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kgsgroup.com

July 24, 2024

Environmental Approvals Branch Manitoba Environment and Climate Change Box 35, 14 Fultz Boulevard Winnipeg, Manitoba R3Y 0L6

Attention: Ms. Agnes Wittmann Director

Re: Sun Gro Horticulture Canada Ltd. Julius Lake West Peat Harvesting Environment Act Proposal

Dear Ms. Wittmann:

On behalf of Sun Gro Horticulture Canada Ltd. (Sun Gro), KGS Group is pleased to submit 2 hard copies and 1 electronic copy of the Environment Act Proposal submission for the proposed Sun Gro Horticulture Canada Ltd. Julius Lake West Peat Harvesting Project. As part of the licencing process an Environment Act Proposal Form with the \$7,500.00 application fee has been included with this Environmental Assessment report.

Please do not hesitate to contact the undersigned if you have any questions or require additional information.

Yours truly,



DL/jr cc: Tim North – Sun Gro Horticulture Canada Ltd.



Name of the development:						
Julius Lake West Peat Harvesting						
Type of development per Classe	es of Development Regulation (I	Manitoba Regulation 164/88):				
Class 2 Development - M	ining	- · ·				
Legal name of the applicant:						
Sun Gro Horticulture Can	ada Ltd.					
Mailing address of the applicant	#52080 Peat Moss Road	1				
Contact Person: Mr. Tim Nor	th					
City: Elma	Province: Manitoba	Postal Code: R0E 0Z0				
Phone Number: (204) 346-2990	Fax: email:	tim.north@sungro.com				
Location of the development: N	lear Beausejour, Manitoba					
Contact Person: Mr. Tim Nor	th					
Street Address: N/A						
Legal Description: Parts of Se	ections 28, 29, 32, 33, Tow	nship 11, Range 09, E1				
City/Town: N/A Province: Manitoba Postal Code: R0E 0Z0						
Phone Number: (204) 346-2990 Fax: email: tim.north@sungro.com						
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Respage address Rysyroup.	Signature of proponent, or o	corporate principal of corporate proponent:				
Date: 2024-07-23						
	Printed name:	Shaun Moffatt				

PRINT

RESET

A complete **Environment Act Proposal (EAP)** consists of the following components:

Cover letter

✓ Environment Act Proposal Form
 ✓ Reports/plans supporting the EAP (see

"Information Bulletin - Environment Act Proposal Report Guidelines" for required information)

Application fee (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):

Class 1 Developments	\$1,000
Class 2 Developments	\$7,500
Class 3 Developments:	
Transportation and Transmission Lines	\$10,000
Water Developments	\$60,000
Energy and Mining	.\$120,000

Submit the complete EAP to:

Director Environmental Approvals Branch Environment and Climate Change Box 35, 14 Fultz Boulevard Winnipeg MB R3Y 0L6 EABDirector@gov.mb.ca

For more information:

Toll-Free: 1-800-282-8069 Phone: 204-945-8321 Fax: 204-945-5229

https://www.gov.mb.ca/sd/ permits_licenses_approvals/eal/licence/ index.html



SUN GRO HORTICULTURE CANADA LTD.

Julius Lake West Peat Harvesting Environment Act Proposal

Revision: Final/Rev 0 KGS Group Project: 22-0293-002

Date: July 24, 2024



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APPROVED BY:

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EXECUTIVE SUMMARY

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was contracted by Sun Gro Horticulture Canada Ltd. (Sun Gro) to prepare a Manitoba Environment Act Proposal (EAP) to obtain the required Environment Act Licence for peat harvesting at the Julius Lake West sub area. The proposed peat harvesting development will not likely result in significant adverse environmental effects, based on the available information for this project, the environment, the assessment of environmental effects outlined in this environmental assessment report, and application of proposed mitigation measures, including conducting the required follow-up.

Sun Gro is the largest producer of peat moss in North America and the largest distributor of peat moss and peat-based growing media products. To sustain Sun Gro's current needs it is necessary to develop the Julius Lake West sub-area for future peat moss harvesting. Sun Gro previously held a quarry lease for the Julius Lake West site in anticipation of this future need, which has since been converted to a Peat Harvest Licence (PHL) along with several other quarry leases. The purpose of the proposed Julius Lake West sub-area development is to continue to provide quality peat-based growing media products to meet the demand of the distribution network in over 40 countries worldwide.

The scope of the project includes planning, designing, constructing, operating, maintaining and eventual decommissioning and restoring of the proposed peat development at the Julius Lake West sub-area. The scope of this assessment included identification, assessment and mitigation of adverse environmental effects of the project, and evaluation of the significance of residual environmental effects. The scope of the assessment also included consideration of direct and indirect biophysical and socio-economic effects.

The project will include an access road, staging area, bog roads, drainage ditch system, sedimentation pond and an outlet ditch with a gated culvert which discharges water toward an existing wetland area west of the site. Major project activities include providing access, clearing vegetation and surface soils, excavating and trenching, harvesting and stockpiling unprocessed peat, transporting and restoring harvested peatland.

The environmental assessment of the proposed peat development was carried out based on project information provided by Sun Gro and in accordance with the Manitoba Environment Act Proposal Report Guidelines. Additional information was acquired from literature and internet searches, publications by the peat industry and environmental organizations; contacts with provincial government representatives; Indigenous and public engagement; and site investigations by the project team. Requirements of *The Environment Act* (Manitoba) and regulations were followed in the preparation of this EAP.

Information regarding the proposed peat development project has been provided to identified rightsholders and stakeholders in the region through various means, including letters, telephone conversations, and meetings with community representatives as part of a community engagement program. Comments and concerns expressed by rightsholders and stakeholders and mitigation measures to address them have been summarized in this EAP.



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STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

This report has been prepared for Sun Gro Horticulture Canada Ltd. (Sun Gro) in accordance with the agreement between KGS Group and Sun Gro (the "Agreement"). This report represents KGS Group's professional judgment and exercising due care consistent with the preparation of similar reports. The information, data, recommendations and conclusions in this report are subject to the constraints and limitations in the Agreement and the qualifications in this report. This report must be read as a whole, and sections or parts should not be read out of context.

This report is based on information made available to KGS Group by Sun Gro. Unless stated otherwise, KGS Group has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith. KGS Group shall not be responsible for conditions/issues it was not authorized or able to investigate or which were beyond the scope of its work. The information and conclusions provided in this report apply only as they existed at the time of KGS Group's work.

Third Party Use of Report

Any use a third party makes of this report or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.

Geo-Environmental Statement of Limitations

KGS Group prepared the geo-environmental conclusions and recommendations for this report in a professional manner using the degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. The information contained in this report is based on the information that was made available to KGS Group during the investigation and upon the services described, which were performed within the time and budgetary requirements of Sun Gro. As this report is based on the available information, some of its conclusions could be different if the information upon which it is based is determined to be false, inaccurate or contradicted by additional information. KGS Group makes no representation concerning the legal significance of its findings or the value of the property investigated.



1.0 INTRODUCTION

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by Sun Gro Horticulture Canada Ltd. (Sun Gro) to prepare a Manitoba Environment Act Proposal (EAP) for the proposed Julius Lake West sub-area peat harvesting development to obtain a Manitoba Environmental Act License. The proposed project consists of developing a peat harvesting area at the Julius Lake West sub-area (Figure 1) to continue to provide quality peat to meet the demand of Sun Gro's distribution network.

An EAP is required for environmentally significant developments within the province of Manitoba, under *The Environment Act* (C.C.S.M. c. E125). The purpose of this EAP is to ensure that the proposed peat harvesting operation is designed, constructed, and operated in an environmentally responsible manner consistent with provincial environmental legislation, policies, and guidance. A peat harvesting operation such as the one proposed by Sun Gro is considered a mining development under the Classes of Development Regulation 164/88 and is therefore considered a Class 2 Development. The EAP was prepared in accordance with the Manitoba *Environment Act Proposal Report Guidelines* (Manitoba Environment and Climate, 2023).

Sun Gro is the largest producer of peat moss in North America and the largest distributor of peat moss and peat-based growing media products to the North American professional plant grower's market. Sun Gro sells products primarily to professional greenhouse, nursery, and specialty crop growers throughout North America, as well as to golf course developers and landscapers. To sustain current needs, it is necessary to develop the Julius Lake West sub-area for future peat moss harvesting. Sun Gro previously held a quarry lease for the Julius Lake West sub-area in anticipation of this future need, which has since been converted to a Peat Harvest Licence (PHL) along with several other quarry leases. The purpose of the proposed development is to continue to provide quality peat-based growing media products to meet the demand of the distribution network in over 40 countries worldwide.

Sun Gro was founded in 1929 in British Columbia as the Western Peat Company Ltd., as a producer of peat moss. Initial success enabled the company to grow, and its operations expanded throughout British Columbia and eastward into central Canada. The business has had several owners over the years and was acquired by Madison Dearborn Partners II, L.P. ("Madison Dearborn") in 1995, a Chicago based private equity firm. Sun Gro operates in 25 locations throughout North America, many of which are in small rural towns and are committed to providing jobs that are safe and pay a fair wage. Sun Gro employs over 800 people and contributes to the economic well-being of local communities. Sun Gro is also committed to minimizing the impact on the local environment and takes great pride in their stewardship of natural resources.

1.1 Previous Studies and Activities

A summary of notable past studies and activities completed in relation to the project is as follows.

• The Province of Manitoba Department of Energy and Mines conducted a survey of multiple bogs throughout southern Manitoba under the Canada-Manitoba Mineral Exploration and Development Agreement to evaluate their potential for commercial peat harvesting operation (Bannatyne, 1980). As



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part of this survey peat testholes were sampled at the Julius Lake West bog and determined that the bog held up to 3,300,000 m³ of peat (Bannatyne, 1980).

- In 2015, several existing Quarry Peat Leases were converted into a PHL in accordance with *The Peatlands Stewardship Act* which came into force on June 15, 2015. PHL No. 3 Julius is comprised of 10 Quarry Lease areas (now termed sub-areas) including Evergreen 1, 2, 3, North Julius, Julius Lake West, South Julius 1 and 2, Moss Spur 1, 2, and 3 (Appendix A).
- In accordance with *The Peatlands Stewardship Act*, Sun Gro submitted an associated Peatland Management Plan (PMP), Peatland Recovery Plan (PRP), and a Community Engagement Plan for PHL No. 3 (Sun Gro, 2019b; Vertex, 2018; Sun Gro, 2018). The PMP promotes responsible economic development of Crown peatlands through proactive resource planning and long-term peat resource management strategies (Manitoba Sustainable Development, 2017a). The PRP outlines how the harvest areas will be restored once operations at a given site are complete. The Community Engagement Plan outlines Sun Gro's engagement plan within the regional area. At the time of submission of the PMP and PRP, Sun Gro did not anticipate harvesting at Julius Lake West within the PHL timelines (2015-2030). Given that Sun Gro now plans to harvest at Julius Lake West, the proposed development change will require review by the Manitoba Environment and Climate Change in accordance with the PHL Guidelines (Government of Manitoba, 2017). The review and consultation requirements required to satisfy the PHL will be combined with the Environment Act Licence (Government of Manitoba, 2017).
- A peat assessment was conducted at Julius Lake West in 2020 and 2021 to supplement and confirm investigations conducted by the Manitoba Department of Energy and Mines (KGS Group, 2022). The investigation confirmed that peat at the Julius Lake West sub-area was of sufficient quality and quantity to warrant harvesting with an estimated volume of 1,320,000 m³ of harvestable peat.



2.0 PROJECT DESCRIPTION

The following sections have been structured to address the Description of Proposed Development requirements as outlined in the EAP Report Guidelines (Manitoba Environment and Climate, 2023).

2.1 Status of Title

As the proposed project lies on Crown Land, there are no Certificates of Titles available, however Sun Gro holds the peat harvesting rights for the proposed harvest area under Manitoba PHL No. 3 – Julius (Appendix A). The Julius Lake West sub-area is located on parts of Sections 28, 29, 32, 33, Township 11, Range 09, E1.

2.2 Mineral Rights

Sun Gro holds the peat harvesting rights to the Julius Lake West sub-area within PHL No. 3. Julius Lake West is one of ten sub-areas for which Sun Gro holds the peat harvesting rights under PHL No. 3.

Julius Lake West covers 177 ha, however only approximately 123.8 ha is proposed to be harvested, as shown on Figure 2. Other areas have insufficient peat depth to warrant harvesting and/or fall within buffer areas around the sub-area boundary. The bog is estimated to contain approximately 1,320,000 m³ of Sphagnum moss. This is equivalent to approximately 132,000 tonnes of product assuming 0.1 tonnes of product per cubic metre of peat harvested.

2.3 Existing and Adjacent Land Use

The proposed harvest site is currently a forested peat bog in a remote location covered predominantly with black spruce. An ATV trail from Colony Road to the west accesses the north side of the bog (Photo 1; Appendix B). This trail runs along the north edge of the bog towards the east side of the bog and then heads to the southeast corner of the sub-area. An existing fire road runs in a north-south alignment approximately 1.2 km east of the Julius Lake West sub-area. Several trails appear to be present in the surrounding area, particularly to the west of the sub-area, possibly related to former forestry activity.

Land use within the regional study area includes a mixture of resource extraction and recreation including forestry, agriculture, hunting, trapping, fishing, outfitting, snowmobiling, camping and recreational cabins.

2.4 Land Use Designation and Zoning

The proposed harvest site is on Crown land within the Rural Municipality (RM) of Reynolds. The site is within the Agassiz Provincial Forest. The Julius Lake West sub-area is located on parts of Sections 28, 29, 32, 33, Township 11, Range 09, E1

2.5 Proposed Development

The proposed Julius Lake West peat harvesting project will include the components described in the following sub-sections and shown in Figure 2.



