



**Lynn Lake Gold Project:
Vegetation and Weed
Management Plan**

Version 0

January 30, 2025

**LYNN LAKE GOLD PROJECT:
VEGETATION AND WEED MANAGEMENT PLAN**

Document History

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Approvals

This document requires the following approvals:

Name	Company Title	Date	Signature

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Acronyms and Abbreviations

%	percent
≤	less than or equal to
≥	more than or equal to
°C	degrees Celsius
Alamos	Alamos Gold Inc.
AQMP	Air Quality Management Plan
CEAA 2012	<i>Canadian Environmental Assessment Act, 2012</i>
cm	centimetre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
EDDMaps	Early Detection and Distribution Mapping System
EIS	Environmental Impact Statement
EMMP	Environmental Management and Monitoring Program
GIS	geographic information system
GPS	global positioning system
ha	hectare
ISCM	Invasive Species Council of Manitoba
ISCM	Invasive Species Council of Manitoba
km/h	kilometres per hour
LAA	local assessment area
LOM	life of mine
m	metre
m/s	metres per second
m ²	square metres
MB CDC	Manitoba Conservation Data Centre

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MECC	Manitoba Environment and Climate Change (formerly Manitoba Environment, Climate and Parks, formerly Manitoba Conservation and Climate)
MESEA	Manitoba's <i>Endangered Species and Ecosystems Act</i>
mm	millimetre
MRSA	Mine Rock Storage Area
PDA	Project development area
PPE	personal protective equipment
PR	provincial road
QA/QC	quality assurance/quality control
RAA	regional assessment area
RGMP	Responsible Gold Mining Principle
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SMRP	Soil Management and Rehabilitation Plan
SOCC	Species of Conservation Concern
SWMMP	Surface Water Monitoring and Management Plan
TMF	Tailings Management Facility
USDA	United States Department of Agriculture
VWMP	Vegetation and Weed Management Plan
WMMP	Wildlife Monitoring and Management Plan

Glossary

Adaptive management	The process of using the findings from ongoing monitoring to continually improve mitigation strategies and procedures to further lessen effects on selected valued component.
Mitigation	A planned activity or process that reduces the severity of a potential effect on a selected valued component.
Monitoring	A planned activity used to evaluate the progress or effectiveness of mitigation measures and verify environmental assessment predictions.
Non-native invasive species	Non-native invasive species are plants that grow outside their country/region of origin and can rapidly spread in areas disturbed by construction but are not listed under <i>the Noxious Weeds Act</i> . Non-native invasive species are those identified by the Invasive Species Council of Manitoba (ISCM).
Regulated weeds	Regulated weeds are plant species designated under <i>the Noxious Weeds Act</i> . The Noxious Weeds Regulations designates regulated weeds as Tier 1, 2, or 3, and specifies requirements for control or elimination. Tier 1 species are those that are considered to have the most potential for negative effects though they may not yet be present in Manitoba. Tier 1 species must be destroyed or eradicated immediately upon discovery. Tier 2 species are already established in Manitoba and have been observed to spread easily. Tier 2 species infestations under five acres (two hectares) must be eradicated; whereas infestations larger than five acres must be controlled and kept from spreading. Tier 3 species are all other designated species that do not require immediate control unless the spread of the occurrence poses a threat to the economy, environment, or the well-being of residents.

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1.0 INTRODUCTION

The following presents the Vegetation and Weed Management Plan ('VWMP' or 'the Plan'), which considers the construction, operation, and decommissioning/closure phases of the Lynn Lake Gold Project ('LLGP' or 'the Project') and the mitigation, management, and monitoring of Project-related effects on vegetation, wetland abundance, and diversity. It is one component of the overall Environmental Management and Monitoring Program (EMMP) for the Project.

For clarity, the term "follow-up programs" as stated in the federal Decision Statement refers to "management and monitoring programs" as outlined in the provincial Environment Act Licences. Both terms are used interchangeably but refer to the same monitoring activities that extend over the life of mine through all phases.

1.1 PURPOSE

The purpose of the VWMP is to guide the implementation of clearing, revegetation, and wetland mitigation measures, and weed management activities on the Project sites during construction, operation, and decommissioning/closure in accordance with environmental protection measures and provincial guidelines.

1.2 OBJECTIVES

Adherence to the VWMP will provide results which are measurable (where possible) and reportable. The objectives of the VWMP are to:

- Reduce the potential for Project-related effects to vegetation and wetlands.
- Reduce the potential for Project-related disturbance to native plant communities.
- Maintain long-term viability of native plant communities.
- Protect Species of Conservation Concern (SOCC) and their habitat.
- Prevent weed establishment.
- Protect against erosion.
- Improve aesthetics.
- Guide vegetation establishment.

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The management and monitoring (follow-up) criteria established for the VWMP were informed by concerns raised through the Environmental Impact Statement (EIS) review and subsequent information requests received from federal and provincial regulators, Indigenous Nations, and stakeholders. Thus, the management and monitoring criteria reflect measurable and meaningful parameters to verify key EIS predictions and to evaluate the effectiveness of mitigation measures. The VWMP will establish a framework for adaptive management that can be used to modify or enhance mitigation strategies for vegetation and wetlands.

1.3 RELATIONSHIP TO OTHER MANAGEMENT PLANS

The VWMP includes reference to several management plans included in the EMMP. Revegetation and weed control will be conducted in disturbed areas of the Project. Through establishing terrestrial vegetation cover, the VWMP also supports the following plans:

- Aquatic Effects Monitoring Plan (AEMP)*
- Air Quality Management Plan (AQMP)
- Erosion and Sediment Control Plan (ESCP)
- Soil Management and Rehabilitation Plan (SMRP)
- Surface Water Monitoring and Management Plan (SWMMP)
- Wildlife Monitoring and Management Plan (WMMP)
- Closure Plans

**See the AEMP for aquatic revegetation measures.*

1.4 REGULATORY CONTEXT

The Project EIS was submitted to the Impact Assessment Agency of Canada (formerly the Canadian Environmental Assessment Agency) pursuant to *Canadian Environmental Assessment Act, 2012* (CEAA 2012), and to Manitoba Environment and Climate Change (MECC; formerly Manitoba Environment, Climate and Parks and formerly Manitoba Conservation and Climate) as an Environment Act Proposal pursuant to *The Environment Act* of Manitoba. The relevant federal and provincial regulatory requirements related to revegetation and weed management work for the Project are outlined below.

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1.4.1 Federal Regulatory Requirements

Species at Risk Act

The *Species at Risk Act* (SARA) provides protection for species at risk (SAR) in Canada that are listed on Schedule 1. The legislation provides a framework to facilitate recovery of species listed as threatened, endangered, or extirpated and to prevent species listed as special concern from becoming threatened or endangered. SARA provides protection for both SAR and their critical habitat by prohibiting: 1) the killing, harming, or harassing of endangered or threatened SAR (sections 32 and 36 of SARA); and 2) the destruction of critical habitat of an endangered or threatened SAR (sections 58, 60, and 61 of SARA; Government of Canada 2002).

Federal Policy on Wetland Conservation

The *Federal Policy on Wetland Conservation*, 1991 includes the principle of no net loss of wetland function in areas of high historical wetland loss. The federal policy applies to projects occurring on federal land and waters or those projects that receive federal funds. It also applies to wetlands of international importance, as determined by the Ramsar Convention, Ramsar, Iran, 1971.

Following the Federal Policy on Wetland Conservation Implementation Guide for Federal Land Managers (Lynch-Stewart et al. 1996), offsets will not be provided for effects to wetlands from Project components resulting in the clearing or infilling of wetlands as the Project is not located on or adjacent to federal lands and is not expected to have a significant effect on wetland dependent Species at Risk, migratory birds, fish or fish habitat due to wetland loss requiring issuance of a licence, permit or authorization (see EIS Chapter 10, Section 10.7; Chapter 11, Section 11.7; and Chapter 12, Section 12.7). The Project also does not affect wetlands of international importance as determined by the Ramsar List (Ramsar 2017). In addition, the Project is not located in an area of high historical wetland loss. Provincial Regulatory Requirements

1.4.2 Provincial Regulatory Requirements

Manitoba's Endangered Species and Ecosystems Act

Manitoba's Endangered Species and Ecosystems Act (MESEA) provides protection to threatened and endangered ecosystems and plant and animal SAR in Manitoba. The Act facilitates the management and development of recovery strategies for threatened, endangered, and extirpated or extinct species to prevent further declines and promote recovery. MESEA-listed species are those that, "are of ecological, educational, aesthetic, historical, medical, recreational and scientific value to Manitoba and the residents of Manitoba" (Government of Manitoba 2018).

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The Wildlife Act

The Wildlife Act provides general provisions for regulating the activities relating to the take and trade of wild animals in Manitoba. A “wild animal” is defined as “an animal or bird of a species or type listed in Schedule A or declared by the regulations to be a wild animal” and includes select amphibian, reptile and mammal species and most bird species. *The Wildlife Act* includes protection for wild animal habitat on Crown land.

Other SOCC in Manitoba are ranked for rarity by the Manitoba Conservation Data Centre (MB CDC 2018). SOCC ranked S1 (very rare throughout its range), S2 (rare throughout its range – 6 to 20 occurrences), and S3 (uncommon throughout its range – 21 to 100 occurrences) by the MB CDC not listed under MESEA are not protected; however, they are important contributors to biodiversity in Manitoba and are considered rare or uncommon.

The Noxious Weeds Act

The Noxious Weeds Act and *Noxious Weeds Regulation* designates certain plant species as Tier 1, 2, or 3, and specifies requirements for control or elimination. Tier 1 species are those that are considered to have the most potential for negative effects though they may not yet be present in Manitoba. Under the Act, Tier 1 species must be destroyed or eradicated immediately upon discovery. Tier 2 species are already established in Manitoba and have been observed to spread easily. Tier 2 species infestations under five acres (two hectares) must be eradicated; whereas infestations larger than five acres must be controlled and kept from spreading. Tier 3 species are all other designated species that do not require immediate control unless the spread of the occurrence poses a threat to the economy, environment, or the well-being of residents. See Appendix A for a list of weed species in Manitoba.

The Water Rights Act

The construction of water control works that temporarily or permanently alter the level or flow of water in a waterbody, including wetlands, is regulated by *The Water Rights Act*. It was amended in 2018 to include wetland offsetting requirements for wetland loss (Government of Manitoba 2019). Alteration or loss of class 3 (seasonal), class 4 (semi-permanent) or class 5 (permanent) wetlands will require a licence and a restoration or enhancement plan prior to disturbance. Marsh and swamp wetlands described in this assessment may require a licence and restoration or enhancement plan prior to disturbance; however, the Act is intended for wetland alterations in the prairie region of Manitoba (Fedorchuk 2021, pers. comm.). The Manitoba Boreal Wetlands Conservation Codes of Practice (Manitoba Agriculture and Resource Development 2020) provides guidelines for the management of effects to wetlands from roads including avoidance, minimization, and offsets. Compensation is not required for bog or fen wetlands. No loss of marsh wetlands (class 3-5) will occur from development of the Gordon or MacLellan sites (Chapter 11, Appendix 11C). Following the Manitoba Boreal Wetland Conservation Codes of Practice (Manitoba Agriculture and Resource Development 2020), Alamos Gold Inc. (Alamos) will contact Manitoba Agriculture and Resource Development regarding potential offsets, or financial compensation, for areas of shallow open water affected by access roads. The locations of areas of potential off-sets, or value of financial compensation, are not currently known. Alamos will work with Manitoba Agriculture and Resource

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Development to determine appropriate off-sets and off-set locations, or financial compensation, for access roads prior to construction if required.

The Conservation Agreements Act

The Conservation Agreements Act enables protection and enhancement of natural ecosystems, wildlife or fisheries habitat, and plant or animal species by imposing restrictions on the use of the land. Conservation agreements can be established between landowners and conservation agencies such as Manitoba Habitat Heritage Corporation, Ducks Unlimited Canada, or Nature Conservancy of Canada. Disturbance of land that has a conservation agreement may be restricted.

The Ecological Reserves Act

Unique, rare, and representative natural features, including habitats, geological features and ecosystems, and modified ecosystems offering opportunities for research may be designated as ecological reserves under *The Ecological Reserves Act*. Areas are designated as ecological reserves by the Government of Manitoba and access and use of these areas requires prior approval.

The Forest Act

The Forest Act regulates and administers, with respect to Crown timber, matters relating for forestry. This includes management, use and conservation of Crown forest lands and timber, as well as afforestation (establishing forest on land with no previous forest cover), reforestation, tree preservation and tree improvement.

The Forest Health Protection Act

Forest threats including insects, diseases, and organisms set out in Schedule A and invasive forest threats set out in Schedule B are regulated through *The Forest Health Protection Act*. Schedule A includes Dutch elm disease, dwarf mistletoe, and emerald ash borer. Schedule 2 includes oak wilt, sudden oak death, and mountain pine beetle. Programs to protect and promote the health of trees and forests in Manitoba, such as the Dutch Elm Disease Management Program, are administered under the Act. The Forestry and Peatlands Branch of MECC monitors for forest insects and diseases such as Dutch elm disease and emerald ash borer. Care must be taken to prevent introduction of an invasive forest threat and identification of an invasive forest threat must be reported.

The Wildfires Act

The burning of land, timber and debris is regulated under *The Wildfires Act*. A burning permit is required for outdoor fires in certain areas of Manitoba within the wildfire season. Fires must not be started if conditions could lead to the fire burning out of control and controls must be in place prior to burning material, including a minimum 6-m-wide strip of land free of inflammable material, or covered by snow or water. Burning material also cannot be placed where it could cause a fire to spread and burning must be supervised until the fire is out.

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The Mines and Minerals Act

The Mines and Minerals Act regulates mining activities in Manitoba and strives for sustainable resource development through reducing negative effects to the environment, promoting conservation and reclamation policies and practices that are good for the economy and the environment. The *Mine Closure Regulation* under the Act outlines “satisfactory conditions” that must be adhered to for revegetation. Deviation from these guidelines requires detailed reasoning be submitted. Vegetation must be self-sufficient six years post reclamation (planting). In addition, the Manitoba Mine Closure Regulation General Closure Plan Guidelines provide direction for revegetation during the closure phase.

1.4.3 Corporate or Other Policies

As a member of the World Gold Council, Alamos is a proud supporter of the Responsible Gold Mining Principles (the RGMPs). The ten RGMPs provide a framework that sets expectations for consumers, investors, and the downstream gold supply chain as to what constitutes responsible gold mining, addressing key environmental, social and governance issues for the gold mining sector. They are designed to provide confidence to governments, investors, employees and contractors, communities, supply chain partners and civil society that gold has been produced responsibly. Following the release of the RGMPs in September 2019, Alamos has implemented and aligned to the framework, and obtained external assurance to provide further confidence that the gold produced by Alamos is responsibly mined. In 2023, Alamos communicated its progress on implementing the RGMPs through Alamos’ 2022 RGMP Progress Report which received independent audit/assurance from EEM EHS Management Inc. (Alamos 2023). The 2022 RGMP Progress Report reflects Alamos’ third year reporting under the RGMP. Alamos will continue to implement the RGMPs through 2024 and beyond. Exploration sites and projects under development, such as the Lynn Lake Gold Project, are excluded from the RGMP implementation process. The RGMPs are only applicable to operating mines. The Lynn Lake Gold Project will be incorporated as it transitions through construction into operation.

