine Gold Project Baseline Study Appendix 1: Dam Safety	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_1_DamSafety.pdf
Valentine Gold Project Baseline Study Appendix 2: Woodland Caribou	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_2_WoodlandCaribou.pdf
Valentine Gold Project Baseline Study Appendix 3: Water Resources	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_3_WaterResources.pdf
Valentine Gold Project Baseline Study Appendix 4: Fish, Fish Habitat and Fisheries	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_4_Fish_Fish_Habitat.pdf
Valentine Gold Project Baseline Study Appendix 5: Acid Rock Drainage / Metal Leaching (ARD/ML)	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_5_ARD_ML.pdf
Valentine Gold Project Baseline Study Appendix 6: Atmospheric Environment	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_6_Atmospheric.pdf
Valentine Gold Project Baseline Study Appendix 7: Avifauna, Other Wildlife and Their Habitats	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_7_Avifauna_OtherWildlife.pdf
Valentine Gold Project Baseline Study Appendix 8: Species at Risk / Species of Conservation Concern (SAR / SOCC)	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_8_SAR_SOCC.pdf
Valentine Gold Project Baseline Study Appendix 9: Community Health, Services and Infrastructure / Employment and Economy	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_9_CommunitessandEconomy.pdf
Valentine Gold Project Baseline Study Appendix 10: Historic Resources	https://www.gov.nl.ca/ecc/files/env-assessment-projects-y2019-2015-rpt_BSA_10_HistoricResources.pdf



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Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
Provincial EIS - 1st Amendment Process (August 2021)	
Main Document	
Valentine Gold Project: Amendment to the Environmental Impact Statement – Part 1 - Table of Contents - EIS Amendment Summary	https://www.gov.nl.ca/ecc/files/env_assessment_y2021_2015_EIS_amendment_part1.pdf
Valentine Gold Project: Amendment to the Environmental Impact Statement – Part 2 (1 of 2)- Responses to Regulatory and Public Comments	https://www.gov.nl.ca/ecc/files/env_assessment_y2021_2015_Eis_ame ndment_part21of2.pdf
Valentine Gold Project: Amendment to the Environmental Impact Statement – Part 2 (2 of 2) - Responses to Regulatory and Public Comments	https://www.gov.nl.ca/ecc/files/env_assessment_y2021_2015_EIS_amendment_part22of2.pdf
Appendices	
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX A: Human Health Risk Assessment	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_A.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX B: ARD/ML Management Approach	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_B.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX C: ARD Onset and Tables	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_C.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX D: Summary of Packer Testing, 2020 Fs-Level Geotechnical Pit Design Program	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_D.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX E: Hydrogeology Baseline Characterization Report	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_E.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX F: Best Available Control Technology Report	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_F.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX G: Caribou Supplemental Information Report	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_G.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX H: Valentine Gold Project: 2020 Fish and Fish Habitat Data Report	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendm ent_Appendix_H.pdf



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Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX I: ECCC-08 Tables	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendment_Appendix_I.pdf
Valentine Gold Project: Amendment to The Environmental Impact Statement – APPENDIX J: ECCC-08 Mapbook	https://www.gov.nl.ca/ecc/files/env_assessment_y2012_2015_amendment_Appendix_J.pdf
Provincial EIS - 2nd Amendment Process (January 2022)	
Main Document	
Valentine Gold Project: Second Amendment to the EIS <ul style="list-style-type: none"> • Table of Contents • Part 1: Summary of the Second Amendment to the EIS • Part 2: Responses to Regulatory Comments 	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_Second_Amendment_EIS.pdf
Appendices	
Valentine Gold Project: Second Amendment to the EIS – APPENDIX A: Caribou Protection and Environmental Effects Monitoring Plan (Preliminary)	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_EIS_amendment_Appendix_A.pdf
Valentine Gold Project: Second Amendment to the EIS – APPENDIX B: Updated Assessment Results and Accompanying Dam Breach Inundation Maps Technical Memo	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_EIS_amendment_Appendix_B.pdf
Valentine Gold Project: Second Amendment to the EIS – APPENDIX C: Final Dam Breach Assessment	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_EIS_amendment_Appendix_C.pdf
Valentine Gold Project: Second Amendment to the EIS – APPENDIX D: Acid Rock Drainage / Metal Leaching Management Plan (Preliminary)	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_EIS_amendment_Appendix_D.pdf
Valentine Gold Project: Second Amendment to the EIS – APPENDIX E: Project Refinements Related to the Feasibility Study	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_Second_Amendment_EIS.pdf
Valentine Gold Project: Second Amendment to the EIS – APPENDIX F: Project Refinements as Caribou Mitigation	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_Second_Amendment_EIS.pdf
Valentine Gold Project: Second Amendment to the EIS – APPENDIX G: Human Health-related Mitigation Measures and Monitoring Table	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_Second_Amendment_EIS.pdf
Valentine Gold Project: Second Amendment to the EIS – APPENDIX H: Cumulative Effects Discussion	https://www.gov.nl.ca/ecc/files/env_assessment_2015_y2022_Second_Amendment_EIS.pdf



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Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
Provincial Conditions of Release	
Valentine Gold Project: Construction Environmental Protection Plan (August 2022)	https://www.gov.nl.ca/ecc/files/env_assessment_y2022_2015_EPP-Construction.pdf
Valentine Gold Project: Analysis of Fulfillment of Pre-Construction Conditions of Release (October 2022)	https://www.gov.nl.ca/ecc/files/EA-2015-Analysis-of-Preconstruction-Conditions.pdf
Federal Technical Review Process	
Guidelines for the Preparation of an Environmental Impact Statement pursuant to the Canadian Environmental Assessment Act, 2012 —Valentine Gold Project — Marathon Gold Corporation (Reference Number: 3)	https://www.iaac-aeic.gc.ca/050/documents/p80169/130996E.pdf
Valentine Gold Project Environmental Assessment Report (Reference Number: 75)	https://www.iaac-aeic.gc.ca/050/documents/p80169/144899E.pdf
Decision Statement Issued under Section 54 of the <i>Canadian Environmental Assessment Act, 2012</i> (Reference Number: 82)	https://www.iaac-aeic.gc.ca/050/documents/p80169/147738E.pdf
From Marathon Gold Corporation to the Impact Assessment Agency of Canada re: Response to Additional Information Request (Reference Number: 69)	https://www.iaac-aeic.gc.ca/050/evaluations/document/143901
<ul style="list-style-type: none"> • From Marathon Gold Corporation to the Impact Assessment Agency of Canada re: Information Requirements (Reference Number: 51): • Appendix IR-03.A ELC Mapbook • Appendix IR-50.B ELC Mapbook • Appendix IR-61.A HHRA • Response to Round 2 IRs - APPENDIX IR(2)-NRCAN04.A • Response to Round 2 IRs - IR(2)-18, IR (2)-19, IR(2)- 21, IR(2)-23, IR(2)-26 and IR(2)-41 • Federal Information Request Responses IR-59 to IR-76 • Federal Information Requests, Responses to IR-01 to IR-07 and IR-27 to IR-58 • Federal Information Requests, Responses to IR-08 to IR-26 • Federal Information Requirements - Appendix IR-21A Supplemental Info • Federal Information Requests, Response to NRCAN-04 • Federal Information Requirements - Response to Conformity Review • Federal Information Requirements - IR-60 Response to Conformity Review • Federal Information Requirements - Response to Round Two IRs 	https://www.iaac-aeic.gc.ca/050/evaluations/document/142573



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Document Title	Government Website Link (Provincial or Federal Government Link as Applicable)
<ul style="list-style-type: none"> • Response to Round Two IRs, IR(2)-100 • Round Three Information Requirements: Response to IR(3)-11 • Round Three Information Requirements: Response to IR(3)-18 • Round Three Information Requirements: Response to IR(3)-54 	
<p>From Marathon Gold Corporation to the Impact Assessment Agency of Canada re: Response to Additional Information Request (Reference Number: 64)</p> <ul style="list-style-type: none"> • Round Three Information Requirements: Response to IR(3) -11 • Round Three Information Requirements: Response to IR(3) -18 • Round Three Information Requirements: Response to IR(3) -54 	<p>https://www.iaac.gc.ca/050/evaluations/document/143672</p>
<p>From Marathon Gold Corporation to the Impact Assessment Agency of Canada re: Response to Additional Information Request (Reference Number: 65)</p> <ul style="list-style-type: none"> • Round Four Information Requirements: Response to IR(4)-11 	<p>https://www.iaac.gc.ca/050/evaluations/document/143673</p>



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1.4.4 Other Environmental Regulatory Requirements, Approvals and Permits

The primary environmental regulatory requirement of the provincial and federal governments is related to EA, as discussed in Sections 1.4.1 and 1.4.2. In addition to EA approval, the Project Expansion is subject to other federal and provincial legislation, including the following:

1. *Canadian Environmental Protection Act (CEPA)*: CEPA relates to pollution prevention and the protection of the environment and human health to contribute to sustainable development. Among other items, CEPA contains a wide range of measures to manage toxic substances and other pollutants and waste.
2. *Species at Risk Act (SARA)* and the *NL Endangered Species Act (NL ESA)*: Both federal and provincial governments regulate species at risk and their protection through specific legislation. SARA is intended to protect species at risk in Canada and their “critical habitat” (as defined by SARA). Under SARA, proponents are required to either demonstrate that no harm will occur to listed species, their residences or critical habitat, or identify adverse effects on specific listed wildlife species and their critical habitat, followed by the identification of mitigation measures to avoid or reduce effects. Activities must comply with SARA, including with prohibitions against 1) the killing, harming, or harassing of endangered or threatened species at risk (SAR) (sections 32 and 36); and 2) the destruction of critical habitat of endangered or threatened SAR (sections 58, 60, and 61). The NL ESA also provides special protection for native plant and animal species considered to be endangered, threatened or vulnerable in NL.
3. *Fisheries Act*: Amendments to the *Fisheries Act* in 2018 reintroduced provisions for the protection of fish and fish habitat, notably the prohibition against harmful alteration, disruption or destruction (HADD) of fish habitat. The Act also prohibits activities that cause the “death of fish” (other than permitted fishing activities), considers the cumulative effects of development activities, and provides improved protection for highly productive, sensitive, rare, or unique fish and/or fish habitats. The *Fisheries Act* stipulates that the Minister may authorize exceptions to these prohibitions while specifying conditions with which a proponent must comply.
4. *Migratory Birds Convention Act (MBCA)*: The MBCA prohibits killing or destroying of the eggs or young of migratory bird species not listed as game birds. Through the EIS, adverse effects to migratory birds were assessed and mitigation measures proposed for migratory birds which are protected under the MBCA, along with their eggs, nests and young.
5. *Canadian Navigable Waters Act (CNWA)*: The CNWA, which came into force in August 2019, replaces the former Navigable Protection Act and applies to anyone planning activities that will affect navigation in navigable waters. The CNWA has been developed to regulate major works and obstructions on navigable waters, even those not listed on the schedule of navigation, and creates a new category for “major” works. “Major works” are those likely to substantially interfere with navigation and will always require approval from Transport Canada. Transport Canada administers the CNWA through the Navigation Protection Program. Other required environmental permits and approvals are typically fulfilled upon release from the EA processes. These permits and approvals include those related to water use, emissions and effluent discharge, and placement of Project Expansion components (e.g., water control structures, culverts). These permits or authorizations are



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applied for separately with relevant information included in the applications. Permits can only be issued following EA release.

Marathon will also apply for surface rights for the Project Expansion pursuant to section 33 of the *NL Mineral Act*. This section entitles Marathon, as the holder of a relevant mining lease, to obtain from the NL Government such surface rights as may be reasonably necessary to carry out the mining operation.

Table 1.9 provides a list of approvals, authorizations and permits that may be required from various provincial and federal agencies for the Project. It is not considered exhaustive. Note that municipal approvals, authorizations or permits are not anticipated, as the Project Area is not located within a municipality.

Table 1.9 Environmental Approvals, Authorizations and Permits Potentially Required for Project Expansion

Environmental Permit, Approval or Authorization Activity for Approved Project	Required for Project Expansion	Issuing/Approval Agency
Provincial		
Release from EA Process	Yes	NLDECC – Minister
Environmental Protection Plan	Update Required	
Certificate of Approval for Construction and Operation (Industrial Processing Works)	Update Required	
Certificate of Approval for Generators	No	
Approval of Environmental Contingency Plan / Emergency Spill Response	Update Required	
Permit to Construct a Non-Domestic Well	No	NLDECC – Water Resources Management Division
Permit to Alter a Body of Water	As required	
Water Use Licence	As required	
Permit to Construct a Potable Water System	No	
Permit to Control Nuisance Animals	No	NLDFFA – Wildlife Division
Operating Permit to Carry out an Industrial Operation During Forest Fire Season on Crown Land	Update Required	NLDFFA – Forestry and Agrifoods Agency
Commercial Cutting Permit	Update Required	
Permit to Burn	No	
Surface and Mining Leases	Update Required	NL Department of Industry, Energy and Technology – Mineral Development and Mineral Lands Division
Development Plan	Update Required	
Rehabilitation and Closure Plan	Update Required	
Financial Assurance	Update Required	
Mill Licence	No	
Quarry Development Permit	No	



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Table 1.9 Environmental Approvals, Authorizations and Permits Potentially Required for Project Expansion

Environmental Permit, Approval or Authorization Activity for Approved Project	Required for Project Expansion	Issuing/Approval Agency
Blasters Safety Certificate	Update Required	Department of Digital Government and Service NL – Government Service Centre
Approval for Storage and Handling of Gasoline and Associated Products	No	
Fuel Storage Tank Registration	No	
Approval for Used Oil Storage Tank System (Oil/Water Separator)	No	
Waste Management Plan	No	
Certificate of Approval for a Sewage/Septic System	No	
Application to Develop Land for Septic	No	
National Building Code – Fire, Life Safety and Building Safety	No	
Buildings Accessibility Registration and Permit	No	
Food Establishment Licence	No	
Federal		
Release from EA Process	EA Update Document Required	IAAC
<i>Fisheries Act</i> Authorization	Updated or new authorization and/or letter of advice may be required based on consultation with Fisheries and Oceans Canada (DFO)	DFO
Initiate <i>Metal and Diamond Mining Effluent Regulations</i> (MDMER) authorization and reporting processes with Environment and Climate Change Canada (ECCC) including notification, identification of final discharge point(s), and required components of effluent monitoring, and environmental effects monitoring (EEM)	Update Required	
Approval of MDMER Emergency Response Plan	Update Required	
Approval to Interfere with Navigation	No	Transport Canada
Licence to Store, Manufacture, or Handle Explosives (Magazine Licence)	Update Required	Natural Resources Canada

There are a number of follow-up, monitoring and management plans in place and/or planned for the Approved Project that will also be applicable to the Project Expansion, and that may require updating for the Project Expansion. A non-exhaustive list of these plans is presented in Section 2.9.



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1.5 PROJECT FUNDING

Marathon has 100% ownership of the Approved Project and the Project Expansion and is not seeking capital funds from federal or provincial government agencies. The Feasibility Study for the Valentine Gold Project (Ausenco 2022), that considers the Approved Project and the Project Expansion, found that the combined Projects have robust economics and merits further exploration and development.



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1.6 REFERENCES

Ausenco (Ausenco Engineering Canada Inc.) 2022. Valentine Gold Project- NI 43-101 Technical Report & Feasibility Study. Available online: [Valentine Gold Project | Technical Reports | Marathon Gold \(marathon-gold.com\)](#)

Marathon (Marathon Gold Corporation). 2020. Valentine Gold Project Environmental Impact Statement. Available online: [Valentine Gold Project - Environment and Climate Change \(gov.nl.ca\)](#)



2.0 PROJECT EXPANSION DESCRIPTION

This chapter describes the infrastructure and the different phases, i.e., construction, operation, and decommissioning, rehabilitation and closure, of the Project Expansion. An explanation of how the Project Expansion is linked with, and interacts with, Approved Project infrastructure and activities is also presented. This chapter also includes an overview of Marathon's overall environmental management approach, the purpose and need for the Project Expansion, and an analysis of alternatives. Additional information related to this Chapter is provided in the following appendices:

- Appendix 2A – Water Management Plan Update for the Berry Pit Expansion
- Appendix 2B – Acid Rock Drainage / Metal Leaching Assessment of the Berry Deposit Report
- Appendix 2C – Valentine Gold Project – Explosives Storage Facility Location Assessment
- Appendix 2D - Surface Detonation Impact on Dam
- Appendix 2E – Mitigation Measures – Approved Project and Project Expansion
- Appendix 2F - Acid Rock Drainage / Metal Leaching Management Plan (Proposed Revision to Address the Berry Pit Expansion)
- Appendix 2G – Marathon Environment and Social Governance Policies

2.1 SUMMARY OF PROJECT EXPANSION AND PHASES

2.1.1 Berry Deposit

Since the Valentine Gold EIS was prepared, drilling programs have continued to expand understanding of the mineralization in Marathon's mineral leases, to refine resource estimates, and to further delineate potential resources. Figure 2-1 illustrates the five gold deposits located within the Valentine Gold property. In addition, macro-economic impacts (e.g., inflation) have had an impact on the economics of the Approved Project.

As a result of continued resource delineation, the mineable resources from both the Marathon and Leprechaun pits have been reduced. This does not appreciably impact the surface area of the pits nor the annual production rate; however, it has a relatively minor impact on the pit volumes and the total resources extracted over the life of mine (i.e., less ore extraction, lower gold production). The discovery and exploration of the Berry deposit has resulted in a positive resource estimate with a mineable resource that offsets the reduction in resources from the Marathon and Leprechaun deposits. Testing confirmed that the deposit lithology and other characteristics of the Berry deposit are similar to those at the Marathon and Leprechaun deposits, and therefore can be processed using the same metallurgical processes.



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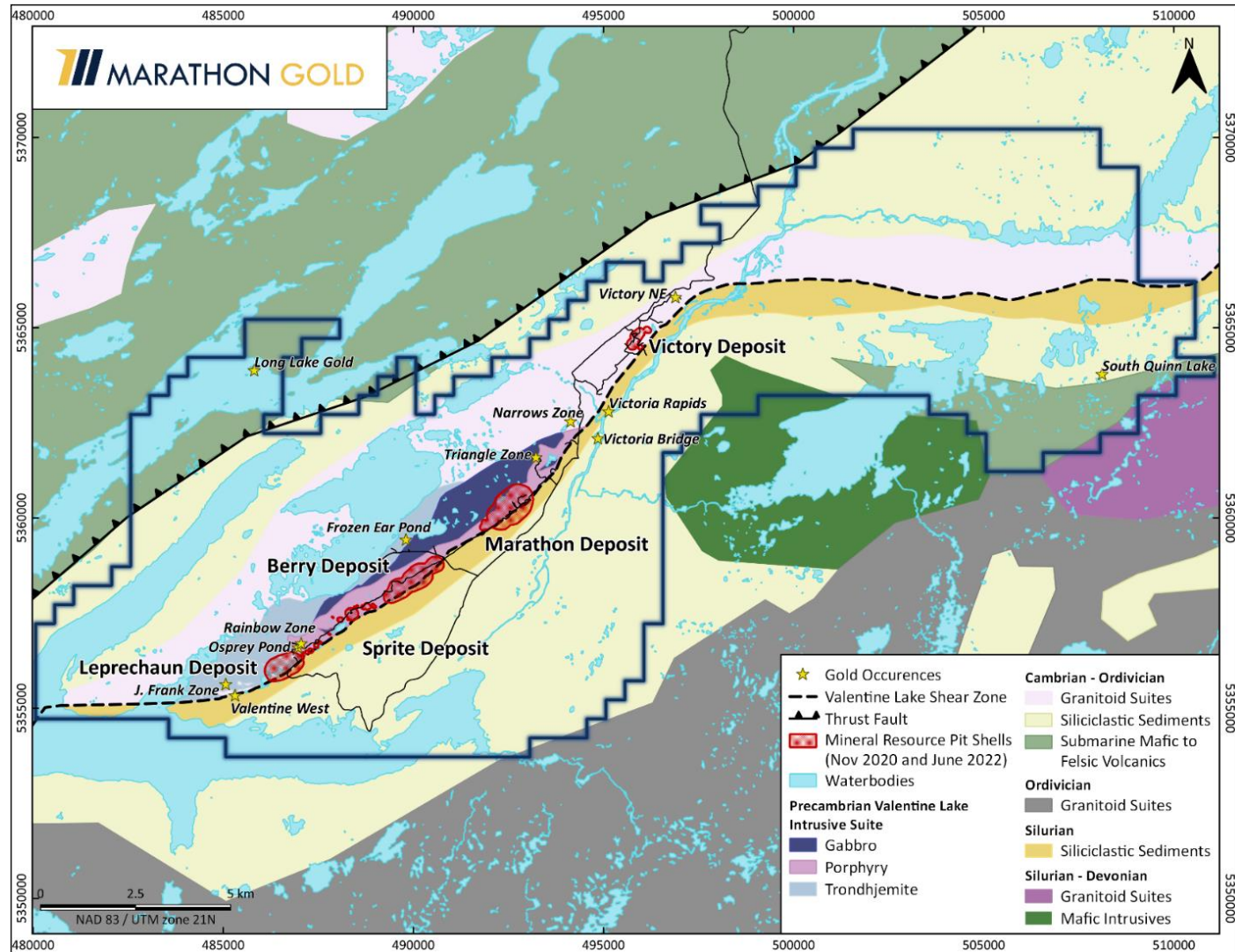


Figure 2-1 Geology and Gold Deposits of the Valentine Gold Property



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Development of the Berry deposit will allow the mine to proceed with similar total resource estimates as outlined in the Valentine Gold EIS without requiring changes to mining methods, processing infrastructure, tailings management or most other Approved Project components and operation processes. An increase in the life of mine (LOM) of 1.4 years and a small increase in mining personnel is expected with the addition of the Berry deposit to the mine plan. The addition will also help balance negative financial factors associated with the rising cost of workforce, materials, equipment, and expendables (e.g., fuel). Table 2.1 shows proven and probable mineral reserves at the three main deposits of the Valentine Gold property (Ausenco 2022).

Table 2.1 Proven and Probable Mineral Reserves

Mine Area	Reserve Class	Mill Feed (Mt)	Diluted Gold Grade (g/t Au)	Contained Metal (Moz)
Marathon	Proven	11.5	1.70	0.6
	Probable	9.9	1.40	0.4
	Marathon Total	21.3	1.56	1.1
Leprechaun	Proven	6.6	2.11	0.4
	Probable	8.6	1.44	0.4
	Leprechaun Total	15.1	1.73	0.8
Berry	Proven	5.3	2.03	0.3
	Probable	9.8	1.36	0.4
	Berry Total	15.1	1.60	0.8
Subtotal	Proven	23.4	1.89	1.4
	Probable	28.2	1.40	1.3
Grand Total	Total Proven & Probable	51.6	1.62	2.7

The Project Expansion will consist primarily of an open pit with three basins (northern, central and southern); a waste rock pile; in-pit haul roads; water management infrastructure; extensions of the Marathon pit overburden and low-grade ore (LGO) stockpiles to accommodate Berry pit overburden and LGO; a relocated explosives storage facility; in-pit waste rock storage (2031 onwards) in the mined-out central and northern basins of the Berry pit; and in-pit tailings storage (2034 onwards) in the mined-out southern basin of the Berry pit (rather than Leprechaun pit, as previously proposed). Until 2034, the Berry pit tailings will be deposited in the engineered TMF described in the Valentine Gold EIS. Mining will be scheduled such that Berry pit will be the first pit exhausted, and post-2034, tailings from the Marathon and Leprechaun pits will be deposited in the mined-out Berry pit.

Project Expansion activities will be incorporated into the overall plan for the Approved Project and, as such, will be supported by existing Approved Project infrastructure, i.e., milling and processing facilities (the mill); TMF; mine maintenance and fueling facilities; ore, overburden and topsoil stockpiles; site-wide stormwater and effluent management, treatment, and discharge (see updated Water Management Plan, Appendix 2A); fuel storage and fueling stations; mine and plant workshops and services; administrative office; personnel accommodations and lunchrooms; and security.



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Construction of the Project Expansion is expected to take four to six months, followed by an estimated operational life of nine years. The Project Expansion will be incorporated into the Approved Project operations, which will operate 24 hours a day, 7 days a week, on a 12-hour shift basis. Rehabilitation and closure planning is a requirement under the NL *Mining Act*, and Marathon's Rehabilitation and Closure Plan (RCP) will be updated to incorporate components of the Project Expansion.

2.1.2 Site Layout

The overall mine site plan (Figure 1-3) shows the location of Approved Project infrastructure and Project Expansion infrastructure. Figure 2-2 is a conceptual drawing of the Project Expansion site in 2038, and shows most Project Expansion infrastructure, including two Berry pit basins containing waste rock (central and northern) and one containing tailings (southern); the Berry waste rock pile; water management infrastructure; overburden stockpile (shared with the Marathon pit); and the new topsoil stockpile. The Berry / Marathon LGO stockpile is not shown as it would be depleted by 2038.

Note that Project Expansion components were sited wherever possible to avoid fish habitat. In particular, the site plan was developed to avoid the deposition of mine waste in fish-bearing waters. During detailed design, the location of watercourses will be verified with results of ground-truthing, and final siting of components will be adjusted as needed.

2.1.3 Construction Phase Overview

Pending regulatory approval, Project Expansion construction activities are anticipated to begin in late 2024 or early 2025. Activities will include clearing and grubbing for phases 1 and 2 of the Berry pit development (refer to Section 2.2.3), Berry ex-pit haul roads, and the north side of the Berry waste rock pile footprint. Other construction activities include the removal and stockpiling of topsoil from the cleared pit areas and waste rock pile footprint. Haul road construction will also be completed, linking the Berry pit to the stockpiles, crusher, and tailings dam. These civil earthworks will occur over a four-month period, with mining scheduled to start in Q2 of 2025.

2.1.4 Operation Phase Overview

Standard surface mining techniques will be used to mine material from the three planned phases (described in Section 2.2.3) of the Berry pit (Figure 2-2), including blasting, loading, hauling ore from the pit to the mill or stockpiles; processing ore; depositing tailings; and hauling and placing waste rock on the waste rock pile. Marathon intends to mine all three pits (Marathon, Leprechaun and Berry) concurrently, with a blast occurring once per day at one of the three pits, depending on operational needs. Phases 1 and 2 (Section 2.2.3.1 and 2.2.3.2) of the Berry pit will be mined during the first five years of the Project Expansion, with phase 3 (Section 2.2.3.3) beginning in Year 6 or 2030. Ore will be processed through the mill where it will be crushed, milled, and processed through gravity and cyanidation processes to recover the gold. Processing is part of the Approved Project and will not require modification or changes as a result of the Project Expansion. Beginning in 2031, waste rock from Berry will be deposited in the mined-out northern basin of the Berry pit. Deposition of waste rock from the Marathon pit into mined-out northern and central basins of the Berry pit will begin in 2033.



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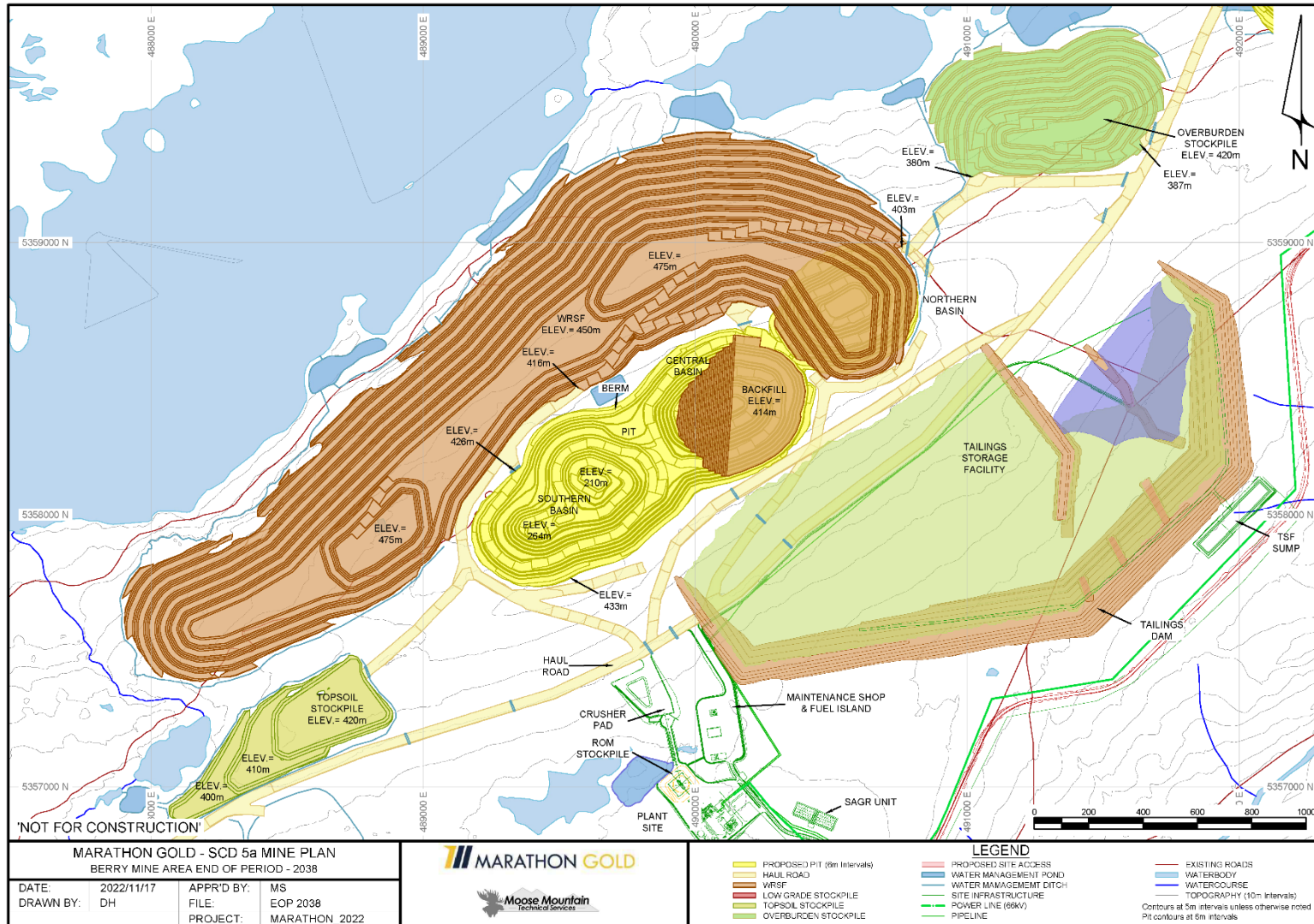


Figure 2-2 Conceptual Layout of Project Expansion and Approved Project Infrastructure in Year 2038



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Tailings will be treated to reduce cyanide concentrations prior to disposal in the engineered tailings impoundment, as described and approved in the Valentine Gold EIS (Section 2.3.4). While there are no planned changes to the design and operation of the tailings impoundment as a result of the Project Expansion, the composition of tailings will change, as ore will be processed from three pits rather than two pits. In addition, as part of the Project Expansion, Marathon proposes to replace the polishing pond (a component of the TMF described in the Valentine Gold EIS) with a submerged attached growth reactor (SAGR®) unit. As well, beginning in 2034, tailings deposition will cease in the engineered tailings impoundment, and the tailings will be pumped to the southern basin of the Berry pit for subaqueous disposal. This is a change from the Approved Project where tailings were planned to be deposited into the exhausted Leprechaun pit.

Shipment of gold doré from site to market in secured trucks is part of the Approved Project and will not require change or modification as a result of the Project Expansion, as there is no change in annual production; however, the Project Expansion will result in a 1.4-year extension of these activities. Progressive rehabilitation will be conducted during operation as further described in Section 2.6.2.

2.1.5 Decommissioning, Rehabilitation and Closure Phase Overview

Once mining has ceased at the mine site, Project Expansion infrastructure will be dismantled and removed; sedimentation ponds will be breached (following water quality testing for regulatory compliance) and graded to reestablish drainage patterns; and disturbed areas will be graded, covered with overburden and organic materials, and seeded to promote natural revegetation. Waste rock and tailings will have been placed in the three basins of the Berry pit during the operation phase (2031-2039), and the central and southern basins will be allowed to flood naturally with surface water runoff, precipitation and groundwater seepage, with excess site contact water directed to the pits where practicable to expedite this process. The northern basin will be part of the waste rock pile with a final crest height of 475 m (Figure 2-2). The site will be rehabilitated to as close to pre-development conditions as practicable, or to a suitable condition for an alternate use upon Project closure. The RCP will detail methods to be used for progressive and closure rehabilitation and post-closure monitoring. In accordance with the Newfoundland and Labrador *Mining Act*, Marathon has submitted a Rehabilitation and Closure Plan (RCP) for the Approved Project, which will be modified to incorporate the changes associated with the Project Expansion.

2.1.6 Project Schedule

As planning and detailed design of the Approved Project has proceeded, the overall LOM schedule has been revised to incorporate activities associated with the Project Expansion. Construction of the Approved Project began in October 2022 and milling is scheduled to begin in January 2025. Construction of components related to the Project Expansion will proceed once regulatory approvals are in place, anticipated to begin in late 2024 or early 2025. Mining of the Berry pit is scheduled to start in 2025, continuing through 2033, for an operational life of nine years. The overall operation phase will continue through 2039, after which the closure phase will begin.



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An estimated development schedule for the Project Expansion is presented in Table 2.2 and for the overall Valentine Gold Project in Table 2.3. These timelines have been developed using assumptions and best estimates for various components of Project Expansion development (e.g., EA and permitting timelines) and construction constraints. The schedule is subject to change as the Project Expansion advances. The Project Expansion will be incorporated into the Approved Project operations, which will operate 24 hours a day, 7 days a week, on a 12-hour shift basis.

Table 2.2 Estimated Project Expansion Development Schedule

Activity	2023			2024				2025			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Submit EA Registration/EA Update Document											
EA Process – NL											
Federal review of EA Update											
Release from NL EA Process / Federal Decision Statement Update											
Management Plan Updates											
Engineering and Supporting Studies											
Permits and Approvals (New or updated)											
Clearing, Site Access and Haul Roads											
Civil Earthworks, Pit Pre-Stripping											
Start of Mining											



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Table 2.3 Estimated Development Schedule for Combined Projects

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
Mining Year	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Model Year¹	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
NL Registration / Federal EA Update Submission and Regulatory Review																								
Approved Project Construction																								
Development and Mining - Leprechaun Pit																								
Development and Mining - Marathon Pit																								
Waste Rock Deposition – Surface (piles)																								
TMF Operation																								
Mill and Process Operation																								
Berry Construction																								
Mining - Northern Basin																								
Mining - Southern and Central Basins of Berry Pit																								
Berry Waste Rock Deposition - Surface (Piles)																								
Waste Rock Deposition - Northern Basin of Berry Pit																								
Waste Rock Deposition - Central Basin of Berry Pit																								
Tailings Deposition - Southern Basin of Berry Pit																								
Waste Rock Piles – Progressive Rehabilitation																								
Waste Rock Piles – Final Rehabilitation																								
LGO Stockpiles Reclaimed to Mill																								
Active mine rehabilitation and closure (all areas)																								
Post-Closure																								➔

¹ For purposes of the Water Quality and Water Quantity Model Update Report, model year differs from mining year



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2.2 PROJECT EXPANSION COMPONENTS

This section provides a description of Project Expansion components that will be incorporated into the LOM plan for the Valentine Gold mine.

The Project Expansion will include the following components:

- New open pit (i.e., the Berry pit) and associated haul roads
- New waste rock pile
- New topsoil stockpile
- New (additional) Marathon topsoil stockpile, relocation of a sedimentation pond proposed for the Approved Project, and temporary sedimentation pond (construction phase only)
- Combined Berry / Marathon overburden and low-grade ore (LGO) stockpile
- Associated water management infrastructure
- Relocation of the explosives storage facility (from the planned location as described in the Valentine Gold EIS) to maintain required setbacks
- Tailings disposal in mined out Berry pit (rather than in Leprechaun pit)
- Replacement of the polishing pond described in the Valentine Gold EIS with a smaller submerged attached growth reactor (SAGR®) unit

An overview of construction activities associated with these Project Expansion components is provided in Section 2.4 and a general description of operation activities is provided in Section 2.5.