2.5.1 ACCESS ROAD

An access road will be constructed from the proposed staging area on the east side of the Julius Lake West sub-area to the existing fire road located east of the site (Appendix B, Photo 3). The access road from the fire road to the staging area will be approximately 1.3 km long. The access road will generally be 15 m (50 feet) wide with a 2 percent minimum grade. This will be sufficient for simultaneous ingress and egress of emergency vehicles in the event of an emergency. Ditches will be constructed on both sides of the road. Material excavated during ditching will be used to build the road base. Gravel will be hauled on-site from the nearest available source and spread to a thickness that will be determined on-site after evaluating the road base condition. A geotextile material will be used beneath the gravel in areas where the earth is swampy or otherwise unstable. Corduroy logs will be installed as needed in areas where existing ground conditions do not have sufficient strength to support haul trucks. The proposed access road will require the installation of culverts to equalize water levels in the roadside ditches. Culvert diameter will be a minimum of 900 mm, with culvert number and locations to be determined based on field conditions.

The east limit of the access road will connect with the existing fire road which runs in a north-south alignment. Vehicles departing the site will travel 2.7 km south along the fire road, and 6.5 km west along Springfield Road (63N) until reaching Colony Road (47E) (Figure 1). The 2.7 km north-south stretch of the fire road and the eastern 1.8 km of Springfield Road may require upgrades to accommodate peat haul trucks. Upgrades potentially required include additional gravel on the surface and equalization culverts to ensure the road is not flooded during wet conditions. The amount of gravel required, and number and locations of culvert crossings will be determined based on field conditions.

2.5.2 SEDIMENTATION POND

A sedimentation pond will be constructed before starting main drainage ditch and field drainage ditch construction. Sedimentation ponds are used to treat peatland drainage water by slowing down the water flow to maximize the settlement of suspended peat particles. The design of the sediment pond will be based on the following criteria.

- Minimum basin volume of 25 m³ per ha of peatland area drained.
- Minimum depth at outlet of 1.5 m.
- Optimum length to width ratio of 6.5:1 to 12:1.
- Minimum retention time of two hours to allow for settling of sediments.
- Five year maximum instantaneous discharge of 0.75 m³/sec/km² resulting in a peak five-year flow of 0.148 m³/sec.

The production area of the peat bog determines the total number of sedimentation ponds based on the above criteria. A single sediment pond will be able to handle the peatland drainage from the proposed 123.8 ha harvest area. For efficiency during cleaning and maintenance the sedimentation pond will be constructed approximately 120 m long x 4 m deep in a V-shape that is 2 m wide at the bottom and 12 m wide at the top resulting in a total volume of approximately 3,360 m³.

The sedimentation pond will be constructed at the end of the main drainage ditches and will have an outlet ditch to discharge drainage water to the surrounding environment. The sedimentation pond will be equipped with a floating boom situated near the outlet to prevent escape of floating debris.



The sedimentation pond will be cleaned periodically to ensure that the accumulated sediment volume does not exceed 25% of the total basin volume. Water levels will be monitored during periods of normal operation to ensure that there is always at least a 1 m depth of free water over a minimum 10 m distance from the pond outlet. Cleaning will take place before and after any significant ditch cleaning or cutting takes place within the upstream catchment area. Solids removed during cleaning will be scooped from the pond with a backhoe.

2.5.3 FIELD DRAINAGE DITCHES

Field drainage ditches are used to remove interstitial surface water and prepare the peat surface for harvesting after clearing. A network of parallel ditches will be cut through the bog using a "V" ditcher. Each field ditch is excavated to 1.5 m deep and 1.5 m wide and spaced approximately 33 m apart. Field drainage ditches will typically be constructed at 90° angles to the main drainage ditches (Figure 2). At the peak development with all 123.8 ha under operation, a total of 76 field ditches will have been cut. Water will drain from the field ditches into the main drains, and then through the sedimentation pond where it will eventually flow off-site. Field ditch construction is typically completed during the winter when the peat is frozen. Therefore, initial peat drainage will likely coincide with the spring runoff period. After this period, the rate at which water drains from the bog will depend on the amount of precipitation. Water will continue to drain from the bog until the water table is reduced to the elevation of the ditches or until the peat becomes frozen.

To reduce discharge during initial field drain construction, the Julius Lake West sub-area will be opened up over a two year period. The storage volume of the development area was calculated to estimate the potential water discharge following the development of the field drains. Based on the field ditches being cut to a depth of 1.5 m the total volume of peat to be drained is approximately 927,000 m³. This volume of peat will hold approximately 880,700 m³ of water assuming an average 95% moisture content before drainage. Moisture content generally varies between 60 to 85% following drainage after the field ditches are cut (Thibault, 1998). Therefore, assuming an average of 70% moisture content remains after drainage (25% drains), the volume of drainage water from opening each 61.9 ha of peatland will total approximately 232,000 m³.

As peat is harvested, the drainage ditches must be deepened to maintain their depth. The ditches are typically deepened by approximately 0.15 m every second year. Based on the assumptions discussed above, this ditch deepening would result in an additional 46,000 m³ of water being released from the peatland every second year.

2.5.4 MAIN DRAINAGE DITCHES

Field drains will drain into main drainage ditches which will be excavated primarily around the perimeter of the harvesting area (Figure 2). The main drainage ditches will be approximately 2 m wide and 3 m deep and are designed with a low gradient to maintain a slow flow so that they will be more conducive to settlement of suspended solids. The main drainage ditches connect the field ditches to the sedimentation pond on the west side of the sub-area, which then discharges drainage water through the outlet ditch into existing drainage in a forested bog area west of the site.



2.5.5 OUTLET DITCH

The outlet ditch conveys water from the main drains off-site to a forested bog area to integrate the drainage into the existing drainage system and minimize change to the water regime. Flows will then continue westward before entering an unnamed drain which eventually discharges to the Brokenhead River.

A control culvert with a sliding gate will be placed in the outlet ditch at the downstream end of the sedimentation pond which will be used to regulate water levels in the peat layer within the harvesting area and allow for some control of water discharge from the site. A 0.3 m diameter culvert is proposed to mitigate the effects of the peat drainage on downstream flows (additional details are provided in the Hydrologic and Hydraulic Analysis in Appendix C). The gate can be closed as needed to slow the water flow and allow for the settlement of suspended peat particles prior to the water being discharged off-site. The gate can also be used to reduce or stop outflow from the sediment pond in the event of a major precipitation event, which exceeds the design flow criteria, assuming the runoff volume does not exceed the volume of available storage.

2.5.6 BOG ROADS

The bog roads connect the access road to the harvest area. The roads will be constructed using nonmerchantable timber and surface vegetation that is removed from the fields as part of the preparation for harvesting. A clay base and gravel topping will be added to allow trucks access to the fields for loading purposes (Figure 2).

2.5.7 FACILITY AND EQUIPMENT REQUIRED AT PROPOSED PEAT DEVELOPMENT SITE

A 4-ha staging area will be developed as part of the proposed project along the east side of the sub-area, where the access road reaches the site. This area will be cleared, graded for drainage to match the surrounding topography and will have gravel placed over top of the existing materials. The staging area will be used for employee vehicle parking, equipment storage and maintenance. Peat may be temporarily stockpiled in this staging area before it is hauled to the existing processing facility near Elma, Manitoba, which is located approximately 62 km southeast of the Julius Lake West sub-area.

A building will be located at the staging area for equipment and employees. The building will consist of a shop area which will be used for equipment repair, maintenance and refueling. The building will also include an office area and lunchroom for staff. The lunchroom and washroom will be equipped with a septic tank installed and maintained by a local authorized contractor. The site will be serviced with a combined system which will include including solar power and an on-site generator. Drinking water will be brought to site as no groundwater wells are proposed.

All fuel required for this development will be stored in the 4-ha staging area in accredited (CAN/ULC S601) steel double walled diesel fuel aboveground storage tanks (ASTs). All the ASTs will be equipped with a 90 L/m electric pump for dispensing fuel. Sun Gro will comply with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products. Manitoba provincial and municipal guidelines and regulations will also be followed for the installation and operation of all ASTs. Small amounts of gasoline will also be stored at the site in portable containers. The gasoline and other petroleum products, such as hydraulic oil, motor oil, and lubricants will be stored in a designated contained storage area within the shop on site.



On-site equipment will include farm tractors to haul and power the different types of peat harvesting operation equipment, loaders to push stacks and load trucks, and dozers and excavators to maintain bog operations.

2.5.8 SCHEDULE OF PROJECT STAGES AND ACTIVITIES

Development at the site is expected to begin once the necessary project approvals have been received. The schedule presented here and summarized in Table 1 assumes receiving the necessary approvals and permits in 2024. Initial work would consist of constructing the access road from the fire road, clearing the trees within the harvest area and installation of the sedimentation pond and drainage ditches in the winter 2025 (January to March). Subsequent work in the spring and summer of 2025 would include additional site preparation and contouring, as well as any upgrades needed to the access road and the existing fire road and portions of Springfield Road. Peat harvesting at Julius Lake West would begin as early as 2025.

The development plan proposes that peat harvesting operations of the 123.8 ha be completed over a period of two years starting in 2025. Harvesting will occur at approximately 61.9 ha in 2025 and at the full 123.8 ha harvest area for the approximately 11 years, from 2026 until approximately 2036, with a final year of harvesting approximately 61.9 ha in 2037. This production schedule is based on an estimated average peat production rate of approximately 850 m³/ha/year and an estimated total of 1,320,000 m³ of horticultural grade peat available at the site. By approximately 2037 the bog area is expected to be harvested down to the final planned depth of harvesting, maintaining the required minimum of 0.5 m of peat in place after harvesting. Restoration activities will begin once peat harvesting is complete at the sub-area.

2.6 Project Boundaries

2.6.1 SPATIAL BOUNDARIES

The spatial boundaries of the assessment include the development area, the project study area, and regional study area (Figure 1). The development area constitutes the area within the sub-area boundary which is cleared, drained and harvested or used for the staging areas or buffer zones. The project study area includes the sub-area and the area within a 3 km radius of the sub-area boundary, which encompasses a total area of 4,606 ha. The regional study area includes the sub-area and the area within a 10 km radius of the sub-area boundary, which encompasses a total area of 36,894 ha. Direct and indirect biological and physical environmental effects of the project are considered within the project study areas, while socio-economic effects are considered in the regional study area.

2.6.2 TEMPORAL BOUNDARIES

The temporal boundary for the assessment is the life expectancy of the proposed peat harvesting operation. This is estimated to be approximately 18 years, which includes 13 years of harvesting followed by 5 years of decommissioning and restoration. Following the expected decommissioning and restoration of the peat harvesting sites, monitoring would continue for a number of years, as required, until any outstanding environmental issues are addressed, or Manitoba Environment and Climate Change is satisfied.



2.7 Funding

Funding for the proposed development comes from Sun Gro.

2.8 Other Approvals

In addition to the PHL which Sun Gro has already obtained and the Environment Act Licence which is being applied for as part of this EAP, Sun Gro will require the following licences/permits (Government of Manitoba, 2017).

- A General Permit from Crown Lands is required under *The Crown Lands Act* for the access road.
- A Work Permit from Natural Resources and Northern Development is required to authorize work on Crown land.
- A Timber Appraisal is required from the Department of Economic Development, Investment, Trade and Natural Resources to authorize removal of any timber within the PHL.

Sun Gro will also be required to revise the existing PMP and PRP for PHL No. 3 to account for harvesting at Julius Lake West sub-area within the PHL license terms. The current PHL will also have to be renewed prior to its expiry in 2030.



3.0 INDIGENOUS AND PUBLIC ENGAGEMENT

An Indigenous and public engagement program was developed and carried out to support the EAP. The engagement program included identification of potentially affected rightsholders and stakeholders, preparation of engagement materials, distribution of project information, and communication with identified rightsholders and stakeholders. A communication log was maintained to document inquiries, follow-ups, responses and action items. Meetings occurred with the Manitoba Metis Federation (February 20, 2024), the RM of Reynolds Council (March 11, 2024) and the Brokenhead Ojibway Nation (March 27, 2024). Details of meeting results, questions/concerns, correspondence, the communication log, sample letters and engagement presentation slides are provided in the Community Engagement Report in Appendix D.

A list of issues that were heard during engagement, along with a description of where this is discussed in the EAP and/or the mitigation measures to address this concern are summarized as follows.

- **Greenhouse gas emissions** Greenhouse gas emission calculations for the life of the project are described in Section 5.2.4 and summarized in Table 12. Greenhouse gas effects, mitigation measures and follow-up measures to address these are discussed in Section 5.3.2. Potential effects and mitigation measures are also summarized in Tables 13 and 14, with follow-up measures summarized in Table 15.
- Engagement and agreements with Indigenous communities A summary of engagement activities, including who was engaged with, questions and concerns, and engagement outcomes, is described in the Community Engagement Report (Appendix D). A question was also raised regarding whether Sun Gro has existing or past agreements with Indigenous communities. Sun Gro does not have any formal agreements or partnerships with Indigenous communities in Manitoba, although peat harvesting does generate local employment, as described in Section 5.4.1.
- Sun Gro and site operation Details regarding site development, operation, site services, and schedule are discussed in Section 2.5. Details regarding site staffing are discussed in Section 5.4.1.
- Tree clearing Tree clearing and timber harvest at a regional level are discussed in Section 4.2.6.2. Environmental effects and mitigation measures related to tree clearing at the sub-area, as well as the use of non-merchantable timber, are discussed in Section 5.3.6. Potential effects and mitigation measures are also summarized in Tables 13 and 14, with follow-up measures summarized in Table 15. A timber appraisal will be required as noted in Section 2.8. Business opportunities related to tree clearing are discussed in Section 5.4.2. The Julius Lake West sub-area is within the Agassiz Provincial Forest, where sustainable use of natural resources is permitted under *The Forest Act* (Manitoba).
- Aboriginal and Treaty Rights Potential project effects on hunting, trapping and traditional harvesting practices as part of Aboriginal and Treaty Rights, as well as mitigation measures, are discussed in Section 5.4.7. Potential effects and mitigation measures are also summarized in Tables 13 and 14, with follow-up measures summarized in Table 15.
- Emergency Response Sun Gro maintains an emergency preparedness plan, spill response plan and fire response procedures. Response to fires and forest fires is discussed in Sections 5.5.1 and 5.6.3. Sun Gro does not operate in hot and dry conditions, as per provincial requirements. Response to other potential emergencies (accidents, floods, spills) are discussed in Sections 5.5 and 5.6.