Working with its members, the World Gold Council has set out RGMPs to address key environmental, social and governance issues for the gold mining sector. One of the key principles is Water, Energy and Climate Change.

Alamos also has a Sustainability Policy. For Alamos, sustainability encompasses excellence in health and safety, environmental management, community engagement, security, and human rights. The Policy outlines Alamos’ commitment to build, operate and close mines in a manner that supports our sustainability vision and promotes the Alamos core values of Safety, Teamwork, Environmental Sustainability, Integrity, and Commitment. The Policy is a key element of the Alamos Sustainability Framework and is supported by Corporate Sustainability Standards that guide site procedures and practices.

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Those corporate sustainability standards (Table 1-1) that may be applicable specifically to the VWMP include:

- Environmental Monitoring
- Biodiversity & Land Use
- Mine Closure

Alamos' standards are regularly updated to reflect the latest developments. For the most current and up-to-date standards, please refer to the online (internal) version.

Table 1-1 Corporate Sustainability Standards

Corporate Policy	Requirement
Environmental Monitoring (CSS-ENV-10.1)	Sites shall develop and implement an environmental monitoring program. The site's environmental monitoring program will be documented as to list of points monitored, coordinates of points monitored, description of points (including the reason for monitoring (e.g., regulatory compliance, baseline, trend analysis, etc.), frequency of monitoring, anticipated duration of monitoring (e.g., the life of the mine), and parameters monitored. The monitoring program will be of sufficient scope to allow for the timely identification of potential environmental impacts prior to their migration offsite. Sites will regularly review their monitoring programs and update for and changes at the mine site as required. At a minimum, the program will meet all environmental regulatory requirements.
Environmental Monitoring (CSS-ENV-10.2)	Compliance monitoring data will be subject to Quality Assurance/Quality Control (QA/QC) verification. Sample results that do not meet QA/QC guidelines will be disregarded and sample collection repeated. Sites must use reliable and accredited labs.
Environmental Monitoring (CSS-ENV-10.3)	Monitoring data will be stored in an electronic database.
Environmental Monitoring (CSS-ENV-10.4)	When compliance monitoring results indicate exceedances of permit or regulatory requirements, or significant deviation from previous results, the results will be reconfirmed with the person or company that did the analysis, and a confirmatory monitoring or sample will be taken immediately if the result is reconfirmed. Sites will also follow any permit-specific or jurisdictional requirements.
Environmental Monitoring (CSS-ENV-10.5)	Monitoring data will be reviewed at least quarterly by the responsible manager to identify trends that may indicate potential for future exceedances of permit conditions or applicable standards, and potential risk. The site General Manager will be formally notified of any exceedances and emerging compliance issues. Refer to CSS-GOV-08 Incident Reporting Standard for any moderate, major, or catastrophic incidents.
Environmental Monitoring (CSS-ENV-10.6)	Sites will assess the need for a monitoring program involving external stakeholders.

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Corporate Policy	Requirement
Biodiversity & Land Use (CSS-ENV-7.2)	<p>Prior to any surface disturbance, sites will evaluate risks of potential impacts to sensitive resources, including:</p> <ul style="list-style-type: none"> • Cultural resources • Traditional knowledge or historical community use • Territorial lands • Historical or archeological features • Threatened or endangered wildlife and vegetation species • Sensitive areas • Sensitive habitats • Wetlands <p>If risks are identified, a Biodiversity and Land Use Management Plan will be developed, implemented and maintained in order to avoid, minimize, mitigate or offset disturbance.</p>
Biodiversity & Land Use (CSS-ENV-7.5)	Sites will minimize ecosystem disturbance to only what is essential for safe efficient operation (including vegetation clearance, soil disturbance, noise, vibration and artificial lighting).
Biodiversity & Land Use (CSS-ENV-7.6)	Sites will control the influence of introduced plants, animals and pathogens, particularly invasive plant species, weeds, feral predators, and plant and animal diseases.
Mine Closure (CSS-ENV-9.5)	<p>Physical restoration and stability shall be described in the life of mine (LOM) closure plan and integrated into the mine plan, including:</p> <p>Revegetation Plan – will be site specific for post-closure land use and biodiversity.</p>

1.4.4 Approval-Related Requirements

The conditions relating to vegetation and wetlands laid out in the federal Decision Statement issued under the *Canadian Environmental Assessment Act, 2012*, provincial Environment Act Licence No. 3390 (Gordon), and provincial Environment Act Licence No. 3391 (MacLellan) with concordance information stating where each condition is addressed in the VWMP are outlined in Table 1-2 below.

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Table 1-2 Approval Related Requirements

Licence	Condition	Corresponding VWMP Section
CEAA 2012	2.1 The Proponent shall ensure that its actions in meeting the conditions set out in this Decision Statement during all phases of the Designated Project are considered in a careful and precautionary manner, promote sustainable development, are informed by the best information and knowledge available at the time the Proponent takes action, including policies, guidelines and directives and community and Indigenous knowledge, are based on methods and models that are recognized by standard-setting bodies, are undertaken by qualified individuals, and have applied the best available economically and technically feasible technologies.	2.0, 3.0
CEAA 2012	2.2 The Proponent shall ensure that its actions in meeting the conditions set out in the Decision Statement are taken in a way that is consistent with any applicable recovery strategy and action plans for listed species at risk.	1.4.5
CEAA 2012	2.5 The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement, determine, as part of the development of each follow-up program and in consultation with Indigenous groups and any other parties being consulted during the development, the following information, unless otherwise specified in the condition: 2.5.1 the methodology, location, frequency, timing and duration of monitoring associated with the follow-up program; 2.5.2 the scope, content and frequency of reporting of the results of the follow-up program to the parties consulted for the development of the follow-up program; 2.5.3 the minimum frequency at which the follow-up program must be reviewed and, if necessary, updated; 2.5.4 the levels of environmental change relative to baseline that would require the Proponent to implement modified or additional mitigation measure(s), including instances where the Proponent may require Designated Project activities causing the environmental change to be stopped; 2.5.5 the technically and economically feasible mitigation measures to be implemented by the Proponent if monitoring conducted as part of the follow-up program shows that the levels of environmental change referred to in condition 2.5.4 have been reached or exceeded; and 2.5.6 the specific and measurable end points that must be achieved before the follow-up program can end. Those end points should indicate that the accuracy of the environmental assessment has been verified and/or that the mitigation measures are effective.	3.0, 4.0, 5.0, 6.0, 7.0
CEAA 2012	2.6 The Proponent shall update the information determined for each follow-up program pursuant to condition 2.5 during the implementation of each follow-up program, at the minimum frequency determined pursuant to condition 2.5.3 and in consultation with Indigenous groups and any other parties being consulted during the development of each follow-up program.	8.0

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Licence	Condition	Corresponding VWMP Section
CEAA 2012	2.7 The Proponent shall provide details of the follow-up programs referred to in conditions 3.12, 3.13, 3.14, 3.15, 4.5, 4.6, 6.3, 6.4, 6.5, 9.3, 10.5 and 12.2, including the information determined for each follow-up program pursuant to condition 2.5, to the Agency and to Indigenous groups and any other parties being consulted during the development of each follow-up program prior to the implementation of each follow-up program. The Proponent shall also provide any update made pursuant to condition 2.6 to the Agency and to Indigenous groups and any other parties being consulted during the development of each follow-up program within 30 days of the follow-up program being updated.	8.0
CEAA 2012	2.8 The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement: 2.8.1 implement the follow-up program according to the information determined pursuant to condition 2.5; 2.8.2 conduct monitoring and analysis to verify the accuracy of the environmental assessment as it pertains to the particular condition and/or to determine the effectiveness of any mitigation measure; 2.8.3 determine whether modified or additional mitigation measure(s) are required based on the monitoring and analysis undertaken pursuant to condition 2.8.2; 2.8.4 if modified or additional mitigation measure(s) are required pursuant to condition 2.8.3, develop and implement these mitigation measure(s) as soon as feasible and monitor them pursuant to condition 2.8.2. The Proponent shall notify the Agency in writing within 48 hours of any modified or additional mitigation measure being implemented. If the Proponent implements any additional or modified mitigation measure not previously submitted to the Agency pursuant to condition 2.5, the Proponent shall submit a detailed description of the measure(s) to the Agency within 7 days of their implementation; and 2.8.5 report all results of the follow-up program to the Agency no later than March 31 following each reporting year during which the follow-up program is implemented and, subject to information determined pursuant to 2.5.2, to the parties being consulted during the development of the follow-up program.	3.0, 4.0, 5.0, 6.0, 7.0, 8.0
CEAA 2012	2.9 Where consultation with Indigenous groups is a requirement of a follow-up program, the Proponent shall discuss the follow-up program with each group and shall determine, in consultation with each group, opportunities for their participation in the implementation of the follow-up program, including the conduct of monitoring, the analysis and reporting of follow-up results and the determination of whether modified or additional mitigation measure(s) are required, as set out in condition 2.8, and opportunities for training to support participation in monitoring. The Proponent shall permit the participation of any interested Indigenous group in the identified follow-up program and training.	5.0, 6.0, 7.0, 8.0

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Licence	Condition	Corresponding VWMP Section
CEAA 2012	<p>2.10 The Proponent shall prepare an annual report for each reporting year that sets out:</p> <p>2.10.1 the activities undertaken by the Proponent to comply with each of the conditions set out in this Decision Statement;</p> <p>2.10.2 how the Proponent complied with condition 2.1;</p> <p>2.10.3 for conditions set out in this Decision Statement for which consultation is a requirement, how the Proponent considered any views and information that the Proponent received during or as a result of the consultation, and the resources provided to support their participation in consultation activities;</p> <p>2.10.4 the information referred to in conditions 2.5 and 2.8 for each follow-up program;</p> <p>2.10.6 for any plan that is a requirement of a condition set out in this Decision Statement, any update(s) to the plan that have been made during the reporting year; and</p> <p>2.10.7 any modified or additional mitigation measure implemented or proposed to be implemented by the Proponent, as determined pursuant to condition 2.8.</p>	8.0
CEAA 2012	<p>2.11 The Proponent shall submit to the Agency the annual report referred to in condition 2.10, including a plain language executive summary in both official languages, no later than March 31 following the reporting year to which the annual report applies.</p>	8.0
CEAA 2012	<p>2.12 The first reporting year for which the Proponent shall prepare an annual report pursuant to condition 2.10 shall start on the day the Minister of the Environment issues the Decision Statement pursuant to subsection 54 (1) of the Canadian Environmental Assessment Act, 2012.</p>	8.0
CEAA 2012	<p>5.2 The Proponent shall avoid disturbing sites of traditional or cultural importance within or near the Project development areas, except for the construction of Designated Project components. In doing so, the Proponent shall:</p> <p>5.2.1 identify, in consultation with Indigenous groups, the location of sites of traditional or cultural importance within or near the Project development areas;</p> <p>5.2.2 provide opportunities to Indigenous groups, prior to construction and at times determined in consultation with each Indigenous group, to:</p> <p>5.2.2.1 harvest and transplant, during seasons where plants can be identified and harvested, plant species used for traditional purposes from areas that will be cleared of vegetation; and</p> <p>5.2.2.2 conduct ceremonies for any sites of traditional or cultural importance that will be disturbed by any Designated Project activities.</p>	2.1.2, 3.1
CEAA 2012	<p>5.4 The Proponent shall develop, prior to construction, and implement, during all phases of the Designated Project, a protocol for inspecting and cleaning vehicles, machinery and equipment associated with the Designated Project that have come from other worksites in order to limit the introduction and spread of weed species within the Project development areas.</p>	3.0

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Licence	Condition	Corresponding VWMP Section
CEAA 2012	5.6 The Proponent shall, when implementing measures to limit the introduction and spread of weed species within the Project development areas, use measures other than broadcast spraying when applying herbicides to mitigate effects to plant species used for traditional purposes by Indigenous groups, unless the Proponent determines that these measures are ineffective at controlling the introduction and spread of weed species.	4.0
CEAA 2012	5.7 The Proponent shall undertake, in consultation with Indigenous groups and relevant authorities, progressive reclamation of areas disturbed by the Designated Project. In doing so, the Proponent shall: 5.7.1 identify, in consultation with Indigenous groups, plant species native to the local assessment areas and plant species used for traditional purposes, to use for revegetation; 5.7.2 establish performance standards for reclaimed areas, including that the areas be self-sustaining, reduce establishment of weed species, restore native species assemblages, and reduce erosion of exposed soils; and 5.7.3 monitor reclaimed areas for a minimum of five years during post-closure or until performance standards established pursuant to condition 5.7.2 are met.	5.0
CEAA 2012	10.4.3 as part of progressive reclamation referred to in condition 5.7, removing and reclaiming all linear features when they are no longer required for the Designated Project, to impede woodland caribou (<i>Rangifer tarandus caribou</i>) predator access to linear features in the Project development areas, including the distribution line right of way, and any access roads identified in consultation with Indigenous groups and relevant authorities as no longer being used for other purposes.	5.0
Environment Act Licence No. 3390 (Gordon)	9. The licensee shall, in the event of a fire which continues in excess of thirty (30) minutes or requires fire suppression assistance from personnel outside of the facility (example: fire department): a) call the fire department; and b) report the fire by calling the Environmental Emergency Report Line (204-944-4888 or toll free 1-855-944-4888), identifying the type of materials involved and the location of the fire.	3.2
Environment Act Licence No. 3390 (Gordon)	17. The licensee shall prepare, implement and continuously maintain in current status, the following plans for the development in a manner acceptable to the director: h) Vegetation and Weed Management Plan;	This document
Environment Act Licence No. 3390 (Gordon)	23. The licensee shall, during construction of the development, operate, maintain and store all materials and equipment in a manner that prevents any deleterious substances (fuel, oil, grease, hydraulic fluids, coolant, paint, uncured concrete and concrete wash water, etc.) from entering watercourses, and have an emergency spill kit for in-water use available onsite during construction.	3.2
Environment Act Licence No. 3390 (Gordon)	24. The licensee shall not locate any petroleum storage tank within 100 metres of the shoreline of any waterway or water body.	3.2