Marathon considered alternatives (e.g., locations, equipment, techniques, methods) for a number of Project Expansion components and activities. These are detailed in the alternatives analysis (Section 2.12), which identifies and describes alternative means of carrying out Project Expansion components, with consideration of technical and economic feasibility, market conditions, regulatory factors, and socio-economic implications.

2.2.1 Open Pit

2.2.2 Mineralization and Resource

The mine site is underlain by five major lithological units including (from northwest to southeast) the Victoria Lake Supergroup (Tulk's Hill Volcanics and clastic sediments), the Valentine Lake Intrusive Suite, the Rogerson Lake Conglomerate, the Victoria Lake Supergroup (metasedimentary, gabbroic and mafic volcanic rocks), and the Red Cross Lake Intrusion (Figure 2-2).

The area hosts structurally controlled, orogenic gold deposits consisting of dominantly shallow southwest-dipping, en-echelon stacked extensional and lesser shear parallel gold-bearing quartz-tourmaline-pyrite veining, and recently identified orthogonal quartz vein sets. The gold-bearing quartz-tourmaline-pyrite - veining (QTPV) is hosted within the Valentine Intrusive Suite, as well as the Rogerson Lake Conglomerate. The Valentine Lake Intrusive Suite constitutes an elongate northeast trending body of Upper Precambrian igneous rocks consisting of dominantly fine to medium grained trondhjemite and



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quartz porphyry units with lesser aphanitic quartz porphyry, gabbro and minor pyroxenite units. The Silurian Rogerson Lake Conglomerate forms a narrow linear unit extending NS-SW for 160 km through central Newfoundland, lies unconformably (overturned) on the southeast margin of the Valentine Lake Intrusive Suite, and is interpreted to have in-filled a fault bounded paleo-topographic depression. An unsorted, pebble- to cobble-sized, polymictic conglomerate dominates the unit.

Five gold deposits and numerous gold prospects and occurrences at earlier stages of exploration have been discovered to date. The Leprechaun, Marathon, Sprite, Berry and Victory gold deposits are the most advanced within the property. At the deposit scale, a pervasively altered, intensely QTPV core complex, which Marathon refers to as the “Main Zone”, has been delineated at the Marathon, Leprechaun and Berry deposits.

Berry Deposit

The Berry deposit is located approximately 3 km northeast of the Leprechaun deposit and 2 km southwest of the Marathon deposit, and spans a strike length of 1.5 km. The Berry deposit contains four potentially mineralized domains: sediments (SED), quartz-eye porphyry (QEPOR), flat-lying, QTPV, and mafic dykes (MD) intruding into the QEPOR and QTPV domains. This recently discovered area consists of dominantly shallowly southwest-dipping, en-echelon, extensional QTPV hosted in quartz-eye porphyry and lesser mafic dykes and aphanitic quartz porphyry. The mineralized corridors are generally 20 to 60 m wide and have been traced to depths of over 350 m. In localized zones, mineralization penetrates across the VLSZ and is found up to 20 m into the Rogerson Lake Conglomerate. The style and configuration of mineralization at Berry is similar to the concentrated mineralized QTPV set packages of the Leprechaun deposit. Drilling at the Berry deposit has defined multiple intervals of high-grade gold, with visible gold throughout up to 3 mm in size (Ausenco 2022). The mineral resource estimate for the Berry Deposit is approximately over 1,000,000 Troy Oz, including both measured and indicated resources (Table 2.1; Ausenco 2022).

The Berry deposit sits on a sloped ridge top. Towards the north, the topography falls off steeply, while towards the south, the topography slopes gently downhill.

2.2.3 Open Pit Design

The design and ultimate pit limits were developed using a pit optimization process, including the Pseudoflow algorithm, and in compliance with the open cut workings in mining operations requirements of the *Occupational Health and Safety Regulations, 2012*. Ultimate pit limits are generally divided into phases or pushbacks over the mine life, and minimum pushback distances of 50 m are maintained. The Berry pit is divided into three phases or pushbacks and has approximate dimensions of 1,925 m southwest to northeast by 580 m southeast to northwest and a maximum depth of 230 m below current ground level. The key parameters used in the pit optimization are summarized as follows:

- A mining block size of 6 m x 6 m x 6 m.
- A breakeven economic cut-off grade of 0.38 g/t gold.



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- Pit designs are configured on 6 m bench heights, with 8.1 m wide berms placed every three benches, or triple benching. Bench face angles, and subsequent inter-ramp angles, are varied based on prescribed geotechnical zones.
- Bench face and inter-ramp slopes in defined zones are listed in Table 2.4.
- Proven and probable mineral reserves within designed pit phases are shown in Table 2.5.

In-pit haul roads and geotechnical berms (25 m wide) are added to the pit design and flatten the inter-ramp slopes out to shallower overall slopes. Geotechnical berms are placed on 108 m vertical spacing, wherever in-pit ramps are not present.

Table 2.4 Pit Slope Criteria for Berry Pit

Domain	Bench Face Angle	Inter-Ramp Angle	Overall Slope
Overburden	25	25	25
South	72	52	40
North	80	58	45
East	76	55	43

Table 2.5 Proven and Probable Mineral Reserves within Designed Pit Phases

Pit Phase	Pit Name	Mill Feed (Mt)	Diluted Gold Grade (g/t Au)	Waste (Mt)	Strip Ratio (t/t)
Berry Construction Phase	B620	0.0	0.00	0.8	-
Berry Phase 1	B621i	4.7	1.69	27.6	5.9
Berry Phase 2	B622i	5.7	1.59	62.7	11.0
Berry Phase 3	B623i	4.7	1.51	79.5	16.8
Total Berry	B623c	15.1	1.60	170.6	11.3

2.2.3.1 Berry Phase 1

The first phase targets the two separate high-grade, low-strip-ratio portions of the deposit in the southwest and northeast, both planned to be mined simultaneously; these will provide feed to the mill for approximately two years (Figures 2-3 and 2-4). The southwest lobe of the pit mines from the pit exit at the 426 m elevation, down to the pit bottom at the 312 m elevation. The main ramp runs counterclockwise down from the pit exit in the north. A small sub-out in the west of the pit will be mined to the 402 m elevation. The northeast lobe of the pit mines from the pit exit at the 414 m elevation, down to the pit bottom at the 336 m elevation. The main ramp runs counterclockwise down from the pit exit in the north. The construction phase is situated in the north corner of the southwest lobe of the B621 open pit, targeting waste rock for ex-pit haul road construction (Ausenco 2022).



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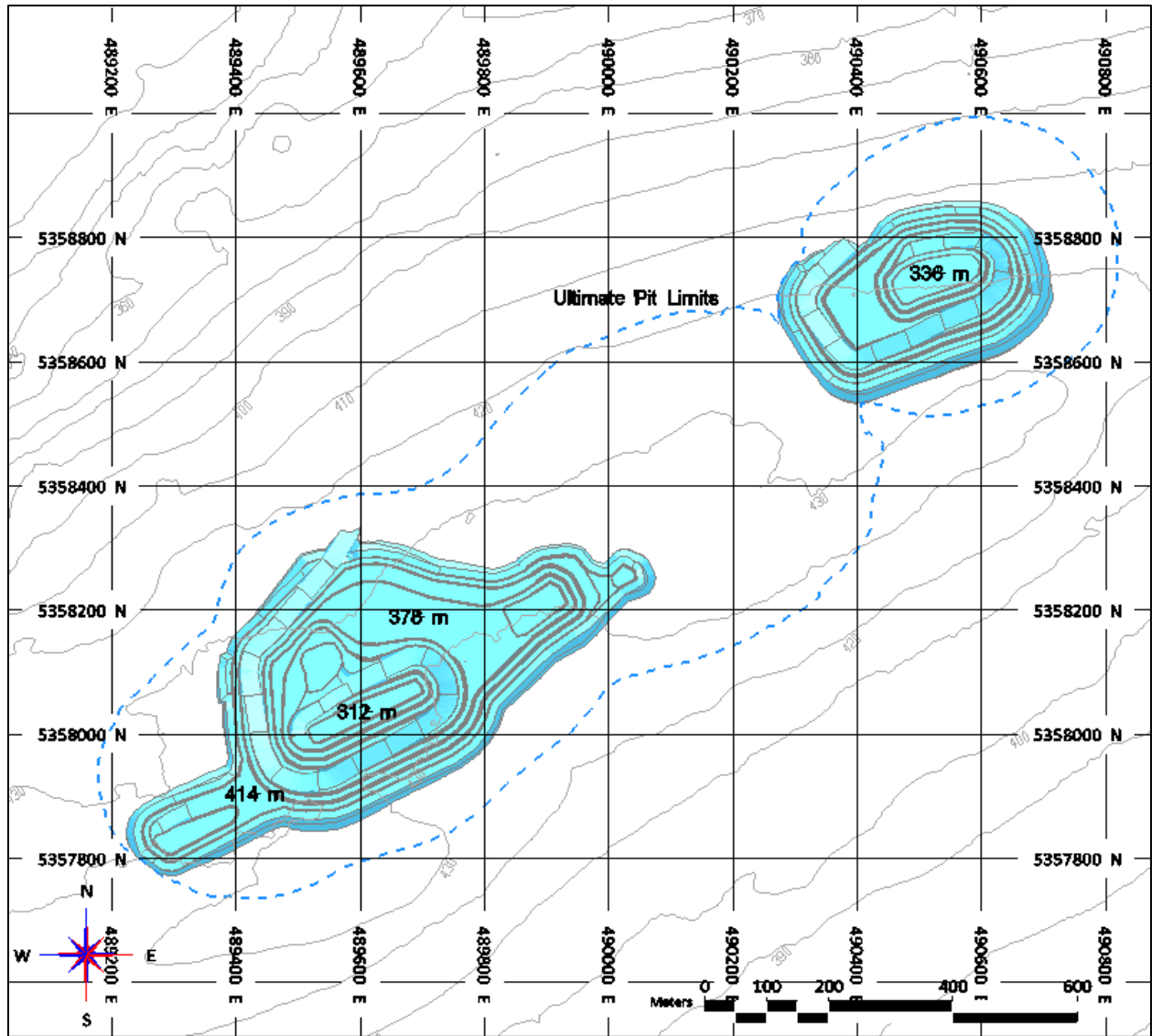


Figure 2-3 Berry Phase 1 Pit, B621



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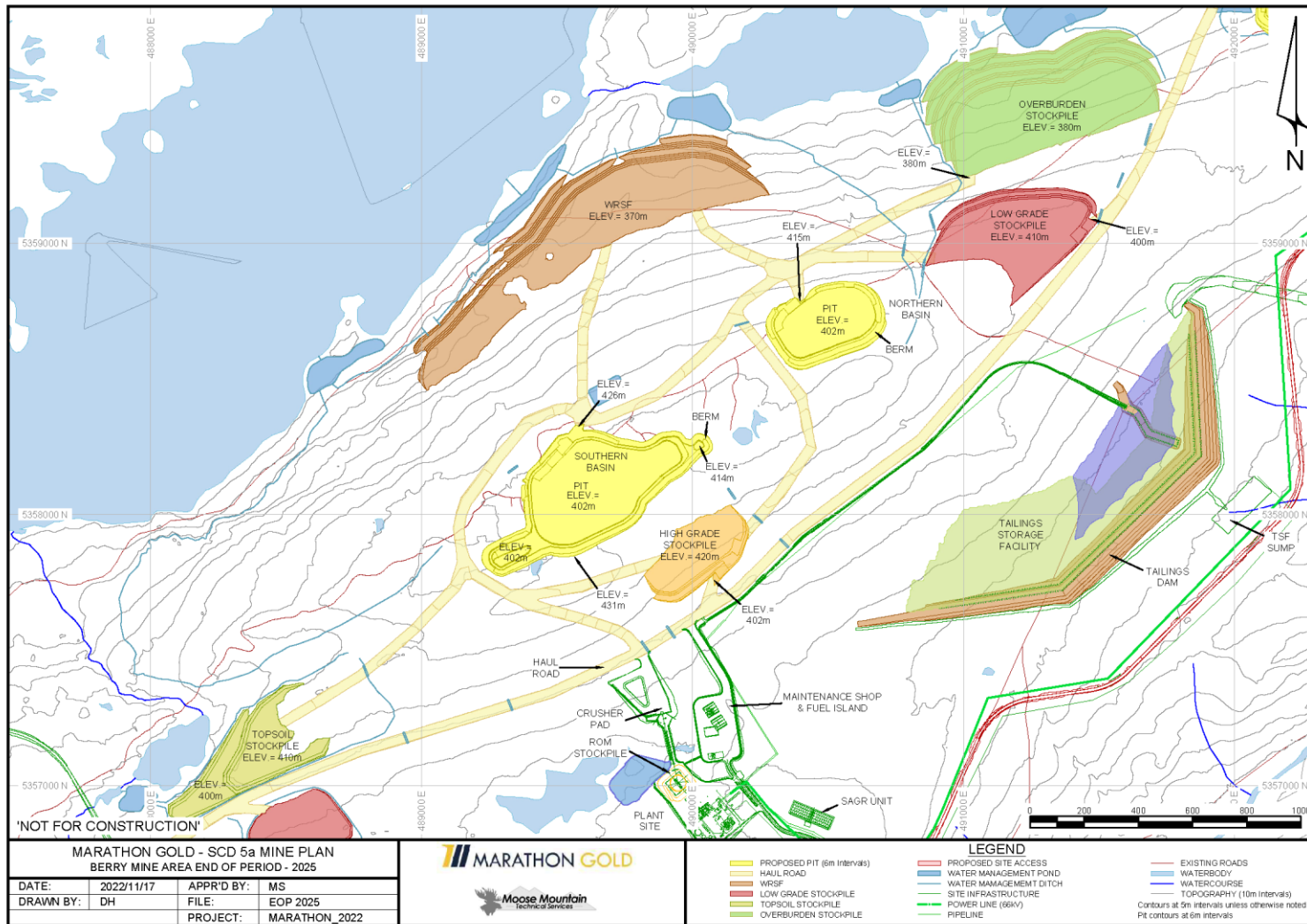


Figure 2-4 Berry Phase 1 Development



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2.2.3.2 Berry Phase 2

This phase targets deeper, higher-strip-ratio mineralization below phase 1. This phase pushes out the southwest lobe of the pit to the west, east and south, while leaving enough room for a final pushback to the phase 3 pit (Figures 2-5 and 2-6). This phase also pushes the northeast lobe of the pit to the ultimate limits in the north, south and east directions. This phase contains about three years' worth of mill feed. The southwest lobe of the pit mines from the pit exit at the 426 m elevation, down to the pit bottom at the 264 m elevation. The main ramp runs counterclockwise down from the pit exit in the north. A small sub-out in the east of the pit will be mined to the 324 m elevation, starting the central lobe of the ultimate Berry pit. A geotechnical berm is left behind at the 360 m elevation. The northeast lobe of the pit mines from the pit exit at the 414 m elevation, down to the pit bottom at the 258 m elevation. The main ramp runs counterclockwise down from the pit exit in the north.

2.2.3.3 Berry Phase 3

The third and final phase targets the remaining deep mineralization. This phase pushes out in the southwest lobe of the pit to the final north limits and the central lobe of the pit to the final limits in the north, east and south directions (Figures 2-7 and 2-8). This phase contains about two years' worth of mill feed and mines from the pit exit at the 420 m elevation, down to the pit bottom at the 198 m elevation in the central lobe and the 210 m elevation in the southwest lobe. The main ramp runs counterclockwise down from the pit exit in the north all the way to the central lobe pit bottom. A branch off at the 348 m elevation and switchback at the 336 m elevation runs the ramp to southwest lobe pit bottom. The pit ramp located on the west side of the southwest lobe, established for phase 2, will also still be available for access into the bottom of the southwest lobe of the pit. The ramp in the southwest lobe will be mined out between 270 m and 282 m elevations, then filled back in for final access to the pit bottom. Geotechnical berms are left behind at the 360 m and 342 m elevations.



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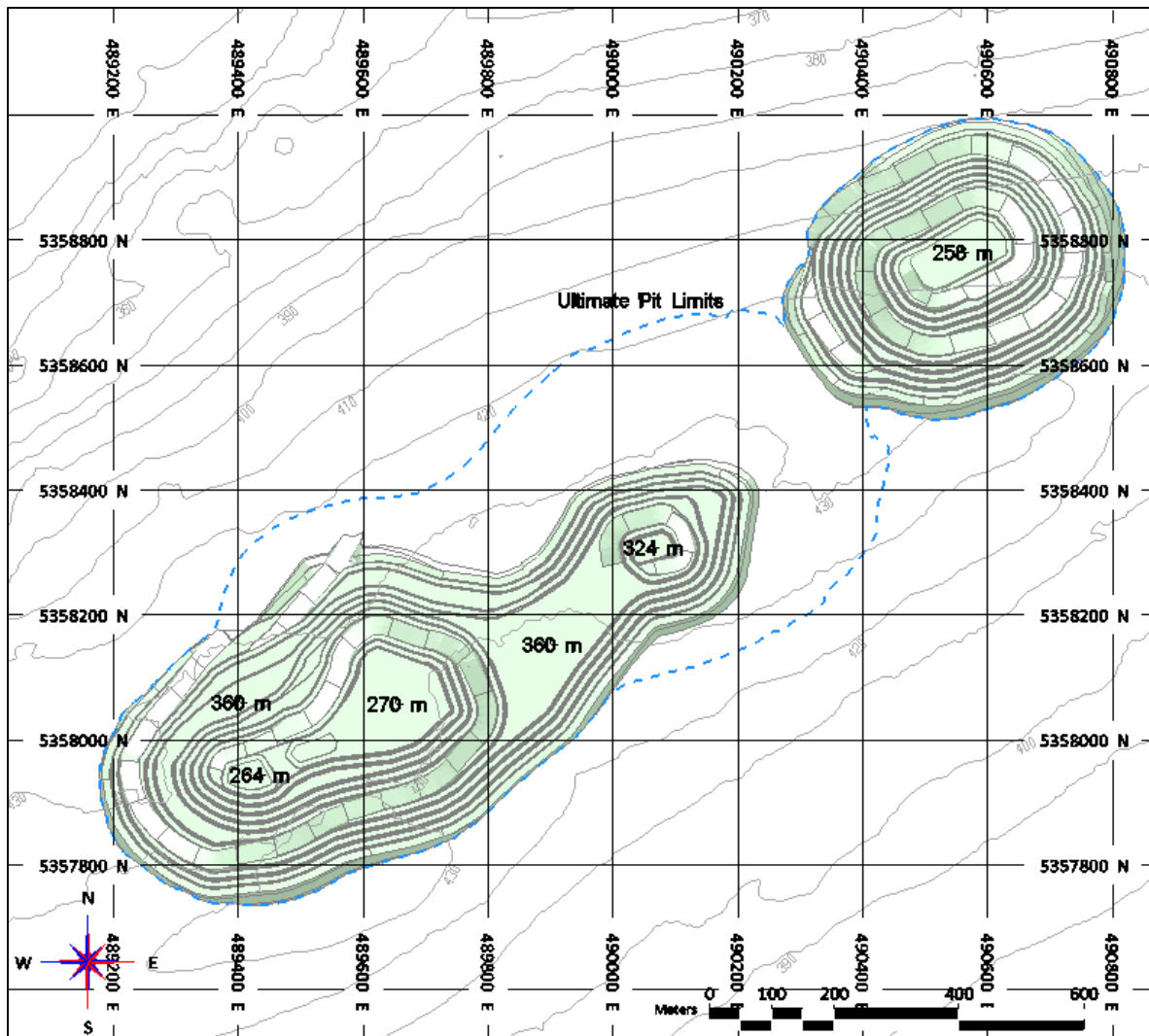


Figure 2-5 Berry Phase 2 Pit, B622



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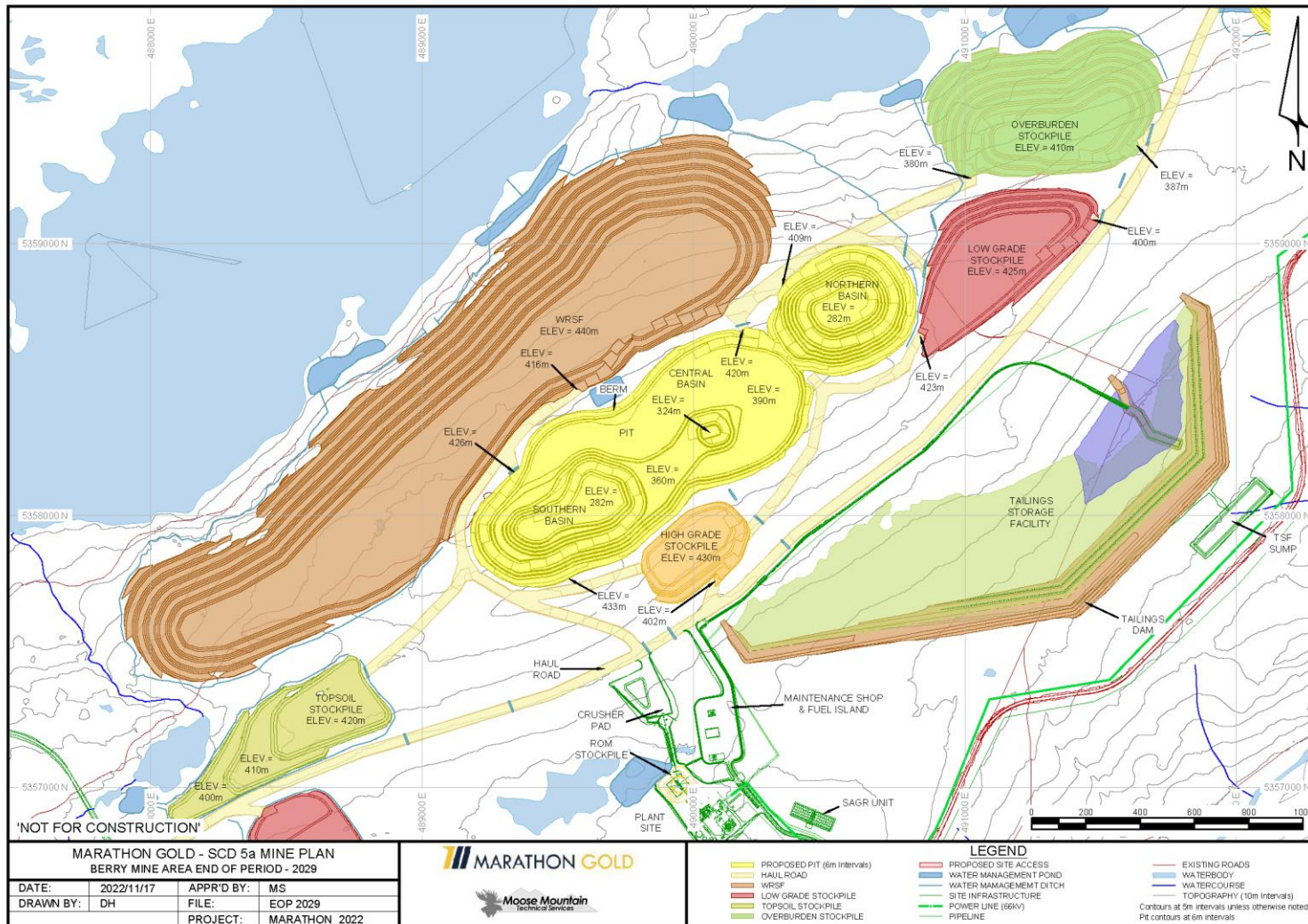


Figure 2-6 Berry Phase 2 Development



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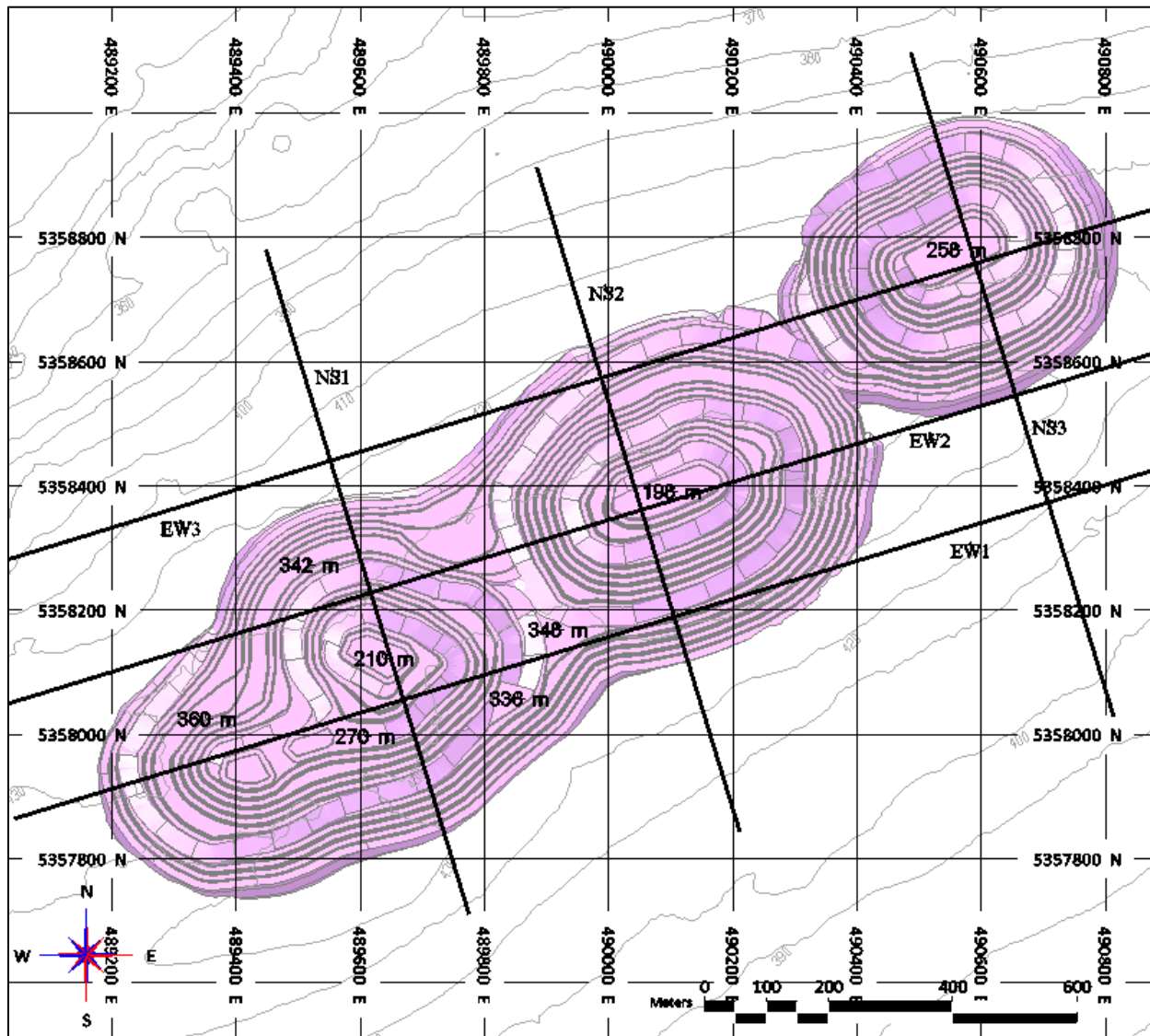


Figure 2-7 Berry Phase 3 Pit, B623



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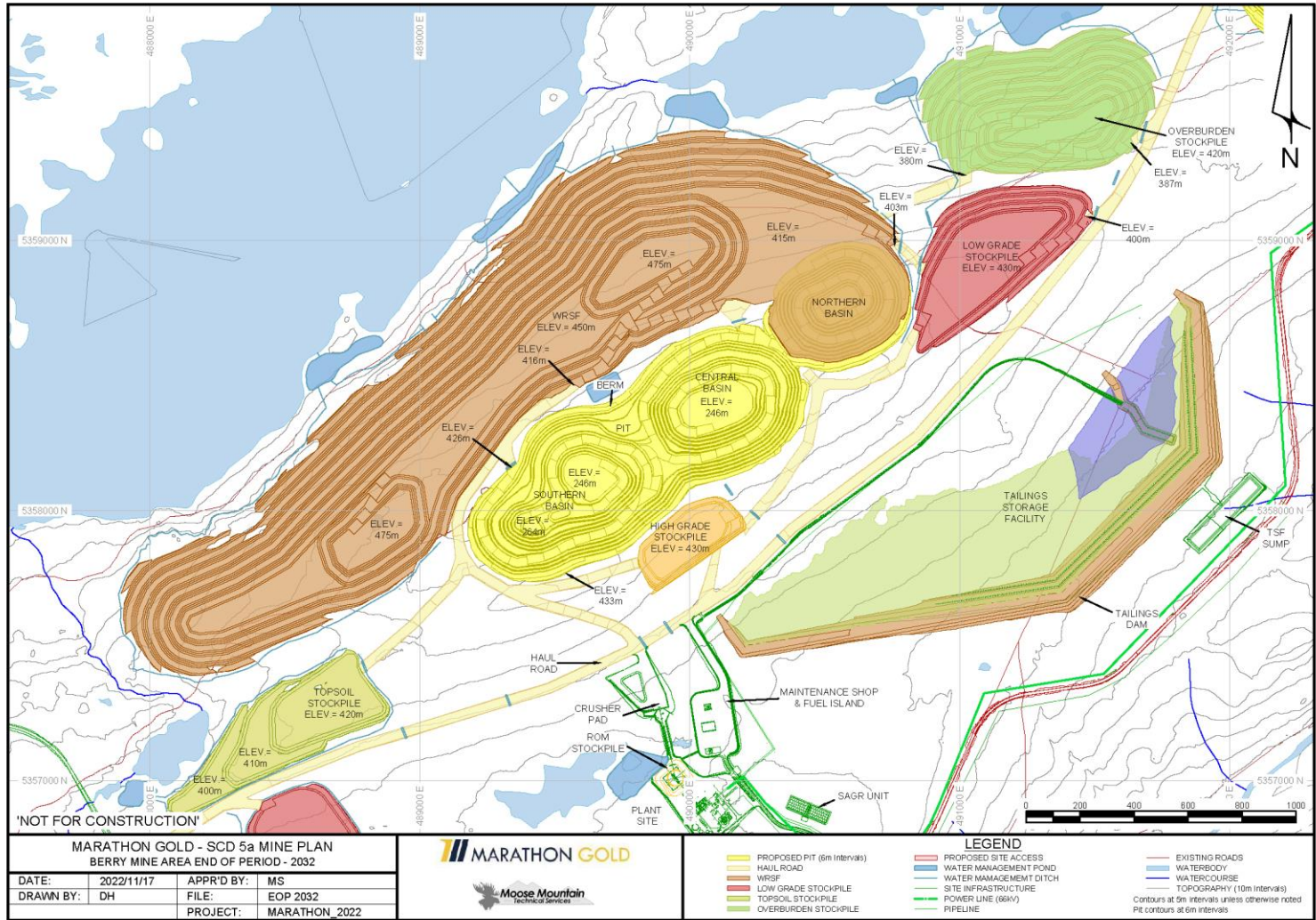


Figure 2-8 Berry Phase 3 Development



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2.2.4 Haul Roads

Two-way haul roads of 28 m width will be designed with a maximum grade of 10%. They are sized to handle 140-tonne payload rigid frame haul trucks. At the basin bottom(s), the last two benches will not have access ramps as it is assumed that the bottom ramp segment will be removed using retreat mining. The bottom two ramped benches of the basin(s) will use one-way haul roads 21 m wide with a maximum grade of 12%. A higher grade is acceptable in these locations since bench volumes and traffic flow are reduced.

Mine haul roads external to the open pit are designed to haul ore and waste materials from the open pit to the scheduled destinations. These roads will have a maximum grade of 8% and are designed to have a dual-lane running width and shoulder barriers on both edges.

2.2.5 Waste Rock Pile

The Berry waste rock pile will generally be designed and constructed in a similar manner as the waste rock piles described in the Valentine Gold EIS, Section 2.3.2. Design considerations of the waste rock pile assume:

- Bottom-up construction
- 15 m lift heights for waste rock
- 1.3:1 active slopes on waste rock lifts
- Berm allowances push slopes out to 2.7:1 on waste rock piles
- Target achievable reclamation slopes of 3.0:1
- Minimal disturbance to existing waterbodies and watercourses

Waste rock from the Berry pit will be placed directly north of the pit limits and built up to a crest elevation of 475 m, as well as backfilled into the mined out northeast lobe (phase 2) of the Berry pit, beginning in 2031 (Figure 2-8). The Berry waste rock pile is estimated to cover an area of approximately 215 ha, having a volume of 101.5 Mm³ (Table 2.6). The final extent of the waste rock pile is shown in Figure 2-2. The waste rock pile has been designed to reduce potential effects to surface water resources and fish and fish habitat. Consideration was also given to avoiding sterilization of potentially economic ore.

Table 2.6 Areas and Volumes of Waste Rock Piles and Stockpiles

Feature	Max Crest Elevation (m)	Footprint (ha)	Volume (Mm3)
Berry Waste Rock Pile	475	215	101.5
Berry Topsoil Stockpile	420	19	1.0
Berry/Marathon Overburden Stockpile	420	36	8.5
Berry / Marathon LGO Stockpile	430	23	3.5

Acid rock drainage (ARD) testing suggests that some of the waste rock from all three deposits at the Valentine Gold mine site are potentially acid generating (PAG). The measured proportion of PAG waste



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rock at the Berry basins is 5% (Ausenco 2022). As mining progresses, waste rock and overburden will be tested on specified intervals for acid generating potential. Identified potentially acid generating materials will be placed within the waste rock piles and encapsulated by non-acid producing waste rock. Otherwise there has been no consideration for segregation of different rock types in the planned stockpiles based on geochemistry.

Metal concentrations in leachates from shake flask extraction (SFE) tests of waste rock samples are below *Metal and Diamond Mining Effluent Regulations* (MDMER) discharge limits. However, a moderate leaching potential was determined for F, Al, As, Cd, Cu, Fe, Mo and Zn, based on the exceedances of the respective long-term Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life (CWQG-FAL) in the leachates from waste rock. Further testing and modelling work specific to waste rock from the Berry pit is ongoing to confirm that ARD and metal concentrations are comparable to the other two open pits of the Approved Project. Based on the results of ongoing testing, water management infrastructure will be constructed as required.

The methods for the ARD / Metal Leaching (ML) assessment followed the Mine Environment Neutral Drainage (MEND) publication entitled "Prediction Manual for Characterizing Drainage Chemistry from Sulphidic Geologic Materials" (Price 2009). A discussion of the geochemistry testing program and how ARD classification of samples are determined is presented in Appendix 2B of this document. Ongoing kinetic testing will continue until the tests have stabilized or are terminated by a qualified professional. Additionally, data analysis and reporting will occur once the tests have been completed.

2.2.6 Low-Grade Ore Stockpile

LGO, which is ore between 0.38 and 0.80 g/t Au, will be stored in a single LGO stockpile between the Marathon and Berry deposits. This stockpile will receive LGO mined from both the Marathon and Berry pits (Figure 2-2) when mined in excess of the mill throughput targets. The LGO stockpile will be placed on a prepared pad in 10 m lift heights with 15 m wide berms, to form overall slope angles of 2.8 horizontal: 1 vertical. The LGO stockpile is planned to take up 23.5 ha in area and be bult up to a crest elevation of 430 m. A 29 m wide haul road will be incorporated into the stockpile to access each 10 m lift. The LGO is planned to be re-handled and fed to the crusher/mill once the open pits are exhausted (2038-2039).

Approximately 43% of LGO from the Berry deposit is estimated to be PAG. Based on results of kinetic testing, stockpiles of LGO will be processed before the estimated time of ARD onset for PAG. The LGO has moderate leaching potential of Ag, Al, As and Zn, based on CWQG-FAL exceedances in SFE leachate. In a scenario where additional information indicates the need for water treatment, the current mine plan facilitates potential collection and water treatment, as it segregates effluent from the Berry / Marathon LGO stockpile from other mine water streams. To further reduce ARD/ML risks, non-PAG LGO will be stockpiled preferentially with PAG LGO routed to the mill feed as soon as practicable, provided the grade requirement for the mill feed is met (Ausenco 2022).