- Water quality Proposed surface water quality monitoring frequency, parameters and locations are discussed in Section 5.3.5, and will be refined based on correspondence with Manitoba Environment and Climate Change through the licensing process. Proposed mitigation measures, follow-up, and potential adaptive management measures are described in Section 5.3.5 and summarized in Tables 13 and 14, with follow-up measures summarized in Table 15. Monitoring requirements are described within the publicly accessible Environment Act Licence for a given project. Water quality monitoring reports prepared by Sun Gro in response to licence requirements can be accessed by contacting Manitoba Environment and Climate Change.
- Socioeconomic Benefits Socioeconomic effects of the project, including employment and business
 opportunities, are discussed in Sections 5.4.1 and 5.4.2. Sun Gro employs 86 people across Manitoba
 with variable workforce sizes at different sites depending on size and stage of site development and
 harvesting.
- **Restoration** Details about how the sub-area will be restored following harvesting are provided in Section 5.2.8, including links to additional resources.
- Drainage A Hydrologic and Hydraulic Assessment was conducted for the site to evaluate potential impacts of water run-off (provided in Appendix C). Baseline surface water drainage conditions are summarized in Section 4.1.6, and potential effects are assessed in Section 5.3.5, including proposed mitigation measures and follow-up measures. Mitigation measures are also summarized in Tables 13 and 14, with follow-up measures summarized in Table 15.



4.0 EXISTING ENVIRONMENT

4.1 Biophysical

4.1.1 Physiography And Climate

The Julius Lake West sub-area is located mainly within the Stead Ecodistrict (375) of the Lake of the Woods Ecoregion in the Boreal Shield Ecozone; however, the south-west portion of the sub-area is within the Steinbach Ecodistrict (726) of the Interlake Plain Ecoregion of the Boreal Plains Ecozone (Smith et al., 1998).

The Stead Ecodistrict is the western-most ecodistrict within the Lake of the Woods Ecoregion which extends from the south-east corner of Lake Winnipeg on the north-west, to the United States border to the south, and into Ontario to the east. The ecodistrict is within the ancient glacial Lake Agassiz basin and has a surface that varies from a level to depressional glaciolacustrine plain dominated by peatlands, to a smooth, level to gently undulating glacial till and fluvioglacial outwash plain to irregular hummocky morainal uplands (Smith et al. 1998). Elevations within ecodistrict range from 221 to 290 metres above sea level (masl). The central area of ecodistrict, within which the Julius Lake West sub-area is situated, is a flat, poorly drained, depressional lowland areas of the ecodistrict, such as the project location, consist of poorly drained peaty Gleysols and Typic/Terric mesosols. Constructed drainage is present in a large part of this area which allows for some areas to be used for agricultural crops (Smith et al., 1998). Drainage within the ecodistrict flows towards Lake Winnipeg, with the western part of the ecodistrict falling within the Brokenhead River division and the eastern part of the Nelson River drainage system (Smith et al., 1998).

The Steinbach Ecodistrict is the south-eastern most ecodistrict within the Interlake Plain Ecozone, which spans from the United States border to the location of the Julius Lake West sub-area, which is situated at its northern limit. Land surface in the Steinbach Ecodistrict varies from a smooth, level glaciolacustrine plain to a gently undulating glacial till and glaciofluvial, terraced plain (Smith et al. 1998). The mean elevation within ecodistrict is about 297 masl. The ecodistrict slopes gently northwestward at approximately 1 m/km. Relief in the ecodistrict includes sandy and gravely ridges and peatlands. Peatlands are especially common along the eastern border of the ecodistrict. Drainage within the ecodistrict flows towards the Roseau River and other creeks which drain towards the Red River, which is part of the Nelson River drainage system (Smith et al. 1998).

Both the Stead and Steinbach Ecodistricts are located within the Subhumid Low Boreal Ecoclimate Region. The region is characterized by short warm summers and long cold winters (Smith et al. 1998). The nearest weather station with historical data is in Pinawa, approximately 37 km north-east of the project site. The mean annual air temperature at the weather station is 2.6°C and the daily mean temperature ranges between 19.0°C in July and -16.2°C in January (Environment Canada, 2024). Precipitation at the station averages 571 mm annually. The average growing season within ecodistricts is 180-184 days with approximately 1,600-1,700 growing degree-days (Smith et al., 1998).



4.1.2 AIR QUALITY

Real-time air quality concentrations are monitored at several sites in Manitoba. While not all sites record the same parameters, most sites measure particulate matter ($PM_{2.5}$), ozone (O_3), nitric oxide (NO), nitrogen dioxide (NO_2) and nitrous oxides (N_2O). At present however, routine air quality monitoring only occurs in urban areas.

The Department of Environment and Climate Change Canada has developed an Air Quality Health Index (AQHI) which converts air quality measurements into a single index that represents the measured quality of air. The AQHI provides a general idea of air quality to the public broken into four risk levels (Table 2). It is provided in this report for reference purposes only as the study area is a remote location.

Health	AQHI	Health Messages		
Risk		At Risk Population	General Population	
Low Risk	1-3	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.	
Moderate Risk	Consider reducing or reschedulingNo need to4-6strenuous activities outdoors if you are experiencing symptoms.activities unle		No need to modify your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.	
High Risk	7-10	Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.	
Very High Risk	Above 10	Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	Reduce or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.	

TABLE 2: AIR QUALITY HEALTH INDEX

(https://weather.gc.ca/airquality/healthmessage_e.html)

It is expected that the AQHI for the regional study area is typically low risk throughout the year; although there are no published sources of air quality data. Air quality in the area is generally excellent compared to large cities and commercial and industrial areas in Manitoba and Canada. Other industrial developments within the regional study area include railroad to the south running east-west through Ste. Rita, and another railroad running southeast-northwest through Molson and a secondary track southwest from Molson. There are also sand and gravel pits off Springfield Rd, and other peat harvest areas in the vicinity, including one approx. 4 km east-southeast and others approx. 10 km east of the sub-area. Other developments in the regional study area include small towns (Ste. Rita, Nourse, Lydatt and Molson), forestry, and recreational activities (ATVs, snowmobiles). The regional study area is otherwise predominantly undeveloped forest, with agriculture at the western limits. The AQHI may be periodically reduced to Moderate Risk during dry periods resulting in dust along the access road and in agricultural fields and peat harvest areas during periods of high winds affecting the fields, or during forest fires that may result in increased particulates.



4.1.3 GEOLOGY

The Lake of the Woods Ecoregion is underlain with bedrock consisting predominantly of crystalline Archaen rocks, with areas of Palaeozoic limestone erosion remnants in the north-west area of the ecoregion (near project location). The area has variable thickness layers of glacial till, fluvioglacial, and peat-covered glacial Lake Agassiz deposits. Exposed bedrock outcrops are more common near the centre and eastern limits of the ecoregion (Smith et al., 1998)

The Interlake Plain Ecoregion is underlain with flat lying Paleozoic limestone rock. The area has a low relief, north to south trending drumlinoid or ridge, the surface deposits are made up of extremely calcareous, very stony and water worked loamy glacial till, with limestone bedrock (Smith et al., 1998)

4.1.4 SOILS

Soils within the Stead ecodistrict are variable based on drainage conditions. Depressional lowland areas generally consist of poorly drained peaty gleysols and typic (deep) and terric (shallow) mesisols, which developed primarily on sedge peat. Upland areas consist generally of dark gray chernozems which overlay glacial till. Soils in the eastern portion of the Steinbach ecodistrict are well-drained Luvisols on sandy deposits with till ridges. There are also Eutric Brunisols that have developed on top of sandy materials within the eastern portion (Smith et al., 1998).

As part of peat investigations conducted at the Julius Lake West sub-area, KGS Group completed 2 peat cores in January of 2021 (KGS Group, 2022). Live sphagnum peat was present from surface to depths ranging from 0.25 m to 0.30 m below ground surface. The top layer of sphagnum peat was followed by a layer of organic peat which ranged from 0.30 m to 2.80 m thick. Below the organic peat layer, silty clay with sand was generally encountered at depths ranging from 1.7 m to 2.8 m below the ground surface. This low permeability silty clay cover forms a very good barrier between the perched water within the peat layer and the groundwater in the underlying aquifers described in the following section.

4.1.5 GROUNDWATER

Groundwater within the Stead and Steinbach Ecodistricts is primarily found in sandy and gravelly aquifers associated with the glacial till, inter-till, beach, and fluvioglacial deposits (Smith et al., 1998). The widely distributed sand and gravel aquifers are associated with a series of upland moraines and glaciofluvial deposits which form the primary source of potable water in the area (Betcher et al., 1995). Regional aquifer supply is very good with groundwater quality generally being excellent. Total dissolved solids in regional groundwater are generally between 300 mg/L and 500 mg/L (Betcher et al., 1995). Beyond areas with extensive sand and gravel aquifers are more local in nature with reduced yield and reduced water quality (Betcher et al. 1995).

A search of a provincial groundwater well database (GW Drill, 2018) indicated the presence of one groundwater well within 3 km of the Julius Lake West sub-area. This particular well was an active production well drilled in 2007 at a well depth of 10.37 metres. An additional 14 groundwater wells are present within 3 to 5 km from the sub-area. Registered wells are within sand and gravel, and limestone and dolomite that consist of domestic production wells. Wells are generally cased to depths of 10 m to 66 m below ground surface, with water present at an average depth of 5.4 m below the ground surface (GW Drill, 2018).



4.1.6 SURFACE WATER

The Stead and Steinbach Ecodistricts are located within the Lake Winnipeg watershed which is part of the Nelson River drainage system. Major rivers in the area include the Winnipeg River and the Brokenhead River, which both drain into Lake Winnipeg. As noted in section 4.1.1, the area is generally poorly drained, although overall surface water in the ecodistrict flows north-west towards Lake Winnipeg.

No waterbodies are present within the Julius Lake West sub-area. An ephemeral pond is located approximately 215 m to the west outside of the sub-area and there is an open water pond approximately 300 m northeast of the sub-area in an adjacent peat bog area. In addition to the ephemeral pond the area to the west side of the sub-area is poorly drained such that the trail is occasionally flooded. Waterbodies within the 10 km regional study area include Julius Lake to the east, the Brokenhead River and Hazel Creek to the west, Bears Creek to the north, and Cedar Lake to the southwest. Several small unnamed creeks and beaver ponds are also present throughout the forested area within the regional study area. These creeks appear to be ephemeral in nature.

The Julius Lake West sub-area is situated within a sub-watershed drainage basin which flows northwest toward the Brokenhead River via an unnamed drain (Appendix C, Figure 1), which continues northwest for 7.1 km beyond the sub-watershed basin through agricultural land use area before joining with the Brokenhead River. The catchment area contributing to this drain, which includes the Julius Lake Wes sub-area covers an area of 26.3 km². A hydrologic and hydraulic assessment was conducted to assess drainage and flow, which is summarized herein, with additional details and calculations available in Appendix C. Frequency flows were calculated based on the topographic and physiographic characteristics of the watershed. Peak outflow from the peat bog development area was calculated to be 0.10 m³/s and 0.52 m³/s for the 5-year and 25-year rainfall runoff event. Flow rates were calculated for the unnamed drain downstream where it crosses Road 47E and Road 66N. Flow rates for a 1 in 2 year (50% frequency flow), 1 in 5 year (20% frequency flow), and 1 in 100 year (1% frequency flow) flood events were calculated to be 1.0 m³/s, 2.0 m³/s, and 5.7 m³/s, respectively. The Road 47E crossing consists of two 1.2 m diameter corrugated steel pipes, while the Road 66N crossing consists of a single 1.2 m diameter corrugated steel pipe. Neither culvert crossing meets hydraulic design criteria at the 5% design discharge. Fish passage criteria are also exceeded at both crossing sites. Additional details and calculations are provided in Appendix C.

Baseline surface water samples were collected on June 2, 2022 from five locations within and downstream of the sub-area as shown in Figure 3. Sample locations included two locations within the peat inside the sub-area (JLW SW-01 and JLW SW-02), one ephemeral pond location west of the sub-area (JLW SW-03), within the unnamed drain downstream of the site (JLW SW-04) and the Brokenhead River (JLW SW-05). Water sampling locations within the peat were determined in the field based on available water and are representative of the perched groundwater table in the peat layer (e.g. Appendix B, Photo 5). As part of the Quality Assurance / Quality Control (QA/QC), one duplicate sample was also collected and analyzed. All laboratory samples were submitted to Bureau Veritas Laboratories (BV Labs), an accredited laboratory in Winnipeg.