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Licence	Condition	Corresponding VWMP Section
Environment Act Licence No. 3390 (Gordon)	25. The licensee shall, with respect to on-site earthen construction works, construct and maintain silt fences or other suitable erosion and sediment controls in the drainage routes transporting surface runoff off the property of the development until vegetation has been reestablished on the disturbed areas.	3.2
Environment Act Licence No. 3390 (Gordon)	26. The licensee shall, during construction and maintenance of the development, prevent the introduction and spread of foreign aquatic and terrestrial biota by cleaning equipment prior to its delivery to the site of the development in accordance with the requirements of Regulation 173/2015 respecting Aquatic Invasive Species, or any future amendment thereof.	3.0
Environment Act Licence No. 3390 (Gordon)	27. The licensee shall not remove, destroy or disturb species unless otherwise authorized pursuant to Manitoba Regulation 25/98, respecting Threatened, Endangered and Extirpated Species, or any future amendment thereof, and pursuant to the federal <i>Species at Risk Act</i> .	1.4.5, 3.0
Environment Act Licence No. 3391 (MacLellan)	9. The licensee shall, in the event of a fire which continues in excess of thirty (30) minutes or requires fire suppression assistance from personnel outside of the facility (example: fire department): a) call the fire department; and b) report the fire by calling the environmental emergency reporting line (204-944-4888 or toll free 1-855-944-4888), identifying the type of materials involved and the location of the fire.	3.2.2
Environment Act Licence No. 3391 (MacLellan)	17. The licensee shall prepare, implement and continuously maintain in current status, the following plans for the development in a manner acceptable to the director: h) Vegetation and Weed Management Plan	This document
Environment Act Licence No. 3391 (MacLellan)	24. The licensee shall, during construction of the development, operate, maintain and store all materials and equipment in a manner that prevents any deleterious substances (fuel, oil, grease, hydraulic fluids, coolant, paint, uncured concrete and concrete wash water, etc.) from entering watercourses, and have an emergency spill kit for in-water use available on-site during construction.	3.2
Environment Act Licence No. 3391 (MacLellan)	25. The licensee shall not locate any petroleum storage tank within 100 metres of the shoreline of any waterway or water body.	3.2
Environment Act Licence No. 3391 (MacLellan)	26. The licensee shall, with respect to on-site earthen construction works, construct and maintain silt fences or other suitable erosion and sediment controls in the drainage routes transporting surface runoff off the property of the development until vegetation has been reestablished on the disturbed areas.	3.2

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Licence	Condition	Corresponding VWMP Section
Environment Act Licence No. 3391 (MacLellan)	27. The licensee shall, during construction and maintenance of the development, prevent the introduction and spread of foreign aquatic and terrestrial biota by cleaning equipment prior to its delivery to the site of the development in accordance with the requirements of Regulation 173/2015 respecting Aquatic Invasive Species, or any future amendment thereof.	3.0
Environment Act Licence No. 3391 (MacLellan)	28. The licensee shall not remove, destroy or disturb species unless otherwise authorized pursuant to Manitoba Regulation 25/98, respecting Threatened, Endangered and Extirpated Species, or any future amendment thereof, and pursuant to the federal <i>Species at Risk Act</i> .	1.4.5, 3.0

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1.4.5 Species of Conservation Concern

Rare plant SOCC are defined as federally and provincially protected species or species listed on federal or provincial tracking lists that are:

- Listed under Schedule 1, Schedule 2, or Schedule 3 of SARA (2002) as endangered, threatened, or special concern, or
- Listed in *The Endangered Species and Ecosystems Act* (2018) as endangered, threatened, or special concern.
- Listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as endangered, threatened, or special concern (2019); or
- Assigned a ranking of S1, S2, or S3 (or a combination of these rankings) by the Manitoba Conservation Data Center (MB CDC) (2022).

1.4.6 Plant Species of Interest to Indigenous Nations

Plant species of interest to Indigenous Nations are species identified by participating Indigenous Nations as traditionally used by the Indigenous Nations. Using Aboriginal Plant Use in Canada's Northwest Boreal Forest (Marles et al. 2008) and the MB CDC plant species list (MB CDC 2018), corresponding scientific names of the common names provided by Indigenous Nations were searched to compile a list of potential species in Manitoba (EIS Volume 4, Appendix L). The list of potential plant species was compared to the comprehensive species list observed in the regional assessment areas (RAA) applied in the EIS.

1.4.7 Weed Species

Weed species including both regulated weeds and non-native invasive species can outcompete native plant species, change water and nutrient availability, and reduce the aesthetic appeal of an area. Regulated weeds in Manitoba are listed in Appendix A. Non-native invasive species are plants that grow outside their country/region of origin and can rapidly spread in areas disturbed by construction but are not listed under the Act. Non-native invasive species are those identified by the Invasive Species Council of Manitoba (ISCM). The ISCM promotes prevention, early detection, and rapid response to save habitats from non-native invasive species (ISCM 2021). As non-native plant species can also interfere with revegetation efforts, measures for unregulated plants are also included in this document. For the purposes of this document, regulated weeds and non-native invasive species will be herein referred to as weeds or weed species.

This VWMP prescribes corrective measures (e.g., mowing and hand-pulling) where necessary to control the abundance and spread of weed species.

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2.0 ENVIRONMENTAL SETTING

2.1 VEGETATION CONDITIONS

The Project is in the Boreal Shield Ecozone, Churchill River Upland Ecoregion, and Reindeer Lake Ecodistrict, which is characterized by black spruce (*Picea mariana*) dominated forests and permafrost and non-permafrost wooded bogs and patterned fens (Smith et al. 1998). Tamarack (*Larix laricina*) is typically found in richer peatland wetlands, while richer upland sites are forested with white birch (*Betula papyrifera*), jack pine (*Pinus banksiana*), and occasionally white spruce (*Picea glauca*). Jack pine stands occur mainly on upland sites, while white birch can be found in both uplands and wetlands throughout the Ecodistrict (Smith et al. 1998). Almost half of the local assessment area (LAA, as established to support the EIS) is upland (6,992 ha, 46%), much of the other half is wetland (6,452 ha, 42%), with the remaining areas classified as water (1,353 ha, 9%), and anthropogenic (484 ha, 3%). Conifer-dominated forests are the most common forest type occurring throughout the LAA, with most being dense, followed by open and sparse. Based on field observations (EIS Volume 4, Appendix L), mixedwood forests were also present in the LAA, but were much less common as deciduous tree species generally require more nutrient rich soil (Zoladeski et al. 1995). Mixedwood forests were more commonly observed in and around the Gordon LAA. Deciduous-dominated forests are absent from the LAA.

Forest fires are common in the area and in 1993 a fire burned the norther tip of the Gordon Project Development Area (PDA) while in 2007 an extensive fire occurred mainly north of Provincial Road (PR) 391 between Gordon and MacLellan sites (Manitoba Conservation and Climate 2019). In 2019, there was a fire that covered a portion of the southern part of the MacLellan site LAA, a small portion of the MacLellan site PDA, and a small portion of the PR 391 LAA (Manitoba Conservation and Climate 2019). These fires have resulted in a mosaic of regenerating shrub dominated uplands and wetlands, as well as pole/sapling forests. Many smaller fires have also occurred throughout the region, though most of the region is unburned and likely consists of mature forest with areas of old growth forest.

2.1.1 Species Diversity

Field surveys documented 200 plant species within the Project area during the 2015 field surveys (June 2 and 3, July 13 to 15, and August 20 to 25, 2015). Of these species, there were 134 vascular plant species, 43 bryophyte species, and 23 lichen species.

Field surveys documented 117 plant species within the Project LAA during the 2022 field surveys (July 6-12, 2022). Of these species, there were 98 vascular plant species, 12 bryophyte species, and 7 lichen species.

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2.1.2 SOCC and Plant Species of Interest to Indigenous Nations

A total of 18 SOCC have been identified by the MB CDC in the Churchill River Upland Ecoregion; however, no federally protected plant species listed under SARA grow in the habitat types found in the LAA (Appendix C; MB CDC 2022). Three SOCC were observed in the Gordon PDA including one occurrence of boreal locoweed (*Oxytropis borealis*), one occurrence of northern ground-cedar (*Diphasiastrum complanatum*), and one occurrence of eyed foam lichen (*Stereocaulon tomentosum*) (Map B-1 Appendix B). Five SOCC were observed in the Gordon LAA including one occurrence of eyed foam lichen, one occurrence of hairy butterwort (*Pinguicula villosa*), one occurrence of lake quillwort (*Isoetes lacustris*), three occurrences of shrubby willow (*Salix arbusculoides*), and one occurrence of small water-lily (*Nymphaea tetragona*) (Map B-1, Appendix B). Three SOCC were observed within the MacLellan PDA including one occurrence of Northern ground-cedar (*Diphasiastrum complanatum*), one occurrence of American parsley fern (*Cryptogramma acrostichoides*) and one occurrence of eyed foam lichen (*Stereocaulon tomentosum*). Three SOCC were observed in the MacLellan LAA including one occurrence of northern ground-cedar, one occurrence of northern woodsia (*Woodsia alpina*), and two occurrences of shrubby willow (Map B-2, Appendix B).

Based on Alamos' engagement to date, 45 of the species observed during the 2015 field surveys and 39 of the species observed during the 2022 field surveys are plant species of interest to Indigenous Nations (Stantec 2017; Stantec 2022). The plant species of interest to Indigenous Nations may not accurately reflect the opinion of all Indigenous Nations and may exclude some plant species. The observed species of interest to Indigenous Nations are common species in Manitoba except for small water lily and shrubby willow. Commonly occurring species observed in the PDAs (average >20% cover) include various species of birch, jack pine, moss, and spruce. Less commonly occurring species observed include mooseberry (*Viburnum edule*), red raspberry (*Rubus idaeus*), and wild strawberry (*Fragaria virginiana*) (1 observation each).

Plant species of interest to Indigenous Nations are expected to occur in all land cover types present in the PDA, LAA, and RAA of both the Gordon and MacLellan sites, including areas of disturbed land. Conifer, bog and mixedwood land cover types provide most of the habitat for plants of interest to Indigenous Nations. Conifer and bog land cover types each provide habitat for 14 plants and mixedwood land cover provides habitat for 10 plant species. In addition, more than one land cover type provides habitat for many of the plant species of interest to Indigenous Nations.

2.1.3 Weed Species

Common dandelion (*Taraxacum officinale*) and quack-grass (*Elymus repens*) are regulated weed species observed in the Gordon PDA (Tier 3 noxious weeds; Government of Manitoba 2017). On the existing reclaimed storage/stockpile areas at the Gordon site, common dandelion occupied 5% cover and quackgrass occupied 10% cover in a 20-m x 20-m survey plot. Common dandelion was also seen in the existing pits at the Gordon site in trace amounts. Four occurrences of common dandelion in the Gordon PDA were noted during the 2022 field survey. One occurrence of common dandelion was observed at the MacLellan site during the 2022 field survey.

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Common dandelion has been documented in mature forest, but in low frequency and density (Sumners and Archibold 2007). The species is expected to occur most frequently, and in higher density, in disturbed areas, including road rights-of-way. Sumners and Archibold (2007) consider the species a low threat and easy to hard to control. Both common dandelion and quackgrass are facultative upland species, meaning they usually occur in non-wetlands but may occur in wetlands, and they are not fire resistant (USDA 2021). Based on this information, all land cover types are expected to be susceptible to invasion by the observed weed species, but they are not expected to alter the community diversity or structure of undisturbed area.

2.2 WETLANDS

The Project is in the High Boreal wetland region, which is characterized by permafrost and non-permafrost wooded bogs and patterned fens (Halsey et al. 1997). Treed bogs were the most common organic wetland in the PDA, followed by treed swamp, shrubby bogs, shrubby fens, and treed fens. Bog wetlands were generally located in and around the MacLellan and PR 391 LAAs; whereas fens were more common in and around the Gordon LAA.

2.3 POTENTIAL PROJECT EFFECTS

Project components and activities that may interact with vegetation and wetlands during construction are:

- Site preparation including vegetation clearing and earthworks.
- Water development and control including dewatering of existing pits (Gordon site).
- Emissions (e.g., dustfall), discharges, and wastes.
- Water management.
- Reclamation.
- Post-closure.

During construction, effects to vegetation and wetlands will occur during site preparation, water development and control, and through emissions, discharges, and wastes. During operation, effects to vegetation and wetlands are anticipated to be limited to effects associated with water management, and emissions, discharges and wastes. No additional clearing is anticipated in this phase. Decommissioning of the sites will occur within existing disturbance. At the Gordon site, decommissioning will not result in greater fragmentation or loss of vegetation, and thus will not negatively interact with vegetation and wetlands. Reclamation at the Gordon site may positively affect landscape, community and species diversity and wetland functions by reclaiming to native uplands or native wetland states in some areas.

Direct effects are activities that result from a primary Project action. Direct Project effects will consist of fragmentation of patches of vegetation, and loss of native plant communities, SOCC, plant species of interest to Indigenous Nations, and wetlands from site clearing.

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Indirect effects are the result of a linkage to an intermediate action or pathway including dust deposition and introduction or spread of weed species that indirectly affect community and species diversity, and alterations to and loss of wetlands, and associated SOCC and plants of interest to Indigenous Nations due to site dewatering that lowers groundwater levels. During operation, dust from road use, drilling, blasting and rock removal from open pit mines will likely result in increased dust deposition on surrounding native plant communities. Dust deposition on plants may affect native plant communities as dust deposition and the chemicals contained within the dust have been shown to affect plant productivity. Both construction and operation may indirectly alter the community and species diversity as a result of introduction and/or establishment of invasive species.

The species cover and composition of wetlands intersected by the Gordon and MacLellan LAAs may be indirectly affected by changes in surface water and groundwater patterns caused by the Project. Overland surface water flow patterns may be altered due to vegetation clearing and site development at the Gordon and MacLellan PDAs and this may alter water levels in adjacent wetlands. Changes in groundwater levels due to site dewatering may also extend to fen, swamp, and marsh wetlands in the LAAs. Effects to bogs from changes in groundwater levels are not expected as bogs typically receive water only from precipitation, have low water flow, and the water table is generally 40 to 60 cm below the peat surface (Halsey et al. 1997). Plant species cover, composition, and structure, and decomposition rates may change in the remaining wetland areas due to altered water levels and water permanency, and some wetlands may be completely lost. Indirect effects to wetlands are expected to persist until the open pits fill and groundwater levels return to baseline/existing conditions.

There are also areas of discontinuous permafrost with the LAA, which may thaw because of dewatering. As water flow changes in the landscape, flow channels that are created may saturate areas of permafrost, which will result in thaw.

Changes may also affect wildlife habitat and plant species of interest to Indigenous Nations. Direct and indirect effects to wetlands functions will be reduced by the Project, but loss of any particular type of wetland function is not expected outside of the LAA.

2.3.1 Change in Landscape Diversity

2.3.1.1 Gordon Site

Construction of the Gordon site will result in an expansion of the existing developed area, and no new habitat patches are anticipated to be created in or around this site, but one large habitat patch will be reduced in size. A patch is defined as a contiguous area of vegetation that is uninterrupted by anthropogenic disturbance. During construction and operation of the Gordon site, three patches will be lost and there will be a loss in patch area. However, at closure, since there is no loss of large intact patches from the LAA, reclamation of the Project will result in an increase in patch area and a reduction in patch perimeter.

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2.3.1.2 MacLellan Site

The construction phase at the MacLellan site will result in fragmentation of native plant community patches. It was determined that four vegetation patches will be lost during construction and operation; however, with the reclamation of the MacLellan site, the result is a positive change in the long-term.

2.3.2 Change in Community Diversity

2.3.2.1 Gordon Site

Construction at the Gordon site is expected to directly affect native plant communities including native upland and wetland communities. Directly affected vegetation communities are those that will be cleared during the construction phase of the Project.