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2.2.7 Topsoil and Overburden Stockpiles

Overburden, including glacial till, topsoil and organic materials (peat), will be excavated during development of the Project Expansion. The overburden materials will be removed to access the bedrock (ore and waste) beneath; the current estimate of overburden materials to be excavated and stockpiled from Project Expansion activities are shown in Table 2.6. Overburden from the Project Expansion will be stored with Marathon pit overburden where the crest elevation is estimated to reach 420 m and is expected to increase from 23.5 to 36.3 ha as a result of the addition of the Project Expansion material.

Topsoil from the Berry pit will be stored in a pile approximately 1 km southwest of the Berry pit limits and will cover an area of approximately 19.2 ha, with a volume of approximately 1.0 Mm³.

Where excess topsoil and overburden materials must be stockpiled for future site rehabilitation, these materials may be windrowed along linear corridors (e.g., road, pipelines), or stored in relatively small stockpiles around the site and in close proximity to where these materials will be reused. Marathon is developing a detailed material balance for all mined (pit) materials and materials to be excavated for general site development at the Valentine Gold mine site. This material balance will reduce the overall Approved Project and Project Expansion footprint and rehandling of materials, while increasing the progressive rehabilitation opportunities related to waste rock piles and other areas of the mine site.

Testing to date has shown that all samples of overburden from the Berry pit are non-PAG. A moderate leaching potential for F, Al, As, Cd, Cu, Fe, Mn, Ni, Pb, Se and Zn from overburden was determined based on SFE leachate concentrations that exceeded the CWQG-FAL. Water quality modelling (Appendix 8A) shows that management of ML from overburden is not required.

2.2.8 Tailings Management

While the Project Expansion does not require changes to the design of the tailings impoundment, the addition of tailings from the Berry pit will alter the geochemistry of the TMF. The assessment of TMF seepage quality was updated as part of the water quality model update (Appendix 8A). The TMF could also experience hydrogeological effects with the addition of the Berry pit that could affect seepage quality (Chapter 7). Therefore, the TMF was also included in the updated hydrogeological model (Appendix 7A). However, there is no risk of ARD/ML beyond that already considered for the Approved Project. The ARD/ML Management Plan is being updated to address the change in the mine plan and a preliminary update is attached as Appendix 2F. There are no changes to the monitoring or management strategies.

With the addition of the Berry pit, the water quantity model (Appendix 8A) was also updated to simulate the placement of Berry pit-associated tailings in the TMF, assess mill reclaim water needs and sources, (particularly during the Mine Years 10 to 15 period when tailings are deposited in the Berry pit and the TMF is the primary source), and ensure there is adequate capacity for tailings in the Berry pit southern basin. Further information on the mine site water balance update is provided in Section 2.2.9.2. The tailings pond will collect direct precipitation, runoff from the tailings surface, effluent discharged from the mill with the tailings (Mine Years 1 to 9), and water pumped back from the seepage collection sumps around the facility. During the operation phase, water will be pumped from the tailings pond via a reclaim



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pump system for the operation of the processing plant. Since the assessment of the Approved Project, further design has been completed with respect to the TMF treatment processes. Excess effluent from the TMF (not re-used for processing) will be routed through a water treatment plant and a SAGR® unit prior to discharge via a pipeline to Victoria Lake Reservoir.

The southern basin of the Berry pit will be exhausted by Year 10 of operation (2034). At that time, tailings slurry will begin to be piped to the mined-out basin for subaqueous disposal (estimated Spring 2034) and continue for the remainder of the mine life. Details with respect to deposition locations and volumes of tailings to be deposited is provided in Table 2.7.

Table 2.7 Tailings Management Details for Approved Project and Project Expansion

Tailings Management Feature	Approved Project / Project Expansion Details
Total tonnage of tailings produced	51.578 million tonnes
Tailings disposal location	Year 1 to 10 – TMF Year 10 to 15 – Berry Pit
Total tonnage of tailings to TMF	31.552 million tonnes
Total tonnage of tailings to Berry Pit	20.026 million tonnes

In Year 10, when tailings deposition is switched from the TMF to the Berry pit southern basin, process water will continue to be sourced from the TMF as reclaim, in addition to the minimum of 8% freshwater make-up from Victoria Lake Reservoir. Additionally, at this time in-pit dewatering would cease in the Berry pit and the pit allowed to fill via natural in-flows and water delivered to the pit as tailings effluent. If the TMF is not able to supply sufficient reclaim during Mine Years 10 to 15, water will be pumped from the Berry southern basin when water levels are less than 100 m below the pit overflow elevation.

Based on the hydrogeological assessment and modelling completed to date (Chapter 7, Groundwater VC), the permeability of the Berry pit (wall and floor rock) is expected to be very low and therefore water quality associated with tailings / effluent discharged to the pit is not expected to have a substantial impact on the surrounding groundwater resources. For in-pit tailings storage, this makes it unlikely that a liner within the pit would be required. In addition, contact water and surface water will be directed to the Berry pit at the same time as tailings deposition is occurring, which will help expedite the flooding of the pit for closure. This will act to further dilute parameters of potential concern (POPCs) within the tailings effluent pumped to the pit (Ausenco 2022). Marathon is currently completing the next phase of hydrogeological drilling to support detailed engineering (Ausenco 2022).

2.2.9 Water Management

The Approved Project mine site is divided into four complexes, from northeast to southwest: the Marathon Complex; the Process Plant and TMF Complex; the Berry Complex; and the Leprechaun Complex (Water Management Plan, Appendix 2A). Water management in these complexes functions independently, with decentralized water treatment and management in each. Water management components consist of sedimentation ponds, berms, drainage ditches, and pumps to collect and contain surface water runoff



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from waste rock piles, low-grade ore stockpiles, overburden stockpiles, topsoil stockpiles, and pits. Further details are provided in the updated Water Management Plan (Appendix 2A).

Water will be managed in accordance with the Approved Project updated Water Management Plan (Appendix 2A). Key aspects of the Water Management Plan are summarized in Chapter 8, Section 8.3.1 of this document. In designing appropriate water management infrastructure for the Project Expansion, Marathon considered a number of design parameters in line with various government policy and guidance. Specifically, design parameters included the following:

- Maintaining a 15 m setback from fish-bearing waterbodies, in line with the NL Policy on Flood Plain Management (DOEC 2004)
- Consideration of climate change associated precipitation events and associated flow. The Representative Concentration Pathway 4.5 (RCP4.5) was applied to climate records to simulate rainfall over the next 20 years, which resulted in higher precipitation events and higher associated design flows than those based on historical climate normal conditions
- Maintaining flow to fish-bearing waterbodies where feasible (draining mine site components to pre-development catchment areas, where practicable)

Water management infrastructure for the Project Expansion is designed to reduce operational risks and environmental impacts, and will be implemented and operated based on the following principles:

- Water management infrastructure is designed under a decentralized water treatment framework, operating under gravity drainage to reduce pumping needs:
 - Surface runoff upstream of the Project facilities will be diverted away to predevelopment catchments, where possible
 - Perimeter ditches around the piles (i.e., waste rock, topsoil and overburden stockpiles) will flow into water management ponds and discharge to the five Final Discharge Points (FDPs)
 - There are five FDP locations at the Berry Complex that ultimately drain to the Victoria River via Valentine Lake
 - Mine water from dewatering the open pit will be collected in sumps and pumped to a water management pond(s) prior to discharge to the environment
- Reduce water inventory through perimeter berms, separation of groundwater and surface water flows, and promotion of overland flow of non-contact runoff
- Effectively control flooding and provide water management design that produces effluent achieving regulatory effluent criteria
- Reduce FDPs through grading of ditches and construction of diversion channels to combine spill points to collective effluent discharge points and/or sedimentation ponds
- Maintain flow to fish-bearing streams and bogs by maintaining pre-development catchments.
- Precipitation and groundwater entering the open pit will be managed in-pit via sloped pit floors and catchment sumps, as required – these catchment sumps are the first opportunity to reduce sedimentation and chemistry impacts (e.g., residual ammonia):
 - Appropriately sized sumps with screened intakes and hydrocarbon absorption booms will be employed in-pit



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- Water collecting in these in-pit sumps will be pumped to the crest of the pit and discharged into an engineered stormwater pond, as required
- Mining of the Marathon, Berry and Leprechaun pits will occur simultaneously through Year 9; during Year 10, tailings deposition to the tailings impoundment as beaches will switch to subaqueous deposition in the Berry pit

2.2.9.1 Sedimentation Ponds

Sedimentation or water management ponds will be appropriately sized for retention and removal (by gravity) of suspended solids (sediment). Discharge from these ponds will be compliant with the applicable regulatory requirements including the MDMER pursuant to the *Fisheries Act*. Precipitation runoff from the waste rock pile and other developed areas of the Project Expansion will be collected via ditches and channels and directed to downstream sedimentation ponds similar to those to be constructed for management of water from the open pit.

Sedimentation ponds will be constructed in-ground, and/or using earthen berms and till, or synthetic liners, where required, to maximize water retention. Sedimentation ponds will be sited based on topography and geotechnical conditions. Where feasible, water collected in pit or in the sedimentation ponds will be used for other approved purposes on site rather than discharged to the environment.

During post-closure, sedimentation ponds and perimeter seepage collection ditches will be retrofitted to permeable reactive barriers to meet closure and post-closure maintained and monitored until water quality meets established objectives.

2.2.9.2 Mine Site Water Balance Update

An updated site-wide water balance was developed to estimate the quantity of mine site contact water planned to be managed during the construction and operation phases, and closure and post-closure sub-phases of the Project Expansion (Water Quantity and Quality Model Update Report, Appendix 8A). Note that the Water Quantity and Water Quality Model Update Report referred to the southern basin of the Berry open pit as the Southwest pit; the central basin is referred to as the Central pit; and the northern basin of the Berry pit is referred to as the Northeast pit. Average precipitation at the mine site was represented by the Climate Normals precipitation (1981-2010) for the Environment and Climate Change Canada (ECCC) climate station Buchans (Station ID 8400698). Building from this base case, a probabilistic Monte Carlo analysis was conducted to extend the analysis to include extreme wet and dry climatic conditions. This allows for the prediction of runoff, seepage, and water quality behaviour and characteristics over this range of climatic conditions.

A proportion of precipitation in the cold months of December through March was assumed to be stored as snow with melt occurring in the months of March through June. Groundwater and surface water inflows to the pits were based on a hydrogeological model developed by Stantec (Appendix 7A). Evaporation from ponds at the site was represented by the average evaporation rate (millimeters per month) reported at the Stephenville and Gander ECCC climate stations (Station IDs 8401700 and 8403800). Actual evapotranspiration (AET) at the site was based on a USGS Thornthwaite model (Thornthwaite, 1948).



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Inputs to the USGS Thornthwaite model included average climate precipitation and temperature data at Buchans, local soil conditions, and recommended values provided by the USGS (McCabe and Markstrom, 2007). The amount of AET was adjusted in the model based on Project Expansion facility and phase. These adjustments were applied to account for the characteristics of stockpile slope, soil storage, and infiltration of each Project Expansion facility.

The TMF water balance considered average monthly flows as well as 25-year wet and 5-year dry annual precipitation scenarios. The water balance model was run from start-up (Year -1) to post-closure (Mine Year 21 and onward). The water quantity and water quality model incorporates the relevant water management infrastructure designs to simulate watershed areas, volume capacities, flow diversions and flow paths for major mine components of the Berry, Marathon and Leprechaun pit complexes, mill and TMF. Figures 2-9 and 2-10 present the Project Expansion water balance for the operation phase and post-closure subphase, respectively, with average annual flow rates in cubic metres per day under climate normal conditions. Actual instantaneous flows will vary significantly by month and by varying annual climate conditions. The following main concepts are included in the Project Expansion site-side water balance model update:

- Perimeter ditches around the stockpiles will flow into water management ponds and discharge to local FDPs. Progressive rehabilitation and closure activities will include adding a soil cover and vegetating the waste rock pile. When the waste rock pile soil covers have established, the seepage collection ditches will have passive permeable reactive barriers installed, where required based on a pilot study, to intercept and treat toe and groundwater seepage.
- Mine water from dewatering the Berry open pit will be collected in sumps and pumped to a water management pond (BER-SP-05) prior to discharge to the environment.
- The TMF receives water from the mill via tailings slurry water (Mine Years 1 to 9), seepage collection pond discharge (intercepting tailings seepage from the tailings pond and pumping back into the pond for reuse) and runoff. In Mine Year 10, tailings deposition to the TMF will switch to deposition in the southern Berry pit. Outflows/losses from the tailings pond include reclaim water to the mill, water retained in the tailings matrix, deep groundwater seepage, evaporation and excess water (tailings pond overflow). The excess of water in the TMF will be treated in a water treatment plant on an eight month to year-round basis when the TMF receives tailings during operations and during the closure/post-closure sub-phases until the TMF is rehabilitated as a landform. From Mine Year 10 to the end of Mine Year 15, tailings will be deposited in the Berry pit and tailings pond water above dead storage will be reclaimed to the process plant. After Mine Year 15 and until Mine Year 17 excess TMF water will be discharged to the treatment plant. In Mine Year 17 the TMF pond will be drawn down by pumping to the treatment plant, the tailings will be graded and have a vegetated overburden cover placed on top and the emergency spillway will be breached. Seepage recirculation will cease during when the TMF pond is drawn down. In post-closure, toe seepage and runoff from the TMF will be allowed to drain downgradient to predevelopment catchments.



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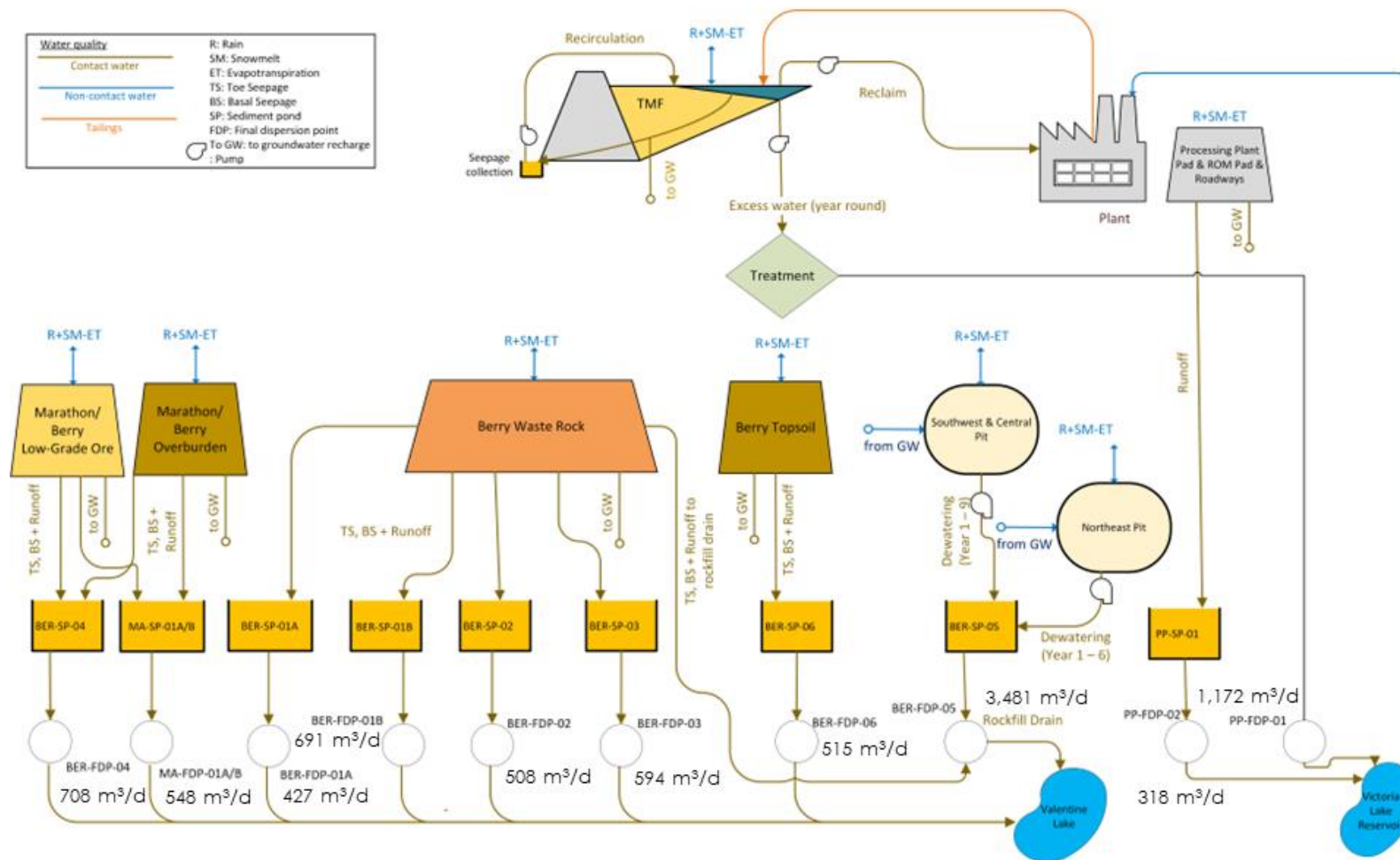


Figure 2-9 Project Expansion Site-Wide Water Balance – Average Operation Mine Years (1 to 9)



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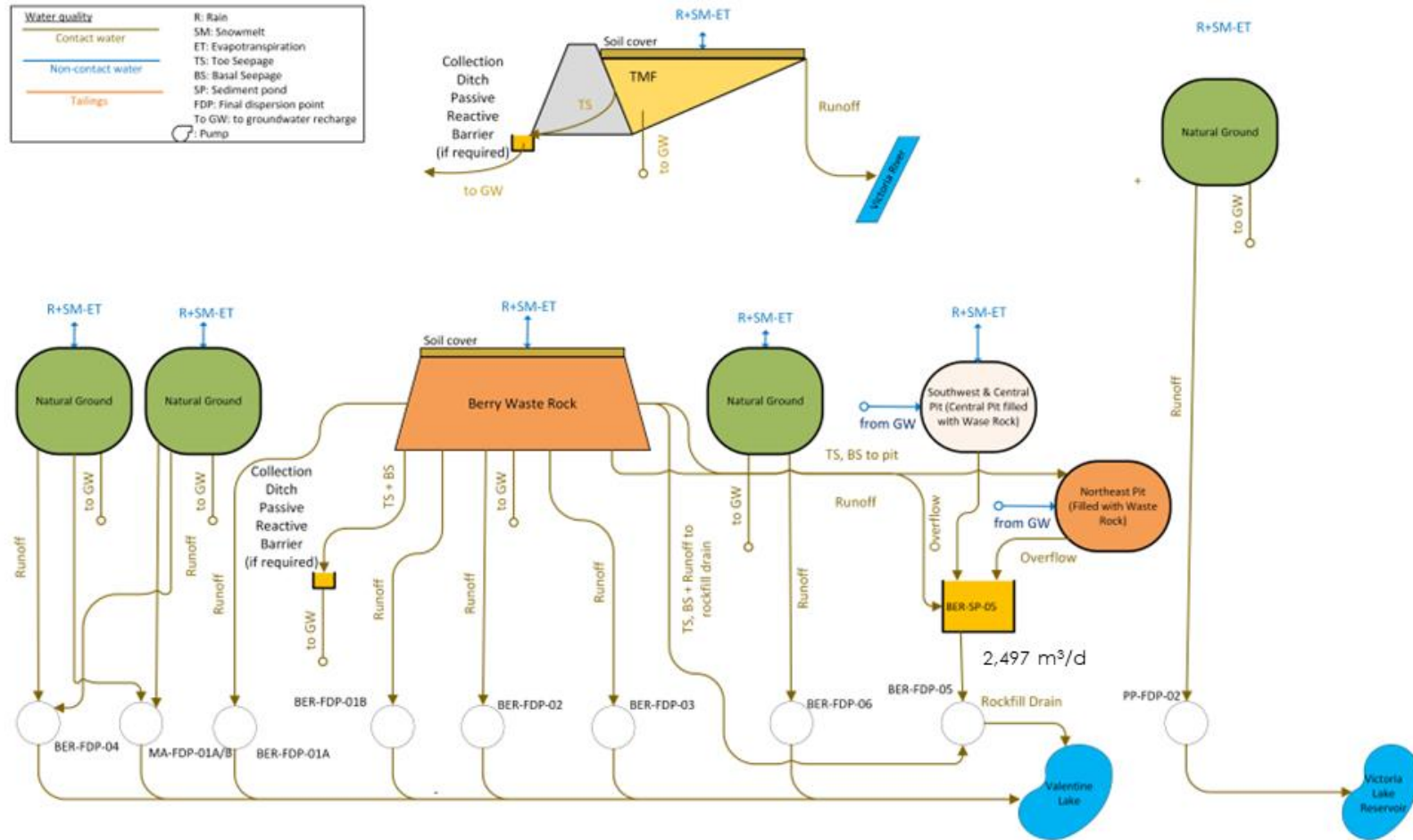


Figure 2-10 Project Expansion Site-Wide Water Balance - Average Post-Closure Mine Year 21 onwards



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- The Northeast pit spillway elevation is lower than the connection elevation to the southwest and central pits. The southwest and central pits are connected at an elevation of 348 m above sea level (asl) with a spillway elevation of 418 m asl. The southwest and central pit complex are proposed to provide reclaim water to the mill from Mine Years 10 to 15 when the TMF pond is not able to meet demand and water levels are at or above 100 m below the pit spillway elevation. No accelerated filling of the Berry pits is planned using freshwater from Valentine Lake or the Victoria Lake Reservoir as is planned for the Marathon and Leprechaun pits.

The water quantity/balance model results indicate that average condition (Climate Normal) average monthly and annual flows from the eight Berry complex water management ponds are typically highest during the operations phase (Mine Years 1 to 9 and/or Mine Years 10 to 13/15). The waste rock pile associated ponds (BER-SP-01A, 01B, 02 and 03) are predicted to have similar flow rates to the operation phase as closure due to increased runoff from the vegetated earth covered piles, and diversion of runoff on slopes adjacent to the open pit to drain to BER-SP-05.

The TMF pond is predicted for the average condition (Climate Normal) to have sufficient storage capacity during the construction and operation phases, and closure sub-phase with no overflow discharge. For the 25-year return period annual wet year there are two years during operation that may require changes to treatment plant operations (e.g., triggering longer treatment duration than the typical eight months per year).

Additional freshwater supplemental flows from the Victoria Lake Reservoir are estimated to be required to meet mill water demands during TMF transition periods between the Stage 1 and 2 lifts when there is reduced storage volume in the TMF available for reclaim. When tailings deposition is transferred to the Berry Southern pit and the only inflows to the TMF are from precipitation, additional freshwater supplemental flow is estimated to be required in Mine Years 11 to 15.

The NE pit will be filled with waste rock and having the Berry waste rock pile on top as well is predicted to fill and discharge to the spillway (404 m asl) between 7.75 and 9.8 years after stopping in-pit mining at the end of Mine Year 6. The southern and central pit complex filled with tailings in southern pit and waste rock in the central pit are estimated to discharge via the spillway at 418 m asl elevation between 6.3 and 9.75 years after stopping in-pit mining at the end of Mine Year 9. The Leprechaun pit without placement of tailings in it following stopping of in-pit mining and a freshwater filling rate from the Victoria Lake Reservoir of 4 Mm³/year will take 10.6 and 11 years from the end of Mine Year 13 to fill. The updated water quantity model for the Project Expansion (Appendix 8A) assessed the length of time to fill the Marathon pit to the spillover elevation of 330 m asl. The model assessed the Approved Project accelerated filling rate of 6.2 Mm³/year from Valentine Lake, beginning at the end of in-pit mining at the end of Mine Year 13. The Marathon pit is predicted to fill to the spillway elevation for the climate normal condition and 5th percentile condition in 9.3 years, and for the 95th percentile condition in 8.8 years, which is a little over a year longer than estimated by the Approved Project model (Marathon 2020).

As part of the Project Expansion, the Leprechaun pit will not receive tailings from the mill. The updated water quantity model (Appendix 8A) assessed the length of time to fill the open pit to the spillway elevation of 380 m asl from when the Leprechaun pit stops operation at the end of Mine Year 12 using the



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Approved Project freshwater taking rate from Victoria Lake Reservoir of 4 Mm³/year to accelerate pit filling (Marathon 2020). The Approved Project model estimated for the average climate condition the Leprechaun pit would fill within eight years after the end of pit operation with the placement of tailings in the pit. The Leprechaun pit with no tailings placed in the pit is predicted to fill within 11 years for the average condition and 5th percentile (5-year return period annual dry year) and 10.6 years for the 95th percentile (25-year return period annual wet year). This estimate will extend the water taking from Victoria Lake Reservoir by up to three years.

2.2.10 Explosives Storage Facility

The Approved Project includes an explosives storage facility consisting of bulk emulsion storage and storage for explosive and blasting accessories (e.g., detonators, boosters, detonating cords).

With development of the Project Expansion, the proposed location of the explosives storage facility will need to be changed to maintain required setbacks and buffers as mandated by Natural Resources Canada's (NRCAN) Explosives Regulatory Division. A design buffer of 1.1 km from all other site facilities and operations (e.g., roadways and infrastructure) is required. The explosives storage facility is now proposed to be located within the footprint of the existing exploration camp, which will be dismantled and removed. Although the location has changed (Figure 1-3), there is no change to the design and activities associated with this facility, which remain as described and assessed as part of the Approved Project. Terrane Geoscience completed an assessment of the relocation and identified no issues with the new site (Appendix 2C). DynoConsult considered the new location from the perspective of potential impacts to the Victoria Dam and concluded no adverse impacts would occur to the Victoria Dam should an accidental explosion occur at the new location (Appendix 2D).

All bulk emulsion and explosives products are manufactured off site and trucked to storage facilities on site. The planned facility will enable storage of approximately 110 metric tonnes of bulk emulsion. A 6 m wide gated access road will lead to a 120 m by 120 m pad. The pad area will contain a 24 m x 24 m pre-engineered metal building, office trailer for personnel and two 20' sea-cans for storage. A separate 30 m by 20 m pad will be constructed along the gated access road for the explosives magazines. Explosives and accessories will be transported to the mine pits as needed.

2.3 COMPARISON OF PHYSICAL ACTIVITIES FOR THE APPROVED PROJECT AND PROJECT EXPANSION

Table 2.8 provides a list of physical activities associated with the Approved Project and identifies those that are applicable for the Project Expansion. Where the physical activity is applicable for the Project Expansion, these activities are further described in the sections below.



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Table 2.8 Comparison of Physical Activities between the Approved Project and the Project Expansion

Approved Project	Project Expansion
CONSTRUCTION	
Access Road Upgrade / Realignment	No access road upgrades / realignments required for the Project Expansion. Activities associated with the access road were described in the Valentine Gold EIS (Marathon 2020), assessed as part of the Approved Project, and remain unchanged.
Construction-related Transportation along Access Road	No increase in construction-related traffic is anticipated for the Project Expansion. Activities associated with construction-related traffic on the access road were described in the Valentine Gold EIS (Marathon 2020), assessed as part of the Approved Project, and remain unchanged.
Mine Site Preparation and Earthworks	Mine site preparation and earthworks will also be required for the Project Expansion. This includes vegetation clearing, stockpiling of organic and overburden materials, development of haul roads, excavation and preparation of excavation bases within the mine site, temporary surface water and groundwater management, and the presence of people and equipment on site.
Construction / Installation of Infrastructure and Equipment	Physical activities associated with the construction and installation of water control structures and presence of people and equipment on-site will also be required for the Project Expansion. No works associated with the installation and commissioning of utilities or buildings on-site are required for the Project Expansion as these were described in the Valentine Gold EIS (Marathon 2020), assessed as part of the Approved Project, and remain unchanged.
Emissions, Discharges and Wastes	Emissions, discharges and wastes associated with the construction phase of the Project Expansion are assessed in this Environmental Registration / EA Update.
Employment and Expenditures	No changes to the employment levels as predicted for the Approved Project are anticipated during the construction phase as a result of the Project Expansion.
OPERATION	
Operation-related Transportation Along Access Road	Only a small increase (5 – 8%) in operation-related traffic along the access road is anticipated for the Project Expansion, as the production rate is not increasing. The increase in mine life will extend the duration of operation-related traffic from 13 years to 14.4 years. This represents only a small incremental change to the operation-related traffic on the access road, as described in the Valentine Gold EIS (Marathon 2020) and assessed as part of the Approved Project.
Open Pit Mining	Open pit mining activities, including blasting and excavation and haulage of rock from the open pit using conventional mining equipment, will be required for the Project Expansion. Blasting frequency is not anticipated to increase as a result of the Project Expansion, however blasting will occur over a longer time period due to the extension of mine life associated with the Project Expansion.



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Table 2.8 Comparison of Physical Activities between the Approved Project and the Project Expansion

Approved Project	Project Expansion
<p>Topsoil, Overburden and Rock Management</p>	<p>Topsoil, overburden, waste rock, and low-grade ore management activities will be required for the Project Expansion.</p> <ul style="list-style-type: none"> • Waste rock pile – 193 ha or 101.5 Mm³ • In-pit waste rock storage (from Berry and Marathon pits) in the northern and central basins of Berry pit, phases 2 and 3 (Figure 2-2) • Topsoil stockpile – 19 ha or 1.0 Mm³ • Overburden and low-grade ore from the Berry deposit will be combined with the Marathon stockpiles; the overburden stockpile will increase in size from approximately 24 to 36 ha and the low-grade ore stockpile will remain at 23 ha • A small, temporary sedimentation pond will be needed for the new (additional) Marathon topsoil stockpile during the construction phase to manage water accumulated in the Marathon pit. The additional Marathon topsoil stockpile (0.06 km² in size) and the addition of the temporary construction sedimentation pond are small changes, consistent with the design refinement process for the Approved Project. They do not result in changes to the effects assessment or mitigation measures for the Approved Project. <p>Rock excavated from the open pit and not processed for gold will be used as engineered fill for site development, maintenance and rehabilitation (assuming it is non-acid generating) or will be deposited in the waste rock pile.</p>
<p>Ore Milling and Processing</p>	<p>The annual production rate will not change with the addition of the Project Expansion, nor will there be changes to the nature of the milling and processing activities as a result of the Project Expansion. Ore milling and processing was described in the Valentine Gold EIS (Marathon 2020), assessed as part of the Approved Project, and remain unchanged.</p>
<p>Tailings Impoundment / Management Facility</p>	<p>The volume of tailings to be processed is not anticipated to change because of the Project Expansion and no changes to the tailings impoundment are anticipated. As with the Approved Project, tailings will be treated via cyanide destruction, thickened and pumped to the tailings impoundment in years 1 to 9. Most activities associated with tailings management were described in the Valentine Gold EIS (Marathon 2020). Marathon plans, however, to upgrade the effluent treatment process by replacing the proposed polishing pond with a smaller SAGR® unit, which provides improved treatment of nitrogen species.</p> <p>In-pit tailings disposal in Berry pit – As part of the Approved Project, tailings were intended to be pumped into the exhausted Leprechaun pit in years 10 through 12. As part of the Project Expansion, tailings will be pumped to a mined-out basin of the Berry pit beginning in Year 10, instead of to the Leprechaun pit. Tailings placed in pit will be flooded during final closure.</p>
<p>Water Management (Intake, Use, Collection and Release)</p>	<p>Water management will be required to support the Project Expansion. Site contact water from the Berry Complex will be managed on site and treated prior to discharge to the environment, with the ultimate receiver being Valentine Lake. Where possible, non-contact water will be diverted away from mine features and infrastructure. As indicated above, the Water Management Plan (Appendix 2A), water quantity and water quality model (Appendix 8A), and assimilative capacity model (Appendix 8B) have been updated as part of the Environmental Registration / EA Update.</p>



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Table 2.8 Comparison of Physical Activities between the Approved Project and the Project Expansion

Approved Project	Project Expansion
Utilities, Infrastructure and Other Facilities	<p>Most utilities, infrastructure and facilities remain unchanged. These were described in the Valentine Gold EIS (Marathon 2020) and assessed as part of the Approved Project.</p> <p>Relocation of the explosives storage facility, maintenance of Berry pit haul roads, and site snow clearing will be required for the Project Expansion.</p> <p>Note that while the location of the explosives storage facility has changed, the design and activities associated with the facility have not changed. An approximately 100 m x 135 m pad will be constructed to store explosives required for mine operations. The explosive pad will have a 1.1 km buffer from other site facilities and operations. The pad area is proposed to be located at the site of the existing exploration camp (which will be dismantled and removed) and will be gated. A separate 30 m x 20 m pad will be constructed to store the explosives magazine. Explosives and accessories will be prepared and transported to the mine pits as needed.</p>
Emissions, Discharges and Wastes	<p>Emissions, discharges and wastes associated with open pit mining, including from heavy equipment, are anticipated for the Project Expansion. The Approved Project emissions inventory, air dispersion model, noise model, groundwater model, Water Management Plan, surface water balance, water quality model, and assimilative capacity model have been updated as part of the Environmental Registration / EA Update.</p>
Employment and Expenditures	<p>A minor change to employment levels is anticipated with the Project Expansion, with an approximate 20% increase in mining personnel. Operation of the combined Approved Project and Project Expansion is estimated to require a peak workforce of approximately 524 fulltime equivalents (FTEs) (44 FTEs above the Valentine Gold EIS estimate) and an average of 366 FTEs.</p>

2.4 CONSTRUCTION ACTIVITIES

General construction activities for the Project Expansion include the following:

- Site Preparation: cutting and clearing of vegetation and removing organic materials and overburden on areas to be developed and developing construction stage water and erosion control (e.g., ditching, temporary / permanent sedimentation ponds) and haul roads
- Earthworks: facilitating construction of infrastructure development areas by excavating, preparing excavation bases, placing structural fill, and grading; stripping and stockpiling organic and overburden materials from open pit, and potential use of open pit development rock for earthworks, such as structural fill and road gravels
- Infrastructure Construction: constructing and installing water management infrastructure

Further details on specific construction and development activities are provided below. Construction activities will be conducted in accordance with the Approved Project Construction Environmental Protection Plan (EPP) under Marathon’s Environmental and Social Management System (ESMS) (Section 2.9), and in respect of the conditions of EA release and permits specific to construction activities. The EPP and ESMS will be updated as needed to address the new or modified mitigation measures



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(Appendix 2E) and/or follow-up measures that are identified throughout the EA process. Construction activities will also be governed by the terms of a Certificate of Approval issued under the NL *Environmental Protection Act* for the Approved Project. It is anticipated that the existing Certificate of Approval will be updated to include the Project Expansion.

2.4.1 Vegetation Removal

In preparation for earthworks, site development, and infrastructure construction, vegetation will be removed from development areas in accordance with cutting permits. Vegetation removal will be planned as per the regulations pertaining to bird breeding seasons and recommended buffers around wetlands and waterbodies, where feasible. Initial construction activities (including vegetation clearing) are scheduled for late fall and winter and are therefore expected to be conducted outside of bird breeding seasons. However, where/if the schedule requires vegetation clearing during bird breeding season, experienced environmental monitors will conduct nest sweeps in accordance with the Avifauna Follow-up Monitoring Plan prepared for the Approved Project, inspecting areas to be cleared to avoid disturbing active nests. This Plan will be updated if additional or modified mitigation and/or monitoring measures are identified for the Project Expansion through the EA process.

2.4.2 Earthworks

The Project Expansion will require earthworks development throughout the footprint of the Project Expansion to support infrastructure, such as haul roads, drainage ditches, sedimentation ponds, and stockpile pads. Surface elevations vary across the site as do soil conditions, which range from boggy areas, thin to thick till layers, and bedrock outcrops. Earthworks construction will include excavation of unsuitable materials (e.g., organic and/or loose soils), preparation of excavation bases, and placement of fill materials (e.g., rockfill, overburden [glacial till]) to develop haul roads, stockpile pads, and water management infrastructure. Organic and overburden soils excavated during earthworks construction will be stockpiled strategically around the site for future site rehabilitation as described in Section 2.6. A Rock and Soils Management Plan has been developed as part of construction planning for the Approved Project to optimize earthworks across the site, reduce excavation and re-handling, and increase the re-use of materials for earthworks construction. This Plan, which forms part of the Rehabilitation and Closure Plan, will be updated to include the Project Expansion.

Earthworks activities will align with Marathon's surface water and groundwater management objectives. Appropriate ditching and sedimentation ponds will be constructed to intercept surface runoff from the Project Expansion site and planned waste rock pile location. Water management infrastructure will be designed to integrate with and complement that designed and constructed for the Approved Project.