In-situ field measurements of general water quality parameters (dissolved oxygen (DO), temperature, pH, conductivity and turbidity) were recorded as part of the baseline sampling program and are summarized in Table 3. Water samples were collected for laboratory analysis of general surface water quality parameters



(Table 4) and metals (Table 5) and compared to the Manitoba Water Quality Standards, Objectives and Guidelines (MWQSOG). These baseline water quality results will form a baseline for comparison of any future surface water sampling at the Julius Lake West sub-area.

Baseline surface water samples collected from the peat water at the sub-area (JLW SW-01 and JLW SW-02) had acidic pH levels of 3.74 and 3.64, respectively (Table 3). These pH levels are below the MWQSOG which is between 6.5 and 9.0. In comparison, the pond to the west (JLW SW-03), the downstream unnamed drain (JLW SW-04) and the Brokenhead River (JLW SW-05) sites had generally neutral pH values within the criteria with values of 7.21, 7.63 and 8.03, respectively.

Dissolved oxygen levels were low at one of the peat sample locations (JLW SW-02), the pond (JLW SW-03) and the downstream unnamed drain (JLW SW-03) with values of ranging from 1.09 mg/L to 5.24 mg/L. These values do not meet the minimum concentration to satisfy the MWQSOG Cool Water criteria for "early life stages" (<6.0 mg/L) and for "other life stages" (<5.5 mg/L) (Table 3). Dissolved oxygen values were higher and above the guideline at one of the peat sample sites (JLW SW-01) as well as the Brokenhead River site (JLW SW-05), with values of 6.19 and 6.10 mg/L, respectively.

Specific conductance values were relatively low at the peat sample locations (<100 μ S/cm), and slightly higher at the nearby pond and downstream unnamed drain and river sites (272-308 μ S/cm). Turbidity values were relatively low at all sites except the unnamed drain site which had slightly higher turbidity.

Based on laboratory analysis of general water quality parameters, the peat samples had acidic pH levels, nutrient values are low in all samples, often below laboratory detection limits and total suspended solids (TSS) concentrations ranged from <1.0 mg/L to 14 mg/L (Table 4). Phosphorus was above the MWQSOG in the pond sample, while the laboratory detection limit for some samples were above the phosphorus guidelines due to matrix interferences, therefore it cannot be confirmed if concentrations were below guidelines. Laboratory analysis of metal parameters shows levels of aluminum, iron and mercury above guideline values in both of the peat samples (JLW SW-01 and JLW SW-02; Table 5). Exceedances of aluminum and iron are associated with the acidic water peat water and have been routinely observed in other bog areas (e.g. KGS Group 2010, KGS Group 2011, KGS Group 2020). The concentration of silver at the Brokenhead River location (JLW SW-05) also exceeded the MWQSOG. Other metal concentrations were below guideline values, and often below laboratory detection limits. The laboratory detection limits of several metals were elevated above some guideline values due to sample matrix interferences at the laboratory.

4.1.7 VEGETATION

Wetlands are considered one of the most productive ecosystems, sustaining more life than any other ecosystem. Wetlands in Canada developed following the most recent retreat of glacial ice and are typically between 5,000 and 10,000 years old. Canada has more than 1.29 million km² of wetlands covering approximately 13% of Canada's land areas (ECCC, 2016a). Canada has 25% of the world's wetlands, covering 6% of the earth's land and freshwater surface (Daigle and Gautreau-Daigle, 2001; Warner and Rubec, 1997).

Vegetation in the Stead and Steinbach Ecodistrict varies based on soil type and drainage. Poorly drained areas have predominantly willows, sedges, and grass species, while well drained areas have jack pine and trembling aspen. Extensive areas within each ecodistrict have been converted to agricultural crops. Areas of



fen peatlands and bog peatlands are present within both ecodistrict which generally consists of black spruce, tamarack, shrubs, sedges, and moss vegetation (Smith et al., 1998).

The proposed harvesting area would be classified as a bog. Bogs generally receive all their water and nutrients from precipitation (termed ombrotrophic), rather than from groundwater, and are thus mineral-poor. A bog is characteristically acidic with the water table at, or near, the surface (perched). Bogs typically have a dense layer of peat covered with moss, shrubs, and sedges, while trees are also common. Typical vegetation dominating bog peatlands are stunted black spruce, *Sphagnum* moss and ericaceous shrubs (Warner and Rubec, 1997; Daigle and Gautreau-Daigle, 2001). The Julius Lake West sub-area can be described as a moderately treed bog area with open areas of *Sphagnum* moss (Appendix B, Photos 2-4).

The Manitoba Conservation Data Center (MBCDC) lists over 3,000 vegetation species in Manitoba, including 132 species in the Interlake Plain Ecoregion and 148 species in the Lake of the Woods Ecoregion (209 unique species) that are provincially tracked (Appendix E). Species tracked by MBCDC include those that are provincially critically imperilled (S1), imperiled (S2) or vulnerable (S3). To provide more site-specific information, the MBCDC was contacted to review the rare species database for occurrences of rare species within the project site and within a 2 km radius of the project site. Currently there are no occurrences of rare vegetation species listed within the MBCDC database at the project site or within a 2 km radius of the project site or within a 2 km radius of the project site. Several species were identified as being present within the general area in apparently similar habitats (Appendix F). These vegetation species and their associated provincial ranking include the following.

- Bristly Buttercup (Ranunculus hispidus var. caricetorum; S2)
- Wild Ginger (Asarum canadense; S3S4)
- White Beakrush (*Rhynchospora alba*; S3)
- Tuberous Grass-pink (Calopogon tuberosus var. tuberosus; S2)
- Rose Pogonia (*Pogonia ophioglossoides*; S1)
- Ram's-head Lady's-slipper (*Cypripedium arietinum*; S2S3)
- Large White-flowered Ground-cherry (Leucophysalis grandiflora; S3S4)
- Large-leaved Aster (Eurybia macrophylla; S1)
- Houghton's Flatsedge (Cyperus houghtonii; S2S3)
- Dragon's-mouth Orchid (Arethusa bulbosa; S2)

None of these species are protected by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the *Species at Risk Act* (SARA), or *The Endangered Species and Ecosystems Act* (ESEA) of Manitoba. The absence of a rare plant in the MBCDC database does not necessarily mean a lack of that plant in the region. This may be related to a lack of botanical surveys conducted in the area.

Vegetation surveys were conducted by qualified and experienced personnel at the Julius Lake West sub-area during two site visits along transects established throughout the project study area (Figure 3). Prior to conducting surveys, information about rare species was identified through desktop investigations to become familiar with species habitat preferences and key characteristics to ensure proper identification. Surveys were conducted in spring (June 6-7, 2022) and mid-late summer (September 1, 2022) to maximize the chance of species identification by coinciding with early and late blooming species. Transect locations were selected by examining aerial imagery and topographic maps to ensure that all vegetation communities within proposed harvest area as well as potential donor sites were visited. Transects were approximately 150 m in



length and spaced out from other transects to maximize spatial coverage. A total of 12 transects were surveyed as shown in Figure 3. In addition to completing surveys along the transects, surveyors were also observing for plant species while navigating to the site and between transects.

During the vegetation surveys a total of 128 plant species were observed within the Julius Lake West subarea (Table 6). Most of the species documented are provincially ranked as S5 (secure) or S4 (apparently secure), with only one S2S3 (imperiled/vulnerable) and one S3S4 (vulnerable/apparently secure) species observed. These include black ash (*Fraxinus nigra*) and blue flag (*Iris versicolor*), respectively. Black ash is listed as Threatened by COSEWIC, but it not listed or protected by SARA or ESEA and blue flag is not listed or protected under COSEWIC, SARA or ESEA.

4.1.8 MAMMALS/HABITAT

The Lake of the Woods and Interlake Plain Ecoregions provide habitat to a diversity of wildlife including black bear, moose, white-tailed deer, wolf, coyote, lynx and snowshoe hare (Smith et al., 1998). Bogs provide habitat to species such as muskrat, beaver, moose, deer, and small rodents, however mammal diversity within bogs is generally low (Daigle and Gautreau-Daigle, 2001; Rochefort et al., 2012).

The MBCDC lists 102 mammal species as being potentially present in Manitoba, including seven tracked species in the Interlake Plain Ecoregion and three tracked species in the Lake of the Woods Ecoregion (8 unique species between the two ecoregions; Appendix E). The MBCDC was contacted to request a list of wildlife species of concern located within the project study area. Currently the MBCDC has no recordings of rare wildlife species within the site or within 2 km (Appendix F). The absence of a rare mammals in the MBCDC database does not necessarily mean a lack of that mammal in the region. This may be related to a lack of surveys conducted in the area.

Mammal surveys were conducted by qualified and experienced personnel in parallel with the vegetation surveys, bird surveys and amphibian surveys throughout the Julius Lake West sub-area (Figure 3). Surveyors observed for animals or animal signs while walking the vegetation transects as well as all travel between transects. All land-types present were surveyed. The presence of a species was recorded if an animal was observed, tracks or scat were identified, it was heard or other clear signs were observed (beds, foraging sign, rubs, etc.).

Mammal surveys identified the presence of six mammal species within the sub-area, including black bear, gray wolf, moose, red squirrel, snowshoe hare and white-tailed deer (Table 7). All mammal species identified are provincially listed as secure (S5) and none of these species are protected by COSEWIC, SARA or ESEA.

4.1.9 BIRDS/HABITAT

The Lake of the Woods Ecoregion provides habitat for various bird species such as ruffed grouse, woodpeckers, bald eagle, turkey vulture, as well as many waterfowl and songbird species (Smith et al., 1998). The MBCDC website identifies over 400 bird species that are present in Manitoba, including 42 tracked species in the Interlake Plain Ecoregion and 31 tracked species in the Lake of the Woods Ecoregion (45 unique species; Appendix E). The MBCDC database has no recordings of rare bird species within the site or within 2 km. Six rare bird species have been recorded in the general area by MBCDC. These species and their associated provincial ranking include the following.



- Red-headed Woodpecker (Melanerpes erythrocephalu; S3B)
- Golden-winged warbler (Vermivora chrysoptera; S2S3B)
- Eastern wood-pewee (Contopus virens; S3B)
- Bobolink (Dolichonyx oryzivorus; S3S4B)
- Barred owl (*Strix varia*; S3S4)
- Barn swallow (*Hirundo rustica*; S4B)

The Manitoba Breeding Bird Atlas (MBBA) was also reviewed and a total of 80 bird species, including seven rare species, have been documented in MBBA square 14PA93 which encompasses the site (Appendix G). The rare species documented within this square include the same six species listed by MBCDC as well as the scarlet tanager (*Piranga olivacea*; S3S4B). Each of the species noted as present in the general area by MBCDC and/or the MBBA are discussed below.

Bird surveys were conducted at the Julius Lake West sub-area following established survey methodology from the Saskatchewan Forest Bird Survey Protocol (Government of Saskatchewan, 2020b). Two bird surveys were conducted, with the first survey occurring May 5 to 7, 2022 and the second survey on June 6 to 7, 2022. A total of 12 locations were selected as bird listening stations (Figure 3). Incidental observations were also recorded while conducting other fieldwork within the sub-area. A total of 45 bird species were recorded within the Julius Lake West sub-area (Table 7). All bird species recorded are provincially secure (S5) or apparently secure (S4). Of the species noted as present in the general area by MBCDC and/or the MMA only the eastern wood-pewee was observed during the bird surveys.

The eastern wood-pewee (*Conypus virens*) has been previously recorded in the general area and was documented within the sub-area during the bird surveys. While it is globally secure (G5), it is provincially rare to uncommon for its breeding population (S3B). It is listed as a species of Special Concern under COSEWIC and SARA but is not listed under ESEA. It is also protected under the *Migratory Birds Convention Act* (MBCA). The eastern wood-pewee is a small greyish-olive songbird which is common and widespread during the breeding season from Saskatchewan to the Maritime Provinces and south to Texas. It overwinters in South America. Its breeding habitat includes forest clearings and edges of deciduous and mixed forests. The population of the eastern wood-pewee has declined however limiting factors are not clearly understood. Possible threats are thought to include loss and/or degradation of breeding habitat due to urban development and forest management, loss and/or degradation of habitat in winter grounds, a reduction in insect prey due to unknown reasons, high rates of mortality during migration and/or in winter grounds, an increase in nest predation, and changes in forest structure due to white-tailed deer over-browsing (COSEWIC, 2012).

The red-headed woodpecker (*Melanerpes erythrocephalu*) has been recorded in the general area but was not recorded during the bird surveys. The species is globally secure (G5) however provincially it is rare to uncommon for its breeding population (S3B). It is listed as Threatened under ESEA and is listed as Endangered under SARA and COSEWIC. It is also protected under the MBCA. The red-headed woodpecker is a medium-sized bird whose range extends from southern Saskatchewan to southern Quebec and south and east to the Gulf of Mexico and the Atlantic Ocean. Habitat includes treed habitat within grasslands including moist mixed grasslands and aspen parkland. The population has declined due to a degradation of suitable habitat and a reduction in food supply (ECCC, 2019)



The golden-winged warbler (*Vermivora chrysoptera*) has been recorded in the general area but was not recorded during the bird surveys. The species is globally apparently secure (G4) however provincially it is imperiled to vulnerable (S2S3B) for its breeding population. It is listed as Threatened under ESEA, SARA, and COSEWIC and is also protected under the MBCA. It is a small warbler with a breeding range that extends from southern Saskatchewan to southern Quebec and in the eastern United States. Its wintering range includes Central and South America. Habitat includes forested areas, especially early successional habitat. Populations have declined due to competition and hybridization with the closely related blue-winged warbler as well as habitat loss (ECCC, 2016b).