The Gordon site may indirectly result in the loss of wetlands (i.e., fen, swamp and marsh) due to dewatering. Indirect effects of dewatering may last approximately 10 years post-reclamation due to natural refilling of the open pit.

Following decommissioning and closure of the Gordon site, portions of the PDA will be reclaimed to native upland.

2.3.2.2 MacLellan Site

Vegetation clearing during construction at the MacLellan site will result in portions of native plant communities being lost or altered. The Project will result in a loss of native upland and wetland plant communities.

The MacLellan site may indirectly result in the loss of wetlands (i.e., fen, swamp and marsh) due to dewatering. Indirect effects of dewatering may last approximately 10 years post-reclamation due to natural refilling of the open pit.

Following decommissioning and closure at the MacLellan site portions of the PDA will be reclaimed upland, native upland, and open water.

2.3.3 Change in Species Diversity

2.3.3.1 Gordon Site

Vegetation clearing during construction at the Gordon site will result in direct loss of three SOCC, boreal locoweed, eye foam lichen, and northern ground-cedar, and occurrences of plant species of interest to Indigenous Nations from site preparation. Three occurrences of shrubby willow and one occurrence of hairy butterwort were observed north of the Gordon PDA, which may be indirectly affected by open pit dewatering during construction and operation. Drier conditions during construction/operation and post-closure due to ground water drawdown will likely lead to the loss of these occurrences in the LAA. Direct effects from the

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Gordon site will reduce the abundance of land cover types that support plant species of interest to Indigenous Nations during construction and operations and after site decommissioning and closure.

Dust deposition at the Gordon site is expected to be highest approximately within 700 m east of the PDA. Dewatering will also affect the distribution and abundance of plants of interest to Indigenous Nations. Plants that are found in wetlands (i.e., cloudberry, willows, alder, black spruce, pond lily and mosses) will be especially vulnerable to groundwater drawdown. Although most plant species of interest to Indigenous Nations are common to Manitoba, a few were infrequently observed during field surveys. Much of the effect to upland species diversity will occur due to vegetation clearing within the PDAs, and effects to wetland species diversity may occur within the LAA, which may result in a change in spatial distribution of plant species of interest to Indigenous Nations within the LAA.

2.3.3.2 MacLellan Site

Vegetation clearing during construction at the MacLellan site will result in the direct loss of three SOCC including American parsley fern, eyed foam lichen, and norther ground cedar, and occurrences of plants species of interest to Indigenous Nations. Three SOCC were observed in the LAA including two shrubby willow occurrences, one occurrence of northern woodsia, and one occurrence of northern ground-cedar. SOCC and plants of interest to Indigenous Nations may be indirectly adversely affected by drawdown from dewatering of the open pit, clearing of the Tailings Management Facility (TMF) and Mine Rock Storage Area (MSRA), and dust deposition from vehicle and equipment use.

Direct effects from the MacLellan site will reduce the abundance of land cover types that support plant species of interest to Indigenous Nations during construction and operations and after site decommissioning and closure.

2.3.4 Change in Wetland Function

2.3.4.1 Gordon Site

During construction at the Gordon site, wetland function and services (e.g., nutrient cycling, decomposition, carbon sequestration, water filtration and storage and habitat) will be directly lost. The loss of wetland functions (e.g., water storage and filtration) of the above wetland area is considered irreversible because this area will be reclaimed to native upland.

Construction and operation at the Gordon site will require dewatering of the open pit and will result in groundwater drawdown within the LAA of at least 1 m within 800 m of the open pit. Groundwater drawdown during construction and operation may alter the wetland class, plant species composition, and decomposition rates of fen, marsh and swamp wetland area.

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2.3.4.2 MacLellan Site

Construction is expected to result in a direct wetland loss at the MacLellan site. Clearing for the MacLellan site includes wetlands in the planned TMF footprint. Upwelling will occur north and east of the TMF at the end of Project operation. This may increase water levels in wetlands in the MacLellan LAA, shift plant composition to species more tolerant of anaerobic soil conditions or deeper water, and alter decomposition rates, potentially slowing decomposition as areas will remain wetter for longer periods.

Construction and operation at the MacLellan site will also require dewatering of the open pit and will result in groundwater drawdown of at least 1 m within 1,200 m of the open pit. Construction of the MacLellan site, including the area of the TMF, will indirectly affect wetlands (i.e., due to altered surface and groundwater flows). Overland surface water flow patterns may be altered due to vegetation clearing and site development at the MacLellan site potentially altering water levels of wetlands in the LAA.

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3.0 MITIGATION AND MANAGEMENT MEASURES

The mitigation measures listed below were developed as part of the EIS and in response to information requests received through the EIS review process. The mitigation measures are generally considered to be industry standards for use in similar applications and environmental conditions and are expected to be effective with proper installation and regular inspection and maintenance. Effects to vegetation and wetlands will be mitigated at both the Gordon and MacLellan sites during preconstruction, construction, operation, and decommissioning/closure through these mitigation measures. Mitigation measures will be evaluated, and additional mitigation identified if unanticipated effects are identified or suspected.

3.1 PRE-CONSTRUCTION

Pre-construction vegetation management measures are identified in Table 3-1. Mitigation measures will be established prior to vegetation clearing and remain in place through operation until the completion of decommissioning/closure. Measures are focused on marking construction limits, collecting seed of SOCC, application of weed control, collection of plants of interest to Indigenous Nations, and setting up buffers to adjacent wetlands.

Table 3-1 Pre-Construction Mitigation Measures

Potential Effect	Mitigation Measures
Change in Landscape Diversity	Clearly mark vegetation clearing limits and maintain marking for the duration of construction. Clearing limits will be visually examined to confirm that they are clearly marked, and that clearing works stay within approved work areas.
Change in Community Diversity	A pre-construction weed survey of the PDAs at each mine site was completed in conjunction with the preconstruction rare plant survey during the summer of 2022.
	Apply weed control measures (e.g., mowing, non-broadcast spray herbicide application) to targeted areas within the PDAs with known weed species infestations (e.g., overburden stockpiles, soil piles, etc.). See Section 5.0 for details on weed control measures and targets.
	Inspect vehicles and equipment prior to entry on site to confirm they are clean and not leaking fluids or fuels. Vehicles and equipment will be regularly inspected during use and repaired as needed to limit potential for leaks and spills that could damage wetland water quality,
Change in Species Diversity	Alamos will provide an opportunity for affected Indigenous Nations to collect plant species of interest to Indigenous Nations from the PDAs prior to clearing.
	A pre-construction rare plant survey of the PDAs and immediate area at each mine site was completed during the summer of 2022 to confirm the location of the known SOCC observations (see Section 3.1.1 for additional details).
	Avoid known occurrences of SOCC, where possible. If avoidance of plant SOCC is not possible, seed collection or transplant of the plant will be completed by a qualified biologist. If seed collection or transplantation is necessary, a separate Seed Collection Plan will be developed to outline the procedure.

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Potential Effect	Mitigation Measures
Change in the Availability of Resources Currently Used for Traditional Purposes ¹	Provide opportunities to Indigenous Nations for harvest of food and medicinal plants and to conduct any ceremonies for any sites of traditional or cultural importance that will be disturbed by any Project activities prior to construction.
Change in Wetland Function	Establish undisturbed 30 m buffers around wetlands where possible and limit vegetation removal to the extent practicable to reduce direct loss of wetlands and indirect effects to water quality. Buffers will be established for wetlands outside of but near the edge of the PDAs where possible. Encroachment into 30 m buffers may be necessary due to Project design constraints. Install sediment fencing or other appropriate measures in areas where 30 m buffers cannot be established.
<p>Note: ¹ Volume 2 Chapter 17 Assessment of Potential Effects on Current Use of Lands and Resources for Traditional Purposes by Indigenous Peoples</p>	

Establishing buffers around wetlands, where possible, will limit effects to wetland water quality as maintained upland vegetation will intercept sediment. The buffer will also support the maintenance of plant composition and structure by limiting changes in light and wind conditions in the wetlands. Many plant species are sensitive to light conditions and changes in wind conditions could lead to altered tree and shrub structure.

3.1.1 Pre-Construction Seed Collection

Collection of SOCC seed or live stakes within the PDA will be completed prior to construction. Seed or live stakes of SOCC plant occurrences affected directly or indirectly by construction or operation of the Project will be collected and applied to appropriate habitat outside the LAA and monitored to evaluate success. Seeds will be hand collected in labelled paper bags with the date, species, and collection location coordinates. Site characteristics will be documented including slope, aspect, moisture regime, soil texture, dominant plant species, and representative photos. The seeds will be air dried prior to storage. After drying, a freezer (-18°C) will be used to kill any insects to preserve the seeds. The seeds will be frozen for a period of one week and then transferred to be stored in a cool dry place (approximately 15°C and humidity of 5-8%). The seeds may also be sent to a greenhouse to be stored or grown for transplant.

The recipient SOCC transplant site(s) will be selected based on site similarities to the donor (seed collection) site using air photo interpretation and data collected during seed collection. If possible, recipient sites will include onsite reclaimed areas with suitable site conditions. The recipient site(s) will be selected prior to seeding/transplantation. Transplants/seeding success will be monitored during general reclamation monitoring (Section 6.0). Seed collection is considered experimental and may not be successful.

If seed collection or transplantation is necessary, a separate Seed Collection Plan will be developed to outline the procedure.

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3.2 CONSTRUCTION

3.2.1 General

During Project construction, vegetation management will focus on limiting weed species introduction vectors and release of deleterious substances to surrounding areas (Table 3-2).

Table 3-2 General Construction Mitigation Measures

Potential Effect	Mitigation Measures
Change in Landscape Diversity	Construction activity will be restricted to the approved PDAs.
Change in Community Diversity	All contractors/construction personnel will receive initial training specific to the VWMP prior to coming on site.
	Equipment and personnel (e.g., boots and clothing) will arrive at Project site clean and free of soil and vegetative debris. Equipment will be inspected and if deemed to be in appropriate condition, will be approved for use and identified with a suitable marker or tag. Equipment that does not arrive at the Project site in appropriate condition will not be allowed within the construction footprint until it has been cleaned, re-inspected, and deemed suitable for use. Random inspections of equipment and personnel may also be completed. Cleaning stations will be established at the construction site. Cleaning stations will be lined by an impermeable liner to isolate the cleaning station from the surrounding area so that the water can be easily removed by hydrovac.
	Silt fencing will be installed and maintained to reduce deleterious substances from entering adjacent to wetlands or waterbodies (Chapter 23, Section 23.5.13). Using sediment fencing and/or other appropriate measures to prevent erosion and siltation into adjacent wetlands (Chapter 23, Section 23.5.13). Silt fencing will be regularly inspected by the Environmental Monitor.
	Dust suppression (i.e., water) will be applied on haul roads during dry periods or periods of high wind to control fugitive dust. AQMP describes additional mitigation measures to monitor and manage ambient air quality near the Project including effects from dust. For example, automatic alerts will be sent to notify environmental representatives of high winds (i.e., wind speed greater than 5 m/s or 18 km/h or Beaufort 3 gentle breeze) and dry conditions (less than 2 mm of precipitation has occurred in the previous 24 hours and the temperature is greater than 15°C), which will trigger the implementation of additional dust mitigation measures.
	A certificate of weed analysis will be encouraged for construction material sources including sand, gravel, rock, straw, and mulch. If weeds are suspected or cannot be ruled out, construction material storage areas will be monitored for invasive species and control measures applied where needed.
	Following construction, some areas of the PDA will be revegetated (see details in Section 5.0). Following revegetation, monitoring will focus on assessing the rate of establishment of a healthy vegetation cover, and mitigation of soil erosion (see Section 6.3).
Change in Wetland Function	Maintain cross drainage to allow water to move freely from one side of roads to the other in areas of permanent or temporary access roads to reduce potential indirect changes in wetland water levels,
	Direct grading away from wetlands, where practicable, and where not practicable install erosion control measures between graded material and wetlands.
	Use sediment fencing or other appropriate measures to reduce erosion and siltation into adjacent/retained wetlands and associated indirect effects on wetland water quality.

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Potential Effect	Mitigation Measures
Change in Wetland Function (cont'd)	Control weeds to reduce potential introduction to wetlands and degradation of uncleared upland areas near wetlands.
	Inspect vehicles and equipment prior to entry to confirm they are clean and not leaking fluids. Vehicles and equipment will be regularly inspected during use and repaired as needed to limit potential for leaks and spills that could damage wetland water quality.
	Place a protective layer such as matting or biodegradable geotextile and clay ramps (or other approved materials) between wetland root/seed bed and construction equipment if ground conditions are encountered that create potential for rutting, admixing (i.e., mixing of soil layers), or compaction.
	Install sediment and erosion controls, filter bags or structures, or other methods to prevent the release of sediment laden water, and to direct and moderate flow to prevent soil erosion, if draining of wetlands is required prior to stripping or infilling.
	Store water collected during site dewatering in management ponds located at the Gordon and MacLellan sites, and release to the environment once federal and provincial requirements are met. Released water will help maintain wetland conditions (i.e., mitigate indirect effects) including hydrology and associated plant composition near the release points and hydrologically connected wetlands, such as adjacent swamps and fens.
	Operate, maintain and store all materials and equipment in a manner that prevents any deleterious substances (fuel, oil, grease, hydraulic fluids, coolant, paint, uncured concrete and concrete wash water, etc.) from entering watercourses, and have an emergency spill kit for in-water use available onsite during construction.
	Petroleum storage tanks will not be stored within 100 metres of the shoreline of any waterway or water body.

3.2.2 Vegetation Clearing and Grading

Vegetation clearing will occur during Project construction, and mitigation measures will be established prior to clearing and remain in place through operation until the completion of decommissioning and closure. Vegetation clearing is currently planned to be completed in the PDAs from August through November of Year 1. Timber removal will be completed prior to vegetation clearing and will include the removal of provincial Crown forest timber within the Gordon site PDA and the MacLellan site PDA. Timber removal permit conditions will be followed including the following measures:

- No green timber will be cut within 150 m of any Provincial Highway or other government road unless the timber is marked or otherwise designated for removal by the Natural Resource Officer.
- No green timber will be cut within 15 m of any building unless marked or otherwise designated by a Natural Resource Officer.
- Brush and logging debris will be cut, lopped, and spread to lie close to the ground.
- Brush disposal must keep pace with cutting operations at all times.
- Stumps will not be cut higher than 30 cm from the highest point of adjacent ground.
- Avoid damages to regeneration and/or planted trees.
- Report forest fires.

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Timber stockpile areas have not been identified at time of writing, however, clearing equipment and timber will be stockpiled away from sensitive features such as wetlands. Alamos will work with MECC to finalize the required compensation payable to MECC, prior to removal of provincial Crown forest timber at the Gordon and MacLellan sites. Merchantable timber will be stored on site for sale and collection or made available to local communities. Non-merchantable timber will be mulched with other cleared vegetation and stored on-site for future use in active closure activities. There will be no open burning of salvaged timber and vegetation during construction.

Mitigation measures in Table 3-3 will be used in addition to the general construction management measures to help avoid or reduce disturbance to vegetation and wetlands.