2.4.3 Fuel Supply

During construction of the Project Expansion, the permanent fuel supply which is part of the Approved Project will be installed and operational. Temporary fueling storage will therefore not be needed to support the Project Expansion.



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2.4.4 Initial Open Pit Development

Organic and overburden soils will be excavated and stockpiled strategically for future site rehabilitation as described in Section 2.6, and mill feed will be mined and stockpiled. At the conclusion of the preproduction period, enough exposed mill feed material and stockpiled material will be available to commence and sustain processing operation. See Section 2.5.1 for the life-of-mine production schedule.

2.4.5 Construction Labour Requirements

Table 2.9 provides estimates of construction-related total direct employment (in full-time equivalents [FTEs]), and the related National Occupation Classification (NOC) codes Canadian labour, as presented in the Valentine Gold EIS (Marathon 2020). An FTE of employment is typically equivalent to approximately 2,000 hours of work. Construction is estimated to require a peak labour force of approximately 625 FTEs (an average of 320 FTEs). No change in construction labour requirements is anticipated as a result of the addition of the Project Expansion.

Table 2.9 Construction-Related Estimate of Direct Employment (FTEs) by Four-Digit NOC Code (No Change from Approved Project)

Category	NOC	Description	Construction (FTEs)	
			Pre-production	Phase 2 Expansion
Trades and Production Occupations	7521	Heavy equipment operators (except crane)	65	9
	7311	Construction millwrights and industrial mechanics (except textile)	55	8
	7511	Truck drivers	52	7
	7237	Welders and related machine operators	35	5
	9411	Machine operators, mineral and metal processing	31	4
	7312	Heavy-duty equipment mechanics	28	4
	7242	Industrial electricians	28	3
	9611	Labourers in mineral and metal processing	22	3
	8614	Mine labourers	19	3
	7452	Material handlers	18	2
	7371	Crane operators	14	2
	7611	Construction trades helpers and labourers	13	2
	7252	Steamfitters, pipefitters and sprinkler system installers	12	1
9241	Power engineers and power systems operators	11	1	
Trades and Production Occupations	7372	Drillers and blasters - Surface mining, quarrying and construction	7	1
	7612	Other trades helpers and labourers	4	1
	7271	Carpenters	2	1
	7251	Plumbers	1	-



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Table 2.9 Construction-Related Estimate of Direct Employment (FTEs) by Four-Digit NOC Code (No Change from Approved Project)

Category	NOC	Description	Construction (FTEs)	
			Pre-production	Phase 2 Expansion
Professional and Physical Science Occupations	2113	Geologists, geochemists and geophysicists	21	3
	2143	Mining engineers	14	2
	2121	Biologists and related scientists	2	1
	2131	Civil engineers	2	-
Human Resources and Financial Occupations	1111	Financial auditors and accountants	12	1
	0112	Human resources managers	5	1
	0111	Financial managers	5	1
	1121	Human resource professionals	2	-
	1112	Financial and investment analysts	2	-
Support Workers	1414	Secretaries (except legal and medical)	12	1
	2263	Inspectors in public and environmental health and occupational health and safety	12	1
	2261	Non-destructive testers and inspection technicians	7	1
	9415	Inspectors and testers, mineral and metal processing	5	1
	1523	Production clerks	5	1
	1525	Dispatchers and radio operators	4	1
	6322	Cooks	9	1
	1241	Administrative clerks	2	1
	2234	Construction estimators	1	-
	6541	Security guards and related security service occupations	-	-
	2262	Engineering inspectors and regulatory officers	1	-
Technical Occupations	2154	Land surveyors	9	1
	2171	Information systems analysts and consultants	4	1
	2243	Industrial instrument technicians and mechanics	7	1
	2232	Mechanical engineering technologists and technicians	7	1
	2212	Geological and mineral technologists and technicians	5	1
	2211	Chemical technologists and technicians	5	1
	2231	Civil engineering technologists and technicians	5	1
Technical Occupations	2253	Drafting technologists and technicians	5	1
	2241	Electrical and electronics engineering technologists and technicians	5	1
	2255	Mapping and related technologists and technicians	4	1
	2254	Land survey technologists and technicians	4	1



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Table 2.9 Construction-Related Estimate of Direct Employment (FTEs) by Four-Digit NOC Code (No Change from Approved Project)

Category	NOC	Description	Construction (FTEs)	
			Pre-production	Phase 2 Expansion
	2233	Industrial engineering and manufacturing technologists and technicians	2	-
	2221	Biological technologists and technicians	5	1
Supervisors, Coordinators, and Foremen	0811	Primary production managers (except agriculture)	12	1
	8221	Supervisors, mining and quarrying	12	1
	9211	Supervisors, mineral and metal processing	5	1
	0211	Engineering managers	7	1
	0711	Construction managers	7	1
	7301	Contractors and supervisors, mechanic trades	5	1
	7203	Contractors and supervisors, pipefitting trades	5	1
Total			660	93
Notes: - Not applicable Source: Adopted from SC 2020; Mining Industry Human Resources Council 2015				

2.5 OPERATION ACTIVITIES

It is anticipated that the Project Expansion will be operated and maintained pursuant to a number of key approvals. Principal among these will be an updated Certificate of Approval (previously awarded specific to the Approved Project), and an updated Development Plan approved under the *Mining Act*. The following summarizes key operation and maintenance activities for the Project Expansion:

- Open Pit Mining: blasting, loading and haulage of rock from the open pit using conventional mining equipment, in sizes and numbers optimized for the operation.
- Utilization of Excavated Rock: rock excavated from the open pit that will not be processed for gold may be used as engineered backfill for post-construction site development associated with the Approved Project (e.g., tailings impoundment dam raises) or for maintenance and progressive rehabilitation; backfilled into mined-out pit basins; or deposited in a waste rock pile.
- Ore Hauling: ore extracted from the open pit will be hauled to stockpiles and the processing area where it will be crushed and ground, then processed to extract the gold via gravity, leaching and flotation processes. As previously indicated, there is no modification to the Approved Project's processing facilities, annual production rate, or processing activities as a result of the Project Expansion; therefore, ore processing is not described further in this document.
- Contact Water and Effluent Management and Treatment: contact water will be managed on site (including reuse as applicable) and treated to remove sediments and deleterious substances prior to discharge to the environment. Where practicable, water will be diverted around site features to reduce



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the amount of contact water requiring management, and water from the tailings impoundment will be pumped to the process facility for reuse. Process water effluent that is not reused and excess TMF water will be treated at the water treatment plant (no change from that described in the Valentine Gold EIS). Marathon plans to upgrade the final stage of the effluent treatment process by replacing the proposed polishing pond with a smaller SAGR® unit, which is more effective in treatment of nitrogen species.

- Transportation, Storage and Use of Hazardous Materials and Fuels: will be conducted in accordance with applicable regulations and guidelines.
- New and Modern Technologies, Equipment and Industry Best Practices: current planning and design for the Project Expansion is based on 'conventional' and proven mining techniques; however, Marathon will incorporate and employ new and modern technologies and equipment and industry best practices where feasible to reduce adverse effects on the environment and, where available, will investigate and consider new and emerging technologies to further improve the 'environmental footprint' of the Project Expansion.
- Update of Procedures and Plans: Marathon will update environmental procedures and plans under the ESMS to address potential environmental effects associated with the Project Expansion – there are numerous environmental plans and monitoring programs required under the Certificate of Approval and other permits that Marathon will incorporate into the ESMS for the operation phase of the Project Expansion.
- Infrastructure and equipment will be subject to regular inspection and maintenance throughout the life of the Project Expansion. Equipment and infrastructure will be inspected, maintained and tested in accordance with current and future standards and regulatory requirements. Marathon will maintain all Project Expansion haul roads, including activities such as culvert maintenance, pick up of refuse, grading and road repairs, snow removal and ice control, traffic sign installation and repairs, dust control, traffic signal maintenance, and vegetation control.

2.5.1 Open Pit Mining

Standard surface mining techniques (drill, blast, load, haul) will be used to mine the three basins within the Berry pit footprint. Drilling will be conducted per optimized blast patterns with 6 m depths in ore, and 6 to 12 m depths in waste. For both the Approved Project and Project Expansion, the contractor/supplier of explosives will also manage the explosives facility, while Marathon will load and fire the blasts. Haulage of ore and waste rock will be carried out using 91 and 135 -tonne haul trucks.

The economic pit limits for the Berry deposit were determined using the Pseudoflow algorithm. A full description of pit development is included in Section 2.2.3.

2.5.2 Operation Labour Requirements

Table 2.10 provides estimates of the cumulative total direct employment in FTEs to be generated over the operation phase of the mine (peak in 2028), and the related NOC codes for Canadian labour. With the addition of the Project Expansion, it is expected that the operation phase over the LOM will require a



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slightly larger labour force than that reported in the Valentine Gold EIS. It is expected that there will be a 21.7% increase in peak employment in mining staff during the operation phase of the mine. Based on the planned work schedule of a 24-hour operation with two 12-hour shifts, the operation phase of the mine (with the Project Expansion included) is estimated to require a peak workforce of approximately 524 FTEs (44 FTEs above the Valentine Gold EIS estimate) and an average of 366 FTEs. Employment estimates by four-digit NOC are considered preliminary and are subject to change as Project planning and engineering progress.

Table 2.10 Change in Estimated Direct Employment (FTEs) with the Addition of the Project Expansion

Category	NOC	Description	Operation (Approved Project)	Operation (Approved Project + Expansion)
Trades and Production Occupations	7521	Heavy equipment operators (except crane)	1,354	1,680
	7311	Construction millwrights and industrial mechanics (except textile)	141	316
	7511	Truck drivers	166	166
	7237	Welders and related machine operators	84	107
	9411	Machine operators, mineral and metal processing	186	193
	7312	Heavy-duty equipment mechanics	187	187
	7242	Industrial electricians	62	80
	9611	Labourers in mineral and metal processing	110	139
	8614	Mine labourers	76	76
	7452	Material handlers	-	-
	7371	Crane operators	-	-
	7611	Construction trades helpers and labourers	36	36
	7252	Steamfitters, pipefitters and sprinkler system installers	-	-
	9241	Power engineers and power systems operators	-	-
	7372	Drillers and blasters - Surface mining, quarrying and construction	464	722
	7612	Other trades helpers and labourers	48	48
	7271	Carpenters	-	-
7251	Plumbers	-	-	
Professional and Physical Science Occupations	2113	Geologists, geochemists and geophysicists	55	55
	2143	Mining engineers	19	19
	2121	Biologists and related scientists	24	24
	2131	Civil engineers	12	12



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Table 2.10 Change in Estimated Direct Employment (FTEs) with the Addition of the Project Expansion

Category	NOC	Description	Operation (Approved Project)	Operation (Approved Project + Expansion)
Human Resources and Financial Occupations	1111	Financial auditors and accountants	-	-
	0112	Human resources managers	-	-
	0111	Financial managers	12	12
	1121	Human resource professionals	12	12
	1112	Financial and investment analysts	-	-
Support Workers	1414	Secretaries (except legal and medical)	-	-
	2263	Inspectors in public and environmental health and occupational health and safety	12	12
	2261	Non-destructive testers and inspection technicians	33	33
	9415	Inspectors and testers, mineral and metal processing	-	-
	1523	Production clerks	23	23
	1525	Dispatchers and radio operators	13	13
	6322	Cooks	-	-
	1241	Administrative clerks	9	9
	2234	Construction estimators	-	-
	6541	Security guards and related security service occupations	48	48
Technical Occupations	2262	Engineering inspectors and regulatory officers	-	-
	2154	Land surveyors	22	22
	2171	Information systems analysts and consultants	-	-
	2243	Industrial instrument technicians and mechanics	48	48
	2232	Mechanical engineering technologists and technicians	8	8
	2212	Geological and mineral technologists and technicians	96	96
	2211	Chemical technologists and technicians	-	-
	2231	Civil engineering technologists and technicians	-	-
	2253	Drafting technologists and technicians	-	-
	2241	Electrical and electronics engineering technologists and technicians	48	48
	2255	Mapping and related technologists and technicians	-	-
	2254	Land survey technologists and technicians	-	-
	2233	Industrial engineering and manufacturing technologists and technicians	12	12
2221	Biological technologists and technicians	12	12	



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Table 2.10 Change in Estimated Direct Employment (FTEs) with the Addition of the Project Expansion

Category	NOC	Description	Operation (Approved Project)	Operation (Approved Project + Expansion)
Supervisors, Coordinators, and Foremen	0811	Primary production managers (except agriculture)	59	59
	8221	Supervisors, mining and quarrying	69	69
	9211	Supervisors, mineral and metal processing	21	21
	0211	Engineering managers	21	21
	0711	Construction managers	-	-
	7301	Contractors and supervisors, mechanic trades	22	22
	7203	Contractors and supervisors, pipefitting trades	-	-
Total			3,624	4,453
Notes: - Not applicable Source: Adopted from SC 2020; Mining Industry Human Resources Council 2015				

2.5.2.1 Mining Sequence

The open pit operations for the Approved Project and Project Expansion are planned to run for 14.4 years, including one year of pre-production. Annual mine activities that incorporate the Project Expansion are summarized in Table 2.11.

Table 2.11 Annual Valentine Gold Mine Activities – Project Expansion Incorporated

Year	Activity
Y1 2025	<ul style="list-style-type: none"> Clearing and grubbing of the east side of the Marathon waste rock stockpile footprint. Clearing and grubbing of the south side of the Leprechaun waste rock stockpile footprint. Clearing and grubbing of phase 1 and 2 of the Berry pit development and Berry ex-pit haul roads and north side of the Berry waste rock stockpile footprint. Removal and stockpiling of topsoil from the pit areas cleared and waste rock stockpile footprints. Haul road construction from the Berry pit to the stockpiles, crusher and tailings dam. Marathon phase 1 pit mined down to 314 bench. Leprechaun phase 1 pit mined down to 332 bench. Berry phase 1 pit mined down to 402 bench. Re-handle of stockpiled high-grade ore. Delivery of construction rockfill to stage 3 of the tailings dam.
Y2 2026	<ul style="list-style-type: none"> Clearing and grubbing the remaining Marathon waste rock stockpile footprints. Removal and stockpiling of topsoil from waste rock stockpile footprints. Marathon phase 1 pit mined down to the 266 bench, phase 2 mined to the 338 bench. Leprechaun phase 1 pit mined down to the 290 bench, phase 2 mined to the 386 bench. Berry phase 1 pit mined down to the 378 bench, phase 2 mined down to the 402 bench. Delivery of construction rockfill to stage 4 of the tailings dam.



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Table 2.11 Annual Valentine Gold Mine Activities – Project Expansion Incorporated

Year	Activity
Y3 2027	<ul style="list-style-type: none"> Clearing and grubbing phase 3 Marathon, Leprechaun, and Berry pits. Clearing and grubbing the remaining Leprechaun and Berry waste rock stockpile footprints. Removal and stockpiling of topsoil from cleared pit and waste rock stockpile footprints Marathon phase 1 pit mined down to the 224 bench, phase 2 mined down to the 302 bench. Leprechaun phase 1 pit mined down to 266 bench, phase 2 mined down to the 356 bench. Berry phase 1 pit mined down to the 348 bench, phase 2 mined down to the 372 bench. Delivery of construction rockfill to stage 4 of the tailings dam.
Y4 2028	<ul style="list-style-type: none"> Marathon phase 1 pit mined down to the pit bottom on the 206 bench. Marathon phase 2 pit mined down to the 266 bench, phase 3 mined down to the 362 bench. Leprechaun phase 1 pit mined down to the pit bottom on the 266 bench. Leprechaun phase 2 pit mined down to 308 bench, phase 3 mined down to the 386 bench. Berry phase 1 pit mined down to the 318 bench, phase 2 mined down to the 324 bench. Re-handle of stockpiled high-grade ore. Delivery of construction rockfill to stage 5 of the tailings dam.
Y5 2029	<ul style="list-style-type: none"> Marathon phase 2 pit mined to the 230 bench, phase 3 mined down to the 350 bench. Leprechaun phase 2 pit mined to 272 bench, phase 3 mined down to the 380 bench. Berry phase 1 pit mined down to the pit bottom on the 312 bench. Berry phase 2 pit mined down to the 282 bench, phase 3 mined down to the 390 bench. Delivery of construction rockfill to stage 5 of the tailings dam.
Y6-Y9 2030-2033	<ul style="list-style-type: none"> Marathon phase 2 pit mined down to the pit bottom on the 134 bench. Marathon phase 3 pit mined down to the 212 m bench. Leprechaun phase 2 pit mined down to the pit bottom on the 170 bench (2032). Leprechaun phase 3 pit mined down to the 212 m bench. Berry phase 2 pit mined down to the pit bottom on the 258 m bench (2030). Berry phase 3 pit mined down to the pit bottom on the 198 m bench. Start of deposition of Berry waste rock in mined out phase 2 Berry open pit (2031). Start of deposition of Marathon waste rock in mined out phase 2 and 3 Berry open pit (2033). Re-handle of stockpiled high-grade ore. Delivery of construction rockfill to stage 6 of the tailings dam.
Y10-Y13 2034-2037	<ul style="list-style-type: none"> Marathon phase 3 pit mined down to the pit bottom on the 44 bench. Leprechaun phase 3 pit mined down to the pit bottom on the 98 bench (2036). Re-handle of remaining stockpiled high-grade ore (stockpile depleted 2034). Re-handle of stockpiled low-grade ore.
Y14 2038 to 2039	<ul style="list-style-type: none"> Re-handle of remaining stockpiled low-grade ore (stockpiles depleted).

2.5.2.2 Mine Production

Ore extracted from the Berry pit will be moved to the processing area 1 km south of the pit where it will either be stockpiled for future processing or crushed and milled, then processed for gold extraction via gravity, flotation and leach processes. The crusher and process plant were assessed as part of the Approved Project (Section 2.3.3, Valentine Gold EIS).



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A production schedule for the combined Approved Project and Project Expansion activities is presented in Table 2.12. The production schedule assumes a short pre-production period, as well as a reduced mill feed requirement during the first full year of production. This updated production schedule may be modified as further infill drilling and mine planning progresses. Currently, Leprechaun, Marathon and Berry pits will be mined simultaneously; however, the sequencing of pit development will be further reviewed, taking into account mine planning, materials movement, and environmental considerations.

The open pit mine operation will operate 24 hours per day, 7 days a week, on a 12-hour shift basis. Mining operations are based on 365 operating days per year, with an allowance of 10 days without mine production built into the mining schedule, to allow for adverse weather conditions and other potential interruptions.

Material and mine waste will be extracted on day and night shifts. Blasting operations will be conducted on day shifts only. Production estimates are based on an assumed mechanical availability of 85 to 90% (90% for haul trucks, 85% for all other equipment), and a 90% utilization (for trucks and loaders) of available hours varied to reflect seasonal usage of equipment where appropriate.

A standard day shift blasting crew will be required, while four rotating labour crews will be scheduled to operate production equipment.



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Table 2.12 Project Expansion Production Schedule

	Year	Life of Mine	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
Mill Feed Tonnes	Kt	15,099	442	592	948	1,919	2,160	1,240	1,200	1,475	1,434	471	—	375	955	1,501	387
Mill Feed Grade , Au	g/t	1.60	2.84	2.51	2.50	1.93	1.89	2.08	1.24	1.89	1.65	0.63	—	0.53	0.53	0.53	0.53
Ore Tonnes Mined from Pit	kt	15,099	1,147	1,613	1,844	2,512	2,461	1,413	1,200	1,683	1,225	—	—	—	—	—	—
Ore Grade Mined from Pit, Au	g/t	1.60	1.51	1.35	1.58	1.58	1.71	1.88	1.24	1.70	1.71	—	—	—	—	—	—
Stockpile Tonnes to Mill	kt	4,192	3	—	—	127	—	—	—	26	346	471	—	375	955	1,501	387
Stockpile Grade to Mill, Au	g/t	0.59	0.96	—	—	0.94	—	—	—	0.94	0.94	0.63	—	0.53	0.53	0.53	0.53
Waste Tonnes Mined from Pit	kt	170,629	12,919	23,419	21,625	22,190	30,606	27,695	19,967	10,012	2,196	—	—	—	—	—	—



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2.5.3 Mine Equipment

The Project Expansion will be developed using standard open-pit technology, scaled appropriately for the size of the operation. Mine equipment described in the Valentine Gold EIS will also be used for mining the Berry pit and with some increase in the numbers of equipment anticipated. Graders will be used to maintain the haul routes for the haul trucks and other equipment within the pit and on all routes to the waste rock pile and the crusher. Trucks outfitted with a water tank and a gravel spreader are included for haul road maintenance. Track dozers (447 kW and 325 kW) are included to handle waste rock, till, and topsoil to the various material storage locations. Front end wheel loaders (4.5 m³ bucket) and hydraulic excavators (3.8 m³ and 3.0 m³ bucket) are included as pit support, loading tools for the articulated haulers, and back-up loaders for the main fleet. Custom fuel/lube trucks are included for mobile fuel/lube support. Various small mobile equipment pieces are proposed to handle other pit service and mobile equipment maintenance functions.

Conventional dewatering equipment (pit bottom submersible pumps) will be used to dewater the mined-out basins of the Berry pit. Daily pit inflow rates have been estimated based on direct precipitation over the pit areas and groundwater inflow rates via host rock hydraulic conductivity. Pit water will be pumped to sedimentation ponds adjacent to the pit, where it will be managed as per the updated Water Management Plan (Appendix 2A).

Mine fleet maintenance activities will be performed in the maintenance facilities located near the process plant site. This infrastructure and activities were assessed as part of the Approved Project, and no changes are anticipated as a result of the Project Expansion.

Loading and hauling for the Berry pit will also use equipment and procedures outlined in the Valentine Gold EIS (Section 2.5.1.4). Reliable mining equipment commonly used in the construction and open pit mining industry and sized to meet the production requirements of the mining schedule, have been selected for the loading and hauling fleet. Loading in ore zones will be completed with hydraulic excavators on 6 m benches, and in waste zones with hydraulic excavators and wheel loaders on 6 m or 12 m benches, depending on grade control requirements.

An auxiliary fleet of dozers, graders, water trucks, and other support equipment required for mine operations, as described in the Valentine Gold EIS, are also available for the Project Expansion. Open pit maintenance activities will include haul road maintenance and dust control, open pit dewatering, transporting operating supplies, relocating equipment, and snow removal.

2.5.4 Blasting

Drilling demands for the Berry pit will be met using production drills described and allocated in the Approved Project EIS. Blasting activities will also follow the protocols described in the Valentine Gold EIS (Section 2.5.1.4), including use of bulk emulsion product with an average density of 1.1 kg/m³, and an explosives load per hole of approximately 215 kg for 12 m holes and approximately 80 kg for 6 m holes. When combustion is complete, the bulk emulsion product does not leave a post-blast ammonium residue.



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Blasting will be limited to daytime hours and there will be an average of one blast each day, rotating between the three pits, for approximately 350 total blasts per year. Average blast depth will be 8.5 m.

For both the Approved Project and Project Expansion, the contractor / supplier of explosives will also manage the explosives facility. Marathon will perform the loading and firing of the blasts; all Marathon blasters will have a valid blasters certificate issued by the NL Department of Environment and Climate Change.

2.5.5 Water Management

2.5.5.1 Surface Water

Site contact water will be managed on site through ditching and sedimentation ponds and treated prior to discharge to the environment. Where feasible, non-contact water will be diverted away from mine features and infrastructure, and site contact and process water will be recycled to the extent possible for use on site.

2.5.5.2 Pit Dewatering

In-pit dewatering systems will be established for Berry pit, consisting of conventional dewatering equipment (pit bottom submersible pumps). An average annual pit inflow rate of 4,583 m³/day has been estimated using a predicted groundwater inflow of 1,770 m³/day (based on numerical hydrogeological modeling (Appendix 7A) and a direct precipitation input of 2,813m³/day (GEMTEC 2022a). The collected contact water will be stored in a sump pit prior to being pumped to a sedimentation pond. Water from the sedimentation ponds will be discharged to the environment following treatment in the sedimentation ponds as needed to meet discharge quality criteria, per the updated Approved Project Water Management Plan.

2.5.6 Tailings Management

As described in Section 2.2.8, there are no predicted changes to the processing of ore or the design and operation of the tailings impoundment as a result of the Project Expansion. As with the Approved Project, tailings will be treated via cyanide destruction, thickened, and pumped to the tailings impoundment in years one through nine (Section 2.5.2 of the Valentine Gold EIS, Marathon 2020). The proposed SAGR® unit, which would replace the polishing pond, provides additional treatment following treatment via the water treatment plant, and would be the last stage of treatment prior to discharge to the environment. It will improve process water and excess TMF water treatment for nitrogen species and is expected to operate well in harsh weather conditions. The addition of tailings from ore sourced from the Berry pit will result in a change in the overall composition of the tailings compared to the Approved Project (i.e., where tailings are produced only from ore sourced through the Marathon and Leprechaun pits). This change has been assessed in this Environmental Registration / EA Update and does not pose any additional risk of ARD/ML beyond that already considered for the Approved Project. The ARD/ML Management Plan is being updated to address the change in the mine plan and a preliminary update is attached as Appendix



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2F. There are no changes to the monitoring or management strategies. The water quality model (Appendix 8A) has also been updated to reflect the addition of tailings from the Berry pit.

Starting in Year 10 of the mine life (2034), tailings from mining Marathon and Leprechaun pits will be pumped to the mined-out southern basin of the Berry pit for subaqueous storage (Figure 2-11). As part of the Approved Project, tailings were planned to be pumped to the exhausted Leprechaun pit; this would no longer occur.

Site investigations were completed at the Berry pit location by Terrane (2022) and GEMTEC (2022b) to investigate the suitability for tailings disposal in the southern basin of the Berry pit. Results from investigations of bedrock permeability, changes in hydraulic conductivity with depth, hydraulic variations in rock mass and fault zones led to the conclusion that faults intersecting or near the Berry pit are not preferred pathways for groundwater flow (GEMTEC 2022b). Based on water quality work conducted as part of the most recent Feasibility Study, which included the Project Expansion. Marathon determined that lining the pit prior to deposition is not necessary (Ausenco 2022). Updated groundwater modelling was completed, and the results are presented in Appendix 7A. Tailings will be deposited in the southern basin, and eventually the pit will be flooded and provided with a permanent passive discharge channel.

2.5.7 Utilities, Infrastructure and Other Facilities

The Project Expansion will not require separate accommodations, power lines, or additional maintenance facilities or utilities from those described in the Valentine Gold EIS for the Approved Project. Procedures described in the Valentine Gold EIS specific to site and access road maintenance, and snow clearing also apply to the Project Expansion.



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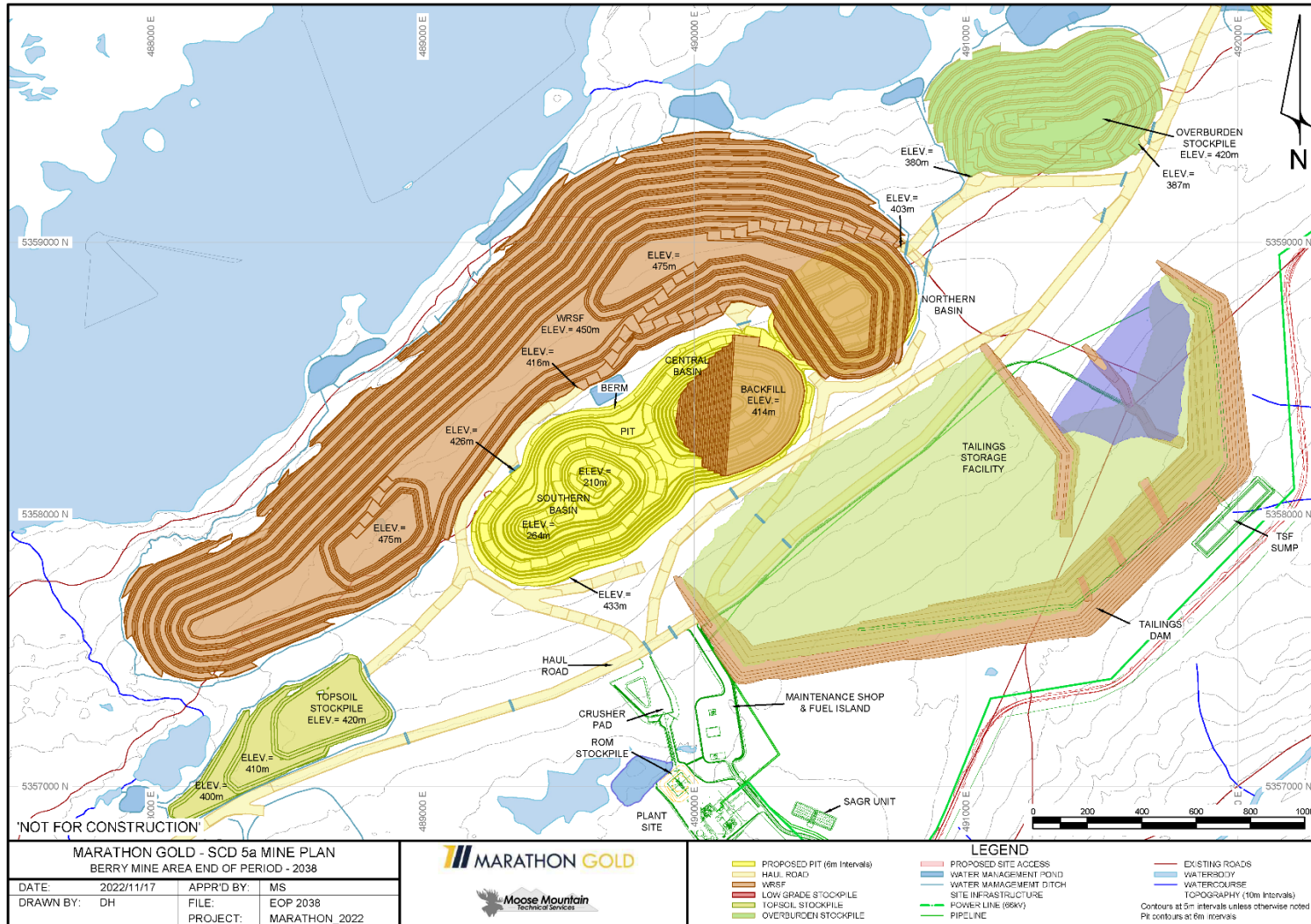


Figure 2-11 In-Pit Tailings Storage in Berry Pit – Year 10 Onwards



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2.6 DECOMMISSIONING, REHABILITATION AND CLOSURE ACTIVITIES

Rehabilitation and closure of a mining operation is required under the NL *Mining Act*, and the requirements for rehabilitation of a mining project are administered by the NLDIET's Mineral Development Division. Rehabilitation and closure are also subject to regulatory review by potentially interested provincial and federal departments. Rehabilitation is defined as measures taken to restore a property as close to its former use or condition as practicable, or to an alternate use or condition that is deemed appropriate and acceptable by the NLDIET, NLDECC, and NL Department of Fisheries, Forestry and Agriculture-Wildlife Division (DFFA-Wildlife Division). In accordance with the Newfoundland and Labrador *Mining Act*, Marathon has submitted a Rehabilitation and Closure Plan (RCP) for the Approved Project, which will be updated as necessary to incorporate the components and activities of the Project Expansion.

The RCP details the estimated rehabilitation and closure cost for the overall Valentine mine site (i.e., Approved Project and Project Expansion) and this must be posted by Marathon as Financial Assurance. This Financial Assurance, which is \$65M for the Approved Project and expected to be approximately \$15M for the Project Expansion, is insurance held by the provincial government for the purpose of rehabilitating the site in the event that Marathon were to default on the Valentine Gold Project (i.e., declares bankruptcy).

Following the cessation of operations for the Project Expansion, its components will be decommissioned. Testing to date indicates that soils and rock materials at the mine site have a low risk of being acid generating (non-PAG), while some ore materials have an increased risk of ARD/ML so are currently classified as PAG. With appropriate mitigation measures (e.g., mixing and blending of PAG and non-PAG materials, encapsulation, backfilling of PAG into the pit), the waste rock pile is not expected to generate ARD or ML. As such, current mine site design and development, as well as plans for rehabilitation and closure, includes specific measures in the ARD/ML Management Plan to address risks related to ARD/ML. In the event that further testing determines that ARD/ML may present a risk post-closure, the Project Expansion site design and RCP will be adapted. ARD/ML test results are presented in detail in Appendix 2B.

There are three key stages of rehabilitation activities that occur over the life span of a mine:

- Progressive Rehabilitation - Progressive rehabilitation involves rehabilitation that is completed throughout the mine operation prior to closure, wherever practicable to do so. This includes activities that contribute to the overall rehabilitation effort and would otherwise be carried out as part of the closure rehabilitation at the end of mine life. Examples of progressive rehabilitation include rehabilitating infrastructure or areas no longer required for ongoing operation (e.g., buildings, roads, laydown areas), Other examples include erosion stabilization and revegetation of completed overburden and/or waste rock piles, infilling or flooding exhausted mining areas, and completing revegetation studies and trials.
- Closure Rehabilitation - Closure rehabilitation activities build on successes of progressive rehabilitation activities and are carried out after mining operations cease. The goal is to restore and/or



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rehabilitate the mine site to as close to its pre-mining condition as practicable. Such activities include demolition and removal of site infrastructure (e.g., equipment, facilities, roads, laydown areas), grading and revegetating disturbed areas, breaching and regrading sedimentation ponds to reestablish drainage patterns, erosion stabilization and revegetation of completed overburden and waste rock piles, and infilling or flooding of the Berry basins.

- Post-Closure Monitoring and Treatment - Post-closure monitoring for the Project Expansion will be incorporated into the RCP plan for the Approved Project. Once closure rehabilitation activities have been completed, a period of post-closure monitoring is required to show that the rehabilitation has been successful. The post-closure monitoring will continue until it has been demonstrated that the rehabilitation of the site has been successful. When the site is deemed physically and chemically stable, and approved by the appropriate regulators, the site will be relinquished to the Crown.

2.6.1 Pit Closure

2.6.1.1 Berry Pit

Upon closure, equipment and dewatering infrastructure will be removed from the Berry pit. The Berry pit incorporates three basins: the northern basin will be backfilled with waste rock as will a portion of the central basin, while the southern basin will be partially backfilled with tailings slurry commencing in Year 10 of operation. Flooding of the Berry pit will begin after deposition ceases and the filling period will be shortened due to the volume of waste rock, tailings, and tailings water deposited. With the planned infilling to the Berry basins, Marathon does not anticipate the need for accelerated filling (with water) of the Berry pit.

Once filled to the spill elevation, the water will be permitted to overflow the basins / pit. A detailed assessment of the pit geometry and spill elevation in relation to the surrounding terrain will be required during operation to determine where the water will ultimately flow from the pit post-closure, and a channel may be required to reconnect this drainage to the natural, adjacent waterbodies. Monitoring of water quality within the open pit during filling will be carried out to assess the potential discharge water quality and to determine if water treatment may be required in the event that water quality does not meet the appropriate criteria (Ausenco 2022).

Rock or soil barricades and signage will be constructed along the crest of the open pit, as well as across any access roads or ramps, barricading access to the open pit. Warning signs will be erected at regular intervals along the berm, notifying the public of the open pit. Areas of sloped access, above and below the final high-water mark, will be constructed to allow ingress and egress for people or animals.

2.6.1.2 Marathon and Leprechaun Pits

Pumping from nearby waterbodies to expedite filling of Marathon pit and Leprechaun pit was assessed as part of the Approved Project, thereby reducing their flooding times and capturing the filling process within the closure and anticipated post-closure monitoring periods. As a result of changes associated with the Project Expansion (e.g., depositing tailings in Berry pit instead of Leprechaun pit), filling of both the Marathon and Leprechaun pits will be extended (approximately one year and three years, respectively)



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from the times estimated in the Valentine Gold EIS (Section 2.2.9.2). No other aspects of pit closure for the Marathon and Leprechaun pits require modification as a result of the Project Expansion.

2.6.2 Other Infrastructure

The duration of rehabilitation and closure activities provides adequate time for earthworks activities to be completed, vegetation to establish, and water quality to improve.