The bobolink (*Dolichonyx oryzivorus*) has been recorded in the general area but was not recorded during the bird surveys. The species is globally secure (G5) however provincially it is vulnerable to apparently secure (S3S4B) for its breeding population. It is listed as Threatened under SARA and COSEWIC and is also protected under the MBCA, however, it is not listed under ESEA. The bobolink is a medium-sized songbird that feeds on insects and grain. Its breeding range includes southern Canada from British Columbia to Newfoundland and much of the United States, while it overwinters in South America. Breeding habitat includes open grasslands and agricultural fields. Their population has declined due to agricultural development, habitat loss and fragmentation, exposure to pesticides and bird control programs in their winter habitat (ECCC, 2022b).

The barred owl (*Strix varia*) has been recorded in the general area but was not recorded during the bird surveys. The species is globally secure (G5) however it is provincially vulnerable to apparently secure (S3S4). It is not listed under SARA, COSEWIC or ESEA and is not protected under the MBCA. The barred owl is a large owl with a range that includes all Canadian provinces and most of the states in the United States. Habitat includes dense forest, including coniferous and deciduous forests, as well as swamps, river valleys, marshes, meadows, and upland areas where they nest in tree cavities. They feed primarily on mice, but also consume other mammals, birds, reptiles, amphibians, and invertebrates (NatureServe, 2023). The removal of large trees with cavities that may provide nesting habitat is thought to be the largest threat to the species (Koes and Artuso, 2018).

The barn swallow (*Hirundo rustica*) has been recorded in the general area but was not observed during the bird surveys. The species is globally secure (G5) and provincially apparently secure for their breeding population (S4B). They are listed as Threatened under SARA and COSEWIC and also protected under the MBCA, however, it is not listed under ESEA. The barn swallow is a medium-sized bird that is found globally. In Canada it is found primarily below the tree line. Breeding habitat includes grasslands, agricultural fields, shorelines, forest clearings and wetlands. They typically nest on man-made structures such as buildings and bridges. The cause of their population decline is thought to be due to a reduction in their insect food source due to pesticides and habitat loss, as well as climate change, human development, changes in agricultural practices and pollution (COSEWIC, 2021).

The scarlet tanager (*Piranga olivacea*) has been recorded in the general area by the MBBA but was not recorded during the bird surveys at the project site. The species is globally secure (G5) however provincially it is vulnerable to apparently secure for their breeding population (S3S4B). It is not listed under SARA, COSEWIC or ESEA but is protected under the MBCA. The scarlet tanager is an insectivorous bird that is found in eastern North America. Southern Manitoba is near the north-west limit of its range. Breeding habitat includes deciduous forests and including mixed swamp, floodplain forests and upland forests. They are most common



in areas with a relatively closed canopy and dense understory. Threats include loss and fragmentation of habitat, both in the northern breeding range and their southern wintering habitat (NatureServe, 2023).

4.1.10 AQUATIC BIOTA/HABITAT

Aquatic biota and habitat, particularly fish and fish habitat are protected under the *Fisheries Act*. The MBCDC identifies the presence of 95 fish species in Manitoba, including 11 tracked species in the two ecoregions encompassed by the site (Appendix E). Additionally, MBCDC tracks eight freshwater mussel species, and one crayfish species present in the ecoregions. A request was submitted to the MBCDC to search for recordings of species of conservation concern, however no rare aquatic species of conservation have been documented within 2 km of the project site. The CDC does note that a mussel known as a creeper (*Strophitus undulatus*) has been recorded in the general area (Appendix F).

The Julius Lake West sub-area does not contain any waterbodies and therefore does not provide fish habitat. An ephemeral pond is present west of the sub-area. Based on aquatic assessments at nearby ponds/lakes in the area, fish species present may include forage fish such as central mudminnow (*Umbra limi*), brook stickleback (*Culaea inconstans*), northern redbelly dace (*Chrosomus eos*) and pearl dace (*Margariscus margarita*), which are all provincially secure (S5) and are not listed under COSEWIC, SARA or ESEA. (KGS Group, 2020).

4.1.11 AMPHIBIANS AND REPTILES

A total of 17 amphibians and 12 reptile species are listed by MBCDC as being present in Manitoba, including several that are provincially and/or federally protected. The MBCDC lists six tracked amphibian species and one tracked reptile species in the ecoregions encompassed by the site (Appendix E). A request was submitted to the MBCDC to search for occurrences of rare species near the project site. No rare amphibian or reptile species have been documented within 2 km of the project site however MBCDC noted that the northern leopard frog (*Lithobates pipiens*) has been recorded in the general area (Appendix F). The northern leopard frog is listed as a species of Special Concern under COSEWIC and SARA, however, it is not listed under ESEA.

Amphibian surveys were conducted by qualified and experienced personnel following established survey methodology from the Saskatchewan Amphibian Visual Survey Protocol (Government of Saskatchewan, 2020a). Amphibian surveys were conducted from May 25 to 27, 2022. A total of three locations were selected as amphibian listening stations (Figure 3). Incidental observations were also recorded while conducting other fieldwork within the sub-area. A total of three amphibian species were recorded within the sub-area (Table 7). All amphibian species recorded are provincially secure (S5) or apparently secure (S4). No rare species were encountered, including the northern leopard frog.

While the northern leopard frog has been documented in the general area it was not recorded during site surveys in the sub-area. It is listed as a species of Special Concern under COSEWIC and SARA but it is not listed under ESEA as it is provincially apparently secure (S4B). It remains widespread but has experienced a considerable contraction of range and the loss of populations in the past, particularly in the west (Environment Canada, 2013). The northern leopard frog requires three distinct habitats in close proximity to meet their seasonal needs. In the winter they hibernate in oxygenated water bodies that do not completely freeze solid. During the spring breeding period they inhabit shallow warm waters in marshes, ditches, lake margins, and slow-moving creeks. In the summer they inhabit riparian and upland habitats, including moist



meadows, pastures, scrubland, riparian corridors, and drainage and irrigation ditches (Environment Canada, 2013). Threats to the northern leopard frog include habitat loss, degradation and fragmentation, particularly due to wetland drainage for agriculture, habitat conversion and fragmentation due to human activities such as cultivation and highways, habitat loss due to urbanization and industrialization, trampling from cattle grazing, alteration of water regimes that create strong currents, introduction of disease, environmental contaminants, fish stocking, road traffic mortality, and commercial harvesting and collecting.

4.2 Socioeconomic

4.2.1 COMMUNITIES

The Julius Lake West sub-area is located on remote Crown land and there are no communities present within the 3 km project study area. The 10 km regional study area falls within three RMs including the RM of Reynolds (north of PTH 15), the RM of Brokenhead in the northwest and the RM of Springfield in the southwest. Communities within the 10 km regional study area include Ste. Rita, Nourse, Lydiatt and Molson. Larger communities present outside of the regional study area include the Town of Beausejour (34 km northwest; Figure 1).

4.2.2 INDIGENOUS

There are no Indigenous communities located in the project or regional study areas. Indigenous communities located within 100 km of the study area include the Brokenhead Ojibway Nation (located approximately 45 km north-northwest), Peguis First Nation (which has a parcel of land 49 km north-west), Sagkeeng First Nation (located 66 km north), Shoal Lake 40 First Nation (located 90 km south-east), Iskatewizaagegan (Shoal Lake) 39 Independent First Nation (located 90 km south-east), and Black River First Nation (located 96 km north). The Julius Lake West sub-area is located within the Recognized Metis Harvesting Area.

First Nation and Metis communities may have interest in the proposed project based on their proximity to the proposed harvesting site and possible traditional land use (TLU) in the area. The Indigenous communities identified under the Participant Profile have been approached about the proposed project through the project's Indigenous and public engagement program (see Section 3.0 and Appendix D).

4.2.3 ECONOMY

The economic base in the region includes forestry, construction, agriculture/horticulture, transportation, tourism and hospitality, and government services. Sources of income in 2021 within the RMs of Reynolds, Springfield and Brokenhead include: employment income (63.2% to 72.6%) and government transfer payments (12.6% to 23.0%) (Statistics Canada, 2023a, b, c). The median 2020 after-tax income for a person 15 years or older was \$37,200 to \$49,600 while the average household income was \$60,800 to \$93,000 (Statistics Canada, 2023a, b, c).

In the RM of Reynolds there were 1,195 people over the age of 15, with 745 in the labour force in 2021. Of those in the labour force, 665 were employed and 80 were unemployed, resulting in an unemployment rate of 10.7% (Statistics Canada, 2023a). Of the 745 people in the labour force, the main occupational categories include trades, transport and equipment operators and related occupations (310 people; 42%), sales and



service (120 people; 16%), and business, finance and administration (75 people; 10%) (Statistics Canada, 2023a).

In the RM of Springfield there were 12,760 people over the age of 15, with 8,625 in the labour force in 2021. Of those in the labour force, 8,170 were employed and 460 were unemployed, resulting in an unemployment rate of 5.3% (Statistics Canada, 2023b). Of the 8,625 people in the labour force, the main occupational categories include trades, transport and equipment operators and related occupations (2,115 people; 25%), business, finance and administration occupations (1,475 people; 17%), and sales and service occupations (1,435people; 17%) (Statistics Canada, 2023b).

In the RM of Brokenhead there were 4,315 people over the age of 15, with 2,890 in the labour force in 2021. Of those in the labour force, 2,665 were employed and 225 were unemployed, resulting in an unemployment rate of 7.8% (Statistics Canada, 2023c). Of the 4,315 people in the labour force, the main occupational categories include trades, transport and equipment operators and related occupations (855 people; 30%), sales and service occupations (520 people; 18%), and business, finance and administration occupations (400 people; 14%) (Statistics Canada, 2023c).

4.2.4 POPULATION

As previously noted, the Julius Lake West sub-area is located in the RM of Reynolds, with the regional study area also overlapping with the RMs of Springfield and Brokenhead. Population statistics for the RMs is presented in Table 8. Population statistics for the small towns within the regional study area were not available. The nearest larger communities outside of the regional study area include Beausejour for which population statistics are also presented in Table 8.

Population / Dwelling Information	RM of Reynolds	RM of Springfield	RM of Brokenhead	Town of Beausejour
Population in 2016	1,338	15,342	5,122	3,219
Population in 2021	1,344	16,142	5,414	3,307
2016 to 2021 Population Change (%)	0.4	5.2	5.7	2.7
Total Private Dwellings	910	5,992	2,213	1,572
Population Density per km ²	0.4	14.7	7.2	609.6
Land Area (km ²)	3,559	1,096	750	5

TABLE 8: POPULATION STATISTICS FOR NEARBY COMMUNITIES

(Source: Statistics Canada, 2023a, b, c, d)

As previously noted, several Indigenous communities have land within 100 km of the Julius Lake West subarea. Population statistics for these communities are presented in Table 9.



TABLE 9: POPULATION STATISTICS FOR SURROUNDING INDIGENOUS COMMUNITIES

Community	On Own Reserve	On Other Reserve	Off Reserve	Total
Brokenhead Ojibway Nation	679	13	1,579	2,271
Peguis First Nation	3,622	134	7,790	11,546
Sagkeeng Anicinabe (Fort Alexander First Nation)	3,671	40	4,895	8,606
Shoal Lake No. 40	298	14	380	692
Iskatewizaagegan No. 39 Independent First Nation	342	31	331	704
Black River First Nation	1,011	19	579	1,609

(Source: Crown-Indigenous and Northern Affairs Canada, 2023) Notes:

- 1. On Reserve counts include "On Reserve" and on "Own Band Crown Land."
- 2. Off Reserve counts include those people living on "Other Band Crown Land," "No Band Crown Land" and "Off Reserve".

4.2.5 SERVICES

The Julius Lake West sub-area is located north of PTH 15 approximately 50 km east of Winnipeg. Within the regional study area, the towns of Ste. Rita, Molson, Nourse and Lydiatt have limited amenities. Just outside of this area, Beausejour to the north-west has amenities such as stores, post office, hotels, recreation complexes, churches, hospitals and schools.

The Royal Canadian Mounted Police provides law enforcement services to the communities located in the area with the nearest detachments being in Beausejour. Similarly, the nearest fire department and hospital are situated in Beausejour.

4.2.6 LAND USE

Land use within the regional study area includes a mixture of resource extraction and recreation including agriculture, forestry, peat harvesting, hunting, fishing and trapping and off-road vehicle use (snowmobiles and ATVs).

4.2.6.1 Agriculture

Agriculture within the Lake of the Woods Ecoregion is limited to relatively small areas of arable land in the lowlands near creeks and rivers where drainage has been improved. Constraints include the presence of dense subsoils which are poorly drained with poor nutrient retention and poor water holding capacity (Smith et al., 1998). Commercial agriculture is more prominent in the Interlake Plain Ecoregions, where crops including spring wheat, cereal grain, oilseeds and hay are grown in the glaciolacustrine soils (Smith et al., 1998). Agricultural activity is present along the western portion of the regional study area (Figure 1).



4.2.6.2 Forestry

Based on aerial imagery of the regional study area there is evidence that commercial forestry occurred within the project study area and regional study area. Based on the small size of trees typically found within peat bogs, it is likely that limited amounts of merchantable timber would be present within the 123.8 ha area to be harvested. Sun Gro will contact the regional forestry office regarding timber removal at the site.

4.2.6.3 Peat Harvesting

Approximately 3.5 km southeast of the Julius Lake West sub-area, just outside of the project study area, is the existing and active Sun Gro South Julius 2 peat harvesting area that is part of Sun Gro's PHL No. 3 Julius. Additionally, just at the edge and outside of the regional study area are several other existing Sun Gro peat harvesting areas that are currently in the recovery phase including North Julius and Moss Spur 1 and 2 that are also part of Sun Gro's PHL No. 3 Julius.