Table 3-3 Construction Mitigation Measures during Vegetation Clearing and Grading

Potential Effects	Mitigation Measures
Change in Community Diversity	Vegetation clearing will occur during dry and frozen conditions, when possible.
	Vegetation clearing will be conducted using mechanical/manual practices (e.g., chainsaws, handsaws, brush saws) within 30 m of wetland boundaries adjacent to the PDAs.
	Vegetation clearing will be monitored by an Elder.
	A protective layer such as matting or biodegradable geotextile and clay ramps or other approved materials will be used between wetland root/seed bed and construction equipment if ground conditions are encountered that create potential for rutting, admixing or compaction.
	Sensitive areas, such as wetlands adjacent to the PDAs, will be buffered by 30 m and clearly marked prior to clearing.
	Cleared merchantable timber will be sold where possible and remaining cleared vegetation will be stored on site for future use in active closure activities. A scaling plan may be submitted to and approved by the Department of Agriculture and Resource Development to receive a timber permit under <i>The Forest Act</i> prior to clearing merchantable timber.
Change in Wetland Functions	Grading will be directed away from wetlands adjacent to the PDA, where practicable.
	Vegetation removal in wetlands will be reduced to the extent practicable.
	Ground level cutting/mowing/mulching of wetland vegetation will be conducted instead of grubbing, where practicable.
	Grading within wetland boundaries will be reduced unless required for site-specific purposes.
	Protective layers such as matting or biodegradable geotextile and clay ramps or other approved materials will be used between wetland root/seed bed and construction equipment if ground conditions are encountered that create potential for rutting, admixing or compaction.
	Cross drainage will be maintained to allow water to move freely from one side of the road to the other in areas of permanent or temporary access roads.
	Frost packing, snow, ice, geotextile swamp mats or access mats will be used for access through wet areas.

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Potential Effects	Mitigation Measures
Wildlife ¹	Vegetation cover along the boundaries of high activity areas (e.g., access roads) will be maintained to reduce sensory (noise and visual) disturbance.
	Schedule vegetation clearing and site preparation activities outside the breeding period for migratory birds (Zone C7; May 7 to August 7; ECCC 2023).
	Schedule vegetation clearing activities to occur outside the woodland caribou calving and calf-rearing period from May 1 to June 30. In the unlikely event woodland caribou are detected within the LAA, site preparation activities will also be postponed until after June 30.
Note: ¹ Relevant mitigation measures included from the Wildlife and Wildlife Habitat Chapter 12.0 of the EIS.	

3.3 OPERATION

Vegetation mitigation measures during Project operation focus on maintenance of protective measures and on-going application of controls to limit the release of deleterious substances to surrounding areas (Table 3-4).

Table 3-4 Operation Mitigation Measures

Project Effects	Mitigation Measures
Change in Landscape Diversity	Restrict operation activity to the approved PDAs.
Change in Community Diversity	Equipment will arrive at Project site clean and free of soil and vegetative debris. Equipment will be inspected and if deemed to be in appropriate condition, will be approved for use and identified with a suitable marker or tag. Equipment that does not arrive at the Project site in appropriate condition will not be allowed within the construction footprint until it has been cleaned, re-inspected, and deemed suitable for use.
	Silt fencing will be maintained to reduce deleterious substances from entering adjacent to wetlands or waterbodies.
	Dust suppression (i.e., water) will be applied on haul roads during dry periods or periods of high wind to control fugitive dust. The AQMP describes additional mitigation measures to monitor and manage ambient air quality near the Project including effects from dust. For example, automatic alerts will be sent to notify environmental representatives of high winds (i.e., wind speed greater than 5 m/s or 18 km/h or Beaufort 3 gentle breeze) and dry conditions (less than 2.54 mm of precipitation has occurred in the previous 24 hours and the temperature is greater than 15°C), which will trigger the implementation of additional dust mitigation measures.
	Use dust collection/control measures when conducting activities that generate dust including ore crushing (see Air Quality Monitoring Plan).
	Mine areas, including stockpiles, active work areas and storage areas, will be regularly evaluated for weed occurrences and corrective measures (e.g., spot-spraying, mowing, hand-pulling) conducted as needed. If pesticide is required, a pesticide use permit will be obtained under <i>The Environment Act</i> (Manitoba). See Section 4.0 for details on weed control.

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Project Effects	Mitigation Measures
Change in Wetland Function	Seepage from the tailings management facility (TMF) will be collected, stored, and tested prior to release
Wildlife ¹	Vegetation around collection ponds and the TMF will be managed (e.g., rocks/gravel to discourage vegetation establishment) to deter wildlife.
	Roadside vegetation will be mowed periodically to maintain line of site.
Note: ¹ Relevant mitigation measures included from the Wildlife and Wildlife Habitat Chapter 12.0 of the EIS.	

3.4 DECOMMISSIONING/CLOSURE

Active closure is currently scheduled to begin in 2029 (Year 6) at the Gordon site and in 2037 (Year 17) at the MacLellan site and is expected to take approximately five to six years to complete at each site. During Project decommissioning/closure, vegetation management will primarily focus on establishing conditions suitable for vegetation growth and application of seed mixes (Table 3-5).

Table 3-5 Decommissioning/Closure Mitigation Measures

Potential Effects	Mitigation Measures
Landscape/ Community/ Species Diversity and Environmental Management and Monitoring ¹	Revegetation will occur as soon as practical after the termination of operations. See Section 5.0 for details on revegetation.
	TMF (MacLellan only): Capping material placement at the TMF will be done progressively as conditions become suitable. Soil cover will be established over the mine rock to promote revegetation. Due to soft ground conditions, these efforts may have to be carried out during the winter with light-weight equipment. Placement of cover material is not planned on the slopes, as regrading will not be possible and revegetation on the bare embankment material (mine rock) is not likely to be successful at the proposed slopes of 1:2.25 (H:V). The surface of the TMF will be revegetated, primarily with grasses.
	Mine Rock Storage Areas (MRSAs): Slope regrading is proposed to allow placement of cover material on the slopes and support revegetation.
	All other disturbed ground will be revegetated based on local needs, but adjacent vegetation communities will likely blend in with these efforts in the long term. These areas include the plant sites, ore stockpile area, the overburden storage areas and other areas that are disturbed as part of operations. It is likely that revegetation on the MRSAs will only be successful on the covered portion. See Section 6.0 for details.
Wildlife	Implement reclamation plans that involve decommissioning and revegetating access trails/roads and the distribution line right-of-way, which will occur as soon as practical after the termination of operation.
Note: ¹ Relevant mitigation measures included from Chapter 11 of the EIS.	

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4.0 WEED MANAGEMENT

This section identifies weed management objectives and goals and weed management control options to meet regulatory requirements. The objectives of weed management are threefold: prevention, early detection, and rapid response. Prevention includes using best management practices to avoid the introduction of weed species in the first place. Early detection includes identifying known occurrences of weed species within the PDAs. Baseline weed species information was collected to support the EIS and is presented in the Vegetation and Wetlands TDR (Stantec 2017) and the 2022 Preconstruction Survey Results (Stantec 2022). Rapid response includes weed control methods to control weed species establishment and spread, which means to stop seed production and vegetative spread. The goal of weed management is to help improve revegetation success and site aesthetics. Weed control will follow *The Noxious Weeds Act and Regulations*.

The baseline conditions reported in the EIS and supporting documents note the presence of two Tier 3 weed species within the Gordon PDA: common dandelion and quackgrass. Since the Project is located in a remote northern area of Manitoba surrounded by native plant communities weed species are less likely to be encountered. The pre-construction weed inventory survey of the PDAs was completed in 2022 and documented weed species (Stantec 2022). A desktop search of the Early Detection and Distribution Mapping System (EDDMaps) will be completed immediately prior to construction for the RAA to check for other known occurrences of weed species in the region.

Based on the pre-construction weed survey, EDDMaps data, and information from the EIS, known non-native invasive species occurrences will be prioritized for control. Through the adaptive management process, priorities for the known non-native invasive species occurrences may be reordered depending on their potential impacts to the Project and surrounding native vegetation. Weed species and their locations are important for determining priorities. Weed species vary greatly in their threat to native plant communities (e.g., prolific seed producers) and their susceptibility to control measures (e.g., resistant to herbicides) and priorities are Project-specific. Any small patches of weed species that occur outside of a large patch of the same species should be given the highest priority. In addition, weed occurrences in high traffic areas are also high priorities as they can easily spread.

Weed management is used to control the introduction and spread of weed species. During construction, the contractor will implement appropriate weed control measures consistent with accepted weed management practices.

The following mitigation measures (in order of priority) will be used to reduce the introduction and spread of weed species during Project construction, operation, decommissioning and closure:

1. Keeping equipment free of soil and debris as equipment can spread propagules (e.g., seeds, rhizomes).
2. Monitoring topsoil and subsoil piles for regulated weed species establishment.
3. Monitoring newly disturbed areas for encroachment of weed species.

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4. Controlling infestations of regulated weed species.
 - i. Tier 2 species infestations under five acres (two hectares) must be eradicated; whereas infestations larger than five acres must be controlled and kept from spreading.
5. Revegetating disturbed land with native vegetation.
6. Using certified clean seed.
7. Applying corrective measures to avoid the growth of regulated weed infestations.

To limit the transport and spread of propagules of weed species, equipment and vehicles should be limited in areas of weed infestations and cleaning/washing stations for equipment (e.g., vehicles, boots, equipment) should be established at the entry/exit point(s) during construction.

Corrective measures of weed species may include the following:

- Mechanical control - i.e., mowing (preferred, if timed correctly prior to seed set).
- Hand-pulling and disposal (preferred, labour intensive; may be the best option for steep slopes or challenging sites).
- Cultural control - i.e., seeding of competitive species.
- Chemical control - i.e., herbicide (not preferred; broadcast spraying will be avoided in favor of spot spraying whenever possible).

Mechanical control is the preferred method of weed control as there are no residual chemicals, it costs less, and there are fewer deleterious effects to pollinators. Mechanical control may include using equipment such as hand mowers (e.g., weed whackers) to selectively control dispersed weed populations. Mowing should be conducted at intervals through the growing season to prevent the weeds from flowering (e.g., monthly during summer until first frost). Mowing is often conducted prior to seeding to increase the amount of litter available.

Hand-pulling may be necessary for species that can easily bloom after mowing (e.g., scentless chamomile). It is important to conduct hand pulling at intervals throughout the growing season to avoid weeds flowering and going to seed. If a weed is flowering or has set seed prior to hand pulling, a bag should be placed over the flower prior to hand pulling to contain the seeds. All weed species should be disposed of at an approved landfill and documented with the environmental monitor. Hand-pulling is labour intensive and can be costly, especially in remote northern environments. However, it is a good opportunity to train local community members on the weed species identification and hand-pulling technique. It is recommended to oversee after conducting hand-pulling (see Section 5.0).

If pesticide is required, a pesticide use permit will be obtained under *The Environment Act* (Manitoba) and a licensed industrial pesticide applicator will be contracted to select and apply all herbicide applications. In addition, herbicides will not be broad sprayed within 30 m of SOCC, ecological communities of conservation concern, wetlands, or waterbodies. Spot spraying, wicking, mowing, or hand picking are acceptable measures for control of weed species in these areas.

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The weed species known to occur in the Gordon PDA are both Tier 3 weed species (common dandelion and quackgrass). Common dandelion covers a total area of 20 m² and may be controlled through mechanical removal, which may be difficult due to its long taproot, or through pesticide application, but mechanical removal is preferred. Mowing will not control common dandelion. Common dandelion is not effective at invading undisturbed native vegetation communities. Populations of common dandelion have also been controlled by competition with aggressive grass species (Stewart-Wade et al. 2002). Quackgrass covers a total area of 40 m² and is controlled by mowing or through competition with a clover-grass cover crop (Ringselle et al. 2015).

Control will be conducted until selected targets for weed control are achieved and as required following site monitoring periods. The targets for weed control will be to contain the spread and prevent seed setting of the existing patches of common dandelion and quackgrass in the Gordon PDA or any other weed species found during the preconstruction surveys.

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5.0 REVEGETATION

5.1 GOALS AND TARGETS

The goals of revegetation are to control erosion, improve aesthetics, and assist in returning the PDAs to a self-sustaining community dominated by native plant species that are in similar abundance to the surrounding upland and representative of early successional development. *The Mine Closure Regulation* under the Act outlines “satisfactory conditions” that must be adhered to for revegetation. Deviation from these guidelines requires detailed reasoning be submitted. Vegetation must be self-sufficient six years post reclamation (planting). Revegetation will primarily occur as part of the implementation of, and in accordance with, the Closure Plan. Plant cover and diversity, including the presence and abundance of plant species of interest to Indigenous Nations, will be factors considered when evaluating revegetation success and need for adaptive management.

Common issues with revegetation include erosion, soil compaction, steep slopes, and lack of nutrients (Polster 2009). Therefore, the targets for revegetation must address these four key issues. Revegetation will target the establishment of structural layers of pre-disturbance communities. Plant composition and specific species abundance will likely differ from existing conditions; however, reclaimed communities will be dominated by native plant species. These species will likely be those of early successional development for example, broadleaf trees, shrubs including blueberry, and forbs including fireweed.

Reclamation efforts will be guided by evaluation of rehabilitation efforts of the historical Farley Mine operations and the nearby EL Mine. As documented in the Closure Plans for the sites, vegetation tests may be carried out whilst operation continues. The variables will include species composition and fertilization requirements.

It is expected that revegetation of disturbed areas will be self-sufficient ten years after completion of reclamation as per Best Management Practice 14 (Mining Association of Manitoba Inc. 2015) based on past evidence of reclamation in the Yukon (Mougeot 1996). If it is determined that revegetation is not self-sufficient, additional revegetation efforts may be required.

The VWMP does not specifically target the restoration of existing conditions in the PDAs. The VWMP targets the establishment of native plants; however, the abundance and distribution are expected to differ from existing conditions.

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5.2 METHODS

5.2.1 Plant Selection

A native seed mix will be used to assist in reducing weed species spread and establishment as well as for erosion control on exposed soils. Only species indigenous to Manitoba will be used for revegetation purpose. Commercially available native plant species of interest to Indigenous Nations will be included in reclamation seed mixes to help support future Indigenous Nations use of the area following Project closure. These species will be selected based on the native vegetation communities at baseline conditions and those adjacent to the area to be seeded. If plant species of interest to Indigenous Nations are not commercially available at the time of revegetation, Alamos will discuss with interested Indigenous Nations and decide together to either substitute other plant species of interest to Indigenous Nations that are available, or harvest seeds/stakes from the surrounding area for reclamation use. Furthermore, if suitable species are available in future years following initial reclamation, benefits of supplemental seeding/planting of those species will be evaluated and completed if beneficial. Additional seeding may not be required if, for example, sufficient seeds or stakes were collected locally and are successfully establishing. Plant species of interest to Indigenous Nations not previously identified will be evaluated for use in reclamation and desired abundance in reclaimed Project areas will be determined following review with the Environmental Advisory Committee. The species will be selected by a qualified biologist in consultation with the Environmental Advisory Committee and MECC. All upland and wetland areas disturbed by the Project will be reclaimed to native upland plant communities. The selected seed mix will be certified weed free.