The Berry waste rock pile will be developed and used throughout the operational life of the Project Expansion. In addition, beginning in Year 2031, waste rock will be deposited in the mined-out northern basin (phase 1) and in a portion of the central basin (phase 3) in 2033. The waste rock pile will be sloped and benched in accordance with the closure design as it is developed, creating overall safe slopes for final closure of three horizontal to one vertical (3H:1V), incorporating interim benching. The waste rock storage pile will also be progressively rehabilitated via placement of overburden / organic materials on benches and slopes and subsequent revegetation. At final closure, only the remaining areas of the waste rock pile that could not be progressively rehabilitated (generally the ramp and top bench(es)) will require rehabilitation.

When vegetation has established on the rehabilitated waste rock pile, water management ponds will be breached to allow drainage to the natural ground and local receivers, and water management features will be removed and restored to natural, pre-development drainage conditions. The Berry / Marathon overburden stockpile and Berry waste rock pile perimeter ditches will be covered with side case material and regraded to allow non-contact water to drain down the over the perimeter ditch footprints and overland to local receivers following natural drainage patterns. Contact seepage will be substantially reduced from the uncovered condition for the waste rock pile due to the increase in runoff and evapotranspiration potential of the vegetated soil covers. The reduced volume of contact seepage will migrate across the perimeter ditches retrofitted with passive treatment systems and assimilate (attenuate naturally) with local groundwater to discharge into local receiving waters.

Based on the results of the water quantity and water quality model update (Appendix 8A), passive treatment may be required during closure / post-closure at the Berry waste rock pile and TMF. The potential need for passive treatment for the TMF during closure / post-closure was previously identified as a component of the Approved Project. Based on the updated water quality model and addition of tailings from the Berry pit to the TMF, seepage quality in the TMF toe seepage collection system is predicted to exceed CWQG-FAL for aluminum, arsenic, cadmium, chromium, copper, manganese, phosphorus, zinc, total ammonia, and unionized ammonia. The model report recommends future monitoring to confirm these exceedances and passive treatment technologies to treat the seepage during closure.

To treat TMF seepage in closure to background or the CWQG-FAL thresholds, further passive treatment is anticipated. The primary passive treatment technologies for mine-related waters include aerobic and anaerobic wetlands, sulfate reducing bioreactors, anoxic limestone drains (ALD), and successive alkalinity producing systems (SAPS). Selection and design of a passive system is based on water chemistry, flow rate, local topography, and site characteristics.



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The Rehabilitation and Closure Plan by GEMTEC (2022b) identified feasible passive treatment options to manage site water post closure for the Approved Project:

- Convert waste rock pile and TMF seepage collection ditches into anerobic Permeable Reactive Barriers (PRBs)
- Convert waste rock pile and TMF seepage collection ditches into French drains with an anaerobic PRB to passively intercept and convey site water to anaerobic vertical flow engineered wetlands

These options will be evaluated and applied for post closure water management for the Berry waste rock pile. Options will be selected based upon anticipated water quality and results of a pilot study. It is anticipated that a subsurface flow PRB will be sufficient to reduce metal concentration to below the CWQG-FAL.

2.6.3 Post-Closure and Long-Term Monitoring

The post-closure monitoring program established for the Approved Project will incorporate the specifics of the Project Expansion and will continue after final closure activities are completed for an estimated six to ten years, noting that final closure for certain components will be closed and rehabilitated prior to the end of the operation phase of the Approved Project. The monitoring period could also be shortened based on the satisfaction of regulators that physical and chemical characteristics of the site are acceptable and stable. During the post-closure period, site monitoring will be carried out to demonstrate that closure strategies of Approved Project and Project Expansion facilities are performing as intended. Monitoring will be conducted at residual FDPs and at receiving locations (e.g., Victoria River, Valentine Lake, and Victoria Lake Reservoir) simulated in the groundwater model to intercept seepage from the pits, waste rock piles, and TMF. Post-closure monitoring and maintenance will be carried out at a reduced frequency from the operation phase or closure period.

When the mine site is deemed physically and chemically stable, it is anticipated that the site will be relinquished to the Crown, noting the requirements for relinquishment at that time may be different from current requirements (Ausenco 2022).

2.7 EMISSIONS, DISCHARGES AND WASTES

Emissions, discharges and wastes will result from Project Expansion activities during construction, operation, and decommissioning, rehabilitation and closure. Marathon will adhere to mitigation measures based on industry standard best practices to reduce emissions, discharges and wastes, as summarized in Appendix 2E. Marathon is also developing a comprehensive ESMS comprised of component management plans listed in Section 2.10. Emissions, discharges and wastes from accidental events are addressed in Chapter 13.

2.7.1 Effluent Management and Treatment

The assessment of Project Expansion-related effects on surface water, including details on sources of effluent, proposed mitigation measures, and residual effects is provided in Chapter 8. During construction



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and operations, surface runoff (i.e., contact water) will be collected via drainage ditches and sent to sedimentation ponds, as described in Section 2.2.9. If necessary, collected water will be treated to meet discharge requirements prior to release to the environment, as described in Section 2.2.9 and in the updated Water Management Plan (Appendix 2A).

2.7.2 Air Emissions

Emissions of air contaminants during Project Expansion phases include particulate matter (dust) from the movement of equipment and earth, greenhouse gases (GHGs) (i.e., carbon dioxide, methane and nitrous oxide), and combustion emissions from the operation of diesel and gasoline powered equipment and vehicles. An emissions inventory for construction and operation for the combined Approved Project and Project Expansion is presented in Chapter 6. In addition, an updated air quality model was completed to include the Project Expansion activities and the results are provided in Appendix 6A.

Emissions during site preparation activities and the construction of Project Expansion infrastructure include combustion gases from vehicles, heavy-machinery, and dust from sources such as the operation of heavy earth-moving equipment and wind erosion. Emissions are expected to occur intermittently during the construction phase. Water collected from sedimentation ponds will be the primary dust suppressant used during construction. Other dust suppressants may be considered (in consultation with NLDECC) where high traffic construction (i.e., temporary) roads are developed and permanent site/haul roads are established during construction. Comprehensive maintenance programs for vehicles and equipment, and for roads being established for the Approved Project will be updated to include the Project Expansion.

In addition to those during construction, potential sources of emissions during Project Expansion operations will include dust generated from blasting and mining, and handling, stockpiling, and transporting ore, waste rock and overburden. Water misting will be used as applicable to reduce fugitive dust and other atmospheric emissions. Additional mitigation measures include limiting vehicle speeds and connecting to the electrical grid to reduce the need for diesel generators, where feasible.

Emissions of air contaminants during active closure are expected to be less than those during the operations phase, and the post-closure phase is expected to generate negligible air emissions.

An estimated 10 million litres (L) of diesel could be consumed during the construction phase, and 45 million L annually during operation and maintenance (for the combined Approved Project and Project Expansion. Based on the anticipated amount of fuel to be consumed, it is estimated that approximately 1,055 kt CO_{2e} could be emitted throughout the life of the combined Projects (construction and operation). Certain emission sources will be equipped with emission control technologies to reduce emissions of contaminants.

Marathon will update environmental management plans to include Project Expansion activities (Section 2.9), as applicable. In addition, Marathon will manage, monitor and report annual air emissions and GHGs to provincial and federal regulators, and will investigate strategies to reduce emissions over the LOM.



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2.7.3 Acoustic Emissions

Noise modelling was completed for the Approved Project and updated based on planned Project Expansion activities. The assessment of Project Expansion-related effects on the atmospheric environment (Chapter 6) includes consideration of potential effects of acoustic emissions on receptors.

Acoustic emissions associated with the Project Expansion include noise from operation of machinery and equipment (e.g., trucks and trailers, bulldozers, front-end loaders, excavators, graders, gravel and rock trucks, scrapers and compactors) during all Project Expansion phases, and from blasting during the operations phase. Noise generated during rehabilitation and closure activities is predicted to be similar to or less than that during construction.

Proposed mitigation measures include ensuring that construction and other mobile equipment is equipped with appropriate muffler systems and selecting equipment to limit overall noise emissions during their operation. In addition to noise mitigation measures, Marathon will update environmental management plans to include Project Expansion activities (Section 2.9), as applicable. As part of the Approved Project, Marathon has implemented a Stakeholder Grievance Process to address noise complaints, should they arise. This process would also apply to the Project Expansion.

2.7.4 Solid and Hazardous Waste Management

Marathon has an approved Waste Management Plan in place for the Approved Project that conforms with the NL Provincial Waste Management Strategy, and that outlines how solid and hazardous waste will be managed over the LOM. This Waste Management Plan will be updated to include the Project Expansion, and solid and hazardous waste generated over the Project Expansion life will be managed as per the Waste Management Plan. The anticipated waste types expected to be generated in each Project Expansion phase and planned methods for disposal are provided in Table 2.13.

Table 2.13 Waste Types and Disposal Methods

Waste Type	Disposal Method
CONSTRUCTION	
Inert construction waste and recyclables (e.g., film plastics, containers/boxes, pallets/wood, cable reels)	Recycling/reuse or offsite landfill
Domestic waste	Offsite landfill
Used oil, oil filters, air filters, etc.	Hazardous materials recycling / disposal facility
OPERATION AND MAINTENANCE	
Inert waste and recyclables (e.g., film plastics, corrugated boxboard, pallets/wood, cable reels, liquid drums/international bulk containers)	Recycling/reuse or offsite landfill
Metal	Recycling
Batteries	Hazardous waste facility
Electrical wiring	Recycling



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Table 2.13 Waste Types and Disposal Methods

Waste Type	Disposal Method
Used oil, oil filters, air filters, glycol, etc.	Hazardous materials recycling / disposal facility
Electronic waste ('e-waste')	Recycling / reuse or offsite disposal
Domestic waste	Offsite landfill
CLOSURE AND REHABILITATION	
Inert waste	Recycling / reuse or offsite landfill
Metal	Recycling
Domestic waste	Offsite landfill

2.8 OCCUPATIONAL HEALTH AND SAFETY

Marathon has developed safe work policies, procedures and practices under an overarching Corporate Health and Safety Management System (HSMS). In addition to adhering to legislated occupational health and safety requirements in compliance with the NL *Occupational Health and Safety Act* and *Occupational Health and Safety Regulations, 2012*, Marathon's HSMS provides for safe work policies, procedures and practices covering construction, excavation and demolition, excavation, rock crushing, general blasting, fire prevention and control, general mining matters, explosives and blasting operations, and open cut workings in mining operations. Marathon is committed to preventing incidents and accidents and reducing health and safety risks by implementing best practices, including the following:

- Actively identifying and addressing hazardous conditions and health and safety risks
- Conducting mandatory site orientations for employees, contractors, consultants and visitors, and providing specialized safety training, as applicable
- Providing adequate supplies of personal protective equipment (PPE) appropriate to the task
- Incentivizing near miss reporting
- Developing, measuring, and reporting on Key Performance Indicators (KPIs) that include both leading and lagging indicators
- Focusing on continuous improvement

The health and safety program will also include industry standard elements, such as maintaining and supporting the Occupational Health and Safety Committee; incident reporting and investigation including determining the root cause and identifying and implementing corrective actions; conducting internal audits and regular workplace inspections; appropriate use of PPE; and requiring daily toolbox talks and mandatory pre-job safety checklists.

2.9 ENVIRONMENTAL MANAGEMENT

Marathon is committed to the sustainable and responsible development of the Project Expansion as reflected in its corporate values and environmental and social governance policies (Appendix 2G). Environmental management and protection are recognized as a corporate priority, which is critical to the successful construction, operation, and decommissioning, rehabilitation and closure of the Valentine Gold



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Project. The policies in Appendix 2G apply to all Marathon personnel, contractors, subcontractors, suppliers, vendors and visitors.

Marathon's environmental management tools include an overarching corporate-wide Environmental and Social Management System (ESMS) that includes environmental management plans, mitigation measures, response plans, and follow-up and monitoring that allows for the commitments made in the Valentine Gold EIS, in this Environmental Registration / EA Update, and in permitting conditions to be implemented, monitored and adapted as needed throughout the LOM. The Project Expansion will be incorporated into management plans for the Approved Project.

The ESMS is designed as a conceptual and systematic framework to manage environmental risks, based on principles of adaptive management and continuous improvement. It guides the development and implementation of environmental management plans (EMPs) required to maintain environmental protection during all Project phases – construction, operation, and decommissioning, rehabilitation and closure. The ESMS and associated EMPs will function as a set of standards to guide the environmentally and socially responsible development and operation of the Project Expansion through the definition and implementation of the following components:

- Defined objectives informed by Marathon's Environment Policy
- Defined roles, responsibilities and accountabilities
- Risk management processes and operating procedures focused on environmental responsibility
- Monitoring, auditing and reporting processes

Existing follow-up, monitoring and mitigation plans established for the Approved Project will be updated to reflect Project Expansion activities, as applicable, and both the Approved Project and Project Expansion will be included in plans that are to be developed for the Operation phase. These plans include the following:

- Surface Water Management Plan (Appendix 2A)
- Acid Rock Drainage and Metal Leaching Management Plan (Appendix 2F)
- Caribou Protection and Environmental Effects Monitoring Plan (Appendix 10B)
- Environmental Protection Plan
 - Avifauna Management Plan
 - Air Emissions Management Plan (including Greenhouse Gas Emissions)
 - Erosion and Sediment Control Plan
 - Wildlife Management Plan
 - Soils and Rock Management Plan
 - Historic Resources Protection Plan
 - Hazardous Materials & Products Program and a Hazardous Waste Storage and Tracking SOP
- Traffic Management Plan
- Waste Management Plan
- Environmental Effects Monitoring Plan (MDMER)
- Tailings / Effluent Release Emergency Response Plan (MDMER)
- Fish Rescue Plan



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- Operations Blasting Procedure
- TMF Operations, Maintenance and Surveillance Manual
- Accidents and Malfunctions Prevention and Response Plan
- Emergency Response Plan
- Wildlife Response Plan
- Current Use of Lands and Resources for Traditional Purposes – Indigenous Communications Plan
- Outfitters Environmental Effects Monitoring Plan
- Gender Equity, Diversity and Inclusion Plan
- Benefits Agreement
- Rehabilitation and Closure Plan

Appendix 2E provides a list of mitigation measures to be applied by Marathon throughout the construction, operation, and decommissioning, rehabilitation and closure phases of the Approved Project and Project Expansion. Table 1 of Appendix 2E details mitigation measures and commitments made in the Valentine Gold EIS, and Table 2 details additional mitigation measures and commitments added during the IR process for the Approved Project. It is not an exhaustive list and will be updated to reflect permit requirements and conditions of release, as applicable. Table 3 of Appendix 2E identifies additional or modified mitigation measures to specifically address the Project Expansion.

In addition, Marathon has developed agreements with Indigenous groups, communities and stakeholders, policies and other commitments post-submission of the Valentine Gold EIS, which would also apply to the Project Expansion and may require updates.

2.10 PURPOSE OF AND NEED FOR THE PROJECT

The purpose of the Project Expansion is to extract gold from the Berry deposit so that the Valentine Gold Project continues to be an important economic benefit to NL, by providing employment and business opportunities to the region, and by providing revenue to the Province and Canada. The Project Expansion will extend the life of the Valentine Gold Project, resulting in additional employment and economic benefits to the local communities, the central region of NL, and the province. By extending the life of the mine without the requirement for additional processing or tailings impoundment infrastructure, the Project Expansion also increases the efficiency of gold production at the mine with limited additional effects on the environment. The need for the Project Expansion is to enhance the return on investment for the Valentine Gold Mine, to maintain its continued economic feasibility. An analysis of gold as a commodity and its uses in various industry sectors is presented in the Valentine Gold EIS, Section 2.9 (Marathon 2020).

2.11 ALTERNATIVES TO THE PROJECT EXPANSION

Market and regulatory factors, and environmental and socio-economic considerations that could impact the chosen mine plan include: a) a sustained higher gold price environment (an estimate of US\$1750/oz was used in the Feasibility Study) that might merit developing larger open pits for the recovery of more mineral reserves, yielding a longer mine life; b) changes to the regulatory environment around tailings management or water quality (for example) that may impede the development of future mineral reserves,



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restricting mine life; or c) changes to the capital market environment that may inhibit the company's ability to finance its capital expenditure requirements. Marathon has considered each of these scenarios, among others, in its assessment of the optimal mining and development plan for the combined Projects and the Corporation.

Mining is an industry focused on the reduction of risk, be it risk of harm to individual persons, risk of harm to the environment, or risk of technical failure leading to capital losses, a fully developed mining plan takes full consideration of the implications of failure / malfunctions. For that reason, the current mine plan as developed in the latest Feasibility Study (Ausenco 2022) contemplates open-pit mining only at this time, and contemplates conventional milling and processing, using established techniques and equipment.

The most recent Feasibility Study (Ausenco 2022) contemplates a 9-year mine life for the Project Expansion and 14.4 years overall for the combined Projects. This is based on the quantity of mineral resources and mineral reserves currently delineated, an assessment of the optimum mining rate based on pit access and ore body geometries (technical feasibility), and the optimum processing rate based on capital expenditures and rate of return (economic feasibility).

The proximity and accessibility of the Berry deposit to Approved Project infrastructure, e.g., processing mill, tailings impoundment, road network, accommodation camp infrastructure, make it economically and technically feasible to exploit, and will allow Marathon to extend the LOM of the Approved Project.

With respect to the Valentine Gold mine, Marathon determined that the mining and processing plan chosen, as presented in the Feasibility Study, is considered to be optimal in terms of technical feasibility, economic feasibility, and overall operating risk. In a scenario where the Project Expansion does not proceed, Marathon concluded that both technical and economic feasibility of the overall Approved Project would be adversely affected.

Given the above, the do-nothing alternative is not a viable alternative to the Project Expansion as it would not meet the purpose of the Project, which is to extract gold ore from the Berry Deposit and maintain the economic feasibility of the Valentine Gold Project.

2.12 ALTERNATIVE MEANS TO THE PROJECT EXPANSION

The following sections review alternative means of conducting planned Project Expansion activities. They are based on the assessment of alternatives presented in the Valentine Gold EIS (Marathon 2020) and have been adapted to the activities applicable to the Project Expansion. Table 2.13 provides a summary of the alternatives presented in the following sections. The analysis of alternative means was considered for the following Project Expansion activities / components:

- Mining methods
- Pit dewatering
- Waste rock management
- Waste rock pile location
- Overburden material storage and management



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- Tailing management and disposal alternatives
- Process water management
- Location of effluent final discharge points
- Labour supply
- Rehabilitation methods

Alternatives assessed for the Approved Project in the Valentine Gold EIS were not reconsidered where the Project Expansion is not anticipated to modify or change Approved Project activities or infrastructure (e.g., tailings impoundment, mill and processing activities).

A consideration of regulatory acceptability, technical feasibility and economic feasibility, as well as the environmental and socio-economic effects (where applicable) of each alternative means is described for each option (Table 2.14).

Table 2.14 Alternative Means Assessment Descriptors

Descriptor	Definition
Technically Feasible (including regulatory factors)	<ul style="list-style-type: none"> • Feasible considering criteria which could influence safe, reliable and efficient operations • Technology must be available and proven for use by a similar activity, and cannot compromise personnel and process safety for it to be considered • Acceptable considering applicable regulatory guidelines and frameworks
Economically Feasibility (including market factors)	<ul style="list-style-type: none"> • Feasible considering capital and operational project expenditure, and opportunity cost • Project expenditure can be impacted directly (e.g., equipment and personnel requirements) and indirectly (e.g., schedule delays)
Environmental and Socio-economic Considerations	<ul style="list-style-type: none"> • Consideration of potential environmental and socio-economic effects on VCs • Considers applicable regulatory guidelines and frameworks for reducing environmental and socio-economic effects and applicable mitigation measures
Implications of Failure / Malfunctions of Option	<ul style="list-style-type: none"> • Consideration of the implications of the option regarding the potential for failure or malfunction, including resulting potential environmental and socio-economic effects
Preferred / Selected Option	<ul style="list-style-type: none"> • The preferred alternative means in consideration of legal acceptability, technical feasibility, economic feasibility, and potential environmental considerations • The preferred alternative means forms the basis for the Project Expansion to be assessed

The following sections provide a comparative analysis of technical and economic feasibility and the environmental and socio-economic effects of the alternatives that led to the selection of the preferred option. Each option for the alternative means is summarized in a tabular format. The preferred alternative means form the basis for the Project Expansion to be assessed (i.e., assumed to be the base case that is assessed for environmental effects in Chapters 7-12 of this document).



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2.12.1 Mining Methods

In the Valentine Gold EIS, several primary mining methods (including placer, in-situ, open pit and underground) were presented for the Approved Project. Each of these methods is described further below in the context of the Project Expansion.

2.12.1.1 Placer Mining

Placer mining is a method of extracting a mineral from alluvial or placer (sand and gravel) deposits that are typically found along river and stream beds. The gold at the Project Expansion is hosted in hard rock, beneath the ground surface, and therefore placer mining is not a technically feasible method.

2.12.1.2 In-Situ Mining

In-situ mining uses a solution pumped into the ground that dissolves the mineral from within the rock; the solution is pumped back out of the ground and the dissolved mineral is extracted from the solution. In-situ mining has been used at a commercial scale to mine copper, uranium, and potash / salts; however, it has not been used to mine gold at scale. Technically speaking, solution or in-situ mining requires a host rock that is porous and fractured, and as such the host rock for the Project Expansion is not suitable for this mining method. Environmentally, the primary concern in solution mining is potential contamination of surface and groundwater resources. From a market and regulatory perspective, as in-situ mining for gold has not been proven successful at a commercial scale, there would be considerable risk in developing a project using this method.

2.12.1.3 Open Pit

Open pit mining is a common mining technique and is the preferred method where sufficient mineral resource is available relatively close to the ground surface (usually within 250 to 350 m of the ground surface or less). Economically, this mining method is less costly than underground mining, which is considered the leading alternative to open pit for most mineral deposits. Open pit mining generally creates a larger environmental footprint due to the pit itself and the associated waste rock pile. As open pit mining operation is typically less expensive to operate and less risky in terms of grade recovery and operating feasibility, market factors, including the ability to raise capital to develop a project, tend to favour open pit projects. Failures in open pits generally occur where poor rock conditions lead to slope failures, lead to unsafe working conditions, or the inability to mine sections of the pit effectively.

2.12.1.4 Underground

Underground mining methods are usually employed where the mineral resource occurs at considerable depth below the ground surface and/or is a mineral deposit that does not lend itself to open pit mining (e.g., narrow-vein mineral deposits). Underground mining requires higher ore grades than open pit mines, as the costs of underground development work (e.g., access ramps, shafts) to access the ore are high, and mine production rates are usually lower. Environmentally, underground mining generally requires less environmental footprint as the surface access points are relatively small and there is usually less waste



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rock generated in underground mining as waste rock can be placed in mined out stopes. Failures in underground mining methods may come via the selection of the underground mining method (e.g., block caving, room and pillar) ultimately not being efficient for ore production, or poor rock conditions that affect the stability of the underground workings, creating safety issues and increasing mining costs. As underground mining is inherently more expensive than open pit, market conditions such as commodity prices may have a larger impact on the viability and success of a project. Underground mining is not technically feasible for extracting the near surface gold resources that have been defined for the Berry deposit.

2.12.1.5 Summary

Table 2.15 summarizes the assessment of alternatives related to mining methods. Based on the proximity of the gold resources to the ground surface, and the relatively low average grade relative to underground mine method requirements, open pit mining is the feasible method for the Project Expansion, which is consistent with the conclusions for the Approved Project.

Table 2.15 Summary of Project Expansion Alternatives Analysis – Mining Methods

Determining Factors	Options Considered			
	Placer	In-Situ	Open Pit	Underground
Technically Feasible (including regulatory factors)	No	No	Yes	No
Economically Feasible (including market factors)	-	-	Yes	No
Environmental Considerations	-	-	Larger footprint than other options; however, it is the only technically and economically feasible option	-
Socio-economic Considerations	-	-	-	-
Implications of Failure / Malfunctions of Option	-	-	-	-
Preferred Option – carried forward in the assessment	✗	✗	✓	✗

2.12.2 Pit Dewatering

As discussed in the Valentine Gold EIS (Section 2.11.2; Marathon 2020), open pit dewatering techniques can be divided into two main groups which may also be used in combination. The first group is pumping methods, where water is pumped from arrays of wells or sumps and piped away for disposal. Pumping methods include in-pit pumping, and ex-pit pumping (i.e., pumping from wells; sub-horizontal wells and drains; wellpoints and ejector wells; and drainage adits and tunnels). The second group of techniques are exclusion methods, where low permeability walls or barriers are used to reduce groundwater inflows into



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the pit. Exclusion methods include bentonite slurry walls; grout curtains; and artificial ground freezing (Preene 2015 and Marathon 2020).

There are two water sources that accumulate within an open pit that need to be addressed, groundwater from the soil and rock forming the exterior shell (or walls) of the pit, and direct precipitation (snow or rain) entering the pit, assuming surface flows are diverted away from the pit. In temperate regions where substantial precipitation falls, some form of in-pit dewatering is generally required to capture and remove the precipitation component. The method of groundwater control within the pits generally depends on the potential rate of flow of groundwater into the pit, and the potential for groundwater flow or pressure to impact the stability of the pit slopes (walls). Where low to moderate groundwater flow is expected, in-pit pumping is generally considered the most efficient solution. Where moderate to high groundwater flow or pressure is expected, ex-pit pumping infrastructure or exclusion methods are employed. The options noted are technically feasible with the exception of ground freezing (based on climate); however, for the Project Expansion the groundwater inflows and pressures associated with pit slope stability are sufficiently low that in-pit dewatering is suitable.

Economically, the costs of each solution rise with complexity, and if more than one method is needed. For pumping methods, the costs are typically lower for in-pit dewatering methods, increasing as the technical requirements move to pumping wells, sub-horizontal drainage, wellpoint systems, and drainage adits and tunnels. Exclusion methods are typically high in cost, unless only a portion of the pit perimeter (pit shell area) is required to be treated.

The primary environmental considerations are the quantity and quality of water that must be managed, as in most cases, the water is pumped to a surface waterbody. The quantity of water depends on the groundwater conditions at the Project Expansion site. The quality of water depends in part on the natural groundwater quality in the area, and also effects from the mining process, including but not limited to, fines (solids) or blast residue chemistry (e.g., ammonia, nitrates). For in-pit dewatering methods, sumps (in-pit settling ponds) are often used to allow some attenuation prior to pumping, which helps settle suspended solids and naturally degrade ammonia. For ex-pit wells, the water quality may not be affected as much by the in-pit solids or chemistry; however, if the wells required are as deep or deeper than the pit, the in-pit drainage may be pulled into the wells via migration through the pit walls.

Failure of pit dewatering system generally results in excess water accumulating in the pit and affecting mining operations. In cases where groundwater pressure impacts slope stability, failure of the system for a period of time may reduce the slope stability and in the worst case, result in a pit slope failure.

2.12.2.1 Summary

Based on the open pit engineering and groundwater assessment work completed to date for the Project Expansion, Marathon's preferred option is to use a combination of solutions for the required pit dewatering requirements. Surface water that could drain into the basins will be diverted. As the groundwater flows into the basins are considered low, and do not substantially impact pit slope stability, in-pit pumping is considered the most efficient method of pit dewatering. Marathon will employ in-pit sumps to collect and manage water prior to pumping it from the pit, and an ex-pit sedimentation pond will



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be constructed to manage water quality prior to release to the environment. As for the Approved Project, Marathon is also planning to use explosives that substantially reduce residual chemistry post-blast, as described in Section 2.3.12 of the Valentine Gold EIS (Marathon 2020). Table 2.16 summarizes the assessment of alternatives related to pit dewatering, which is consistent with the conclusions for the Approved Project.

Table 2.16 Summary of Project Expansion Alternatives Analysis – Pit Dewatering

Determining Factors	Options Considered		
	In-Pit Pumping	Ex-Pit Pumping	Exclusion Methods
Technically Feasible (including regulatory factors)	Yes	Yes, however this is not required	Yes, however this is not required
Economically Feasible (including market factors)	Yes	Yes, however this is less feasible than in-pit pumping	Yes, however this is less feasible than pumping
Environmental Considerations	-	-	-
Socio-economic Considerations	-	-	-
Implications of Failure / Malfunctions of Option	-	-	-
Preferred Option – carried forward in the assessment	✓	✗	✗

2.12.3 Waste Rock Management

Options for waste rock management for the Project Expansion for an open pit of this nature include:

- Disposal in a natural waterbody
- Creation of an on-land waste rock pile
- Disposal in-pit during operation or at the end of the mine life
- Use as construction aggregate for the development of the Project Expansion
- Use / sale as construction aggregate for other developments or markets

Disposal in a natural waterbody is a technically feasible approach and may be economically feasible if a suitable waterbody exists close to the open pit. From a regulatory perspective, it is not usually considered favourable relative to on-land piles, and in-water disposal in fish habitat requires additional environmental approvals, including listing on Schedule 2 of MDMER. Environmentally, there are a number of potentially important considerations, including degradation of water quality and potential downstream impacts and destruction of fish habitat. However, there are some positives such as elimination of dust generation and improvement of general aesthetics. In the case of potentially acid-generating waste rock, submergence in a waterbody would be a permanent mitigation, assuming the waste rock could be stored a minimum of several metres below the water surface.

Waste rock is most often stored in surface piles near the open pit. Technical considerations for this alternative include general geometry, slope stability, the acid-generating potential of the rock, and contact water management. Economically, this alternative is often preferred unless the rock is potentially acid-



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generating and must be covered at closure and/or water runoff treated indefinitely, or if the suitable / acceptable location is a great distance from the open pit. Environmental considerations such as dust generation, aesthetics, contact water management, and footprint (e.g., disruption or destruction of vegetation, waterbodies) can be managed with proper design, planning for closure, and progressive rehabilitation over the operational phase of the Project Expansion. Potential failure would be in the form of slope failure that could result in disruption of additional footprint, degradation of water or a waterbody, and loss of revegetated (rehabilitated) surface area.

Placement of waste rock in an open pit is technically feasible if an exhausted open pit, or an exhausted area of an open pit, is available. In most cases, these opportunities do not exist; however, for the Project Expansion, this will be an option in the Berry pit, beginning in Year 6.

Theoretically, waste rock generated over the life of the Project Expansion could be re-excavated and returned to the open pit from where it came at the end of the mine life; however, there are a number of important considerations for this alternative:

- In NL, it is required to make efforts to progressively rehabilitate the exposed waste rock pile; these efforts would be sacrificed and the area beneath the pile would need to be rehabilitated once the life of Project Expansion is complete
- A nearly equal number of years of equipment operation (fuel consumption, vehicle emissions, dust, and employment) to return the waste rock to the same open pit
- Approximately 70 to 80% of the waste rock material would fill the pit due to bulking; therefore, 20 to 30% of the waste rock would remain within the waste rock pile location and would need to be covered with overburden and revegetated
- Once the pit was filled, it would reduce the risk of slope failures on highwalls, as they would be better supported by the weight of the waste rock material
- Backfill of 300 m vertical depth of the open pit will be slow, however 'creep' settlement of the waste rock backfill in the pit will continue for some time after it is originally filled and will require long term maintenance to 'top up' the fill in the pit as it will also likely settle unevenly; this will also prevent the placement of a soil cover and subsequent revegetation of the pit area for some time
- In general terms, the cost associated with the activities outlined above would make mining the Berry pit uneconomical

The Berry, Marathon and Leprechaun pits will be mined simultaneously and will be exhausted within several years of each other. There will be an opportunity to backfill the exhausted northern basin of the Berry pit completely and central basin partially with waste rock from the southern basin of Berry pit and Marathon pit.

It is usually advantageous to use waste rock generated from the open pit to produce aggregates (rockfill, gravel, even sand) for the construction of the mine infrastructure, provided the waste rock is suitable from an engineering perspective and is not acid-generating or metal-leaching. The general effect of using waste rock for aggregates required for Project Expansion development includes a reduction in the volume of waste rock that must be otherwise disposed of, and a reduction in the requirement to quarry aggregates from an otherwise natural area that would not be impacted by the Project Expansion



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development. Economically, use of waste rock for aggregate is preferred as the material has already been stripped, drilled, blasted, and excavated; processes which comprise a good portion of the cost of aggregate production. There is no specific failure mechanism for this alternative unless the material were to be acid-generating or unsuitable from an engineering perspective, both of which are mitigated through proper testing programs.

Generation of aggregates for uses outside the Project Expansion can be considered where the rock is chemically stable and has desired engineering properties for other uses. There are many considerations that may affect the feasibility of this option, including the distance to market (transportation costs versus sale price of product), transportation emissions, end-use specifications (cost of crushing and screening), and others. The environmental implications for a mining project include a potential reduction in waste rock management costs (creation and management of piles, water management, rehabilitation), reduced footprint, reduced emissions (dust), and improved aesthetics. From a socio-economic perspective, this alternative is likely to create additional jobs; however, would also lead to a substantial increase in traffic on the local roads and highways, depending on the transportation route to market.

2.12.3.1 Summary

Table 2.17 summarizes the assessment of alternatives related to waste rock management. Marathon's selected options include on-land waste piles, in-pit backfilling, and use of waste rock for aggregate for site development. Most of the waste rock is expected to not be acid-generating and therefore, does not require special management that is not already considered in the Approved Project's ARD/ML Management Plan. The minor amounts of potentially acid generating waste rock will be managed within the pile or in the backfilled pit so that no ARD/ML issues develop. In-lake disposal is not considered by Marathon, primarily based on stakeholder engagement and regulatory considerations. Use of waste rock as aggregate for other projects will be considered.

Table 2.17 Summary of Project Expansion Alternatives Analysis – Waste Rock Management

Determining Factors	Options Considered				
	In-Lake Disposal	On-Land Piles	In-Pit	Aggregate for Project Expansion	Aggregate for Other
Technically Feasible (including regulatory factors)	Yes	Yes	Yes	Yes	Yes
Economically Feasible (including market factors)	Yes		Yes	Yes	Yes
Environmental Considerations	Changes to fish habitat would require <i>Fisheries Act</i> approvals	Contact water management is required; however, rock is mostly not PAG	Additional traffic, fuel combustion, and dust due to transportation	-	Additional traffic, fuel combustion, and dust due to transportation



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Table 2.17 Summary of Project Expansion Alternatives Analysis – Waste Rock Management

Determining Factors	Options Considered				
	In-Lake Disposal	On-Land Piles	In-Pit	Aggregate for Project Expansion	Aggregate for Other
Socio-economic Considerations	Stakeholders do not support	-	-	-	Additional job creation
Implications of Failure / Malfunctions of Option	-	-	-	-	-
Preferred Option – carried forward in the assessment	X	✓	✓	✓	X
					though could be pursued in the future if feasible

2.12.4 Waste Rock Pile Location

Marathon has considered the location and related factors to the design for the Berry waste rock pile to be developed for the Project Expansion. The key factors considered are summarized as follows:

- Sterilization of potentially economic ore – Marathon completed condemnation drilling at the waste rock pile location to determine if the development of the pile could sterilize potentially economic mineralization. Condemnation of any major site component area is a requirement of NLDIET during the post-EA permitting process; however, it is best practice to complete the work early in the design and EA to ensure that major site components do not need to be relocated later in these processes. Condemnation drilling indicates no significant mineralization within the principal footprint of the Berry waste rock pile. Some mineralization located along the southwest periphery of the planned waste rock pile will require additional evaluation.
- The distance from the pit to the waste rock pile is important to reduce haul truck travel distances. This is not only an economic consideration (operating costs); it is also a major factor in the overall footprint of the Project Expansion, fuel consumption and emissions from the haul trucks, and air quality (dust generation from truck travel and noise).
- Reducing impacts to surface water resources and water balance, as well as fish and fish habitat. These factors have been considered in selecting the location of the waste rock pile and have also contributed to the selected Project Expansion layout / footprint.
- Topography is an important contributor to the footprint / layout, slope stability, storage capacity, and aesthetics components of the waste rock pile design. Topography also influences the design of runoff effluent management.



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2.12.4.1 Summary

For the Berry waste rock pile, potential locations and configurations were considered in general proximity to the Berry open pit; however, based on consideration of the factors described above, there was effectively no acceptable or appropriate alternatives other than the location selected.