4.2.6.4 Hunting, Fishing and Trapping

The Julius Lake West sub-area is within Manitoba Game Hunting Area (GHA) #35, which has hunting seasons for white-tailed deer, black bear, gray wolf, upland game birds and migratory game birds (Government of Manitoba, 2022b). The Julius Lake West sub-area is on Crown land within the Agassiz Provincial Forest where the public is permitted to hunt. Most hunting seasons are in the fall and early winter; however, some seasons are also in the spring (e.g., bear, migratory game bird). First Nation and Metis hunters can hunt for subsistence year-round. No hunting lodges are known to be present within the regional study area.

The project regional study area is within Open Trapping Area #4 where trapping for furbearing animals such as beaver, mink, muskrat, otter, badger, fisher, red fox, coyote, lynx, bobcat, marten, raccoon, red squirrel, wolf and weasel is permitted by licenced trappers at various times between October and April (Government of Manitoba, 2022c). The extent of trapping activity within the regional study area is not known. The Manitoba Trappers Association was engaged as part of the EAP (Section 3.0 and Appendix D).

Sport fishing activities may occur within the regional study area along the Brokenhead River on the west side of the regional study area. One lake is present within the region (Julius Lake), however it is remote and does not appear to contain suitable habitat for sport fish.

The Peguis First Nation Community Interest Zone (CIZ) is located within the regional study and project study area approximately 2 km west of the Julius Lake West sub-area (Figure 1). The Brokenhead Ojibway Nation CIZ is located just outside of the regional study area to the north-west. CIZs are areas of protection within 30 km adjacent to First Nation reserves. Their intent is to protect the area from development while a First Nation undergoes Treaty Land Entitlement (Manitoba TLE Framework Agreement, 1997).

4.2.6.5 Parks, Recreation and Snowmobiling

No provincial or federal parks are located within the regional study area. The Julius Lake West sub-area is within the Agassiz Provincial Forest. Sustainable use of natural resources is permitted in provincial forests under *The Forest Act* (Manitoba) (Figure 1).

Snowmobile trails are present within the project study area and the regional study area and are maintained by the Eastman SnoPals Snowmobile Club, the Brokenhead Trailblazers, and the Springfield Pathfinder Snowmobile Club. The nearest trail is along PTH 44 and runs south from Seddons Corner to Molson into the


regional and project study area and out to the east along a Hydro transmission line located approximately 2 km north of the sub-area (trail 62). There are also trails along PTH 44, PR 302 and PTH 15 (SnoMan, 2022).

The region also appears to be used for recreational ATV riding however no ATV clubs appear to maintain trails within the regional study area. It is likely that trails used for snowmobiles in the winter are used by ATVs in other seasons.

4.2.7 AREAS OF INTEREST

There are no Areas of Special Interest (ASIs) present within the project and regional study areas. Several ASIs are present north of the regional study area, including the Milner Ridge East ASI (ASI # 33), the Seddons Corner ASI (ASI #34), the Milner Ridge West ASI (ASI #35), and Milner Ridge North ASI (ASI #36) which are all located north of PTH 44. These sites are located approximately 14 kms north of the Julius Lake West sub-area. ASIs are not legally designated or protected (Government of Manitoba, 2022a).

4.2.8 HERITAGE RESOURCES

Heritage resources are protected in Manitoba under *The Heritage Resources Act*. The Manitoba Historic
Resources Branch of Manitoba Culture, Heritage and Tourism has reviewed the proposed project
development area for Julius Lake West sub-area and has indicated a low potential to impact significant
resources. Therefore, the Historic Resources Branch has no concerns with the project at this time (Appendix
F). If heritage resources are discovered, construction will cease, and the Historic Resources Branch will be
notified immediately, with further construction occurring only as directed by the Historic Resources Branch.



5.0 ENVIRONMENTAL EFFECT ANALYSIS

5.1 Environmental Assessment Methods

The environmental assessment of the proposed peat harvesting development was carried out based on project information provided by Sun Gro and in accordance with the Manitoba *Environment Act Proposal Report Guidelines* (Manitoba Environment and Climate, 2023). Additional information was acquired from literature and internet searches, publications by the peat industry and environmental organizations, contacts with provincial government representatives, Indigenous and public engagement, and site investigations by the project team. Requirements of *The Environment Act* (Manitoba) and regulations were followed in the preparation of this EAP.

The environmental effects of the proposed peat harvesting project on the environment in the project and regional study areas were identified using checklists and professional judgement. Advice by government representatives, concerns expressed by the rightsholders and stakeholders, and brainstorming among the consultant team was also used to identify environmental issues and associated environmental effects. The adversity of environmental effects was determined based on categories presented in Table 10.

The significance of the residual environmental effects of the proposed peat harvesting operation were evaluated following industry best practice. The degree of change from the existing conditions and the value of the environmental components being affected determine significance of an adverse effect. Criterion for this determination as referenced in Table 11 include: a) Societal value of affected environmental components, b) Ecological value or sensitivity of affected environmental components, c) Duration, d) Frequency, e) Geographic extent, f) Magnitude, and g) Reversibility. For each criterion a particular level of significance rating (1, 2 or 3) is assigned. To judge the overall significance of an effect, the rating and criteria should be considered together. An effect is determined significant when: (1) it rates a "3" for at least four criteria, at least one of which must be criteria a or b; or (2) it is rated "2" or "3" for all criteria.

5.2 Environmental Issues

Potential environmental issues associated with the project were identified by considering the nature of the project, the location, and environmental effects typical of peat harvesting projects. Site specific environmental issues will be discussed in a regional context.

5.2.1 LOSS OF WETLAND

Public concern exists regarding the loss of wetlands as a function of wildlife habitat and other ecological functions. This is due to land use changes such as urban development, increased population and in particular agricultural development, especially in the prairie regions of Canada, where there are fewer wetlands remaining (Rubec, 2003). Many wetland areas have been lost due to draining for agricultural land use. Overall, development has accounted for approximately 15% loss of Canadian wetlands (Smith et al., 1998). Horticultural peat harvesting, in comparison, accounts for 0.03% (34,000 ha) of Canada's total peatland area (CSPMA, 2023). Additionally, the CSPMA has research from peatland restoration activities showing that a functioning wetland ecosystem can be restored within 5 to 7 years following completion of restoration.



5.2.2 LOSS OF WILDLIFE HABITAT

Loss of wildlife habitat, particularly waterfowl nesting areas, is another concern. Waterfowl and other wildlife species favour swamps, marshes and shallow open water wetland classes as habitat due to the diverse range of vegetation. In contrast, bogs and fens have limited importance as habitat for waterfowl and some wildlife species because they tend to have very little open water (Gautreau-Daigle, 1990), low diversity of vegetation and limited cover for waterfowl or other bird nesting purposes. An evaluation of waterfowl use of bog areas found that some waterfowl use ponds within bogs for staging and migration. Usage was directly related to the availability of open water in the area and little difference was noted between developed and undeveloped areas (Gautreau-Daigle, 1990). The number of waterfowl and wildlife species and the total wildlife populations in bogs and fens are generally lower in comparison to other wetland classes or to mineral soil ecosystems.

Mammal species such as muskrat and beaver and game species such as woodland caribou, moose and deer utilize peatland habitat. Overall, wildlife diversity within bogs is low due to low vegetation productivity of the bog habitat with little variation in populations noted between the natural and disturbed areas (Gautreau-Daigle, 1990). Moose populations have been shown to use bog areas, but no population differences were observed between harvested and unharvested bogs (Gautreau-Daigle, 1990).

5.2.3 LOSS OF RARE VEGETATION SPECIES

Protecting rare or endangered species and other vegetation is a concern regarding peat harvesting projects. Peat harvesting affects vegetation that is unique to peatland bog environments such as pitcher plants (*Sarracenia* spp.), bladderworts (*Utricularia* spp.) and sundews (*Drosera* spp.) that are not found in other mineral soil environments. These types of species occupy a niche that few other species are suited to and are found in many bog ecosystems. Many of these species are widely distributed throughout Canada's boreal wetland regions. Several orchid species, some of which are rare, also occur in peatland environments (Daigle and Gautreau-Daigle, 2001).

The composition of vegetation in bogs tends to have a typical association of species adapted to the regional conditions. As such, the potential effects of a peat harvesting project will depend on the regional environment. If there is a large area of undisturbed bog in the region that will still support the unique vegetation types, then harvesting a peat bog that is only a small portion of the area will have minimal effects on rare vegetative species.

5.2.4 RELEASE OF GREENHOUSE GASES

The release of greenhouse gas (GHG) emissions associated with peat harvesting is another environmental concern. As *Sphagnum* grows, carbon is stored in the plant material, which accumulates as peat due to the anaerobic conditions (low oxygen levels) caused by the high water table. Land use change, particularly from undisturbed peatland (which typically has a high water table and full vegetation cover) to peatland under extraction (which has a reduced water table and no vegetation cover), results in a net increase in GHG emissions (Cleary et al., 2005). The net increase is caused by an increase in the rate of in-situ decomposition through increased diffusion of oxygen, increased carbon dioxide (CO₂) emissions, and a reduction of ecosystem production resulting through the removal of living biomass from the peatland surface.



Research by Cleary et al. (2005) described the net GHG emissions from the Canadian peat industry and established a formula for estimating the GHG emissions from land use change, which includes a value for the standard flux of GHG per unit area within peatland under extraction (1,061 t/km²/yr) and within cutover peatland under restoration (1,288 t/km²/yr) (Cleary et al., 2005). Other literature was also reviewed which cited similar flux rates (Maljanen, et al., 2010). Values from Cleary et al. (2005) were used as they are from Canadian peatlands rather than European (Maljanen et al., 2010).

Work conducted by Waddington et al. (2010) and Strack et al. (2014) suggests that sphagnum restoration could result in a disturbed area returning to a carbon sink, during the growing season, in as little as 2-3 years post-restoration. Waddington et al. (2010) state that harvested peatlands will likely return to a net carbon sink (on an annual basis) in 6 to 10 years post-restoration. Strack (2018) noted restored peatlands can become annual carbon sinks within 15 years post-restoration. Environment and Climate Change Canada (2022a) states that there is a high degree of variability regarding whether restoration sites act as a carbon source or sink 10 years following restoration. Based on these studies it was assumed that the restored harvest areas become net neutral for GHG 5 years post restoration for the purposes of calculating CO₂ eq. values. The latest research indicates that the annual carbon balance returns to values comparable to the natural environment between 10 and 15 years following restoration (Waddington et al., 2010; Strack et al., 2014; Strack and Zuback, 2013; Waddington and Day, 2007).

Using the equations established by Cleary et al. (2005) incorporating peatland under extraction and cutover peatland under restoration, the total quantity of CO_2 eq. produced due to land use change throughout the 13 years of operation and 5 years post-restoration was calculated to be 23,735 t - CO_2 eq. (Table 12). Cleary et al. estimated the GHG contributions from each component of the life cycle of peat harvesting where land use change accounted for 15%, peat harvesting and processing accounted for 4%, transport to market accounted for 10% and decomposition accounted for 71% (Cleary et al. 2005). However, GHG emissions from decomposition are associated with the end use and should not be attributed to the producer. Therefore, after 13 years of operation and 5 years post restoration of the Julius Lake West sub-area, in addition to the 23,735 t - CO₂ eq. emitted from land use change (Table 12), the GHG emissions from peat harvesting and processing would be 6,329 t - CO₂ eq. and from transportation to market would be 15,823 t - CO₂ eq., respectively. This equates to a total GHG emission of 45,888 t - CO₂ eq. over the project lifetime and equivalent to 3,530 t - CO_2 eq/yr. The most recent available data for CO_2 emissions in Canada are for 2022, which had a total value of 7.08×10^8 t - CO₂ eq (708 Mt) (ECCC, 2024). Therefore, an average year of production at the Julius Lake West sub-area will account for approximately 0.0005% of the total annual emissions for the country. If the 71% decomposition (112,345 t - CO₂ eq.) is also attributed to Sun Gro then this equates to a total GHG emission of 158,233 t - CO₂ eq. over the project lifetime, equivalent to 12,172 t - CO_2 eq/yr which accounts for approximately 0.0017% of the total annual emissions for the country. This quantity of CO₂ eq. can be decreased by incorporating mitigation measures to minimize GHG emissions throughout the life cycle of peat harvesting.

5.2.5 IMPACTED SURFACE WATER QUALITY

Good surface water quality is valued for consumption, agriculture, and recreation, and is important for migratory birds and aquatic biota. Impacts to surface water quality due to peat harvesting activities are an environmental concern. Following the removal of surface vegetation, the exposed peat particles can be



transported into the drainage system, thus increasing suspended particles and other chemical parameters (primarily pH) in the water. Management of drainage water to slow down the flow of water enabling solids to settle out of the discharge water have become an integral part of peat harvesting operations.