A suggested upland species mix is presented in Table 5-1. The upland species mix selected was based on species identified during engagement with Indigenous Nations. Table 5-1 provides suggested native pioneer/early successional species for revegetation of upland plant communities. These species are commercially available in neighbouring provinces, but not commercially available in Manitoba. It is important to select some species that are nitrogen fixers (e.g., alder) to increase the nutrient availability on site (Polster 2009). Grasses will not be included during revegetation unless in small amounts. Grasses tend to increase competition with woody species, increase herbivory on site, and increase establishment of weed species thus inhibiting the recovery of forested communities (Polster 2010). Willow/alder staking is another option for site stabilization and erosion control. Live stakes can be harvested from the surrounding area, cut into 1-1.5 m lengths and stored in water. Holes can be driven into the ground at approximately 0.5 m depth and the live stakes transplanted into the holes. The live stakes can act as nurse plants, stabilizing the soil, trapping litter, and creating a microsite that is suitable for other species.

Cover crops that consist of short-growing (non-native) annual species such as oats may be used in areas that require immediate soil stabilization or to control aggressive weed species (Table 5-2).

The TMF will be partially capped and seeded. Approximately 75% of the TMF will be capped, which will be subject to confirmation of capping material availability during detailed design. The TMF will be reclaimed using a native reclamation mix (plants species of interest to Indigenous Nations are not likely to be used at the TMF).

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If SOCC cannot be avoided during construction, seed collection from the adjacent surrounding native vegetation community may be an option for revegetation. For example, shrubby willow occurs within the LAA, and propagules may be available for reestablishment of these species within the PDAs during closure as this species produces a high abundance of seed (USDA 2020) and there are a variety of habitats it can grow in (Flora of North America 2020).

Table 5-1 Upland Species

Common Name	Scientific Name
Green alder (stakes)	<i>Alnus viridis</i>
Labrador-tea	<i>Rhododendron groenlandicum</i>
Scouler willow	<i>Salix scouleriana</i>
Velvet-leaf blueberry	<i>Vaccinium myrtilloides</i>
Bog cranberry	<i>Vaccinium vitis-idaea</i>

Table 5-2 Annual Cover Crop Seed Mix

Common Name	Scientific Name	% in Seed Mix
Common oats	<i>Avena sativa</i>	25
Annual rye	<i>Lolium multiflorum</i>	50
Winter rye	<i>Secale cereale</i>	25

5.2.2 Site Preparation

Prior to revegetation, the site will be prepared following the rough and loose approach (Polster 2009) to create topographic heterogeneity within the site that will promote diversity (see SMRP). The rough and loose approach is created by successively excavating holes and creating mounds throughout the site which generates microsites, allows for root development, and prevents erosion (Polster 2009). This would include mechanical ripping of the soil (Polster 2009). Woody debris from clearing may be spread throughout the site and embedded in the soil where possible to create more microtopographic diversity, add nutrients, prevent erosion, and create habitat for wildlife and plants (Polster 2009).

5.2.3 Seeding/Planting Application

5.2.3.1 Seeding

Seeding will be carried out using methods appropriate for the location, as determined by the environmental and Indigenous monitors and may include:

- Hand broadcast seeding (preferred in small areas or difficult terrain)
- Drill seeding (preferred in large areas with easy access and few rocks)

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- Mechanical broad-cast seeding (e.g., roadsides)
- Hydro-seeding (generally not used for native species).

5.2.3.2 Planting

Live staking, if conducted, should be done after site preparation and can include willow and alder stakes that have been collected locally from areas adjacent to the site. The soil will be loose after site preparation which will allow for the live stakes to be planted deeply and their roots to grow easily (Polster 2009).

5.2.4 Schedule

Revegetation will occur immediately after components are no longer needed (post construction and/or at decommissioning/closure), under dry ground conditions. Seed application will be targeted for early spring (during dry ground conditions prior to June 15) or late fall prior to first frost. Seeding will not be conducted during the summer due to higher temperatures and low precipitation, which can negatively impact the success of seed germination and vegetation establishment. Watering may be required if implemented during late spring or summer.

5.3 REVEGETATION MONITORING

5.3.1 Schedule and Thresholds

Monitoring will focus on assessing the rate of establishment of a healthy vegetation cover, and mitigation of soil erosion. A qualified biologist will complete an inspection of the revegetation during the peak growing season of the calendar year following initial seeding to determine if reseeding or weed control measures area required during the fall. Monitoring thresholds for the revegetated sites are outlined in Table 5-3. Monitoring is expected for the first five to six years following revegetation. Environmental Monitors will be onsite with the qualified biologist during the inspections.

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Table 5-3 Monitoring Thresholds for Revegetated Areas

Attribute	Time Period			
	Year 1*	Year 2	Years 3-4	Year 5
Erosion/Soil Movement	Some evidence of soil movement, but flow patterns are short and shallow	Some evidence of soil movement, but flow patterns are short and shallow	No sign of soil movement	No sign of soil movement
Litter Quality	N/A	Accumulation present	Clear evidence of accumulation, including standing dead and fallen material	Clear evidence of accumulation and decomposition, including standing dead and variably decomposed fallen material
Litter Quantity	N/A	N/A	Litter somewhat patchy to uniform across site (including leaf litter, needle litter, and woody debris)	Litter more or less uniform across site (including leaf litter, needle litter, and woody debris)
Plant Cover	≥25% ²	≥30%	≥35%	≥40% and greater than or equal to cover observed in year three
Plant Diversity	≥90% of seeded species are present	Seeded plants are the dominant cover Non-native perennial plants occupy ≤5% of total cover	Seeded plant abundance is within 25% of species cover in seed mix Non-native perennial plants occupy ≤5% of total cover	All dominant and indicator plants of corresponding early to mid-seral native community are present. More than one community structural layer is present (e.g., forbs, prostrate and low shrubs). Percent cover of all species is at or below natural levels and unlikely to abnormally dominate the site and reduce diversity to less than the number of species in seed mix. Non-native plants occupy ≤5% of total cover.
Plant Vigour	≤25% of plants are wilted or have signs of disease ¹	≤20% of plants are wilted or have signs of disease	≤15% of plants are wilted or have signs of disease	No signs of poor plant health or disease (e.g., wilted leaves, necrosis, infected seed heads)

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Revegetation
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Attribute	Time Period			
	Year 1*	Year 2	Years 3-4	Year 5
Weed Abundance	No Tier 1 ³ regulated weed species present. Tier 2 ³ regulated weed abundance similar to surrounding undisturbed area or less than 15%. Annual/Tier 3 ³ regulated weed/non-native plant abundance not interfering with desired plant development (i.e., not out shading plants).	No Tier 1 ³ regulated weed species present. Tier 2 ³ regulated weed abundance similar to surrounding undisturbed area or less than 10%. Annual/Tier 3 ³ regulated weed abundance/distribution ≤ few patches and sporadically occurring plants.	No Tier 1 ³ regulated weed species present. Tier 2 ³ regulated weed abundance similar to surrounding undisturbed area or less than 5%. Annual/Tier 3 ³ regulated weed abundance/distribution ≤ few patches and sporadically occurring plants.	No Tier 1 ³ regulated weed species present. Tier 2 ³ regulated weed abundance similar to surrounding undisturbed area or less than 5%. Annual/Tier 3 ³ regulated weed abundance/distribution ≤ few sporadically occurring plants.
<p>Notes:</p> <p>* Initial monitoring phase conducted following at least one full growing season after completion of site revegetation.</p> <p>¹ If area is seeded.</p> <p>² Assessed in late summer. Areas selected for reseeding if percent cover target not achieved.</p> <p>³ Tier 1 species are weeds that are considered to have the most potential for negative effects though they may not yet be present in Manitoba under The Noxious Weeds Act. Tier 1 species must be destroyed or eradicated immediately upon discovery. Tier 2 species are already established in Manitoba and have been observed to spread easily. Tier 2 species infestations under five acres (two hectares) must be eradicated; whereas infestations larger than five acres must be controlled and kept from spreading. Tier 3 species are all other designated species that do not require immediate control unless the spread of the occurrence poses a threat to the economy, environment, or the well-being of residents.</p>				

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5.3.2 Sampling Methods

Pre-determined, randomly selected fixed sampling plots will be established at/prior to the commencement of monitoring. At each sampling plot, plant cover, diversity, and vigour; litter quality and quantity; and regulated weed abundance density will be assessed. In addition, representative control plots outside of the PDAs will be selected to determine benchmark plant cover. Plots will be placed at least 10 m apart from each other. Depending on the extent of revegetation, at least three plots will be sampled in each native vegetation community (from baseline conditions) using 0.5 m x 0.5 m quadrats. A permanent marker (e.g., metal stake/nail with label flush to the ground) will be placed in the southwest corner of each quadrat. The quadrat will be square to the cardinal directions. Location coordinates will be recorded for the permanent marker at each plot using a Global Positioning System (GPS) with an accuracy of at least 3 m.

At each assessment location, vegetation cover of all vascular plant species will be recorded using the Braun-Blanquet cover-abundance scale, as well as total ground cover of non-vascular plants, litter, surface water, and bare ground. Cover and height of each shrub/tree species will also be recorded if present. Photographs and spatial coordinates of each plot will also be recorded. Photographs showing general site conditions will be taken at fixed locations including the ground cover and all four cardinal directions (quadrat included).

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Environmental Monitoring
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6.0 ENVIRONMENTAL MONITORING

Monitoring (follow-up) is the continuation of observation, measurement, or assessment of environmental conditions at and surrounding the Project, its components, or activities. Two types of monitoring are typically undertaken for environmental assessments: environmental monitoring to verify the accuracy of predictions and implemented mitigation measures; and compliance monitoring for verification of practices or procedures to meet legislated requirements. Components to be monitored have been determined based on regulatory instrument requirements as per legislation, environmental importance, sensitivity and vulnerability, and licence requirements. Environmental monitoring will be conducted during all phases of the Project.

Monitoring plans describe sampling procedures, quality control and assurance programs, laboratory methods and protocols, laboratory accreditations, and reporting requirements, where applicable. The plans also provide details on the location, design, methods (e.g., parameters to be measured), applicable regulatory instruments, and schedule for the monitoring programs. Engagement of Indigenous Nations in monitoring will be incorporated into the monitoring plans where appropriate and applicable.

Monitoring will include the following components/activities:

- Monitoring of transplanted/seeded SOCC at recipient sites.
- Spatial mapping of the actual Project footprint using geographic information system (GIS) with comparison with the plan.
- Project footprint tracking through construction to document the extent of vegetation clearing and quantify direct effects to wetlands.
- Verification of indirect wetland effects.
 - Groundwater and surface water monitoring stations will be installed in the LAAs, including wetlands, to evaluate potential changes in water conditions (see SWMMP). Monitoring locations will be discussed with affected Indigenous Nations and adjustments considered. Adjustments in monitoring locations could include identified locations of wetland dependent plant species of interest to Indigenous Nations.
 - Water level monitoring will be conducted in fish-bearing swamps at the Gordon and MacLellan sites to determine the timing, magnitude, geographic extent, and duration of water level changes that may be caused by draw-down of the groundwater table at both mine sites.
 - Water levels will be monitored in selected wetlands within the predicted maximum extent of groundwater draw-down and in selected wetlands outside of the predicted maximum extent of groundwater draw-down to act as “control” sites for a “before/after/control/impact” study design (see SWMMP). The number and location of these wetlands will be finalized prior to construction with input from federal and provincial regulators and the Environmental Advisory Committee.

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- Changes in vegetation composition and cover will be paired with the water level monitoring. The wetlands will be selected by the environmental monitor and include those that are receiving water level monitoring, had mitigation measures (e.g., sediment fences) applied during pre-construction, and/or are adjacent to the PDA. The number and location of these wetlands will be finalized prior to construction with input from the federal and provincial regulators and the Environmental Advisory Committee.
- Project footprint tracking through operations to document the extent of vegetation clearing and quantify direct effects to wetlands.
- Post-reclamation monitoring undertaken for at least five years after revegetation to determine success. Monitoring will be completed in the revegetated areas to determine the following:
- Sustainable vegetation community has been established and successional processes are occurring on the site.
- Vegetation community functions (i.e., erosion control) have been restored.
- Soil development is occurring (see SMRP).
- The specified closure activities aim to promote the re-establishment of vegetation and wildlife habitats on site.

The specific and measurable end points for concluding the monitoring program will be set to ensure the accuracy of the environmental assessment and the effectiveness of mitigation measures. These end points will be achieved either at permanent closure or earlier if it can be demonstrated that there are no further impacts warranting continued monitoring.

6.1 METHODS

Native vegetation communities, wetlands, and weed species will be monitored during the life of the mine to document the following:

- Erosion and/or soil movement
- Plant species composition (desirable/seeded species presence or absence)
- Plant litter quality and quantity
- Plant cover, diversity, and vigour (i.e., height)
- Regulated weed abundance and density
- Surface water and hydrology
- Incidental observations of wildlife.

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A plot-based assessment will be used for the entire revegetated area (see Section 5.3) whereas sensitive features, weed infestations, wetlands, MRSAs, and soil stockpiles should be inspected using a rapid assessment. The rapid assessment includes a random meander for issues of vegetation establishment (e.g., areas of bare ground, signs of erosion, etc.) as well as SOCC, plants of interest to Indigenous Nations, and weed species.

Monitoring results may identify the need for adaptive management if applicable reclamation thresholds are not met. See Section 7.0 for more details on adaptive management.

6.2 MONITORING LOCATIONS

The monitoring locations include areas that have been revegetated, areas of known weed infestations, sensitive features, wetland complexes adjacent to the PDA, and SOCC transplant locations, if conducted. In addition, overburden, soil stockpiles, and MRSAs are to be monitored for signs of physical instability (slope stability, erosion, and vegetation cover).

6.3 SCHEDULE

Table 6-1 identifies the monitoring schedule by activity during construction, operation, decommissioning/closure, and post-closure. Permanent closure will occur when the site is stable, and monitoring is no longer required. For vegetation and wetlands this would occur when vegetation has sufficiently re-established to control erosion and is on a trajectory to a self-sustaining cover with the desired native species composition of early successional development. Revegetated areas are to be assessed in the late summer unless otherwise specified. Plants will be flowering or producing seed during late summer making them easier to identify.