2.12.5 Overburden Materials Storage and Management

Overburden, including glacial till, topsoil and organic materials (peat), will be excavated during development of various Project Expansion features. In the open pit area, overburden materials must be removed in the pit area to access the bedrock (ore and waste) beneath; however, in other areas of infrastructure development (e.g., roads, waste rock pile) only the surficial topsoils and organic materials may need to be removed. Marathon will develop an accurate inventory of the overburden materials that are expected to be excavated and stockpiled at the site. Marathon will also develop a soils balance for the site, which will address the amount of overburden materials to be excavated, and the amount of overburden materials that will be required to complete progressive and closure rehabilitation of the site. For a project of this size, it is expected that stockpiled overburden materials will be used in rehabilitation activities and, in order to have sufficient overburden materials for rehabilitation, materials often need to be excavated that would not otherwise be required to be moved for engineering and site development purposes.

There are no true alternatives to stockpiling overburden materials when regulations and best practices are considered, unless there are sufficient overburden materials beyond those required for both progressive and closure rehabilitation. This is only likely to be in the case of non-organic overburden materials like glacial till. In NL, the requirement to salvage overburden materials is dictated in the rehabilitation and closure guidelines to the NL *Mining Act*. In consideration of these requirements and incorporating best management practices, overburden materials storage and management generally results in the following:

- Development of a soils mass balance (part of an overarching Soil and Rock Management Plan contained within the RCP), which will identify how much and when overburden materials will be produced during development of the site components, and how much and when material will be required for rehabilitation, which will in turn determine stockpile volume requirements during the life of mine.
- The locations for stockpiling overburden are generally based on the volumes to be stored, while attempting to keep the stockpiles as close to the areas where these materials will eventually be required for rehabilitation. Keeping the stockpiles in proximity to their final use location reduces adverse environmental effects from equipment usage for loading, hauling, and placement for rehabilitation. The stockpile location selection also considers 'standard' environmental issues such as avoiding fish and fish habitat, reducing footprint, and contact water management.
- The soils mass balance / management plan will also consider stockpiling overburden materials within the future footprint of a mine component that will expand with time (secondary locations). For example, development of the open pits, waste rock piles, and tailings impoundment will be limited to



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begin, leaving substantial future footprint area for temporary storage of overburden materials that will be used in progressive rehabilitation and that will be moved prior to the mine component expanding into that footprint. This reduces the overall footprint, while also reducing adverse environmental effects.

- Regulatory guidelines and best practices require that water contacting the overburden materials stockpiles be captured and managed prior to release. It is also necessary to provide cover to the surface of the stockpile to reduce soil loss and dust generation. Temporary covers may include seeding or artificial covers, which also aid in maintaining water quality by reducing erosion.
- With proper planning, it is possible to avoid double handling (excavation, stockpiling, re-excavation) for some rehabilitation activities by taking overburden materials from the expansion of a mine component (e.g., a raise of the tailings dam) and placing these directly on an area being progressively rehabilitated (e.g., an early bench on a waste rock pile).
- Some overburden materials may be used in construction if suitable, and this should also be considered in the soil management plan. For example, glacial till material may be incorporated into the tailings dam design and may be used in the development of building and equipment pads.

For the Project Expansion, Marathon selected two potential options: locating an overburden stockpile adjacent to the Berry pit and waste rock pile or enlarging an overburden stockpile that is part of the Approved Project. The Berry pit will generate surplus overburden materials that will require longer term storage, and these materials are expected to be reused for later progressive and final rehabilitation of the waste rock piles. Overburden stockpiles are sized to contain the overburden produced from the open pit over the full life of the pit, without reductions for use in progressive rehabilitation activities, temporary stockpiles in future development footprint, or use in construction. Other overburden materials excavated for site development are expected to be stockpiled in future development footprint areas, windrowed adjacent to the infrastructure (e.g., site roads) or reused in progressive rehabilitation.

2.12.5.1 Summary

Developing stockpiles for overburden materials, including glacial till, topsoil and organic materials, is not considered an optional component of the Project Expansion. There are a number of options with respect to how these materials are stockpiled around the site, and Marathon will employ the available options to reduce the overall Project Expansion footprint and rehandling of these overburden materials, generally reduce environmental effects, and enhance the reuse of overburden materials in site rehabilitation. The locations of the primary stockpiles have been selected to avoid waterbodies, fish and fish habitat, and wetlands, and to be in close proximity of excavation (the pit) and of where these materials will be primarily used for rehabilitation (the waste rock pile). Environmentally, alternate locations may increase haulage distance (costs, fuel consumption, and emissions) and could adversely affect other environmental features such as wetlands and fish habitat. It is noted again that the size (footprint) and location of the primary and secondary storage areas will continue to be evaluated and optimized throughout the planning and engineering stages, and as part of the RCP. Table 2.18 summarizes the assessment of alternatives related to overburden stockpile management.



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Table 2.18 Summary of Project Expansion Alternatives Analysis – Overburden Stockpile Management

Determining Factors	Options Considered			
	Existing Stockpiles	Secondary Storage (windrows)	Primary Stockpiles Located Adjacent to Pit / Waste Rock Piles	Primary Stockpiles Located Elsewhere
Technically Feasible (including regulatory factors)	Yes	Yes	Yes	Yes
Economically Feasible (including market factors)	Yes	Yes	Yes	May not be depending on location
Environmental Considerations	-	-	-	-
Socio-economic Considerations	-	-	-	-
Implications of Failure / Malfunctions of Option	-	-	-	-
Preferred Option – carried forward in the assessment	✓	✓	✓	✗

2.12.6 Tailings Management and Disposal Alternatives

The Valentine Gold EIS discussed several methods for tailings disposal including offshore disposal, disposal in a waterbody, co-disposal with waste rock, and dry stacking. The two in-water disposal options were not considered options for the Approved Project based on technical feasibility, and environmental and potential public opposition. Co-disposal with waste rock and dry stacking were assessed in the Valentine Gold EIS, and both were deemed not technically feasible due primarily to climate conditions and regulatory considerations. Since these two options were deemed not feasible for the Approved Project, they were not considered in this alternatives assessment. The two options considered are outlined below.

2.12.6.1 Tailings Impoundment

Deposition of tailings within an engineered impoundment is the most common disposal method. A TMF was fully assessed as part of the Valentine Gold EIS for the Approved Project. Disposing of Berry pit tailings into the approved tailings impoundment will not require any changes or modification to the tailings impoundment nor will it affect the risk of a tailings dam failure. As there is capacity within the tailings impoundment to accommodate Berry pit tailings for the first nine years of operation, this represents the most technically, economically and environmentally favourable option for tailings disposal, as it does not require the construction of any additional tailings disposal infrastructure.



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2.12.6.2 In-Pit Disposal

Depositing tailings in an exhausted open pit is a safe and stable method of tailings disposal, particularly if tailings are PAG. Technical considerations include the need to have an exhausted pit available for disposal, potential contamination of groundwater resources surrounding the pit, potential need for a permanent water cover over the tailings (e.g., in the event the tailings are acid-generating), and designing for rehabilitation (exposed high-walls, ingress / egress requirements, barricades and signage, and slope stability). From economic, regulatory, and environmental perspectives, this alternative is generally preferred over other options. Failures or malfunctions in terms of the storage / containment of tailings are limited.

The Approved Project planned for tailings to be deposited in the exhausted Leprechaun pit starting in Year 10. As part of the Project Expansion, it is proposed that tailings will be pumped to a mined-out basin of the Berry pit beginning in Year 10, instead of to the Leprechaun pit. While in-pit disposal in both the Leprechaun pit and Berry pit is considered economically and technically feasible, the Berry pit is closer to the process plant, therefore provides reduced piping distance compared to the Leprechaun pit.

2.12.6.3 Summary

Based on infrastructure available as part of the Approved Project (i.e., an approved tailings impoundment), disposal of Berry pit tailings (thickened tailings deposition, as for the Approved Project) in the approved tailings impoundment is considered the most economically, technically, and environmentally favourable option for tailings management for the first nine years of operation.

Based on the current mine plan, the southern basin of the Berry pit will be exhausted in Year 9 of operation and a new tailings pipeline will be constructed to the Berry pit for tailings delivery, which will also aid in filling the open pit for closure. In the Valentine Gold EIS in-pit disposal was planned for the Leprechaun Pit and the switch to the Berry pit for disposal will still be advantageous for tailings disposal. As indicated in Section 2.12.6.2, use of the Berry pit will allow tailings to be piped a shorter distance.

2.12.7 Process Water Management

Marathon's team has evaluated the process water treatment system design generally and, with respect to the most recent regulatory requirements, specifically ammonia (GOC 2023). As a result, Marathon is replacing the polishing pond (a component of the Approved Project) with a SAGR® unit, which provides further treatment of ammonia.

A polishing pond is often included in the tailings water management design as a secondary pond to allow further attenuation and settlement of solids prior to release to the environment either in batch or continuous release. Prior to submission of this document, Marathon considered options for improving water treatment for nitrogen species and arrived at a better treatment alternative, by way of the SAGR® unit. Suspended solids and metals are reduced to non-toxic levels by a metals precipitation / filtration process (water treatment plant) prior to treatment via the SAGR®. The suspended solids concentration into the SAGR® is expected to be <5 mg/l on average and no more than 25 mg/l. Metals will be reduced





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to final discharge levels by the metals precipitation / filtration process. The compounds entering the SAGR® are primarily bioavailable nitrogen species such as thiocyanate, cyanate and ammonia. Biomass in the SAGR® oxidizes these compounds and reduces overall ammonia to non-toxic levels. Excess biomass created as a byproduct of ammonia detoxification in the SAGR® is aerobically digested within the SAGR®. SAGR® discharge is therefore low in suspended solids, metals, thiocyanate, cyanate, ammonia and bacteria.

Table 2.19 summarizes the assessment of alternatives related to additional process water management.

Table 2.19 Summary of Project Expansion Alternatives Analysis – Process Water Treatment Options

Determining Factors	Options Considered	
	Polishing Pond	SAGR Unit
Technically Feasible (including regulatory factors)	Yes	Yes
Economically Feasible (including market factors)	Yes	Yes
Environmental Considerations	Larger footprint, may not adequately address ammonia	Smaller footprint, improved treatment of nitrogen species
Socio-economic Considerations	-	-
Implications of Failure / Malfunctions of Option	Poor or non-compliant discharge	-
Preferred Option – carried forward in the assessment		

2.12.8 Locations of Effluent Final Discharge Points

As described in the Valentine Gold EIS, numerous factors are considered in the selection and establishment of FDPs, including the size of the site, number and spacing of mine site components, downstream impacts (water flow and fish habitat), topography, predicted water chemistry, and other site features. For the Project Expansion, the local topography and the distinct various water management complexes across the Project Area have resulted in the selection of five FDPs, as described in Chapter 8 (Surface Water Resources VC) of this document and the updated Water Management Plan (Appendix 2A).

As discussed in the Valentine Gold EIS, the alternatives to the selection of numerous FDPs would be to use pumps and pipelines to consolidate effluent discharge points into fewer discharge points, or ultimately to a single effluent discharge point. The alternative of reducing the number of discharge points is assessed as follows:

- It is considered technically feasible, using pumps and pipelines, to move effluent across the distances and elevations required to consolidate into one or several points for final discharge. It would likely result in a relatively small increase in site footprint to accommodate pipeline routes and associated service roads (where other roads cannot be followed).



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- Economically it would be considerably more expensive to purchase, install, operate and maintain the network of pumps and pipes required to reduce the number of final effluent discharge points, and the fewer points, the more expensive. Further, no active water treatment of effluent discharges is currently anticipated other than the effluent at the tailings impoundment; however, if FDPs were combined (i.e., with tailings effluent), the water treatment plant capacity would need to be increased.
- From a regulatory perspective there would be a reduction in the number of water sampling locations, which in turn would result in a modest cost reduction (collection, testing and reporting costs).
- The most important environmental consideration is expected to be the disruption caused to the water balance of the sub-watersheds and the removal of drainage (flow) to downstream fish habitat. Potential alternatives to maintaining water supply to fish habitat if the number of FDPs were to be reduced include pumping water upstream from Valentine Lake or Victoria Lake Reservoir or using groundwater wells (pumped) to replace the water (effluent) diverted from these sub-watersheds and associated waterbodies. Another potential environmental consideration is the concentrated release of effluent from a smaller number of (or single point) discharge(s), which would result in less natural dilution of constituents that may be present, even if within regulatory limits.
- Failure or malfunction considerations include an increased number of pumps and pipelines, resulting in an increased risk of malfunction or failure, which in turn may result in erosion due to overland water flow and uncontrolled release of effluent that may exceed suspended solids criteria.

2.12.8.1 Summary

Table 2.20 summarizes the assessment of alternatives related to effluent discharge points. While multiple FDPs is the preferred option, the downstream area from the Berry waste rock pile is long and relatively flat, where it will be challenging to maintain gravity flow in ditches and buffers between Valentine Lake and the sedimentation ponds. Through advanced engineering, Marathon will continue to evaluate options to pump contact water where it makes sense for this Project Expansion component.

Table 2.20 Summary of Project Expansion Alternatives Analysis – Effluent Discharge Points



Determining Factors	Options Considered	
	Multiple Discharge Points	Reduced Number or Single Discharge Point
Technically Feasible (including regulatory factors)	Yes	Yes
Economically Feasible (including market factors)	Yes, increased capital costs for multiple ditching and management ponds plus increased sampling requirements	Yes, typically lower capital costs, however higher operating costs for pumping to centralize treatment and discharge
Environmental Considerations	Better to maintain small watershed balances and areas of fish habitat	Requires more assimilative capacity at discharge, disrupts small watershed balances
Socio-economic Considerations	-	-



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Table 2.20 Summary of Project Expansion Alternatives Analysis – Effluent Discharge Points

Determining Factors	Options Considered	
	Multiple Discharge Points	Reduced Number or Single Discharge Point
Implications of Failure / Malfunctions of Option	-	Increased number of pumps and pipeline increase potential for mechanical / pipeline malfunction or failure
Preferred Option – carried forward in the assessment		

2.12.9 Labour Supply

The latest Feasibility Study (Ausenco 2022), which addresses both the Approved Project and the Project Expansion, contemplates labour sourced primarily from NL, specifically the central region. Marathon considers the potential availability of labour with pre-existing experience in heavy equipment operation, environmental monitoring, mineral processing, equipment maintenance, geology and engineering, administration, and logistics to be a specific commercial advantage for the Project Expansion. This is based on Marathon’s surveys of regional contractor capacities, and the quality and quantity of resumes already received from prospective employees within the region. Alternate strategies that contemplated sourcing a workforce outside of the province or region would have a negative impact on the Project Expansion economically and in terms of its social acceptability.

It is possible that certain specialized roles, in particular in geology or mining engineering or mineral processing, will be sourced from outside the province based on the availability of suitable candidates within NL with those specific skillsets. However, hiring priority will be given to residents of NL and, specifically, residents in the closest communities. Following approval of the Approved Project, Marathon has established human resources practices aimed at the recruitment and retention of a skilled workforce for the duration of the combined Projects.

Human resources risk is a major concern of the Canadian mining industry. The inability to attract and retain skilled employees in often remote mining locations leads to operational inefficiencies; environmental, health and safety risk; production shortfalls; and cost escalation. These are amongst the risks that Marathon may also experience should it not be able to source a workforce with adequate skills and experience from the region. Again, Marathon considers the potential availability of this workforce in central NL to be a specific commercial strength and is not contemplating an alternate workforce strategy.

2.12.9.1 Summary

Table 2.21 summarizes the assessment of alternatives related to labour supply.



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Table 2.21 Summary of Project Expansion Alternatives Analysis – Labour Supply

Determining Factors	Options Considered	
	Local, Regional, Provincial Hiring Preferences	No Hiring Preferences
Technically Feasible (including regulatory factors)	Yes	Yes
Economically Feasible (including market factors)	Yes	Yes
Environmental Considerations	-	-
Socio-economic Considerations	Preference for local hiring	-
Implications of Failure / Malfunctions of Option	-	-
Preferred Option – carried forward in the assessment	✓	✗

2.12.10 Rehabilitation Methods

Rehabilitation and closure of a mining operation is required under the NL *Mining Act*, and the requirements for rehabilitation of a mining project are administered by the NLDIET’s Mineral Development Division. Rehabilitation and closure are also subject to regulatory review by potentially interested provincial and federal departments. Marathon has submitted a Rehabilitation and Closure Plan (RCP) , which will be updated as required to incorporate the Project Expansion. An updated rehabilitation and closure cost will be estimated and posted by Marathon as Financial Assurance. This Financial Assurance is insurance held by the provincial government for the purpose of rehabilitating the mine site in the event that Marathon defaults on the combined Projects (e.g., declares bankruptcy).

As described in the Valentine Gold EIS, the following sections present rehabilitation alternatives considered for the various Project Expansion components. Rehabilitation techniques are continually evolving, therefore the techniques and alternatives considered and presented in this document may change with time. This aligns with the guidance provided by NLDIET, Mineral Development Division, in that an RCP is not considered “final” until approximately 6 to 12 months prior to cessation of mining. This allows the final project rehabilitation requirements to be fully understood and facilitates consideration of the latest rehabilitation techniques.

It is also important to note that there is no “alternative” to completing progressive rehabilitation. The NL *Mining Act* and associated guidelines outline the requirement to plan for and complete progressive rehabilitation of mining projects, to the extent feasible.

2.12.10.1 Open Pit Rehabilitation

Open pit excavations can be rehabilitated using several techniques:

- Allowing the pit to flood with water (flooding)
- Backfill the pit using waste rock excavated from the pit, or from another open pit
- Use the pit for tailings storage



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These alternatives have been considered for the Project Expansion, and the following describes the considerations in selecting the preferred option. Note that a factor in the decision or regulatory approval to backfill an open pit is the potential for exploitable resource beneath the open pit. NLDIET considers mineral resources, even if not economical at a given point in time, to be of potential value as technologies and markets change with time. However, if condemnation drilling has clearly defined a lack of exploitable resource beneath an exhausted open pit, then a 'permanent' form of pit rehabilitation such as backfilling with waste rock may be preferred.

Flooding

Allowing the open pit to flood (fill) with water is the most common method of rehabilitation for larger open pits. Technical considerations may include the length of time it could take to fill the open pit naturally via groundwater, surface water, and precipitation inflows; the presence of highwalls (exposed slopes remaining above the flooded water level); and ingress / egress requirements for animals or people that may enter the flooded pit.

Economic considerations include the cost associated with creating the ingress / egress area(s), barriers and signage addressing the approach to highwall areas from above the pit crest, and pumping water to flood the pit (if the natural inflow sources will take considerable time to flood the pit volume).

The treatment of highwalls (stability), barriers and signage, as well as ingress / egress requirements are addressed in the NL *Mining Act* guidelines. Environmental considerations are generally specific to the site and open pit being considered. As the Berry open pit wall rock is not currently expected to generate ARD / ML drainage from water accumulating in the pit, discharge location and downstream connection are expected to be the primary environmental considerations. Steep slopes and waterbodies of this size and depth are common in the general area of the Project Expansion and therefore animals (such as caribou or moose) are expected to move around these features.

The most important failure or malfunction may be a pit slope failure above the flooded level of the pit, which would reduce the slope angle and likely remove the barricade and signage from this area, creating an additional physical hazard.

Backfilling with Waste Rock

Backfilling of large open pits is not a common rehabilitation method. Generally, waste rock is piled near the pit and, in NL, it is a requirement to make efforts to progressively rehabilitate the exposed waste rock pile. Should, at the end of the life of the pit, the waste rock material be re-excavated to fill the exhausted open pit, the following would result:

- A nearly equal number of years of equipment operations (fuel consumption, vehicle emissions, dust, and employment) to return the waste rock to the same open pit
- Approximately 70 to 80% of the waste rock material would fill the pit due to bulking; therefore, 20 to 30% of the waste rock would remain within the waste rock pile location and would need to be covered with overburden and revegetated



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- Once the pit was filled, it would reduce the risk of slope failures on highwalls as they would be better supported by the weight of the waste rock material
- Backfill of 300 m vertical depth of the open pit would be slow, however, 'creep' settlement of the waste rock backfill in the pit would continue for some time after it is originally filled and would require long-term maintenance to 'top up' the fill in the pit as it would also likely settle unevenly; this would also prevent the placement of a soil cover and subsequent revegetation of the pit area for some time
- In general terms, the cost associated with completely backfilling an open pit with waste rock would make the Project uneconomical
- The most economical and environmentally acceptable option to backfill an open pit occurs when a second pit is developed nearby and the waste rock from the second pit is placed in the exhausted open pit. In Marathon's case, the three open pits (Marathon, Leprechaun and Berry) will be mined generally over a similar time frame. However, the Berry pit will see three separate basins mined and, as the northern and central basins are exhausted, there will be an opportunity to dispose of some Berry pit and Marathon waste rock from the latter mining benches in the northern and central basins of the Berry pit. Marathon will exploit this opportunity to the fullest as engineering and mine planning proceeds

Backfilling with Tailings

Depositing tailings in an exhausted open pit is a safe method of tailings disposal, particularly if tailings are PAG. There are two mechanisms that can be considered for this alternative: an exhausted open pit is used to deposit tailings as part of the operational plan; or tailings are excavated from within the tailings impoundment and deposited within an exhausted pit at the end of the mine life.

The first alternative is typically a good solution for tailings disposal, provided an exhausted open pit or basin is available for this purpose during the operational life of the mine. Technical considerations include potential contamination of groundwater resources surrounding the pit, the need for a permanent water cover over the tailings (e.g., in the event the tailings are PAG), and that the final form of the rehabilitation will be similar to the physical conditions and long-term risks associated with flooding of the pit (exposed high-walls, ingress / egress requirements, barricades and signage, and slope stability). From an economics, regulatory, and environmental perspective, this alternative is generally preferred over other options.

The second alternative is synonymous with backfilling with waste rock post-mining. It would require years of equipment operation to move the tailings to the pit, which will in turn create adverse environmental effects, noting that there is a substantial long-term environmental benefit where permanent dams would otherwise need to be maintained to store the tailings at surface, especially if PAG. Unless the tailings can be safely stacked above the lowest elevation of the pit crest, the final form of the rehabilitation is likely to have similar physical conditions and long-term risks associated with flooding of the pit (exposed high-walls, ingress / egress requirements, barricades and signage, and slope stability). Economically, this alternative would carry a very high cost due to the material handling costs associated with rehandling the tailings.



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Summary

Table 2.22 summarizes the assessment of alternatives related to rehabilitation methods for the open pit. Marathon’s current plan to rehabilitate the basins of the Berry pit is to completely backfill the northern basin to the same crest elevation as the Berry waste rock pile, partially backfill the central basin with waste rock, and use the southern basin for tailings storage. In addition, the central and southern basins will be allowed to flood, ingress / egress areas will be created, the pit slopes will be designed for appropriate factors of safety for long term stability, and barricades and signage will be placed along remaining highwalls. Marathon plans to partially backfill the southern basin of the Berry pit with tailings once the pit is exhausted in Year 9; however, this will only fill a portion of the basin and therefore the remaining volume of the pit will be flooded.

Table 2.22 Summary of Project Expansion Alternatives Analysis – Open Pit Rehabilitation Methods

Determining Factors	Options Considered		
	Flooding	Backfilling with Waste Rock	Backfilling with Tailings
Technically Feasible (including regulatory factors)	Yes	Yes	Yes
Economically Feasible (including market factors)	Yes	Yes	Yes – for a portion of the Berry pit (once the southern basin is exhausted)
Environmental Considerations	Ingress/egress areas will be incorporated into the design	Ingress/egress areas will be incorporated into the design as appropriate	Ingress/egress areas will be incorporated into the design as appropriate
Socio-economic Considerations	-	-	-
Implications of Failure / Malfunctions of Option	-	Very low	Very low
Preferred Option – carried forward in the assessment	✓	✓	✓

2.12.10.2 Waste Rock Pile Rehabilitation

As described in Section 2.11.1.3 of this document relative to the management of waste rock, Marathon has determined that a combination of an on-land waste rock pile and in-pit disposal are the best options for the Project Expansion. Rehabilitation alternatives for the waste rock pile have been considered as follows:

- Disposal in-pit during the operation phase
- Progressive and closure rehabilitation via cover and revegetation in-place



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The considerations regarding in-pit disposal once the Berry open pit is exhausted are outlined in the previous section regarding open pit rehabilitation and not repeated herein. For the Project Expansion, this is a technically and economically viable solution.

Progressive and final (closure) rehabilitation through revegetation in-place is a common rehabilitation method in modern mining practice. BMPs require that the pre-development design of the waste rock pile addresses key rehabilitation considerations, including stable slopes for application of overburden and revegetation, benching for access and breaks in the slope, and footprint and geometry related to post-closure aesthetics and surface water runoff.

As provincial regulations require the revegetation of mine site components where feasible, there are no other alternatives to consider for an on-land pile. Specific alternatives may be considered in terms of the application of organics / topsoil / overburden as cover and growth medium for the revegetation process, and the species type and variety of plants to use in the revegetation process. These considerations will be addressed during revegetation trials conducted during the operation phase as progressive rehabilitation takes place, and in consultation with the appropriate regulators.

Summary

For the Project Expansion, Marathon has selected in-pit waste rock disposal and rehabilitation in-place as the preferred rehabilitation methods for waste rock rehabilitation. These two options are technically and economically feasible. Table 2.23 summarizes the assessment of waste rock pile rehabilitation alternatives.

Table 2.23 Summary of Project Expansion Alternatives Analysis – Waste Rock Pile Rehabilitation

Determining Factors	Options Considered	
	Disposal of Waste Rock to Pit	Rehabilitate In-Place
Technically Feasible (including regulatory factors)	Yes	Yes
Economically Feasible (including market factors)	Yes – Partial or complete backfilling of exhausted central and northern basins of the Berry pit is economically feasible	Yes
Environmental Considerations	Smaller overall waste rock pile footprint	-
Socio-economic Considerations	Lower health and safety risks, increased employment	-
Implications of Failure / Malfunctions of Option	-	-
Preferred Option – carried forward in the assessment	✓	✓

2.12.10.3 Overburden and Organic Stockpile Rehabilitation

Overburden and organic stockpiles will be used for progressive and final rehabilitation of the mine components. A materials balance will be completed as part of the formal RCP, which will consider



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materials movement and storage requirements over the life of the mine and the volume of overburden and organic soil requirements for rehabilitation. It is generally expected that the materials in the overburden and organic soils stockpile will be used for rehabilitation and therefore these stockpiles will not exist once closure activities are complete. The disturbed footprint left by the stockpile will be contoured, scarified and revegetated once the stockpile is depleted. There are no rehabilitation alternatives considered for these components of the Project Expansion.

2.12.10.4 Low-Grade Ore Stockpile Rehabilitation

The Berry and Marathon pits will share an LGO stockpile, to be located in the same footprint as previously assessed for the Approved Project for the Marathon pit LGO stockpile. Alternatives for rehabilitation consider the following:

- The stockpile will be depleted once the ore is processed at the mill, leaving only the rockfill pad
- LGO may be left on site in a scenario where a drop in gold prices makes ore processing uneconomical

Assuming the ore stockpile is depleted, the rockfill pad will be recontoured to blend to the surrounding terrain, covered with overburden / organics, and revegetated. There are no alternatives considered for this rehabilitation approach when the stockpile is depleted.

Should the stockpile not be depleted, there are alternatives that may be considered. NLDIET requires that the RCP consider closure concepts based on this case and include sufficient closure costs in the estimate for this conservative case. The alternatives that are generally considered in the case where a stockpile is not depleted are as follows:

- The ore is moved to a waste rock pile or to the exhausted open pit, and the remaining pad is rehabilitated as described above
- The ore is left in place and covered with overburden / organics and revegetated

Both options are technically feasible, and the selection of the preferred option is likely to be based on economic and environmental factors. If the ore materials are not PAG, there are no substantive adverse environmental considerations for either option. However, if the ore materials are PAG, to leave the ore in place would require a more robust cover (likely a geosynthetic liner) prior to the soil cover and revegetation, to mitigate potential ARD / ML issues. For either scenario, leaving the ore in place would likely require contouring and expansion of the stockpile footprint, as design slopes for temporary stockpiles are typically steeper than for permanent material piles. Cover installation, revegetation and other works are costly and would usually be weighed against the cost of moving the material to a waste rock pile or open pit. In the case of PAG materials, the best option in terms of long-term ARD / ML mitigation is usually to move the material to an exhausted open pit, where it would be permanently covered by water (flooded).

Approximately 40% of LGO is estimated to be PAG, however, because of the currently planned short duration of the LGO stockpile (i.e., the plan to mill the stockpiled material), no mitigation is currently recommended for the LGO stockpile, with the exception of the collection of contact water prior to



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discharge. To reduce ARD/ML risks, non-PAG LGO will be preferentially stockpiled, while PAG LGO will be directed to the mill feed as soon as practicable, as long as the grade requirement for the mill feed is met.

As indicated above, the potential need for long-term ARD / ML mitigation will be factored into the updated RCP in the event that the stockpile is not depleted.

Summary

Table 2.24 summarizes the assessment of alternatives related to rehabilitation methods for the shared Berry / Marathon LGO stockpile. Marathon's current plan is to mill the stockpiled material and complete the simple rehabilitation of the pad as described above. Per NLDIET's requirements, the formal RCP will assume the most conservative approach for the LGO stockpiles, in the event the material is not milled.

Table 2.24 Summary of Project Expansion Alternatives Analysis – Low-Grade Ore Stockpile Rehabilitation Methods

Determining Factors	Options Considered		
	Material Relocated	Rehabilitated In Place	Mill Ore and Rehabilitate
Technically Feasible (including regulatory factors)	Yes	Yes	Yes
Economically Feasible (including market factors)	Depends on volume of material left on stockpile	Yes	Yes
Environmental Considerations	Preferable when LGO is PAG	Largest rehab footprint	Reduces rehab footprint
Socio-economic Considerations	Potentially shorter mill life	Potentially shorter mill life	Longer mill life (employment)
Implications of Failure / Malfunctions of Option	-	-	-
Preferred Option – carried forward in the assessment			

2.12.10.5 Site Roads

The haulage road and site roads will be decommissioned across the site upon cessation of mining as part of the closure rehabilitation activities. The exception is that some roads will be left in place for the purpose of conducting post-closure monitoring and maintenance. At the conclusion of the post-closure monitoring period, Marathon will consult with the appropriate regulators (e.g., NLDIET and NLDECC) to determine if these roads are to be rehabilitated or left as-is.

The method of rehabilitating the site roads includes removal of culverts and recontouring the roadbed materials to align with the adjacent topography. The disturbed ground is then covered with overburden materials, where required, and revegetated. There are no alternatives considered for the rehabilitation of site roads.



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2.12.10.6 Revegetation Alternatives

Many of the rehabilitation alternatives discussed above involve the eventual revegetation of the component or area. Revegetation has traditionally involved placement of overburden to create sufficient growth medium to allow 'temporary' revegetation using grasses to limit erosion and dust lift-off, and to allow subsequent natural revegetation of the area. As mine rehabilitation techniques evolve, improved methods incorporate natural aesthetics and the re-introduction of native plant species to achieve results that are much closer to the pre-existing conditions at a much earlier stage post-closure.

Marathon has not completed study work at this time to determine which alternatives may be best suited to the eventual progressive rehabilitation of the Project Area. Marathon is committed to working with regulators, Indigenous groups, and stakeholders to consider revegetation alternatives that can be practically applied to the rehabilitation of the Project Area. Marathon will commence revegetation trials early in the operational life of the mine as areas are identified for progressive rehabilitation, and consultation, research and application during vegetation trials may consider alternatives such as:

- Using seeds from native plant and tree species in direct revegetation
- Transplanting native plant and tree species to rehabilitation areas
- Use of plant and tree islands to promote natural revegetation
- Use of terrain cover options (rock outcrops, boulder piles or fields) and creation or recreation of small ponds, streams and/or wetlands
- Determining scales for potential use of the alternatives above to enhance the rehabilitation methods and benefits for natural elements, including wildlife

2.12.11 Summary of Alternative Means Analysis

Table 2.25 presents a summary of the alternatives means analysis provided in Section 2.12 and identifies the alternatives that have been carried forward for assessment in this Environmental Registration / EA Update.