5.2.6 IMPACTED DRAINAGE PATTERNS

Impacts to the existing drainage pattern due to peat harvesting activities are an environmental concern. The constructed drainage at the harvesting area will discharge water to the west, consistent with the existing drainage pattern. During initial drainage and subsequent ditch deepening, there will be a temporary increase to downstream flows resulting from the removal of interstitial water within the peat. After construction of the field drains, it is uncertain whether the peat drainage will result in an increase or decrease to downstream peak flows following future precipitation events. Some reporting (Daigle and Gautreau-Daigle, 2001) suggests that downstream peak flows tend to be reduced following peatland drainage due to the increased available pore space (i.e. storage) in the drained peat. Conversely, Landy and Rochefort (2012) summarize peatland drainage research from various authors and lists numerous reasons to explain how peatland drainage can either increase or decrease downstream peak flows, depending on the drainage technique used, the type of peatland, and its placement in the landscape. Similarly, Holden et al. (2004) reviewed a number of conflicting studies on this topic and emphasizes the importance of considering the ditch network design and peat properties when determining the effects of artificial drainage on water storage and runoff generation from peatlands. Project-related drainage and existing downstream culvert capacity was evaluated (Appendix C) and Project-related drainage effects will be mitigated to ensure there is no additional risk of flooding downstream (see Section 5.3.5).

5.2.7 INCREASED TRAFFIC

Transportation of peat from the harvest areas to the processing facility during operation will result in a seasonal increase in traffic volumes on roadways as described in Section 5.4.3. Increased truck traffic will increase dust, will further degrade the road requiring more frequent road maintenance and has the potential to increase the number of vehicle accidents and vehicle-wildlife interactions. The volume of traffic in the regional area would be increased as a result of the project.

5.2.8 RECLAMATION AND RESTORATION

Reclamation focuses on the potential after-uses of harvested peatland sites, whereas restoration focuses more on re-establishment of the site as a peatland, with a functional natural ecosystem with characteristics as close as possible to the pre-harvesting conditions. Though reclamation and restoration requirements for peat harvesting projects in Canada have not been clearly defined, it has become an integral part of peatland management in this country.

There are several methods for peatland reclamation such as transforming the site into a new functioning wetland that would be useful as waterfowl habitat, developing agricultural cropland or establishing a forestry plantation on site. Sun Gro proposes to restore the fully harvested areas to pre-disturbance conditions, as *Sphagnum* peat bogs based on their restoration experience at other peat bogs in the area (e.g., Elma and Moss Spur bogs), and in accordance with the peatland restoration methods described in CSPMA Peatland Restoration Guide (Quinty and Rochefort, 2003). Sun Gro has developed a Peatland Recovery Plan for PHL 3 following Manitoba's Submission Guidelines for Peatland Recovery Plans - Peatland Management Guidebook



(Manitoba Sustainable Development, 2017b) to fulfill the requirements of *The Peatlands Stewardship Act*. The report describes the actions Sun Gro will be taking to restore harvest areas to a peat accumulating ecosystem once harvesting is complete. Sun Gro continues to work with the Peatland Ecology Research Group (PERG) to study peat recovery as several Sun Gro sites. Research results will help inform future recovery approaches at Sun Gro sites (Vertex, 2018).

5.2.9 PEAT FIRE

The burning of peat deposits can result in smoke which may cause health concerns and traffic accidents. Fires may be started naturally or as a result of human activity. In some instances, in the past, fires have been deliberately set to remove peat for cereal crop agriculture (Manitoba Clean Environment Commission, 1977). Peat fires can burn for long periods of time (months, years) propagating in a creeping fashion beneath the peat surface. Forest fires are a key element for ecosystem renewal within the boreal shield environment with fires started by lightning being the dominant disturbance (Neary et al., 2005). Without fire suppression, an area of forest burns every 50 to 100 years (Bergeron et al., 2004).

Beginning in 2021, the Province began providing detailed real-time weather information four days in advance, allowing peat harvesting operators to better plan operations. In addition, Sun Gro has a Fire Response Procedures – Peat Fires outlining emergency fire response (Sun Gro, 2024).

5.3 Biophysical Effects Assessment

5.3.1 MICROCLIMATE

The vegetation clearing in preparation for the proposed peatland development project will likely result in minor changes in airflow, wind speed and snow depositional pattern in and immediately adjacent to the development area. The potential adverse effects of the project on microclimate were assessed as minor. The effects may be mitigated by installing snow fences to control snow deposition on the property if required. Follow-up involves periodic observation of the changes in airflow patterns and snow deposition. The residual effect was determined to be not significant (Table 13).

5.3.2 AIR QUALITY

Increases in fugitive dust may occur in the local area during construction, operation and reclamation of the project associated with access road construction, clearing, ditching, harvesting, stockpiling, loading and transporting activities. A total of approximately 123.8 ha of peat will be exposed to potential wind erosion at the Julius Lake West sub-area. Handling of peat during harvesting and loading will potentially result in fugitive dust as well as increased truck traffic along the gravel access road to the site. Dust is controlled as part of the routine operation to reduce particulate matter in the air. It is unlikely that Manitoba's air quality guidelines would be exceeded during construction and operation phases of the project. The potential effects on air quality were assessed to be moderate. The effects may be mitigated by using an approved dust suppressant such as water on roads, minimizing peat harvesting and handling activities during high wind events, reducing the area of peat in fields and peat stockpiles exposed to prevailing winds, controlling vehicle speeds, instructing employees on proper harvest equipment operation to minimize dust, covering loads being hauled from the site, re-vegetating harvested areas and utilizing windbreaks (tree and brush barriers). Proposed



follow-up involves periodic observations for fugitive dust levels, inspections of local area for accumulated dust and tracking of public complaints. The residual environmental effect of increased fugitive dust during construction and operation was determined to be not significant (Table 13).

Increased levels of NO_x, SO₂ and GHGs may result from equipment and vehicle emissions during site preparation, peat harvesting and transporting activities. Additionally, some construction materials and the use of fuel may release volatile organic compounds (VOCs). The potential adverse effects on air quality in the local area were assessed to be minor. Proposed mitigation measures include using low sulphur fuels, requiring a high standard of maintenance for equipment and vehicles, limiting unnecessary long-term idling and using appropriate fuel dispensing equipment. Proposed follow-up includes periodic observation of air quality during construction, recording maintenance of heavy equipment and requiring submission of Safety Data Sheets (SDSs) for all products used. Residual environmental effects of NO_x, SO₂, GHGs and VOCs on air quality were determined to be not significant (Table 13).

Increased releases of GHG into the atmosphere will result from clearing and land use change associated with peat harvesting activities. While construction of ditches reduces the release of methane, harvesting peat releases CO_2 and reduces carbon sequestering (Landy and Rochefort, 2012). The overall net flux, as discussed in Section 5.2.4 is an increase in GHG with an estimated release of 23,735 t - CO_2 eq. from land use change throughout the 13 years of operation and 5 years post restoration. The total GHG emission over the project lifetime are 158,233 t - CO_2 eq., when accounting for GHG contributions for each component of the life cycle of peat harvesting. This is equivalent to 12,172 t - CO_2 eq/yr which accounts for approximately 0.0017% of the total annual emissions for the country. This potential increase in GHG when compared to national levels is considered to be a minor effect. Mitigation measures proposed to address GHG concerns include minimizing the areas cleared and implementing the PRP activities to restore the area to a carbon sink. The proposed follow-up involves adherence to licence terms and conditions. The residual effect of increased GHGs during construction and operation was determined to be not significant (Table 13).

5.3.3 SOILS

Site preparation and peat harvesting activities will result in an average loss of 1.1 m depth of surface cover and peat; however, the actual depth of loss will vary across the site as the peat thickness is variable. The average harvesting of peat is estimated to be 850 m³/ha/year. The full 123.8 ha harvestable peat area will be cleared and prepared over two years starting in 2025, with peat harvesting continuing until the end of approximately 2037, at which time the sub-area is expected to have been harvested to the final planned depth of harvesting. This removal of soil (peat) from the site through the process of harvesting was assessed to be major. Mitigation measures proposed to address the effects of soil loss include minimizing the surface area disturbed to the area being harvested, leaving non-commercial peat reserves in place, and implementing the PRP to restore the area to natural conditions. Proposed follow-up includes annual monitoring and reporting on implementation of the progressive restoration activities. The residual effect of soil loss was determined to be not significant (Table 13).

Soils in the development area may become contaminated from accidental leaks, spills and releases of fuel or other hazardous substances during site preparation and peat harvesting activities. The potential adverse effects on soil quality were assessed to be moderate. Proposed mitigation includes preventing leaks, spills and releases, providing ULC Certified double-walled fuel storage tanks with spill prevention and leak



detection, requiring drip trays for equipment, designating re-fueling areas, ensuring equipment arrives to site in good condition, providing spill clean-up equipment and materials, and providing an emergency spill response plan. Proposed follow-up includes periodic inspections for leaks, spills and releases, ensuring construction and operation crews adhere to designated areas, remediate and record fuel spills and releases, periodic updates of the spill response plan (Sun Gro, 2019a) and adherence to licence terms and conditions. The residual effect of accidental leaks, spills and releases on soil quality was determined to be not significant (Table 13).

5.3.4 GROUNDWATER

Groundwater in the harvest area may become contaminated from accidental leaks, spills and releases of fuel or other hazardous substances during site preparation and peat harvesting activities. Groundwater quality in the development area has not been analyzed for contaminants however it is assumed to be good quality due to its remote location. Groundwater is used as a potable water source within 5 km of the site. The low permeability clay cover on-site, as discussed in Section 4.1.4 forms a very good barrier between the perched water in the peat and the underlying local bedrock aquifer. This essentially isolates the peat from the groundwater so the proposed development will have little to no measurable effect on the groundwater table. The proposed development does not include the installation of any groundwater wells which could provide a conduit if installed incorrectly. The potential adverse effects of the project on groundwater quality were assessed to be minor. Proposed mitigation includes preventing leaks, spills and releases, providing ULC Certified double-walled fuel storage tanks with spill prevention and leak detection, requiring drip trays for equipment, providing spill clean-up equipment and materials, and provide an emergency spill response plan (Sun Gro, 2019a). Follow-up proposed involves periodic inspections for leaks, spills and releases, remediate and record any fuel spills and releases, periodic updates of the emergency response plan and adherence to license terms and conditions. The residual effects of accidental leaks, spills and releases on groundwater quality were determined to be not significant (Table 13).

5.3.5 SURFACE WATER

While waterbodies such as lakes, rivers, creeks and intermittent streams will not be disturbed, low lying areas within the harvesting area such as small intermittent ponds and drainage swales that contain water only during spring snow melt and/or when the water table is high will be lost due to site drainage for peat harvesting operations. Research has shown that ditches created in organic soils can result in water table influences between 5 m (with moderately decomposed peat) and 50 m (within less decomposed peat) from a ditch (Boelter, 1972). Approximately 123.8 ha (70% of the sub-area) of land will be cleared and drained within the Julius Lake West sub-area. A buffer zone with no development will be implemented within 100 m of the sub-area limits. The restoration work to begin when the harvesting area is closed will result in development of wetland areas that will offset the surface water area lost during project construction. Potential adverse effects on surface waters associated with drainage for the proposed development were assessed to be moderate. Proposed mitigation includes minimizing the area disturbed, maintaining water levels on the adjacent undisturbed lands, and implementing the PRP to restore water levels to pre-harvesting conditions. Follow-up proposed includes periodic inspection of surface waters and annual reporting on implementation of the restoration activities. The residual effect of loss of surface waters was determined to be not significant (Table 13).



Site drainage activities during construction, operation and on-going maintenance will result in changes to the flow rate of surface water, however there will be no change to the direction of surface water runoff from the harvest area. As discussed in Section 2.5.2, drainage from the harvesting area will be directed from the sedimentation pond through an outlet ditch to a natural discharge point where it will be integrated into the existing natural drainage system and minimize changes to the water regime. Drainage patterns in the proposed harvest area discharge indirectly to the Brokenhead River. A hydrologic and hydraulic assessment was conducted to assess potential effects of drainage to the adjacent environment and infrastructure (provided in Appendix C and summarized herein). This assessment showed that the existing downstream culvert crossings at Road 66N and Road 47E are undersized and do not meet current design criteria. Without mitigation, flow resulting from the peatland drainage would have the potential to cause increased flood damage during future runoff events. Several options for mitigating the effects of the drainage from the harvest area were assessed. It was determined that installation of the 0.3 m diameter gated outlet control discharge pipe prior to the initial drainage would be the most favourable option to mitigate impacts to downstream flows during construction and operation. As detailed in Appendix C, with installation of a 0.3 m outlet pipe, downstream peak flows are effectively reduced to less than the pre-project conditions for 10year flood events and larger. For the 2-year and 5-year events, downstream peak flows would be anticipated to increase by only 6% and 1%, respectively. To mitigate this increase during these smaller runoff events, it is recommended that the flow rate from the 0.3 m diameter outlet pipe be reduced during the initial drainage by partially closing a gate on the culvert if the drainage is coinciding with the peak of spring freshet. Considering implementation of the above-described mitigation measures, the effect of the project on the capacity of existing downstream crossings is considered minor. Follow-up proposed includes monitoring the 0.3 m diameter outlet control pipe to ensure proper operation and monitoring of discharge flow rates from the harvest area in accordance with licence terms and conditions. The residual effect of changes to the surface water regime was determined to be not significant (Table 13).

Suspended sediment levels in the surrounding wetlands and drainage ditch may become elevated during spring snowmelt and major precipitation events due to increased exposed peat area associated with harvesting. As discussed in section 4.1.6, baseline surface water samples collected from the peat within the sub-area generally had low suspended solids concentrations (<10 mg/L). Drainage from the harvest site will not be discharged directly into a waterbody as the outlet ditch uses over-land flow with the drain terminating in a treed area west of the bog. This will provide ample time for particulate matter in the water to be filtered by the surrounding bog area prior to flowing to a waterbody. The potential adverse environmental effects to surface water quality were determined to be minor. Proposed mitigation includes installing a gated culvert to block drainage from the harvest area if needed to manage suspended sediment. Proposed follow-up includes collecting surface water samples from the outlet monthly with analysis for suspended sediment levels, develop additional surface water sampling if required in consultation with Manitoba Environment and Climate Change, cleaning of drainage ditches on a regular basis, periodically inspecting for evidence of erosion and adherence to licence terms and conditions. The residual effect of increase surface water runoff on suspended sediments was determined to be not significant (Table 13).