Table 6-1 Monitoring Schedule

Monitoring Activity	Frequency			
	Construction	Operation	Decommissioning	Closure/Post-Closure
<i>Revegetation Areas</i>	Ongoing, if applicable	Annually until rehabilitation is complete and then reduced to every 5 years	Post-revegetation	Annually in late summer until rehabilitation is complete and then reduced to every 5 years until the revegetation goal has been reached
<i>Sensitive features (i.e., known SOCC locations)</i>	Ongoing	Annually until rehabilitation is complete and then reduced to every 5 years	Post-revegetation	Annually in late summer until rehabilitation is complete and then reduced to every 5 years until the revegetation goal has been reached
<i>Weed Infestations</i>	Ongoing	Annually during the active growing season	Prior to decommissioning and post-revegetation	Annually in late summer until rehabilitation is complete and then reduced to every 5 years until the revegetation goal has been reached

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Monitoring Activity	Frequency			
	Construction	Operation	Decommissioning	Closure/Post-Closure
<i>Wetlands</i>	Ongoing/as needed (when construction is within/adjacent to wetlands)	Three times within the first five years (i.e., year 1, 2 and 5) and then once every five years (mid-to late- July/August)	Annually	Annually in late summer until rehabilitation is complete and then reduced to every 5 years until the revegetation goal has been reached
<i>MRSAs</i>	n/a	Annually	Annually	Annually in late summer until rehabilitation is complete and then reduced to every 5 years until the revegetation goal has been reached
<i>Soil Stockpiles</i>	Ongoing	Annually during the active growing season	Prior to decommissioning and post-revegetation	Annually in late summer until rehabilitation is complete and then reduced to every 5 years until the revegetation goal has been reached

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Adaptive Management
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7.0 ADAPTIVE MANAGEMENT

Adaptive management is a planned process for responding to uncertainty or to an unanticipated or underestimated project effect. Information learned from monitoring actual project effects is applied and compared to predicted effects. Where a variance between the actual and predicted effects occurs, a determination is made as to whether modifications or other actions are necessary to revise the existing mitigation measures. As part of this commitment, technically and economically feasible mitigation measures will be implemented if monitoring indicates that specified levels of environmental change have been reached or exceeded. Feasibility and implementation decisions will be made based on the circumstances and considerations at the time.

Results from the monitoring of Project effects will be applied and compared with predicted effects and pre-selected targets. Where a variance between the actual and predicted effect occurs, a determination will be made by Alamos as to whether modifications or other actions are necessary to address the observed variance in effects. Adaptive measures may consist of re-application of a mitigation measure (e.g., weed control, additional seed application), modification of a mitigation measure (e.g., installation of silt fencing in a new location, adjustment of seed mix application rate or method of application), or selection of a new mitigation measure (e.g., live planting instead of seeding).

Alamos' adaptive management strategy will involve ongoing dialogue with agencies, participating Indigenous Nations (through the Environmental Advisory Committee), and stakeholders throughout the Project, followed by modified policies, practices and initiatives as appropriate (see Section 7.1 for additional details).

7.1 THRESHOLDS FOR ADAPTIVE MANAGEMENT

Contingency measures will be implemented through the adaptive management process. Adaptive management may be required if the results of the monitoring programs indicate that the original mitigation strategies outlined in Section 3.0 of the VWMP are deficient for reducing the impact of Project activities on vegetation and wetlands, do not meet the thresholds stated in Table 5-3, or are deemed ineffective or less effective than anticipated. Adaptive management may also be employed if previously unexpected sensitive features are discovered through monitoring (such as previously undetected SAR or SOCC in the PDAs). Vegetation and wetland thresholds are set for the following attributes: erosion/soil movement, litter quality and quantity, plant cover, plant diversity, plant vigour, and weed abundance. If the soil, vegetation, wetland, or reclamation thresholds are not met during the environmental monitoring for a particular year, then appropriate contingency measures will be considered. Adaptive management will be required if vegetation is not self-sufficient after six years of planting in accordance with *The Mine Closure Plan Guidelines*.

As reclamation is an iterative process, contingency measures may not be new or novel approaches, but may be the re-deployment of mitigation measures. For example, contingency measures will be required if vegetation is not on a trajectory for establishment of desired self-sustaining communities (e.g., $\geq 35\%$ plant cover in years three and four after reclamation) or conditions do not meet final targets in accordance with the Mine Closure Plan Guidelines. Areas of below target cover would be examined for possible issues,

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such as poor plant vigour or erosion, and soils may be evaluated for nutrient deficiencies. Depending on site evaluation results, areas of poor growth may be fertilized and re-seeded or re-planted, using the initial seed/plant plan or adjusted to include species better suited to observed conditions. The need for modified or new measures will be evaluated based on the degree of problems, Environmental Advisory Committee input, and available reclamation science.

Vegetation and weed management will be implemented during construction and operation, but the majority of reclamation will occur during closure/decommissioning. The following contingency measures could be deployed if vegetation and wetland management thresholds are not met:

- Weeds and non-native aggressive plant species
- Application or re-application of weed control measures (e.g., mowing, non-broadcast spray herbicide application, competitive seeding) to targeted problem areas in the PDAs and observed problem areas immediately adjacent to the PDAs.
 - Additional seeding and or planting will be done to outcompete weeds. Only species native to Manitoba will be used for revegetation purposes.
 - Seeding with non-persistent cover crops to compete with aggressive weed species.
- Sediment entering wetlands
 - Reinstall, reimplement and/or redesign erosion cover and control measures where required, including slope texturing, mulching, or a rolled erosion control product paired with revegetation efforts.
 - Seeding with non-persistent cover crops to support immediate soil stabilization.
- Low plant cover or diversity (e.g., seeded/planted species fails to establish)
 - Evaluation of plant establishment and development of alternative seed mix or planting regime for plants that failed to establish. This could include targeted local native seed collection and stem harvesting for propagation and subsequent planting.
 - Additional seeding and/or planting using suitable plant species of interest to Indigenous Nations to increase plant cover.
- Poor plant vigour
 - Evaluation of soil nutrient levels and application of fertilizer or other amendments if nutrient deficiencies are identified.
 - Development of new seed mix or mixes if poor vigour is specific to a particular species or plant groups.

Draft triggers have been identified using publicly available recommendations from Alberta (Adams et al. 2016) and professional judgement. The success of these contingency measures will be monitored, and adaptive management will be implemented until appropriate thresholds are met.

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Reporting
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8.0 REPORTING

Reports from monitoring programs will be submitted annually by March 31 to regulatory authorities and shared with interested Indigenous Nations (through the Environmental Advisory Committee) and stakeholders. Annual reporting will include a plain language executive summary in both official languages. Annual reporting will be used to document the applied mitigation measures, methods, results, and recommendations for future monitoring or adaptive management. The annual reports will include figures of the PDAs with the location and boundaries of the disturbance, survey locations, regulated weed infestations, and any other environmental constraints. A photo appendix will also be included to illustrate the monitoring findings. The annual summary reports are to be provided to interested parties during preconstruction, construction, operation, and, when applicable, during closure. The annual monitoring data will be reviewed internally by Alamos and used to implement adaptive management as appropriate.

8.1 NOTIFICATION OF REPORTABLE INCIDENTS

The following incidents are to be reported immediately to relevant agencies:

- Species at Risk Mortality – all relevant data regarding identification of mortality of an endangered or threatened species under SARA will be reported to MECC/Canadian Wildlife Service (CWS) within two business days.

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9.2 PERSONAL COMMUNICATIONS

Fedorchuk, Lee. 2021 Peatlands Program Lead for Manitoba Agriculture and Resource Development Forestry Branch. Winnipeg, Manitoba. Contacted by Nicole Kearns, Vegetation and Wetlands Lead, Stantec Consulting Ltd. Saskatoon, Saskatchewan, on February 10, 2021.

Appendix A Weed Species List

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Appendix A Weed Species List
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Table A-1 Weed species Listed Under the Noxious Weeds Regulations In Manitoba

Common Name	Scientific Name	Area for Which Designation Applies*
Designated Tier 1 Noxious Weeds		
Russian knapweed ¹	<i>Acroptilon repens</i>	Whole province
jointed goatgrass ¹	<i>Aegilops cylindrica</i>	Whole province
garlic mustard ³	<i>Allaria petiolata</i>	Whole province
smooth pigweed	<i>Amaranthus hybridus</i>	Whole province
Palmer amaranth	<i>Amaranthus palmeri</i>	Whole province
tall waterhemp	<i>Amaranthus tuberculatus</i>	Whole province
diffuse knapweed ¹	<i>Centaurea diffusa</i>	Whole province
yellow star-thistle ¹	<i>Centaurea solstitialis</i>	Whole province
spotted knapweed ¹	<i>Centaurea stoebe</i>	Whole province
squarrose knapweed	<i>Centaurea virgata</i>	Whole province
common crupina ¹	<i>Crupina vulgaris</i>	Whole province
hound's-tongue ³	<i>Cynoglossum officinale</i>	Whole province
Patterson's curse ¹	<i>Echium plantagineum</i>	Whole province
woolly cupgrass ¹	<i>Eriochloa villosa</i>	Whole province
Japanese knotweed ³	<i>Fallopia japonica</i>	Whole province
giant hogweed ³	<i>Heracleum mantegazzianum</i>	Whole province
orange hawkweed ³	<i>Hieracium aurantiacum</i>	Whole province
serrated tussock	<i>Nassella trichotoma</i>	Whole province
red bartsia	<i>Odontites vernus</i>	All areas of the province outside the Municipality of Bifrost-Riverton and the Rural Municipalities of Armstrong, Fisher, Gimli, Rockwood, St. Andrews and St. Clements
mile-a-minute weed ¹	<i>Persicaria perfoliata</i>	Whole province
saltcedar ¹	<i>Tamarix ramosissima</i>	Whole province
Designated Tier 2 Noxious Weeds		
hoary alyssum ³	<i>Berteroa incana</i>	Whole province
Japanese brome ²	<i>Bromus japonicas</i>	Whole province
downy brome ²	<i>Bromus tectorum</i>	Whole province
nodding thistle ²	<i>Carduus nutans</i>	Whole province
yellow nutsedge	<i>Cyperus esculentus</i>	Whole province
Cypress spurge	<i>Euphorbia cyparissias</i>	Whole province
leafy spurge ²	<i>Euphorbia esula</i>	Whole province
baby's-breath ³	<i>Gypsophila paniculata</i>	Whole province
St. John's-wort ²	<i>Hypericum perforatum</i>	Whole province

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Common Name	Scientific Name	Area for Which Designation Applies*
field scabious ²	<i>Knautia arvensis</i>	Whole province
ox-eye daisy ²	<i>Leucanthemum vulgare</i>	Whole province
dalmatian toadflax ²	<i>Linaria dalmatica</i>	Whole province
scentless chamomile ²	<i>Matricaria perforata</i>	Whole province
red bartsia ²	<i>Odontites vernus</i>	Municipality of Bifrost-Riverton and the Rural Municipalities of Armstrong, Fisher, Gimli, Rockwood, St. Andrews and St. Clements
invasive common reed ²	<i>Phragmites australis</i>	Whole province
bouncingbet ²	<i>Saponaria officinalis</i>	Whole province
bladder campion	<i>Silene vulgaris</i>	Whole province
common tansy ²	<i>Tanacetum vulgare</i>	Whole province
Designated Tier 3 Noxious Weeds		
common ragweed	<i>Ambrosia artemisiifolia</i>	Whole province
giant ragweed	<i>Ambrosia trifida</i>	Whole province
greater burdock	<i>Arctium lappa</i>	Whole province
common burdock ³	<i>Arctium minus</i>	Whole province
woolly burdock	<i>Arctium tomentosum</i>	Whole province
absinthe	<i>Artemisia absinthium</i>	Whole province
common milkweed	<i>Asclepias syriaca</i>	Whole province
showy milkweed	<i>Aslepias speciosa</i>	Whole province
barberry	<i>Berberis vulgaris</i>	Whole province
creeping bellflower ³	<i>Campanula rapunculoides</i>	Whole province
lenspod whitetop	<i>Cardaria chalepensis</i>	Whole province
hoary-cress	<i>Cardaria draba</i>	Whole province
hairy whitetop	<i>Cardaria pubescens</i>	Whole province
Lamb's quarters	<i>Chenopodium album</i>	Whole province
bulb-bearing water hemlock	<i>Cicuta bulbifera</i>	Whole province
western water hemlock	<i>Cicuta douglasii</i>	Whole province
spotted water hemlock	<i>Cicuta maculata</i>	Whole province
northern water hemlock	<i>Cicuta virosa</i>	Whole province
Canada thistle ³	<i>Cirsium arvense</i>	Whole province
bull thistle ³	<i>Cirsium vulgare</i>	Whole province
poison hemlock	<i>Conium maculatum</i>	Whole province
Canada fleabane	<i>Conyza canadensis</i>	Whole province
narrow-leaved hawk's-beard	<i>Crepis tectorum</i>	Whole province
jimsonweed	<i>Datura stromonium</i>	Whole province
flixweed	<i>Descurainia sophia</i>	Whole province

**LYNN LAKE GOLD PROJECT:
VEGETATION AND WEED MANAGEMENT PLAN**

Appendix A Weed Species List
January 30, 2025

Common Name	Scientific Name	Area for Which Designation Applies*
stork's bill	<i>Erodium cicutarium</i>	Whole province
hemp-nettle	<i>Galeopsis tetrahit</i>	Whole province
cleavers	<i>Galium aparine</i>	Whole province
false cleavers	<i>Galium spurium</i>	Whole province
dodder	<i>Cuscuta species</i>	Whole province
foxtail barley	<i>Hordeum jubatum</i>	Whole province
false ragweed	<i>Iva xanthifolia</i>	Whole province
kochia	<i>Kochia scoparia</i>	Whole province
prickly lettuce	<i>Lactuca serriola</i>	Whole province
yellow toadflax ²	<i>Linaria vulgaris</i>	Whole province
wild parsnip	<i>Pastinaca sativa</i>	Whole province
European buckthorn ²	<i>Rhamnus cathartica</i>	Whole province
Russian thistle	<i>Salsola pestifer</i>	Whole province
white cockle,	<i>Silene alba</i>	Whole province
biennial campion	<i>Silene dioica</i>	Whole province
night-flowering catchfly	<i>Silene noctiflora</i>	Whole province
wild mustard	<i>Sinapis arvensis</i>	Whole province
American black nightshade	<i>Solanum americanum</i>	Whole province
hairy nightshade	<i>Solanum sarachoides</i>	Whole province
cutleaf nightshade	<i>Solanum triflorum</i>	Whole province
perennial sow-thistle ³	<i>Sonchus arvensis</i>	Whole province
spiny annual sow-thistle	<i>Sonchus asper</i>	Whole province
annual sow-thistle	<i>Sonchus oleraceus</i>	Whole province
dandelion	<i>Taraxacum officinale</i>	Whole province
stinkweed	<i>Thlaspi arvense</i>	Whole province
<p>Notes: * Noxious Weed Regulations (Government of Manitoba 2017). ¹ ISCM Category 1 plants (ISCM 2021). ² ISCM Category 2 plants (ISCM 2021). ³ ISCM Other Terrestrial Invasive plants (ISCM 2021).</p>		