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Table 2.25 Summary of Alternative Means Analysis for the Project Expansion

Options Considered	Summary of Alternative Analysis	Alternatives Assessed in EA Update / EA Registration
Mining Methods (Section 2.12.1)		
<ul style="list-style-type: none"> • Placer Mining • In-Situ Mining • Open Pit • Underground 	Placer, in-situ and underground mining are not technically feasible mining methods for the Berry pit. Open pit mining is a common mining technique and the preferred method where sufficient mineral resource is available relatively close to the ground surface.	<ul style="list-style-type: none"> • Open Pit
Pit Dewatering (2.12.2)		
<ul style="list-style-type: none"> • In-Pit Pumping • Ex-Pit Pumping • Exclusion Methods 	While ex-pit pumping and exclusion methods are technically and economically feasible, they are not required as the rock is not highly fractured, groundwater inflows will be low, and pressures associated with pit slope stability are sufficiently low that in-pit dewatering is suitable.	<ul style="list-style-type: none"> • In-Pit Pumping
Waste Rock Management (Section 2.12.3)		
<ul style="list-style-type: none"> • In-Lake Disposal • On-Land Piles • In-Pit Disposal • Aggregate for Project • Aggregate for Other 	<p>Disposal in a natural waterbody is technically and potentially economically feasible. However, from a regulatory and stakeholder perspective, it is not considered favourable relative to an on-land pile.</p> <p>In-pit disposal is technically and economically feasible in a scenario where the Berry pit is mined simultaneously as the Marathon and Leprechaun pits since the Berry pit will be mined in three phases, creating mined out basins starting in 2031 of the LOM. Waste rock from Berry pit will be disposed of in the mined-out central basin, and waste rock from the Marathon pit will be deposited in mined-out central and northern basins of the Berry pit. On-land waste piles and use of waste rock for aggregate for site development were selected as they are considered technically and economically feasible with management of environmental considerations (i.e., dust generation, aesthetics, contact water management) through proper design, planning for closure and progressive rehabilitation over the operational phase of the Project Expansion.</p>	<ul style="list-style-type: none"> • On-Land Pile • In-Pit Disposal • Aggregate for Project • Aggregate for Other (if feasible)
Waste Rock Pile Location (Section 2.12.4)		
<ul style="list-style-type: none"> • Area Northwest of the Pit 	No acceptable or appropriate alternatives to the area northwest of the Berry pit are available. Per criteria in Section 2.12.3.2, the area northwest of the Berry pit was selected as it does not hold economical mineralization potential; does not result in direct adverse effects to fish habitat and reduces effects on surface water generally; avoids placement of waste rock within the primary caribou migratory corridor; and	<ul style="list-style-type: none"> • Area northwest of the Berry pit



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Table 2.25 Summary of Alternative Means Analysis for the Project Expansion

Options Considered	Summary of Alternative Analysis	Alternatives Assessed in EA Update / EA Registration
	results in fewer emissions (fuel consumption) than other locations in feasible proximity.	
Overburden Material Storage and Management (2.12.5)		
<ul style="list-style-type: none"> • Primary Existing Stockpile • Secondary Storage (windrows, future Project footprint areas) • Primary Stockpiles Located Adjacent to Pits / Waste Rock Piles • Primary Stockpiles Located Elsewhere 	<p>Developing stockpiles for overburden materials, including glacial till, topsoil and organic materials is a required component of the Project Expansion. Overburden from the Project Expansion will be stored in the Marathon pit overburden stockpile. As the primary and existing stockpile, this location is located a relatively short distance from the planned Berry pit. Proximity ensures haulage distances and associated costs, fuel and emissions are reduced. Temporarily enlarging an existing overburden stockpile also allows Marathon to limit unnecessary expansion of the overall mine site.</p>	<ul style="list-style-type: none"> • Primary Existing Stockpiles
Tailings Management and Disposal Alternatives (Section 2.12.6)		
<ul style="list-style-type: none"> • Existing Engineered Tailings Impoundment • In-pit Disposal in Berry pit 	<p>An engineered tailings impoundment, approved and under construction for the Approved Project, will receive tailings generated from the Berry pit. In-pit tailings disposal is only possible when a mined-out basin or pit becomes available – which is the case once the southern basin of the Berry pit is mined-out. In 2034, in-pit disposal in the southern Berry basin will occur for the remainder of tailings generated over the LOM (i.e., ore from the Marathon and Leprechaun pits and LGO stockpiles).</p>	<ul style="list-style-type: none"> • No alternative considered
Process Water Management (Section 2.12.7)		
<ul style="list-style-type: none"> • Polishing Pond • SAGR Unit 	<p>As described in the Valentine Gold EIS, a polishing pond is an essential component of tailings management. A SAGR unit is a newer technology that is smaller, can operate in colder temperatures, and can more effectively remove ammonia, thereby expediting treatment and shortening retention time prior to release to the receiving environment.</p>	<ul style="list-style-type: none"> • SAGR Unit
Effluent Discharge Points (Section 2.12.8)		
<ul style="list-style-type: none"> • Multiple Discharge Points 	<p>Both single and multiple discharge points are technically and economically feasible; however, a single or reduced number of FDPs carries a higher operating cost,</p>	<ul style="list-style-type: none"> • Multiple Discharge Points



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Options Considered	Summary of Alternative Analysis	Alternatives Assessed in EA Update / EA Registration
<ul style="list-style-type: none"> Reduced Number or Single Discharge Point 	<p>disrupts small watershed balances, and requires an increased number of pumps and pipelines thereby increasing the potential for mechanical / pipeline malfunction or failure.</p> <p>Multiple FDPs may have increased capital costs; however, they result in less disruption to small watershed balances and areas of fish habitat. An updated Water Management Plan (Appendix 2A), and Project Expansion-specific surface and groundwater modelling confirm the appropriate assimilative capacity at the chosen discharge points, such that potential effects on watershed balances and fish habitat are limited and not significant.</p>	
Labour Supply (Section 2.12.9)		
<ul style="list-style-type: none"> Local, Regional, Provincial Hiring Preferences No Hiring Preferences 	<p>Marathon considers the potential availability of this workforce in central NL to be a specific commercial strength and is not contemplating an alternate workforce strategy.</p>	<ul style="list-style-type: none"> Local, Regional, Provincial Hiring Preferences
Open Pit Rehabilitation (Section 2.12.10.1)		
<ul style="list-style-type: none"> Backfilling with Waste Rock Backfilling with Tailings Natural or Accelerated Flooding 	<p>Backfilling with waste rock is technically and economically feasible for two basins of the Berry pit, the northern and central basins. Backfilling with tailings and flooding are also technically and economically feasible. Marathon's current plan for closure is to store tailings subaqueously in the southern basin. The pit would then be allowed to flood naturally. Other closure features include the creation of ingress and egress areas, designing and developing the pit slopes for appropriate factors of safety for long term stability, and placing barricades and signage along remaining highwalls.</p> <p>Given the technical and economic feasibility of waste rock and tailings deposition in the Berry pit during operations, Marathon does not consider accelerated pit flooding as necessary for closure. Natural filling of the pit post-tailings and waste rock deposition is desired and will occur within a relatively short period of time (i.e., 5-8 years).</p>	<ul style="list-style-type: none"> Backfilling with Waste rock Backfilling with Tailings Natural Flooding
Waste Rock Pile Rehabilitation (Section 2.12.10.2)		
<ul style="list-style-type: none"> Deposition of Waste Rock in Berry Pit 	<p>As the Berry pit will be mined in three phases, it will be technically and economically feasible to directly deposit a portion of waste rock from the Berry and Marathon open pits in the Berry pit. Beginning in 2031, waste rock from the Berry open pit will be</p>	<ul style="list-style-type: none"> Deposition of Waste Rock in Berry Pit Rehabilitate In-Place



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Options Considered	Summary of Alternative Analysis	Alternatives Assessed in EA Update / EA Registration
<ul style="list-style-type: none"> • Rehabilitate In-Place 	deposited in the mined-out central basin of Berry pit. Beginning in 2033, waste rock from Marathon pit will be deposited in the central and northern basins of the Berry open pit. This will result in a smaller footprint for the Berry waste rock pile.	
<p>Low-Grade Ore Stockpile Rehabilitation Methods (Section 2.12.10.4)</p>		
<ul style="list-style-type: none"> • Material Relocated • Rehabilitated In-Place • Mill Ore and Rehabilitate Pad 	Each option is considered technically and economically feasible. However, milling the ore and rehabilitating the pad increases the mill life, which also extends employment.	<ul style="list-style-type: none"> • Mill Ore and Rehabilitate Pad



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2.13 ADAPTIVE MANAGEMENT

Adaptive management is a planned and systematic process and intervention mechanism for continuously improving environmental management practices and adjusting monitoring by learning from outcomes. Adaptive management provides the flexibility to address/accommodate new circumstances, to adjust monitoring, implement new mitigation measures, or modify existing measures. The Project Expansion and the Approved Project will identify root causes of and correct incidents with appropriate measures and corrective actions, aimed to prevent reoccurrence and/or similar occurrences.

Marathon is committed to continuous improvement of its environmental management. Environmental management strategies will be regularly assessed to verify their continued suitability, adequacy and effectiveness.



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2.14 REFERENCES

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3.0 ENGAGEMENT

This chapter describes engagement initiatives related to the Berry Pit Expansion (Project Expansion) undertaken with Indigenous groups, communities, stakeholders, and government departments and agencies. It summarizes issues which were identified in relation to the Valentine Gold Project (Approved Project) and sets out questions, comments and concerns raised regarding the Project Expansion. It also indicates where and how these are addressed in this Environmental Registration / Environmental Assessment (EA) Update.

3.1 OVERVIEW OF ENGAGEMENT

Marathon is committed to conducting its activities within a sustainable development framework which reduces harm to the environment, contributes to local communities, respects human and Indigenous rights, and which is characterized by openness and transparency in all its dealings. One of the key principles of sustainable development is meaningful engagement with the individuals, communities, Indigenous groups, and stakeholders interested in or potentially affected by Marathon's activities, to build and maintain positive, long term, and mutually beneficial relationships.

Beginning in 2019, prior to the registration of the Approved Project for environmental assessment, Marathon developed and implemented an approach to engagement which is intended to build constructive relationships with communities, Indigenous groups, and potentially affected stakeholders in order to foster support for the Project; enhance stakeholder capacity; and assist Indigenous groups and stakeholders in understanding how Marathon's activities may affect them (both positively and negatively) and how Marathon will work to reduce adverse effects and maximize benefits appropriately. This approach to engagement has continued since the release of the Approved Project from environmental assessment and will apply throughout the life of the Project.

This approach incorporates the key elements of Marathon's *Indigenous Relations Policy* and *Community Relations Policy*:

- Open, honest, transparent, respectful dialogue with people and communities over the life of the Project
- Timely, ongoing transmission of relevant information
- Respect for input of Indigenous groups, and communities and other stakeholders
- Inclusive, culturally sensitive and appropriate methods of engagement
- Acknowledgement of, and responsiveness to, identified issues and concerns
- Integration of feedback from Indigenous groups, communities and stakeholders into project planning and design, the assessment of effects and the development and implementation of mitigations



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Marathon's engagement activities are primarily directed at the following individuals, groups and organizations which are potentially affected by the Approved Project and Project Expansion:

- Communities (the six communities in reasonable proximity to the Project) including local government institutions, residents, local businesses and schools as well as cabin owners and other potentially affected individuals
- Miawpukek First Nation (MFN) and Qalipu First Nation (Qalipu), including Chief and Council, executive staff, membership, business development associations
- Civil Society Organizations, including environmental non-government organizations (ENGOs)
- Fish and Wildlife Associations, including the Newfoundland and Labrador Outfitters Association (NLOA) and Salmonid Groups (Atlantic Salmon Federation (ASF), the Environment Resources Management Association (ERMA), Salmonid Association of Eastern Newfoundland (SAEN), Salmonid Council of Newfoundland (SCNL))

The method and frequency of engagement adopted by Marathon depends upon the level, interest and influence of the particular stakeholder, taking into account stakeholder capacity, needs and interests, barriers to engagement, required resources to enable meaningful stakeholder participation and prior history with development. In addition, Marathon has also concluded agreements with each of the six communities, both Indigenous groups, and the NLOA, each of which provides a framework for ongoing engagement. In all instances, whether pursuant to agreement or not, Marathon endeavours to implement engagement approaches that are tailored and responsive to diverse needs, including cultural preferences, and to employ a wide range of communication methods, including meetings (both in-person and virtual), e-mails, phone calls and written correspondence.

Marathon's approach to engagement with stakeholders has been developed consistent with its core corporate values and is based upon the timely and transparent sharing of all relevant Project related information, ongoing opportunities for dialogue, identification and responsiveness to issues and concerns and consideration of stakeholder input into Project planning and design. Stakeholder engagement activities are tracked using software and are described in internal monthly reports and summarized in quarterly presentations to the Board of Directors. In addition, stakeholder engagement is a component of Marathon's quarterly newsletter as well as the quarterly and annual reports to government required by the terms of the NL Benefits Agreement concluded with the province, and the annual Sustainability Report. Stakeholder engagement is monitored as part of the Environmental and Social Management System.

3.2 SUMMARY OF ISSUES RAISED DURING THE APPROVED PROJECT

Marathon's engagement efforts in relation to the EA of the Approved Project were fully described in Chapter 3 of the Valentine Gold Project Environmental Impact Statement (Valentine Gold EIS) (Marathon 2020) and the issues and concerns identified by communities, Indigenous groups and stakeholders were also fully documented in that chapter and, as relevant, in other specific chapters of the Valentine Gold EIS. Since the Project Expansion will take place largely within the Project Area assessed for the Approved Project and since the activities associated with the Project Expansion are effectively the same as those associated with the Approved Project, issues and concerns raised during the EA of the Approved Project may be relevant to the assessment of the Project Expansion. Additionally, given the



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similarity between Approved Project activities and Project Expansion activities, the assessment of predicted effects and related mitigation measures set out in the Valentine Gold EIS (Marathon 2020) will be relevant to the assessment of predicted effects and potential mitigation measures associated with the Project Expansion. The following sections summarize the engagement efforts and issues identified during the environmental assessment of the Approved Project by reference to Indigenous groups, communities and stakeholders.

3.2.1 Communities

Marathon has worked diligently with communities in the Central Region to build relationships, to ensure that communities and residents are informed of the Project and provided with an opportunity to express issues and concerns, and to reduce adverse effects and maximize benefits for local residents and businesses. Particular focus has been placed on the six communities closest to the proposed Project site: the Towns of Buchans, Millertown, Badger, Grand-Falls Windsor and Bishop's Falls and the Local Service District of Buchans Junction.

Marathon has concluded Community Cooperation Agreements with each of these communities and has actively engaged the communities through regular and ongoing communications (e-mails, conference calls, quarterly newsletters, social media, monthly meetings of community leaders) which are designed to inform the communities of Project-related developments, the progress of EA and future employment and contracting opportunities. As part of the EA of the Approved Project, Marathon also conducted both in-person and virtual public information sessions during 2019 and 2020 respecting the development of the Approved Project, which included an overview of potential effects and associated mitigation measures, and the EA process.

During the EA of the Approved Project, the following principal issues were identified by the communities (at both in-person and virtual meetings):

1. Issues related to potential bio-physical effects
 - a. Air quality – dust, including dust from tailings
 - b. Water quality – potential impact of Approved Project activities upon nearby waterbodies; potential contamination resulting from use of cyanide; treatment of effluent
 - c. Wildlife – impact on caribou; impact on moose and land use
 - d. Acid rock drainage and potential metal leaching
 - e. Potential impacts from tailings, including impact on water bodies in the event of a tailings breach
 - f. Rehabilitation and Closure – use of waste rock and overburden; potential long-term effects of Approved Project on fish and wildlife and downstream impacts on tourism; disposition of tailings pond after mine closure
 - g. Fish and Fish Habitat – potential for dam breach; contamination of fish habitat



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2. Issues related to potential socio-economic effects:
 - a. Impact on Local Infrastructure – medical services, housing, schools, roads
 - b. Employment and training – local preferences, workforce size, workplace conditions and salaries; life of mine; on the job training and mentorship opportunities; employment qualifications
 - c. Procurement – opportunities for local businesses
 - d. Engagement – need for continuing engagement with communities

Additional issues raised by communities related to Marathon’s corporate structure, anticipated future exploration activities, Project schedule and financing, and the impact of COVID-19 upon the Approved Project schedule. Issues were considered and were fully addressed by Marathon (see Chapter 3 Valentine Gold EIS, Sections 3.5.2.2. and 3.5.2.3 and Tables 3.4 – 3.10 [Marathon 2020]) and predicted effects assessed in the Valentine Gold EIS (Marathon 2020). It should also be noted that, in compliance with a condition of the release-of the Approved Project from EA by the NL Minister of Environmental and Climate Change, Marathon entered into a Benefits Agreement with the province (July 2022), which commits Marathon to the principles of first opportunity and full and fair consideration for provincial residents and provincial suppliers for employment and contracting opportunities associated with the Approved Project. As part of the NL Benefits Agreement, Marathon has also developed a Human Resources (HR) Plan and a Gender Equity, Diversity and Inclusion (GEDI) Plan, which are intended to eliminate barriers and create opportunities for participation in the economic benefits associated with the Approved Project by members of underrepresented groups – women and gender diverse persons, Indigenous persons, persons with disabilities and members of visible minorities. The NL Benefits Agreement and associated HR and GEDI Plans provide for continued engagement with provincial residents and suppliers in order to address community concerns related to employment and procurement.

Since the release of the Approved Project from environmental assessment by the NL Minister of Environment and Climate Change on March 17, 2022, and by the federal Minister of Environment and Climate Change Canada on August 24, 2022, Marathon has continued to engage with each community respecting the progress of the Approved Project.

3.2.2 Indigenous Groups

Part 2, Section 5 of the Federal EIS Guidelines for the Approved Project (the Guidelines) directed Marathon to engage with Qalipu First Nation (Qalipu) and Miawpukek First Nation (MFN) to obtain their views on “the project; and effects of changes to the environment on Indigenous peoples (health and socio-economic conditions; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; and current use of lands and resources for traditional purposes) pursuant to paragraph 5(1)(c) of CEAA 2012.”

Marathon’s Indigenous engagement process has been developed in concert with MFN and Qalipu, taking into account their views as to the type, nature and frequency of engagement. The approach to engagement is based upon consistent and regular contact and information exchange designed to enable each Indigenous group to understand the Approved Project and identify potential effects on their communities, activities, asserted or established Indigenous rights, and interests. Consistent with the Guidelines, Marathon made considerable efforts to provide both MFN and Qalipu with opportunities to



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learn about the Approved Project, including its location, design, potential effects and proposed mitigation measures. Prior to and during the EA of the Approved Project, each Indigenous group was given reasonable opportunities to provide input respecting the potential effects of the Approved Project upon Indigenous interests and activities, and to discuss potential mitigation, avoidance and monitoring measures. These engagement efforts included:

- Information Sharing Initiatives: transmission of, and opportunities to review, Approved Project-related documentation including EIS baseline information, newsletters, notices and other materials (e.g., press releases), related to the Approved Project, Marathon's corporate operations, and employment and business opportunities
- Meetings: meetings and offers to meet with Indigenous leadership, community members and other groups in person (by video, conference calls, or webcast) to discuss the Approved Project and associated regulatory processes, issues and concerns and potential mitigation measures, and holding a Project review workshop to provide information related to the Approved Project's proposed layout and design
- Land and Resource Use Studies: offers of funding to conduct land and resource use studies and to collect Indigenous knowledge to enhance Marathon's understanding of the potential Approved Project effects on Indigenous interests and activities, and to incorporate into the Valentine Gold EIS (Marathon 2020). Qalipu conducted a land and resource use and traditional knowledge study (Collection of Current Land Use and Aboriginal Traditional Knowledge) which was incorporated into the Valentine Gold EIS (Marathon 2020). Miawpukek's land and resource use and traditional knowledge study was completed in 2022 and its results have been taken into account in the development of monitoring and mitigation measures
- Avoidance, Mitigation and Monitoring Initiatives: discussion with representatives of each Indigenous group of potential mitigation, monitoring and avoidance measures to address potential effects

In addition, Marathon invited each group to share Indigenous knowledge relevant to the existing environment and the assessment of the potential effects of the Approved Project and proposed mitigation measures, and in the Valentine Gold EIS (Marathon 2020), Marathon took into account relevant Indigenous knowledge acquired through engagement or through publicly available materials.

Marathon's engagement activities with both MFN and Qalipu during the EA of the Approved Project are fully described in Chapter 3, Valentine Gold EIS, Section 3.4 (Marathon 2020). During the EA of the Approved Project, issues specific to each Indigenous group were identified as follows.

3.2.2.1 Qalipu

The principal issues identified by Qalipu during the EA of the Approved Project were:

- Need for continuing engagement and cooperation
- Access to economic opportunities, with specific reference to education and training, employment and access to contracting opportunities
- Environmental stewardship and involvement in monitoring initiatives



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- Potential adverse effects on wildlife (particularly caribou) and resulting effects on current use of land and resources
- Potential effects on water quality and quantity and fish habitat
- Design of tailings facility and possibility of breach and subsequent contamination of water bodies
- Use of cyanide
- Dam integrity and impact of blasting
- Socio-economic effects including positive effects on employment and business opportunities

Chapter 3 of the Valentine Gold EIS, Table 3.2 (Marathon 2020) sets out the issues identified by Qalipu during engagement, including comments contained in the Qalipu land and resource use and traditional knowledge study, and Marathon's responses, as well as associated references in the Valentine Gold EIS (Marathon 2020).

3.2.2.2 MFN

The principal issues identified by MFN during the EA of the Approved Project were:

- Need for continuing engagement and cooperation
- Access to economic opportunities, with specific reference to education and training and access to contracting opportunities
- Involvement in ongoing environmental monitoring initiatives
- Potential adverse effects on wildlife, particularly caribou and salmon, and resulting effects on current use of land and resources
- Effects on Species at Risk
- Water treatment, potential adverse effects on aquatic life
- Design of tailings facility
- Use of cyanide

Chapter 3 of the Valentine Gold EIS, Table 3.3 (Marathon 2020) sets out the issues identified by MFN during engagement and Marathon's responses, as well as associated references in the Valentine Gold EIS (Marathon 2020).

3.2.2.3 Current Engagement with Indigenous Groups

Prior to the release of the Approved Project from EA, Marathon entered into agreements with each Indigenous group. In May 2021, Marathon entered into a Socio-Economic Agreement (SEA) with Qalipu which addressed environmental stewardship (including participation in environmental monitoring), employment and training, procurement and workplace conditions. At the same time, Marathon also entered into a Memorandum of Understanding with MFN, and in May 2022, Marathon concluded an SEA with MFN containing provisions similar to those contained in Qalipu's SEA. Both SEAs provide for continuing engagement with respect to the Approved Project, including engagement in relation to permits and plans. Consistent with the terms of the SEAs, Marathon will continue to engage with each Indigenous group respecting the Approved Project, including any changes to the Approved Project.



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3.2.3 Stakeholder Engagement

Marathon's engagement activities with stakeholders (such as environmental non-governmental organizations) and fish and wildlife associations such as the Newfoundland and Labrador Outfitters Association (NLOA) and Salmonid Groups (ERMA, ASF, SCNL and SAEN) are fully described in Valentine Gold EIS, Chapter 3, Section 3.5.3 (Marathon 2020). Key issues and concerns identified by these stakeholders during engagement were as follows:

- Tailings – design of tailings facilities and potential alternatives; potential for breach and impact on other mines in the area
- Air Quality – potential for GHG emissions
- Water Quality – potential for contamination of waterbodies; treatment and management of contact, surface water runoff and ground water at site; protection of fish-bearing ponds; impact of dam failure on water quality
- Approved Project components – pit stability; potential for acid rock drainage; use of cyanide; source of power for mining operations
- Fish and Fish Habitat – habitat offsetting
- Approved Project description – size of Approved Project footprint; duration of life of mine; alteration of existing roads; impact on roads due to increased traffic; processing method; impact on forestry operations; transportation of tailings
- Wildlife – potential impact of noise and waste rock and interference with caribou migration
- Engagement – scope of Marathon's engagement activities
- Socio-economic Impacts – general support for Approved Project but need to compensate if outfitting operations are impaired

Table 3.11 of the Valentine Gold EIS (Marathon 2020) sets out the issues and concerns identified by fish and wildlife associations and civil society organizations during engagement activities, Marathon's responses, and associated EIS references. Since release of the Approved Project from the EA process, Marathon has continued to engage with these organizations respecting the progress of the Approved Project, as appropriate.

3.3 ENGAGEMENT EFFORTS FOR THE PROJECT EXPANSION

Consistent with its core values, commitment to meaningful and ongoing engagement as described in Section 3.1, and the terms of any agreement concluded with the province (such as the NL Benefits Agreement), communities, Indigenous groups or stakeholders, Marathon has continued to engage with Government Departments and Agencies, Indigenous groups, communities and stakeholders since submission of the Valentine Project EIS. In order to facilitate engagement respecting the Project Expansion, Marathon developed an engagement process applicable to communities and stakeholders and a separate process applicable to Indigenous groups. These processes were developed cooperatively with the specific stakeholder entities in order to ensure that information was delivered in the most effective and timely manner and that stakeholders were provided with a reasonable opportunity to consider the information, determine the possible impacts upon their interests, and discuss with Marathon.



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While, as noted above, separate processes were implemented with respect to communities, Indigenous groups and stakeholders, common materials were developed to facilitate meaningful engagement. Marathon prepared a Project Summary (Appendix 3A) describing the Project Expansion which was circulated to Indigenous groups, communities and stakeholders. Marathon followed up by offering to meet with each potentially affected group to discuss issues and concerns. In response to this offer, meetings were held with communities, Indigenous groups and the NLOA. Communities and other stakeholders were provided with a poster (Appendix 3B) containing the dates, times and locations of the public information sessions for display in publicly accessible locations such as town halls, convenience stores and fire halls, and for posting on websites and social media. This poster was reproduced in a newspaper advertisement in the Central Wire (both hard copy and on-line versions) which ran for two weeks preceding the commencement of the public information sessions. The newspaper advertisement was supplemented by regular radio announcements which aired throughout the three days preceding the commencement of the public information sessions.

Six in-person public information sessions were held in the communities closest to the Project Area which were open to all residents of the Central Region and the province. Marathon also held virtual meetings with Indigenous groups and the NLOA. A power point presentation (Appendix 3C) describing the Project Expansion, its predicted environmental effects and potential mitigations, was delivered at both in-person and virtual sessions, followed by a discussion period. All issues and concerns raised by communities, stakeholders and Indigenous groups were documented and these issues and concerns, together with Marathon's responses, are set out in the following sections.

Consistent with its commitment to ongoing engagement and with the terms of any agreement which has been concluded with an Indigenous group, community or stakeholder organization, Marathon will continue to engage with communities, Indigenous groups and stakeholders following submission of the Environmental Registration / EA Update to federal and provincial regulators. Indigenous groups, communities and stakeholders will be notified upon submission and the document will be made available to communities, Indigenous groups and various stakeholders and will also be accessible to the public through Marathon's website. Marathon will meet as appropriate to discuss and respond to any questions and will continue to engage collaboratively with Indigenous groups, communities and stakeholders to provide Project-related information, take into consideration any comments or feedback and work in a spirit of cooperation to address issues and concerns.

Marathon's specific engagement efforts respecting the Project Expansion in relation to Indigenous groups, communities and civil society organizations, and regulators are described more fully in the following sections.

3.3.1 Indigenous Groups

Qalipu and MFN were each contacted by phone during the week of May 1, 2023, to discuss the Project Expansion and appropriate engagement processes. On May 8, 2023, both Qalipu and MFN were provided with the Project Summary outlining the Project Expansion for review and comment. In the email transmitting the Project Summary, Marathon offered to meet virtually with each group at a mutually convenient time to deliver a power point presentation and discuss the predicted effects of the Project



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Expansion and associated potential mitigations. Both MFN and Qalipu were advised that any issues and concerns identified by an Indigenous group, together with Marathon's responses, would be included in the Environmental Registration/EA Update submitted to federal and provincial regulators. Following transmission of the Project Summary, Marathon contacted each group by phone and email to discuss a meaningful engagement process, which would include the provision of capacity funding.

Following an email exchange and a virtual meeting between Marathon and the Qalipu Chief and Band Manager, on May 16, 2023, Marathon and Qalipu agreed by phone upon an engagement process on May 30, 2023. As agreed, engagement would be conducted through an independent consultant working in conjunction with the Qalipu Natural Resources Committee. In a subsequent email exchange with Qalipu's consultant on May 30, 2023, it was further agreed that engagement would be conducted in two phases: engagement prior to submission Environmental Registration/EA Update to federal and provincial regulators (Phase 1), and engagement following submission of the Environmental Registration/EA Update to federal and provincial regulators (Phase 2).

Consistent with this arrangement, on June 2, 2023, Marathon provided Qalipu with relevant materials (including the Valentine Gold EIS Summary (Marathon 2020) and the Project Summary) and confirmed the details of the agreed-upon review process. On June 7, 2023, Marathon also provided Qalipu with a draft table of contents for the Environmental Registration/EA Update to clarify the scope of Phase 2 engagement. Following this correspondence, the parties met virtually on June 8, 2023. At the virtual meeting, Marathon delivered a power point presentation describing the Project Expansion and discussed the predicted environmental effects and potential mitigations with the consultant and a member of the Qalipu Natural Resources Committee. A copy of the presentation, together with other materials as requested, were provided to Qalipu representatives immediately following the virtual meeting and Qalipu agreed to provide any comments by June 26, 2023. Qalipu's preliminary comments were received on June 26, 2023 and these comments together with Marathon's responses, are set out below in Table 3.1.



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
<p>Caribou – loss of habitat due to larger project footprint – need to quantify habitat loss and in consultation with province, evaluate options for offsetting through long-term protection of adjacent areas and re-evaluate impact on caribou and any offsetting required for continuous use of area</p>	<p>The Valentine Gold EIS (Marathon 2020) took a conservative approach and assumed all habitat within the Project Area would be cleared. As Project Expansion activities are almost entirely limited to the Project Area (only an additional 0.034 km² area of additional habitat affected, which corresponds to approximately 0.1% of the existing Project Area) and similar in nature to the Approved Project (i.e., open pit mining), the addition of the Project Expansion does not result in any change to the characterization of residual effects for change in habitat for the Approved Project alone. Please refer to Chapter 10 for further assessment information for the Caribou Valued Component.</p> <p>The Caribou Protection and Environmental Effects Monitoring Plan (CPEEMP; Appendix 10B) defines the mitigation measures aimed at reducing the risk of adverse effects on caribou and describes the follow-up and monitoring activities that will be undertaken to verify effects predictions and mitigation effectiveness. In consultation with NLDDFA – Wildlife Division, the CPEEMP will be reviewed and revised as needed to address planned Project Expansion activities, including triggers for reduction or suspension of Approved Project and/or Project Expansion activities.</p>	<p>Chapter 10</p>
<p>Caribou – migration routes - substantial reduction in the permeability of the project site due to the severing of two game trails and larger project footprint - need for “progressive reclamation” plan to re-establish permeability of the project site – need to evaluate impact on caribou migration to protect migration corridors from further development and control activities to allow for new migration routes - application of new monitoring protocols to monitor areas both within and outside project area – potential for use of fencing or overpass structures to facilitate caribou movement through site</p>	<p>The effects of the Project Expansion on caribou, including the potential for reduced permeability of the mine site is assessed in Chapter 10. In accordance with the Newfoundland and Labrador <i>Mining Act</i>, Marathon has submitted a Rehabilitation and Closure Plan (RCP). RCPs are updated every five years. Information on progressive reclamation and final closure activities is detailed in Marathon’s, <i>Rehabilitation and Closure Plan, Valentine Gold Project, Marathon Gold Corporation</i>.</p> <p>The current CPEEMP (Appendix 10B) is designed to help understand and manage predicted Approved Project effects through long-term monitoring activities. The CPEEMP considers both direct and indirect Approved Project effects, and potential cumulative effects on caribou. The CPEEMP presents thresholds and adaptive management actions to be further developed in consultation with NLDDFA – Wildlife Division, with the goal of avoiding or reducing adverse effects on caribou and its habitat. The CPEEMP is updated regularly, based on conditions of authorization (EA release and permitting); collection of baseline data prior to construction; ongoing review with regulators, scientific experts, Indigenous groups, and stakeholders; and information from follow-up and monitoring activities as the Approved Project advances.</p> <p>In consultation with NLDDFA – Wildlife Division, the CPEEMP will be reviewed and revised as needed to address planned Project Expansion activities, including triggers for reduction or suspension of Approved Project and/or Project Expansion activities.</p>	<p>Chapter 10, RCP</p>



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
<p>Caribou – cumulative effects - Need to review cumulative impacts, specifically the identification of undisturbed areas available for caribou – need to reevaluate delineation of spatial extent of adjacent habitat for displaced caribou - continuity analysis of adjacent habitat</p>	<p>Marathon completed a cumulative effects assessment (CEA) for the Approved Project, and this has been updated for the Project Expansion (Chapter 10). The CEA includes an estimate of the cumulative disturbance to habitat within the four caribou herd ranges (Section 10.8.3). Overall, the assessment of combined cumulative residual effects from the Approved Project and Project Expansion on change in habitat, movement, and mortality risk do not change the conclusions as presented in the Valentine Gold EIS (Marathon 2020).</p>	<p>Chapter 10</p>
<p>Caribou – site reclamation – need for updated progressive reclamation plan with timelines and monitoring programs and methods to determine the effectiveness of progressive reclamation Need for final reclamation plan to show how migration through the project site will be re-established; steps to achieve a functional ecosystem suitable for caribou and pine marten; how access to site will be decommissioned to prevent further disturbance and detailed monitoring plan</p>	<p>A detailed Rehabilitation and Closure Plan (RCP) for a mine is a significant management plan. In accordance with the <i>Mining Act</i>, Marathon has drafted and submitted the Approved Project RCP to the NLDIET for review and approval prior to the start of operations. Marathon’s RCP will be updated to include the Project Expansion. Generally, an RCP is updated every five years to reflect ongoing activity at a mine site and to refine rehabilitation and closure activities. A final RCP is generally provided to NLDIET within six months of final closure of a mine site. The operation phase will continue through 2039, after which the closure phase will begin.</p> <p>The RCP considers rehabilitation strategies that are sustainable and compatible with local and regional topography, soil, and climatic conditions to return the area to as near natural / pre-development conditions as possible.</p> <p>The overall objectives of the RCP proposed are:</p> <ul style="list-style-type: none"> • restoration of the health and fertility of the land to a self-sustaining, natural state; • provision of an agreeable habitat for wildlife (including caribou, marten and fish) in a balanced and maintenance free ecosystem; • creation of a landscape which is visually acceptable and compatible with surrounding terrain; • mitigation and control to within acceptable levels, the potential sources of pollution, fire risk, and public liability; and • provide a safe environment for long term public access. <p>Marathon intends to revegetate 100% of the disturbed footprint using available stockpiled overburden and stockpiled and windrowed organic materials both progressively and at final closure.</p> <p>Following successful implementation of the closure approach, the Project Area will be useable for hunting, fishing, cabin-owners, and other recreational activities, consistent with historic pre-development use. Surface rights will be returned to the Crown once the lands are rehabilitated and stabilized to the level prescribed as satisfactory to the various governing bodies.</p>	<p>RCP (not included in this document)</p>



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
	<p>A post-closure monitoring program will continue from the operational monitoring program and will incorporate appropriate changes and updates, as required. As each Project component reaches closure, Marathon will move into the post-closure monitoring phase. Post-closure monitoring will continue after the final closure activities are completed for each Project component. When the site is deemed physically and chemically stable, and approved by the appropriate regulators, the site will be relinquished to the Crown.</p> <p>Marathon will finalize post-closure and long-term monitoring plans, in consultation with the appropriate regulators, once design is complete and operations are underway. Marathon anticipates that closure monitoring plans will be similar to operational monitoring plans in order to provide a continuity of data whereby robust comparisons can be made. Post-closure monitoring will include physical monitoring of vegetation efforts, slope stability, and public safety measures, chemical monitoring of surface water and groundwater, bio-physical monitoring, and reporting. During the post-closure monitoring phase, if these components require specific attention (i.e., re-seeding, slope adjustment, etc.), Marathon will complete necessary measures to address.</p>	
<p>Pine Marten – habitat loss due to enlarged project footprint – need to identify habitat that can be used for offsetting and, if offsetting not considered, justification for non-consideration</p>	<p>Pine marten was recently reassessed as Special Concern (from Threatened) by COSEWIC in May 2022. The change in designation is largely based on an estimated increase in the total number of mature individuals on the Island (2,558-2,837 in 2019 compared to 320-622 in 2007). The increase is attributed to reduced incidental mortality; increased prey base (though the introduction of southern red-backed vole); and a decreased rate of forest harvesting / habitat loss (COSEWIC 2022). The extent of its occurrence is also increasing, and it is believed to occupy a wider range of habitats, including disturbed habitats and younger aged forests (COSEWIC 2022).</p> <p>Approximately 6.3 km² of the Project Area and 41.8 km² of the Project Local Assessment Area overlaps with critical habitat for marten. There is currently 6,200 km² of critical habitat identified on the Island, as well as large tracts of suitable habitat in areas outside the Project Area. The Valentine Gold EIS took a conservative approach and assumed all habitat within the Project Area would be cleared. As Project Expansion activities are almost entirely limited to the Project Area (only an additional 0.034 km² area of additional habitat affected) and similar in nature to the Approved Project (i.e., open pit mining), the addition of the Project Expansion does not result in any change to the characterization of residual effects for the Approved Project alone. Residual effects for the combined Projects on wildlife (other than caribou) are predicted to be not significant.</p>	<p>Chapter 11, Sections 11.2.3, 11.3.2</p>



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
<p>Pine Marten – habitat loss - need for detailed reclamation plan that describes how project site can be restored to functional ecosystem – need to identify alternative habitat for displaced pine marten – need for continuity analysis of adjacent habitat that shows potential movement paths around the project site</p>	<p>See comments above for Caribou – site reclamation for details on Marathon’s RCP for the site. Pine marten was recently reassessed as Special Concern (from Threatened) by COSEWIC in May 2022. The change in designation is largely based on an estimated increase in the total number of mature individuals on the Island (2,558-2,837 in 2019 compared to 320-622 in 2007). The increase is attributed to reduced incidental mortality; increased prey base (though the introduction of southern red-backed vole); and a decreased rate of forest harvesting / habitat loss (COSEWIC 2022). The extent of its occurrence is also increasing, and it is believed to occupy a wider range of habitats, including disturbed habitats and younger aged forests (COSEWIC 2022).</p> <p>Approximately 6.3 km² of the Project Area and 41.8 km² of the Project Local Assessment Area overlaps with critical habitat for marten. There is currently 6,200 km² of critical habitat identified on the Island, as well as large tracts of suitable habitat in areas outside the Project Area. The Valentine Gold EIS (Marathon 2020) took a conservative approach and assumed all habitat within the Project Area would be cleared. As Project Expansion activities are almost entirely limited to the Project Area (only an additional 0.034 km² area of additional habitat affected) and similar in nature to the Approved Project (i.e., open pit mining), the addition of the Project Expansion does not result in any change to the characterization of residual effects for the Approved Project alone. Residual effects for the combined Projects on wildlife (other than caribou) are predicted to be not significant.</p>	<p>Chapter 11, Sections 11.2.3, 11.3.2</p>
<p>Caribou and Pine Marten – Impacts of Future Development - QFN requires information on areas that will be maintained or enhanced for the movement and/or migration around the project site and possibly the Marathon mineral claim boundary.</p>	<p>See comments above for Caribou – site reclamation for details on Marathon’s RCP for the site. Marathon completed a cumulative effects assessment (CEA) for the Approved Project for caribou and this has been updated for the Project Expansion (Chapter 10). The CEA includes an estimate of the cumulative disturbance to habitat within the four caribou herd ranges (Section 10.8.3). Overall, the assessment of combined cumulative residual effects from the Approved Project and Project Expansion on change in habitat, movement, and mortality risk do not change the conclusions as presented in the Valentine Gold EIS (Marathon 2020).</p> <p>AS indicated above, pine marten was recently reassessed as Special Concern (from Threatened) by COSEWIC in May 2022. The change in designation is largely based on an estimated increase in the total number of mature individuals on the Island (2,558-2,837 in 2019 compared to 320-622 in 2007). The increase is attributed to reduced incidental mortality; increased prey base (though the introduction of southern red-backed vole); and a decreased rate of forest harvesting / habitat loss (COSEWIC 2022). The extent of its occurrence is also increasing, and it is believed to occupy a wider range of habitats, including disturbed habitats and younger aged forests (COSEWIC 2022).</p>	<p>Chapter 10, Section 10.8, Appendix 10B</p> <p>Chapter 11</p>