**LYNN LAKE GOLD PROJECT:
VEGETATION AND WEED MANAGEMENT PLAN**

Appendix A Weed Species List
January 30, 2025

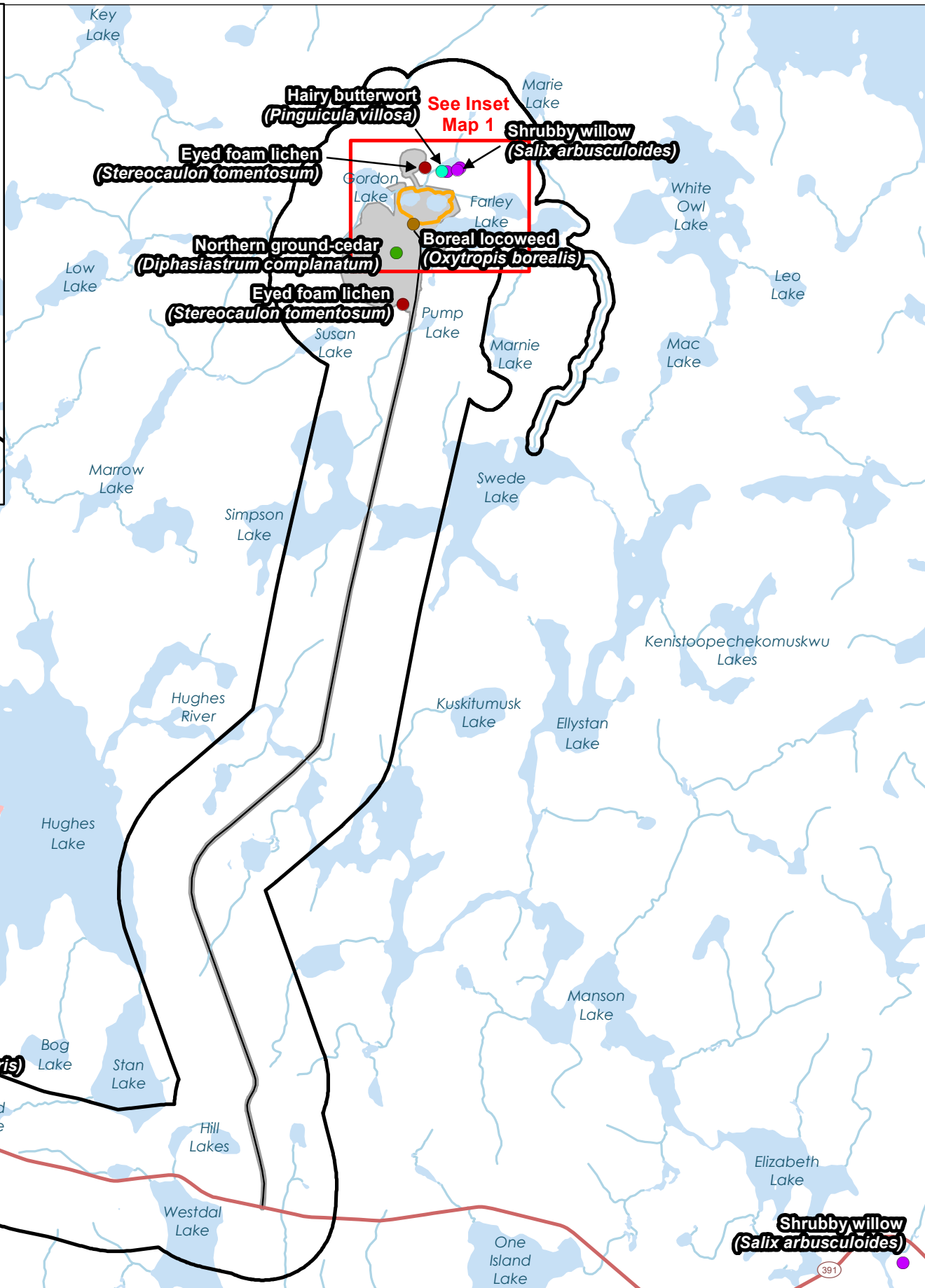
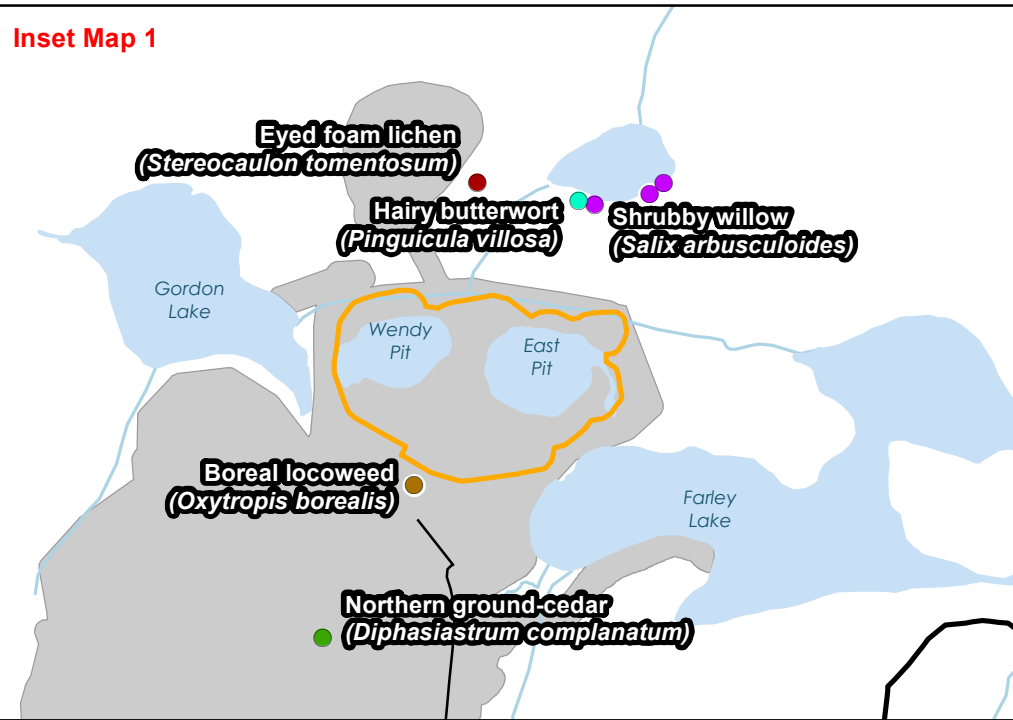
Table A-2 Non-Native Invasive Species Listed By the Invasive Species Council of Manitoba Not included in the Noxious Weeds Regulations

Common Name	Scientific Name	ISCM Category*¹
flowering rush	<i>Butomus umbellatus</i>	2
field bindweed	<i>Convolvulus arvensis</i>	other
purple nutsedge	<i>Cyperus rotundus</i>	1
blue weed	<i>Echium vulgare</i>	2
Dame's rocket	<i>Hesperis matronalis</i>	other
Himalayan balsam	<i>Impatiens glandulifera</i>	2
tansy ragwort	<i>Jacobaea vulgaris</i>	other
white cockle	<i>Lychnis alba</i>	other
purple loosestrife	<i>Lythrum salicaria</i>	2
scotch thistle	<i>Onopordum acanthium</i>	other
kudzu vine	<i>Pueraria montana</i>	1
tall buttercup	<i>Ranunculus acris</i>	other
cow cockle	<i>Saponaria vaccaria</i>	other
puncture vine	<i>Tribulus terrestris</i>	other
bird vetch	<i>Vicia cracca</i>	other
Notes: * ISCM 2021 ¹ Species not listed under the Noxious Weeds Regulations.		

**LYNN LAKE GOLD PROJECT:
VEGETATION AND WEED MANAGEMENT PLAN**

Appendix B Maps

Inset Map 1



Project Infrastructure

- Proposed Open Pit
- Project Development Area

Study Area

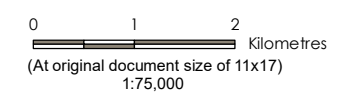
- Vegetation and Wetlands Local Assessment Area (LAA)

SOCC Locations

- Shrubby Willow (*Salix arbusculoides*)
- Small Water-Lily (*Nymphaea tetragona*)
- Lake Quillwort (*Isoetes lacustris*)
- Boreal locoweed (*Oxytropis borealis*)
- Eyed foam lichen (*Stereocaulon tomentosum*)
- Hairy butterwort (*Pinguicula villosa*)
- Northern ground-cedar (*Diphasiastrum complanatum*)

Landbase

- Existing Access
- Highway
- Watercourse
- Waterbody
- First Nation Reserve



Notes
 1. Coordinate System: NAD 1983 UTM Zone 14N
 2. Base Data Sources: Government of Manitoba and Government of Canada.

Project Location
 Lynn Lake, Manitoba
 Prepared by A.Campigotto on 2023-11-06
 Technical Review by NKearns on 2023-11-06

Client/Project
 ALAMOS GOLD INC.
 Lynn Lake Gold Project
 111473033

Map No.
B-1

Title
Species of Conservation Concern (SOCC) - Gordon Site

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Project Infrastructure

- Proposed Open Pit
- Project Development Area

Study Area

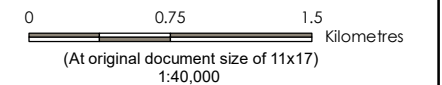
- Vegetation and Wetlands Local Assessment Area (LAA)

SOCC Locations

- Shrubby Willow (*Salix arbusculoides*)
- Northern Woodsia (*Woodsia alpina*)
- Northern ground-cedar (*Diphasiastrum complanatum*)
- American parsley fern (*Cryptogramma acrostichoides*)
- Eyed foam lichen (*Stereocaulon tomentosum*)

Landbase

- Existing Access Road
- Highway
- Watercourse
- Waterbody



Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base Data Sources: Government of Manitoba and Government of Canada.

Project Location

Lynn Lake,
Manitoba

Prepared by ACampigotto on 2023-11-06
Technical Review by NKearns on 2023-11-06

Client/Project

ALAMOS GOLD INC.
Lynn Lake Gold Project

111473033

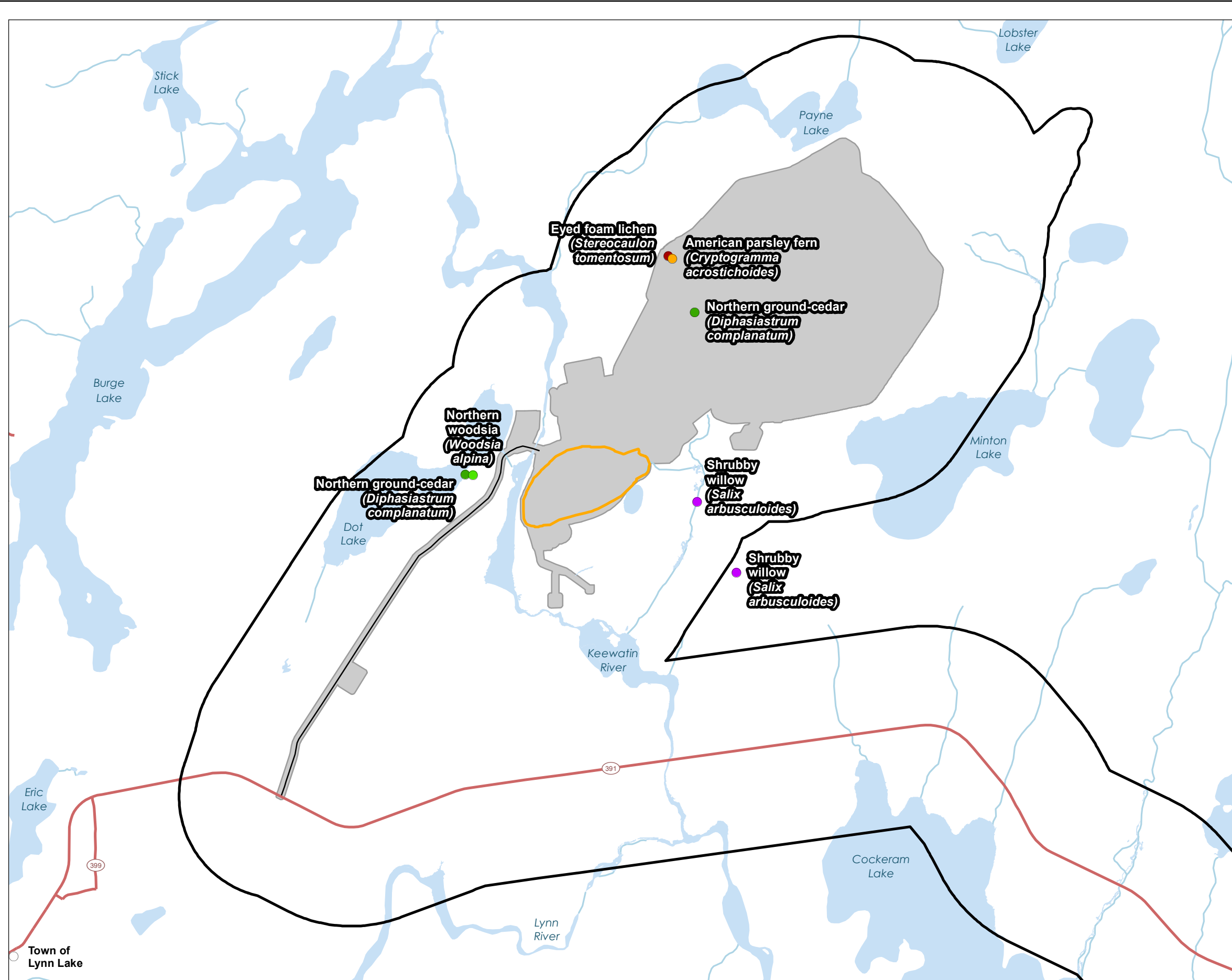
Map No.

B-2

Title

**Species of Conservation Concern (SOCC) -
MacLellan Site**

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Appendix C Plant SOCC with Potential to Occur in the Churchill River Ecoregion

**LYNN LAKE GOLD PROJECT:
VEGETATION AND WEED MANAGEMENT PLAN**

Appendix C Plant SOCC with Potential to Occur in the Churchill River Ecoregion
January 30, 2025

Table C-1 Plant SOCC with the Potential to Occur in the Churchill River Ecoregion

Scientific Name ¹	Common Name	S Rank
<i>Arethusa bulbosa</i>	Dragon's-mouth	S2
<i>Botrychium spathulatum</i>	spatulate moonwort	S1S2
<i>Carex michauxiana</i>	Long-fruited Sedge	S1
<i>Carex pauciflora</i>	few-flowered sedge	S3
<i>Coptidium pallasii</i>	Pallas buttercup	S1S2
<i>Gymnocarpium robertianum</i>	limestone oak fern	S1
<i>Isoetes lacustris</i>	Lake quillwort	S2
<i>Juncus stygius var. americanus</i>	moor rush	S1S2
<i>Luzula wahlenbergii</i>	Wahlenberg's woodrush	S1?
<i>Malaxis paludosa</i>	bog Adder's-mouth	S1?
<i>Nymphaea tetragona</i>	small water-lily	S2?
<i>Polypodium sibiricum</i>	Siberian polypody	S3
<i>Rhynchospora alba</i>	white beakrush	S3
<i>Salix arbusculooides</i>	shrubby willow	S2S3
<i>Salix vestita</i>	rock willow	S3
<i>Woodsia alpina</i>	Northern woodsia	S2
<i>Woodsia glabella</i>	smooth woodsia	S2
<i>Woodsia oregana ssp. cathcartiana</i>	Cathcart's woodsia	S1
<p>Note: ¹ Data from the Manitoba Conservation Data Centre (MB CDC) 2022. Churchill River Upland Ecoregion: Plants. Accessed February 2022. http://www.manitoba.mb.ca/fish-wildlife/cdc/ecoregions/index.html.</p>		