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
	<p>Approximately 6.3 km² of the Project Area and 41.8 km² of the Project Local Assessment Area overlaps with critical habitat for marten. There is currently 6,200 km² of critical habitat identified on the Island, as well as large tracts of suitable habitat in areas outside the Project Area. The Valentine Gold EIS (Marathon 2020) took a conservative approach and assumed all habitat within the Project Area would be cleared. As Project Expansion activities are almost entirely limited to the Project Area (only an additional 0.034 km² area of additional habitat affected) and similar in nature to the Approved Project (i.e., open pit mining), the addition of the Project Expansion does not result in any change to the characterization of residual effects for the Approved Project alone. Residual effects for the combined Projects on wildlife (other than caribou) are predicted to be not significant.</p>	
<p>Migratory Birds – compliance with legislation – what is the strategy that will be used to ensure compliance with the Migratory Birds Convention Act and Regulations and provisions of the Provincial Wildlife Act and Regulations, pertaining to the protection of migratory birds, nests and their eggs, including how clearing during construction will be conducted to prevent contravention of legislative regime.</p>	<p>The Valentine Gold EIS (Marathon 2020) fully assessed environmental effects on avifauna, including migratory birds, and concluded that, with mitigation, no significant residual effects would occur as a result of the Approved Project. This assessment is also considered valid with the addition of the Project Expansion. Mitigation and monitoring measures for avifauna for the Approved Project are outlined in the Avifauna Management and Monitoring Plan, which was reviewed by regulators and Indigenous groups. As the Project Expansion is occurring almost entirely within the Project Area and Project Expansion activities are similar in nature to the Approved Project, the mitigation and monitoring measures identified for the Approved Project are considered applicable and effective for the Project Expansion. Regardless, the Avifauna Management and Monitoring Plan will be reviewed and updated as needed to specifically address Project Expansion activities.</p>	<p>Chapter 11</p>
<p>Fish and Fish Habitat – potential to affect undisturbed habitat buffers between the project site and Valentine Lake – request for detailed description of any buffer zones between the project site and Valentine Lake that will be impacted; evaluation of potential effects of alteration of buffer zones on fish, aquatic resources and shoreline birds; mitigations to reduce these impacts</p>	<p>The minimum buffer that will be maintained between Project Expansion infrastructure and Valentine Lake is 15 m, in accordance with provincial regulatory requirements. This buffer will be maintained through survey staking of infrastructure components and water management features (i.e., sediment ponds and ditching) to confirm the minimum setback. A loss of fish habitat will occur in some small streams and ponds associated with construction and operation of water management infrastructure. Marathon will develop and implement a Fish Habitat Offsetting Plan in consultation with Fisheries and Oceans Canada (DFO) that will offset for lost habitat at a nearby location. During decommissioning, rehabilitation, and closure, seepage from the TMF into Victoria River is conservatively predicted to exceed MDMER limits for cyanide, un-ionized ammonia, and copper, unless treated. If this is the case, passive treatment will be implemented to treat TMF seepage to regulated limits. With mitigation and treatment, the environmental assessment has determined there are no significant effects on fish and fish habitat that will result from routine Project Expansion activities, or from the cumulative effects of the Approved Project and Project Expansion in combination with other past, present, or reasonably foreseeable future projects.</p>	<p>Chapter 8 Chapter 9, Sections 9.3, 9.5 and 9.6</p>



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
<p>Terminology – Need to define “technologically and economically feasible” and provide information of who determines what is technologically and economically feasible and how disputes over meaning and applicability are resolved</p>	<p>The same methodologies used for evaluating technologically and economically feasible alternative means to conduct the Approved Project in the Valentine Gold EIS (Marathon 2020) were also used for the assessment of alternative means to conduct the Project Expansion. In the Valentine Gold EIS (Section 2.11) (Marathon 2020), technically feasible (including regulatory factors) was defined as:</p> <ul style="list-style-type: none"> • Feasible considering criteria which could influence safe, reliable, and efficient operations • Technology must be available and proven for use by a similar activity, and cannot compromise personnel and process safety for it to be considered • Acceptable considering applicable regulatory guidelines and frameworks <p>Economically feasible (including market factors) was defined as:</p> <ul style="list-style-type: none"> • Feasible considering capital and operational project expenditure, and opportunity cost • Project expenditure can be impacted directly (e.g., equipment and personnel requirements) and indirectly (e.g., schedule delays) <p>The alternatives assessment was reviewed and approved as part of the provincial and federal EA processed for the Approved Project.</p> <p>A discussion of alternatives that considers options that are technologically and economically feasible (based on the above definitions) is presented in Chapter 2 of this document for the Project Expansion.</p>	<p>Chapter 2, Section 2.11</p>
<p>Follow-up Plans – provide QFN with opportunity to review all follow-up plans that require updating as a result of the changes in the designated project before final approval under the EA process.</p>	<p>Marathon is committed to ongoing engagement with Qalipu and MFN over the life of the Approved Project and has entered into a Socio-Economic Agreement (SEA) with each Indigenous group. While the terms of each SEA are confidential, the agreements provide for a structured framework for engagement, including engagement on environmental matters, and for the creation of an environmental committee to review permits, plans and authorizations. As required by the Federal Conditions of environmental approval, Marathon engaged with each group with respect to the development of specific follow-up plans, including an Indigenous Traditional Use of Lands and Resources Communications Plan. Pursuant to Federal Conditions 2.16 and 2.17, Marathon has commenced consultation with both Qalipu and MFN in relation to the Project Expansion and will continue to engage with each group according to agreed-up processes. This engagement will, as required by Federal Conditions 2.5.3 and 2.6, include consultation on any follow-up plans which require updating as a result of a change to the Approved Project.</p>	<p>Chapter 2, Table 2.13</p> <p>Chapter 3, Section 3.3.2</p>



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
<p>Caribou Follow-up Program – Marathon must establish a new plan or update existing plan to take into account potential for barriers to movement across project site due to Berry -</p> <p>Plan to include thresholds for determination of barrier effects within the project site and potential offsetting areas and mitigations in event thresholds are exceed. Thresholds must include consideration of predation rates, recruitment rates, movement rates, anthropogenic impacts, and calving ground fidelity.</p>	<p>The current CPEEMP (Appendix 10B) is designed to help understand and manage predicted Approved Project effects through long-term monitoring activities. The CPEEMP considers both direct and indirect Approved Project effects, and potential cumulative effects on caribou. The CPEEMP presents thresholds and adaptive management actions to be further developed in consultation with NLDDFA – Wildlife Division, with the goal of avoiding or reducing adverse effects on caribou and its habitat. The CPEEMP is updated regularly, based on conditions of authorization (EA release and permitting); collection of baseline data prior to construction; ongoing review with regulators, scientific experts, Indigenous groups, and stakeholders; and information from follow-up and monitoring activities as the Approved Project advances.</p> <p>In consultation with NLDDFA – Wildlife Division, the CPEEMP will be reviewed and revised as needed to address planned Project Expansion activities, including triggers for reduction or suspension of Approved Project and/or Project Expansion activities.</p>	<p>Chapter 10, Section 10.4, Appendix 10B</p>
<p>Monitoring – Involvement of QFN</p>	<p>Marathon is committed to the employment of Qalipu members as environmental monitors and the involvement of Qalipu in monitoring programs. Qalipu members have participated in Marathon’s Country Food Survey program, Historic Resources Survey and the Big Game Sampling Program. Marathon and Qalipu have concluded a Socio-Economic Agreement (SEA) which includes provisions respecting the participation of Qalipu in monitoring programs and the employment of a Qalipu member as on-site environmental monitor. Marathon will continue to discuss opportunities for the conduct of or participation by Qalipu in monitoring programs over the life of the Project, including the Project Expansion.</p>	<p>Chapter 3, Section 3.2.2.3</p> <p>Chapter 12, Section 12.3</p>



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Table 3.1 Qalipu Representatives Preliminary Comments

Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
<p>Employment and Contracting - an increased opportunity for employment of QFN members, as well as an increased potential to access contracts related to the establishment, operation and decommissioning of the mine.</p>	<p>Marathon Gold has concluded a Benefits Agreement with the Province (July 2022) which provides for first opportunity and full and fair consideration for provincial residents and suppliers. As part of the NL Benefits Agreement, Marathon has developed a Gender Equity, Diversity and Inclusion (GEDI) Plan which provides for the elimination of barriers to economic opportunities (employment and contracting) on the part of historically underrepresented groups, including Indigenous persons. The GEDI Plan also sets out aspirational targets for the employment of Indigenous persons and stipulates actions on the part of Marathon and its contractors to achieve these targets and to promote supplier diversity. Marathon reports to the province on a quarterly basis detailing its progress in the recruitment and selection of Indigenous persons and in the area of supplier contractual diversity.</p> <p>In addition to the NL Benefits Agreement, the Socio-Economic Agreement (SEA) concluded with Qalipu also contains provisions respecting employment and business opportunities for Qalipu members and Qalipu businesses, including participation in monitoring programs. Compliance with these provisions is overseen by two committees established under the SEA: Employment, Education and Training Committee and a Procurement Committee. Pursuant to both the NL Benefits Agreement and the SEA, Marathon has taken steps to facilitate access by Qalipu members and businesses to the economic opportunities associated with the Approved Project and these strategies will be applied to economic opportunities associated with the Project Expansion. These steps include: employment and procurement information sessions targeted at Qalipu members and Qalipu businesses; provision of advance notice to Qalipu of employment and contracting opportunities; regular communication of training and employment requirements; ongoing collaboration with Qalipu and educational facilities respecting apprenticeships; collaboration with Qalipu respecting the development of cultural sensitivity training materials; unbundling of contracts to create opportunities for smaller businesses and consideration of sole source opportunities. Pursuant to the SEA Marathon will continue to work with Qalipu over the life of the Project to facilitate Qalipu participation in the workforce and in the award of contracts.</p>	<p>Chapter 3, Sections 3.2.1, 3.2.2.3</p> <p>Chapter 12, Section 12.3</p>



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Phase 2 engagement will commence with the concurrent submission of the Environmental Registration/EA Update to regulators and to Qalipu. Marathon will continue to engage with Qalipu to address both the preliminary comments provided by Qalipu in Phase 1 and any additional comments and concerns provided during Phase 2.

A similar approach was taken with respect to engagement with MFN. As noted previously, following a telephone call with MFN during the week of May 1, 2023, to discuss a potential engagement process, Marathon transmitted the Project Summary to MFN on May 8, 2023. In the email transmitting the Project Summary, Marathon outlined a proposed engagement process and offered to meet virtually to discuss the Project Expansion. In subsequent phone calls, MFN and Marathon agreed that engagement would be conducted through an external consultant working with MFN staff. It was also agreed that engagement would be conducted in two phases. As part of Phase 1, Marathon and MFN met virtually on June 1, 2023. During the meeting Marathon delivered a power point presentation describing the Project Expansion, including predicted effects and associated potential mitigations (Appendix 3B). A copy of the presentation was subsequently provided to MFN on June 3, 2023, for review with the request that any comments be provided by June 23, 2023. On June 27, 2023, MFN advised Marathon (by email) of its intention to defer any comments until submission of the Environmental Registration/EA Update to federal regulators. In subsequent discussion with MFN's consultant on July 3, 2023, it was agreed that Marathon would provide the Environmental Registration/EA Update to MFN concurrent with submission to regulators. It was also provisionally agreed that MFN could conduct its review and provide any comments pursuant to the framework for review of environmental documents set out in the Marathon MFN SEA. In accordance with the SEA, Marathon will continue to engage with MFN to address comments and concerns provided during Phase 2 of the engagement process.

3.3.2 Community and Stakeholder Engagement

In keeping with Marathon's corporate values (Respect, Accountability, Transparency, Inclusion and Prosperity) and with the terms of relevant agreements, Marathon has engaged with communities and stakeholder organizations respecting the Project Expansion. Engagement activities are described below.

3.3.2.1 Community Engagement

Since prior to registration of the Approved Project, Marathon has worked diligently with communities in the Central Region to build relationships, to ensure that the communities and residents are informed of the Project and provided with an opportunity to express issues and concerns, and to reduce adverse effects and maximize benefits for local residents and businesses. Particular focus has been placed on the six communities closest to the proposed Project site: the Towns of Buchans, Millertown, Badger, Grand-Falls Windsor and Bishop's Falls and the Local Service District of Buchans Junction. Marathon began the formal process of stakeholder engagement respecting the Project Expansion on March 16, 2023, at the monthly meeting of mayors. Marathon provided a brief description of the Project Expansion and followed up at the next monthly mayors meeting on April 20, 2023, to propose a series of in-person information sessions on the Project Expansion in each of the six communities. In subsequent emails with community representatives, it was agreed that the in-person information sessions would be held between May 24 –



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26, 2023. On May 8, 2023, community leaders were provided with a copy of the Project Expansion Summary (Appendix 3A) for review and circulation to interested parties. On the same day, each community was also provided with a poster listing the dates, times and locations of the community meetings together with the request that the poster be displayed in publicly accessible places such as town halls, convenience stores and libraries, and shared on community social media sites. The poster was also published on Marathon's social media platforms and was reproduced in an advertisement in both print and on-line versions of the Central Wire newspaper for two consecutive weeks preceding the public information sessions. Details of the meetings were also the subject of periodic public service announcements on local radio stations during the 3 days preceding the meetings.

Meetings were held in each of the 6 communities on the following dates:

- May 24, 2023 – Buchans Junction, Buchans, Millertown
- May 25, 2023 – Bishop's Falls, Grand Falls – Windsor
- May 26, 2023 - Badger

Each public information session typically lasted between 2 and 3 hours and consisted of a power point presentation describing the Project Expansion, predicted environmental effects and potential mitigations followed by a discussion period. In addition, a community survey was administered at the end of each meeting to allow community members to anonymously express any environmental (bio-physical and/or socio-economic) concerns relating to the Project Expansion. Based upon the comments provided at the information sessions together with the survey results, the overwhelming majority of survey respondents (77%) indicated that they had no concerns with respect to the Project Expansion. A small minority of respondents identified concerns (in several cases, responses included both bio-physical and socio-economic concerns). Identified concerns related to local economic opportunities (hiring, contracting) associated with Project Expansion (22% of responses), potential impacts on water (3% of responses), and the possibility of increased dust/impact of vehicular traffic on roads (1% of responses).

Issues and concerns identified at the community meetings, including survey comments, together with Marathon's responses and EA references are set out in Table 3.2.

Marathon continues to meet with community leaders on a regular basis (most recently on June 21, 2023) to discuss socio-economic and bio-physical concerns and, as committed to in the Community Cooperation Agreements which have been concluded with each of the 6 communities, Marathon will engage with community leaders, residents and businesses to provide Project Expansion information and discuss issues and concerns.



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Table 3.2 Community Issues and Concerns

Community Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
Socio-economic - Social impact on communities after Project closure	Consistent with its corporate values, Marathon is committed to the sustainable development of the Valentine Project, including the Project Expansion, which will maximize benefits and minimize adverse effects upon the individuals, communities, Indigenous groups and stakeholders which are potentially interested in or affected by Marathon's operations. The commitment to sustainable development informs Marathon's approach to stakeholder relations and is reflected in a number of policies, including the Indigenous Relations Policy, the Community Relations Policy and Marathon's Stakeholder Grievance Process. It is Marathon's objective to reduce the adverse environmental effects of its activities and ensure that Indigenous groups, communities and stakeholders are left in at least the same position from a socio-economic perspective after Project closure as they were prior to the commencement of Marathon's operations. Marathon has taken active steps to achieve this objective including the following ways: through the conclusion of agreements with communities, Indigenous groups and the NLOA, which provide a framework for ongoing engagement and dialogue on both bio-physical and socio-economic issues; through the conclusion of a Benefits Agreement with the government of Newfoundland and Labrador (July 2022) which provides for first opportunity and full and fair consideration for provincial residents and suppliers in accessing the economic opportunities associated with Marathon's activities; through its recruitment and selection process (including education, training and scholarship initiatives) which will foster the development of transferable employment skills; through its contracting and procurement policies which are intended to encourage the development of local business capacity; and through its community sponsorship and cultural investment programs which will preserve and enhance community and Indigenous activities, culture and infrastructure, and contribute to the ongoing viability of the local volunteer sector. It is Marathon's intention to leave a positive legacy in the Central Region which will foster resilience and sustainability.	Chapter 12
Socio-economic – Need to ensure local hires to work on Berry – need to ensure that hiring process prioritizes hiring of residents of communities closest to the mine site	Marathon is committed to maximizing local benefits through the recruitment and selection of qualified local residents. As per the NL Benefits Agreement, Marathon has committed to a workforce which consists of at least 85% provincial residents and, consistent with its engagement with local communities in proximity to the Project area, has implemented a recruitment process which prioritizes the hiring of qualified local residents and members of underrepresented groups (women and gender diverse persons, Indigenous persons, persons with disabilities and members of visible minority groups). Marathon's commitments in this regard are binding on its contractors and included in the commercial terms of contracts. To ensure that the hiring process prioritizes qualified local hires, Marathon provides communities and Indigenous groups with advance notice of employment opportunities, holds employment information sessions (both virtual and in-person) and reports regularly on progress in meeting its commitments to provincial residents to both community leaders and the province. Marathon continues to work with local educational institutions and government agencies to identify training and apprenticeship programs, which in turn will contribute to the creation of a sustainable workforce for the life of the Project.	Chapter 12



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Table 3.2 Community Issues and Concerns

Community Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
Socio-economic – need to ensure opportunities for local businesses	Pursuant to the NL Benefits Agreement (July 2022), Marathon is committed to the principles of first consideration and full and fair opportunity for qualified provincial suppliers subject to considerations of commercial reasonableness. These commitments have been communicated to Marathon’s contractors and are included in the commercial terms of such contracts. In addition, and consistent with Community Cooperation Agreements, Marathon has made and will continue to make reasonable efforts to increase opportunities for local businesses through such measures as: unbundling contracts where commercially feasible to allow participation by smaller businesses; consideration of business location and diversity factors in evaluation criteria; provision of advance notice of upcoming contract opportunities to local businesses and Indigenous businesses; the holding of supplier information workshops targeted at local and Indigenous suppliers; consideration of sole source opportunities for local and Indigenous businesses where appropriate; and the institution of a Small Business Identification of Opportunities Process which is intended to foster local business capacity.	Chapter 12
Infrastructure – impact on roads due to increased vehicular traffic	A 5-8% increase in traffic is predicted for the access road to the mine site as a result of the Project Expansion. Marathon does not expect the level of vehicular traffic to increase in communities surrounding the mine site by more than 5-8% and does not believe that this slight increase will adversely affect road infrastructure in the communities. The Traffic Management Plan for the Approved Project will also apply to the Project Expansion. This Plan serves to manage transportation of workers and materials to site, product leaving site, the number of vehicles accessing the site, and to reduce traffic delays.	Chapter 1, Section 1.5
Infrastructure – impact on roads – general condition of the highway is poor and will deteriorate further with increased traffic – can Marathon provide assistance or support?	A 5-8% increase in traffic is predicted for the access road to the mine site as a result of the Project Expansion. Marathon does not expect the level of vehicular traffic to increase in communities surrounding the mine site by more than 5-8% and does not believe that this slight increase will adversely affect road infrastructure in the communities. The Traffic Management Plan for the Approved Project will also apply to the Project Expansion. This Plan serves to manage transportation of workers and materials to site, product leaving site, the number of vehicles accessing the site, and to reduce traffic delays. Through its ongoing engagement with communities, Marathon is aware that there are issues with road conditions on provincial highways which are unrelated to Marathon’s activities. Marathon has been engaged with communities and is committed to work with communities to address these concerns, including through contribution to signage and other mechanisms to address speeding, and through support for communities in their interactions with relevant provincial departments respecting upgrades to road conditions.	Chapter 1, Section 1.5



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Table 3.2 Community Issues and Concerns

Community Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
Water Quality – potential release of contaminants into Beothuk Lake	A number of detailed baseline studies have been completed in the vicinity of the mine site to understand the water quality prior to the start of mine activities. Discharges from the mine site will be monitored and treated, if required, prior to release to the receiving environment such that no regulatory guidelines will be exceeded. There will be no discharges directly to Beothuk Lake (formerly Red Indian Lake). An environmental effects monitoring program will be in place to monitor changes in water quality from baseline quality as the mine develops. Overall, the EA determined there are no significant residual effects on surface water resources resulting from routine Project Expansion activities or routine Project Expansion activities combined with Approved Project activities.	Chapter 8, Sections 8.3, 8.5 and 8.6
Air Quality – dust on roads from increased vehicle traffic; dust from construction activities	Air quality modeling was completed to predict the concentrations of air contaminants from Project Expansion and Approved Project activities. The modelling considered vehicle traffic, earthmoving activities, and material handling, all of which result in dust emissions. The results of the modelling show that changes in air quality, including changes in dust, from the combined Project activities will not be significant. Mitigation measures are also in place to address dust emissions and include the use of dust suppressants, emission control technology on select exhaust sources, and stabilization of the various stockpiles. Marathon regularly engages with communities and other stakeholders such as cabin owners to discuss and address issues of concern, including the potential for dust, and has implemented a Stakeholder Grievance mechanism which provides redress for stakeholders disproportionately and adversely affected by Marathon’s activities.	Chapter 6, Sections 6.3, 6.5 and 6.6
Fish and Fish Habitat – what are the predicted effects on Fish and Fish Habitat?	A loss of fish habitat will occur in some small streams and ponds associated with construction and operation of water management infrastructure. Marathon will develop and implement a Fish Habitat Offsetting Plan in consultation with Fisheries and Oceans Canada (DFO) that will offset for lost habitat at a nearby location. During decommissioning, rehabilitation, and closure, seepage from the TMF into Victoria River is conservatively predicted to exceed MDMER limits for cyanide, un-ionized ammonia, and copper, unless treated. If this is the case, passive treatment will be implemented to treat TMF seepage to regulated limits. With mitigation and treatment, the environmental assessment has determined there are no significant effects on fish and fish habitat that will result from routine Project Expansion activities, or from the cumulative effects of the Approved Project and Project Expansion in combination with other past, present, or reasonably foreseeable future projects.	Chapter 9, Sections 9.3, 9.5 and 9.6



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Table 3.2 Community Issues and Concerns

Community Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
Wildlife – are there pine marten in the area and if so, will they be affected?	<p>Pine marten was recently reassessed as Special Concern (from Threatened) by COSEWIC in May 2022. The change in designation is largely based on an estimated increase in the total number of mature individuals on the Island (2,558-2,837 in 2019 compared to 320-622 in 2007). The increase is attributed to reduced incidental mortality; increased prey base (though the introduction of southern red-backed vole); and a decreased rate of forest harvesting / habitat loss (COSEWIC 2022). The extent of its occurrence is also increasing, and it is believed to occupy a wider range of habitats, including disturbed habitats and younger aged forests (COSEWIC 2022).</p> <p>Approximately 6.3 km² of the Project Area and 41.8 km² of the Project Local Assessment Area overlaps with critical habitat for marten. There is currently 6,200 km² of critical habitat identified on the Island, as well as large tracts of suitable habitat in areas outside the Project Area. The Valentine Gold EIS took a conservative approach and assumed all habitat within the Project Area would be cleared. As Project Expansion activities are almost entirely limited to the Project Area (only an additional 0.034 km² area of additional habitat affected) and similar in nature to the Approved Project (i.e., open pit mining), the addition of the Project Expansion does not result in any change to the characterization of residual effects for the Approved Project alone. Residual effects for the combined Projects on wildlife (other than caribou) are predicted to be not significant.</p>	Chapter 11, Sections 11.2.3 and 11.3.2
Avifauna – how will construction impact birds – will there be construction during bird breeding season?	<p>The Valentine Gold EIS (Marathon 2020) fully assessed environmental effects on birds and concluded no significant residual effects would occur as a result of the Approved Project. The Valentine Gold EIS (Marathon 2020) took a conservative approach and assumed all habitat within the Project Area would be cleared. As Project Expansion activities are almost entirely limited to the Project Area (only an additional 0.034 km² area of additional habitat affected) and similar in nature to the Approved Project (i.e., open pit mining), the addition of the Project Expansion does not result in any change to the characterization of residual effects for the Approved Project alone. With the implementation of mitigation measures (including application of the Valentine Gold Project: Avifauna Follow-up Monitoring Plan), direct or indirect effects resulting from the Project Expansion in combination with the Approved Project are not predicted to have significant residual adverse effects on avifauna, including species at risk.</p>	Chapter 11, Section 11.3.2
Water Quality – concern about location of waste rock pile near Victoria Lake and possibility of contamination	<p>As noted above, baseline studies completed in the vicinity of the mine site will be used as part of a monitoring program to monitor changes in water quality because of mine activities, including the Berry waste rock pile. Discharges from the mine site will be monitored and treated, if required, prior to release to the receiving environment such that no regulatory guidelines will be exceeded.</p>	Chapter 8, Sections 8.3, 8.4 and 8.8



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Table 3.2 Community Issues and Concerns

Community Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
Project Expansion – Environmental Assessment - Will the proposed expansion be reviewed by both federal and provincial regulators?	The Project Expansion will be reviewed by both federal and provincial regulators. As outlined in Section 1.4, Marathon is required to submit a provincial Environmental Registration under the Newfoundland and Labrador <i>Environmental Protection Act</i> . Based on information available in the <i>Impact Assessment Act</i> , Marathon believes that the federal government will view the Project Expansion as a change to an existing Designated Project (i.e., a change to the already approved Valentine Gold Project). The Impact Assessment Agency of Canada will make an official determination after receipt of this document. If considered a change to a designated project, federal regulators will review this EA update, post it for public comment and determine if the proposed change is acceptable. The same document (this EA Registration Document / EA Update) is being submitted to both provincial and federal regulators to meet the requirements of both levels of government.	Chapter 1, Section 1.4
Project Expansion – environmental assessment – how long will the process take? Is the process different from the environmental assessment of the Approved Project?	The EA process and associated timeline for the Project Expansion will be dependent on decision-making by the federal and provincial governments. The provincial government will review this Environmental Registration and determine if the Project Expansion can be released from further assessment, with conditions, or if further assessment is required. This decision will affect the length and nature of the provincial EA process. For the Approved Project, further assessment was required in the form of an Environmental Impact Statement (EIS). Based on information available in the <i>Impact Assessment Act</i> , Marathon believes that the federal government will view the Project Expansion as a change to an existing Designated Project (i.e., a change to the already approved Valentine Gold Project). The Impact Assessment Agency of Canada will make an official determination after receipt of this document. If considered a change to a designated project, federal regulators will review this EA Registration Document / EA Update, post it for public comment and determine if the proposed change is acceptable. The Approved Project required an EIS under the former federal assessment legislation (i.e., the <i>Canadian Environmental Assessment Act, 2012</i>).	Chapter 1, Section 1.4
Environmental Assessment – why is Marathon looking for permits for Berry now? – wasn't the deposit known at the time of the environmental assessment of the Valentine Project?	The full extent of the resource in the Berry deposit was not well understood at the time the Valentine Gold EIS went through provincial and federal EA review processes. Additional drilling has allowed Marathon to better delineate and understand the extent of the Berry resource and limitations to resources in the other Valentine Gold deposits.	Chapter 1, Section 1.1
Project – is there a possibility of further expansion as a result of ongoing RC drilling?	RC drilling is used to further define/verify resources within existing defined open pits. The results might change the pit design very slightly, but these changes are mainly related to improved grade control and rock management during mining operations.	NA



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Table 3.2 Community Issues and Concerns

Community Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
Project – is there a possibility of underground mining?	Exploration drilling has identified resources beneath the limits of each open pit. However, the drilling that has been done to date is not sufficient to determine if future underground mining might be feasible. Further exploration drilling to assess the potential for underground mining may be conducted from lower elevations within the open pits as these pits are developed.	NA
Project - is exploration ongoing? Are there other known deposits?	Marathon’s exploration activities are ongoing and are currently focussed on locating new deposits that are located in the lesser-explored areas of Marathon’s mineral claims. There have been other deposits located (e.g., Victory deposit), however, based on the exploration work to date, those deposits are not considered economical to mine.	NA
Project Expansion – waste rock – is waste rock acid generating?	Waste rock from the Berry pit is undergoing geochemical testing to determine acid generating potential. This work is ongoing and will be monitored over the life of the mine. Appendix 2B provides the results of this testing program to date. Marathon also has a dedicated ARD/ML Management Plan in place that provides management and mitigation measures should waste rock or other material be deemed acid generating or metal leaching	Chapter 2, Appendix 2B and 2F
Project Expansion – waste rock – is there any use for the waste rock?	As indicated in the Valentine Gold Project: Acid Rock Drainage Metal Leaching Management Plan (Proposed Revisions to Address the Addition of the Berry Pit Expansion) (Appendix 2F), construction rock will be primarily sourced from waste rock generated during development of the open pits. Prior to use for construction, waste rock types will be characterized with respect to ARD potential as described in Section 3.2 of the ARD/ML Management Plan to verify that only non-PAG material with low metal leaching potential is used in construction.	Chapter 2, Section 2.12.3
Rehabilitation and Closure – how long will the process take?	Progressive rehabilitation will occur over the operation phase. Final rehabilitation and closure will occur once mining operations have ended, estimated for 2039, and are expected to last for 3-5 years. Depending on final closure design, monitoring programs may be implemented for a number of years post closure to verify water quality in the vicinity of the mine site	Chapter 2, Section 2.6
Tailings Pond – Water quality - how secure is the tailings pond? Is there a possibility of contamination of Victoria River?	The tailings management facility, which includes the tailings impoundment and tailings pond, was fully assessed in the Valentine Gold EIS (Marathon 2020) and is designed to high engineering standards. The Project Expansion does not require changes to the design of the tailings impoundment or tailings pond from that assessed for the Approved Project. Water collected in the tailings impoundment, will be treated as required and reused in the process plant. Rain and snow will increase volumes in the tailings impoundment. Excess water will be treated by the water treatment plant and SAGR unit to meet regulatory standards prior to discharge.	Chapter 8, Section 8.3



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Table 3.2 Community Issues and Concerns

Community Issue/Concern	Marathon Response/Action/Mitigation	EA Reference
Expansion Project – Air Quality – GHG emissions - will Marathon use any electric vehicles?	Updated modeling was completed. The Project Expansion, in combination with the Approved Project, is not predicted to adversely affect air quality, or increase GHG emissions substantially. There will be a small increase in GHG emissions, however, the estimated contribution of maximum operating year GHG emissions for the combined Approved Project and Project Expansion to provincial and national totals are 1.5% and 0.02% CO _{2e} , respectively. Marathon will consider the use of electric vehicles. Currently light vehicles cannot be procured, and electric versions of large haul truck sizes have not been produced. However, Marathon will continue to explore available options.	Chapter 6



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3.3.2.2 Stakeholder Engagement

Marathon has engaged with key stakeholder organizations that were engaged during the EA of the Approved Project and which have expressed an interest in the Project Expansion and its potential effects on the biophysical and/or socio-economic environment. Fish and wildlife organizations constitute a key stakeholder group, and Marathon engages with these stakeholders on an ongoing basis to keep them apprised of activities in the Project area and to discuss any issues and concerns. These organizations include the NLOA and Salmonid Groups (ERMA, ASF, SCNL and SAEN). Regular engagement activities include the ongoing provision of Project-related information, notices of and invitations to public information sessions, face-to-face/virtual meetings and conference calls. A description of engagement activities undertaken with fish and wildlife organizations relating to the Project Expansion are described below.

In May 2022, Marathon entered into the Outfitters Environmental Effects Monitoring Plan (OEEMP) agreement with the NLOA. The OEEMP provides a framework for ongoing engagement between Marathon and NLOA, including engagement with respect to potential changes to the Approved Project. In accordance with the OEEMP, on May 8, 2023, Marathon provided the NLOA with the Project Summary describing the Project Expansion for circulation to membership, together with an offer to meet to discuss. The NLOA was subsequently provided with a copy of the public information sessions poster and its members were invited to attend any of the information sessions. Following an email exchange in mid-May, an in-person meeting between Marathon and the Executive Director of the NLOA to discuss engagement in relation to the Project Expansion was held on May 25, 2023. Marathon met virtually with the NLOA Board on June 14, 2023, to deliver the Power Point presentation (Appendix 3B) describing the Project Expansion, its predicted environmental effects, and associated potential mitigation measures. Following the meeting, the NLOA were provided with a copy of the PowerPoint presentation for further review and comment. On June 28, 2023, the NLOA Board advised Marathon that it had no issues with the Project Expansion as it would take place within the Approved Project footprint. Marathon will continue to engage with the NLOA consistent with the provisions of the OEEMP and, if necessary, the OEEMP will be revised as appropriate to take into account the Project Expansion.

A similar approach was taken with respect to engagement with Salmonid Groups. On May 8, 2023, Marathon provided each organization with the Project Summary for circulation to membership and offered to meet to discuss the Project Expansion, its predicted effects and associated mitigations. In addition, the email of May 8 also included a copy of the poster detailing the dates, times and locations of the public information sessions held between May 24 and May 26, 2023. No interest was expressed in a meeting although a representative of ERMA did attend the public information session held in Bishop's Falls on May 25, 2023. On May 9, a representative of the ASF indicated by email that issues and concerns with the Project Expansion were the same as those that Salmonid Groups had previously expressed in relation to the Approved Project, which issues are set out in section 3.1 and relate primarily to potential effects upon water quality and fish and fish habitat.

In addition to the engagement efforts described above, Marathon has also provided other stakeholders such as environmental NGOs and individuals with the Project Summary and will meet as requested with



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these stakeholders to discuss issues and concerns following the submission of the Environmental Registration/EA Update to regulators.

Consistent with its commitment to ongoing engagement, Marathon will continue to engage with stakeholders following the submission of the Environmental Registration / EA Update to federal and provincial regulators. Indigenous groups, communities and stakeholders will be notified upon submission of the Environmental Registration / EA Update, and this documentation will be made available to these groups. Marathon will also make this documentation accessible to the public through its website. In addition to the processes described in the preceding sections, Marathon also remains prepared to meet upon request to discuss the Project Expansion and will take any feedback into account as appropriate.

3.3.3 Government Departments and Agencies

Marathon has been consulting with federal and provincial regulators since initiating site exploration activities in 2010, including throughout preparation of the Valentine Gold Project EIS, during development of responses to information requests (federally) and EA amendments (provincially), and in relation to implementation, of and adherence to, EA conditions of release. The provincial and federal EIS Guidelines, through which individual departments specified requirements for the assessment of the Approved Project, were also referred to during development of the Environmental Registration / EA Update.

Marathon has held the following meetings with regulators in preparation for submission of the Berry Complex Expansion Environmental Registration / EA Update:

- February 9, 2023: NLDECC – EA Division representatives
- February 23, 2023: IAAC representatives of the Decision Statement Team, Compliance Promotion/Enforcement Team, and Regional Operations Headquarters Group
- June 15, 2023: NLDECC – EA Division representatives and provincial and federal government department / agency members of the Environmental Assessment Committee for the Approved Project
- July 5, 2023: IAAC representatives of the Decision Statement Team, Compliance Promotion / Enforcement Team, and Regional Operations Headquarters Group

During the meetings, Marathon provided a presentation of the proposed Project Expansion, and the government departments / agencies discussed with Marathon the requirements for the respective regulatory processes. Regulators asked questions regarding the proposed additional infrastructure and activities, such as whether / how the Project Expansion would affect Approved Project infrastructure and activities; if Berry pit would be mined consecutively or concurrently with Marathon and Leprechaun pits; whether the Project Expansion would extend the overall life-of-mine and / or require additional workforce; and how the Project Expansion may affect particular VCs.

Marathon will continue to consult with government departments and agencies as applicable regarding compliance with conditions of release, updating of management plans and follow-up and monitoring plans and programs to incorporate the Project Expansion, and other aspects of regulatory requirements and compliance.