The surface water chemistry in the downstream receiving water may become altered during site construction and operation associated with the drainage management. As discussed in section 4.1.6, baseline surface water samples collected from within the Julius Lake West sub-area had acidic pH levels that were outside of



the MWQSOG. Elevated concentrations of aluminum, iron and mercury in most surface water samples collected at the sub-area also exceeded MWQSOG, however these parameters are commonly naturally elevated in the environment (e.g., KGS Group, 2010; KGS Group, 2011; KGS Group, 2020). The proposed harvesting will discharge water overland and eventually into the Brokenhead River. The proposed development may alter the timing and rate of drainage during both initial drainage of the harvest area and during operation, as previously discussed. However, with installation of a 0.3 m diameter outlet control pipe, the volume of water discharged during initial drainage and during operation will be similar to existing conditions and is minimal in comparison to the drainage area within the watershed and the size of the receiving catchment. The potential adverse environmental effects to surface water quality were determined to be minor. Proposed mitigation includes using a gated culvert to control discharge from the harvest area if required. If the control of the discharge is not sufficient in maintaining the water chemistry, a limestone or carbonate lined drainage ditch can be installed to increase the pH of the draining bog water before being discharged to the environment. Proposed follow-up includes collecting monthly surface water samples from the outlet to carry out pH analysis. Any additional surface water sampling required will be developed in consultation with Manitoba Environment and Climate Change. The residual effect of bog water runoff on surrounding water bodies was determined to be not significant (Table 13).

Surface water in the development area may become contaminated during construction and operation from accidental leaks, spills or releases of fuels or other hazardous substances. The baseline surface water sampling did not include contaminants such as hydrocarbons, however, it is assumed that they would not be present as the area is remote. The potential adverse effect of spills on surface water quality was assessed to be moderate. Proposed mitigation includes preventing leaks, spills and releases, providing ULC Certified double-walled fuel storage tanks with spill prevention and leak detection, requiring drip trays for equipment, providing spill clean-up equipment and materials, and preparing an emergency spill response plan (Sun Gro, 2019a). Follow-up proposed involves periodic inspections for leaks, spills and releases, remediate and record any fuel spills and releases, periodic updates of the emergency response plan and adherence to license terms and conditions. The residual effects of accidental leaks, spills and releases on surface water quality were determined to be not significant (Table 13).

5.3.6 VEGETATION

The proposed harvesting activities will result in the loss and disturbance of terrestrial vegetation including tree, shrub, herbaceous and grass species. A total of 123.8 ha of land will be cleared for the peat development. MBCDC has no records of rare or endangered plant species within 2 km of the Julius Lake West sub-area, however, 10 tracked species were noted to be present within the general area (Section 4.1.7). None of these 10 species are listed under COSEWIC, SARA or ESEA and none of the tracked species identified by MBCDC as being within the general area were observed at the site during the vegetation surveys. Only one plant species of the 128 species identified on site during the vegetation surveys is of interest. Black ash was identified on the site and is listed as Threatened under COSEWIC, however it is not protected under SARA or ESEA. The potential adverse effect of the project on vegetation loss was assessed to be moderate. Proposed mitigation measures include minimizing loss and disturbance of vegetation, protecting vegetation along the perimeter of the cleared areas from blow-down, limiting construction activities to designated areas, utilizing timber removed from site, and re-vegetating disturbed or reclaimed areas during and after harvesting operations. Proposed follow-up includes periodic inspection for vegetation stress and mortality around the



cleared area and for the invasion of nuisance or weed species, and reporting annually on restoration activities implemented. The residual effects were determined to be not significant (Table 13).

Increases in fugitive dust will result in the local area during construction and operation of the project, as previously noted, which can settle on and stress vegetation in the local area. The potential adverse effects of dust on vegetation were assessed to be minor. However, the effects may be mitigated by controlling dust and stopping operational activities during high wind events. Proposed follow-up involves periodic inspection of the local area for accumulated dust. The residual effects of dust on vegetation were determined to be not significant (Table 13).

Peat harvesting activities pose a risk of starting a peat fire. Sources of fire include spontaneous ignition, lightning strikes, equipment and accidents. Sparks or dust accumulation on hot surfaces of the engine and exhaust are the usual causes of fire from equipment. Fire is a concern in the harvest area as well as the local and regional areas. Uncontrolled fires can result in substantial loss of peat resources to Sun Gro, forest cover and wildlife habitat, property damage and the loss of life. Potential adverse effects from a peat fire were assessed to be major. Mitigation measures proposed to address potential fires include implementation of peat fire response procedures (Sun Gro, 2024). Sun Gro has a First Responder Committee with employees from the different levels of operations. Committee objectives are to detect, prevent and make recommendations to company representatives and employees. This committee works in collaboration with provincial and municipal regulations, codes and guidelines to provide fire suppression equipment on-site, prepare, exercise and implement an emergency response plan that includes fire and explosion prevention, notification and response. The committee will notify Manitoba Environment and Climate Change immediately if a fire or explosion occurs. Every piece of mobile equipment will be equipped with one 10 lb ABC fire extinguisher. Rake, conditioner, profiler and vacuum harvesters will also be equipped with one 12 L galvanized steel bucket with a 3 m rope. A mobile suction water pump with sufficient discharge hose to cover the peat harvesting area will be installed. Main drains will be constructed in a manner to retain a certain amount of water which can be used for fire fighting. In areas without a natural water source, a filled water tank wagon will be on site. Other on-site equipment will also include fire blankets and water backpacks. Proposed follow-up includes regular inspections, including routine examination of fire suppression equipment, and periodic testing and evaluation of the emergency preparedness plan and fire response procedure. Preventative measures will include regular employee education and training in the use of this equipment. The residual effects of the project on the risk of fire were determined to be not significant (Table 13).

5.3.7 MAMMALS/HABITAT

Site preparation will result in loss and disturbance of mammal habitat. The total area to be cleared is approximately 123.8 ha. This area accounts for approximately 2.7% of the project study areas and 0.3% of the regional study area, in which there is abundant habitat, as this is a relatively undeveloped region. As previously noted, the MBCDC has no records of rare wildlife species within the project study area, and no mammal species listed under COSEWIC, SARA or ESEA were observed within the study area during baseline investigations. The potential adverse effects of clearing on habitat loss were assessed to be minor. Proposed mitigation measures include minimizing loss and disturbance of vegetation, limiting construction activities to designated areas, limit operation activities to areas disturbed during construction and re-vegetating



disturbed or reclaimed areas after harvesting is complete. Proposed follow-up involves periodic inspection during construction and operation, maintenance of re-vegetated areas, and ensuring adherence to environmental guidelines and protocols. The residual effects of mammal habitat loss and disturbance were determined to be not significant (Table 13).

Construction activities and equipment use during operation may have adverse effects on terrestrial mammals. Some of the mammals may adapt, whereas most will avoid the area and use the abundant surrounding habitat. As discussed above, no protected species have been documented within the regional study area, and none were observed at the sub-area. Therefore, the potential adverse effects were assessed to be minor. Proposed mitigation measures include minimizing the area of disturbance by limiting construction activities to designated areas, limit operation activities to areas disturbed during construction, maintaining habitat around the sub-area and implementing the PRP to restore wildlife habitat. Follow-up proposed includes maintenance of re-vegetated areas and ensuring adherence to licence terms and conditions. The residual effects were determined to be not significant (Table 13).

Vehicle traffic associated with site preparation and operation activities, in particular transporting peat, may result in increased vehicle – wildlife interactions and associated wildlife mortalities, vehicle damage, and human injury or death. No local data are available on wildlife mortalities, vehicle damage or human injury/deaths. The potential adverse environmental effect of peat harvesting operations on vehicle – wildlife interactions was assessed to be minor. Mitigation measures proposed to address the effects on wildlife-vehicle interactions include operating transport trucks during daylight hours, providing wildlife awareness information to drivers and adhering to posted speed limits. Proposed follow-up includes maintaining records of vehicle-wildlife interactions. The residual effect was determined to be not significant (Table 13).

Domestic waste materials at the bog facility may attract problem or nuisance wildlife to the development area. Problem or nuisance wildlife may include black bear, porcupine, skunk, rodents or raccoons. Garbage cans will be regularly removed from site for off-site disposal. The potential environmental effect was assessed to be minor. Mitigation measures proposed include regular disposal of waste at existing waste facilities and use of animal deterrents such as noisemakers, reflectors and scents if required. Proposed follow-up includes maintaining records of problem or nuisance wildlife and adhering to licence terms and conditions. The residual effect of problem or nuisance wildlife associated with the peat mining operation was determined to be not significant (Table 13).

5.3.8 BIRDS/HABITAT

Site preparation will result in loss and disturbance of migratory bird habitat and potentially waterfowl habitat during site preparation. In addition to the tree clearing being a direct impact on bird habitat, disturbance through noise in proximity to the proposed harvest sites may adversely impact waterfowl habitat. As discussed in Section 4.1.9, one rare bird species was documented within the sub-area; the eastern wood pewee (S4B; listed by COSEWIC and SARA as "Special Concern"). The sub-area consists primarily of black spruce bog which does not provide breeding habitat for this species, as their preference includes forest clearings, and mixed and deciduous forests. The potential adverse environmental effects of habitat loss were generally assessed to be minor. Proposed mitigation measures include minimizing loss and disturbance of vegetation, completing tree clearing in the winter in accordance with the *Migratory Birds Convention Act* (specifically outside of critical nesting and rearing periods of April 14 to August 28), limiting construction



activities to designated areas, limit operation activities to areas disturbed during construction, maintain 100 m buffer zone around the sub-area boundaries, and re-vegetating disturbed or reclaimed areas after harvesting is complete. Proposed follow-up involves periodic inspection during construction and operation, maintenance of buffer zones and re-vegetated areas, and ensuring adherence to environmental guidelines and protocols. The residual effects of bird habitat loss and disturbance were determined to be not significant (Table 13).

Noise and vibrations associated with the use of heavy equipment during construction and operation of the proposed harvesting area may result in the disturbance of migratory and other birds and waterfowl during nesting and rearing periods. Spring and early summer are the most critical times for most of these bird species. The clearing will be conducted during the winter outside of these critical times. Therefore, the potential adverse effects of peat harvesting on birds were assessed to be minor. Proposed mitigation measures include locating peat harvesting components away from any identified critical migratory bird habitat and scheduling construction activities outside of critical nesting and rearing periods and maintaining buffer zones around sub-area boundaries. Proposed follow-up consists of adherence to licence terms and conditions. The residual effects on bird nesting and rearing were determined to be not significant (Table 13).

5.3.9 AQUATIC BIOTA/HABITAT

Construction and operation of the proposed project may have adverse effects on aquatic biota and habitat. As noted in section 4.1.10, the Julius Lake West sub-area does not provide fish habitat, however there is potential for forage fish to be present at downgradient ephemeral waterbodies. Due to the lack of waterbodies within the sub- area, any concerns related to aquatic biota are associated with the drainage from the development area.

Drainage and harvesting activities during operation of the project could result in increased sediment loads to downstream waterbodies. Elevated levels of suspended sediment can reduce water quality, which may interfere with fish spawning, navigation and the ability to locate food and escape predators. Settling suspended particles can potentially smother and kill fish eggs or larvae. The drainage plan does not discharge any water to natural waterbodies. A control culvert with a sliding gate will be installed at the outlet which can stop the flow of water leaving the site, if required, during a major precipitation event which exceeds the design flow criteria. Closing the culvert gate allows for the settlement of suspended peat particles. Water leaving the outlet ditch will be discharged overland (i.e., not into a waterbody). The potential adverse effects of sediments on aquatic biota and habitat were assessed to be minor. Mitigation measures include the installation of the gated culvert. Follow-up measures included periodically inspecting the outlet ditch for debris, cleaning of drainage ditches and monitoring water discharge on a monthly basis as previously detailed in Section 5.3.5. The residual effects were assessed to be not significant (Table 13).

5.3.10 AMPHIBIANS AND REPTILES

Peat harvest area construction and operation activities, in particular site drainage and equipment and vehicle use may have adverse effects on amphibians and reptiles and their habitat in the harvest area. A request to the MBCDC did not identify any documented recordings of rare amphibian or reptile species within 2 km of the project site, however MBCDC did note that the northern leopard frog has been recorded in the general area. The northern leopard frog is listed under COSEWIC and SARA as a species of Special Concern. As



discussed in Section 4.1.11, this species remains widespread but is of Special Concern as it has experienced a considerable reduction of range and loss of populations in the past. The northern leopard frog uses a variety of wetland habitats to meet its overwintering and breeding needs therefore the species is adversely affected by habitat fragmentation and conversion, including wetland drainage. While the proposed development will alter the existing bog area; the lack of waterbodies within the sub-area makes it unlikely that the northern leopard frog would be present. The potential adverse effects were assessed to be minor. Proposed mitigation includes minimizing the area of disturbance by limiting construction activities to designated areas and limiting operation activities to areas disturbed during construction. No follow-up activities are proposed. The residual effects of the project on amphibians and reptiles were determined to be not significant (Table 13).

5.4 Socioeconomic Effects Assessment

5.4.1 ECONOMIC CONDITIONS

The economy in the regional area surrounding the proposed development includes forestry, construction, agriculture/horticulture, transportation, tourism and hospitality, and government services. The peat harvesting industry currently has a positive impact in the development area, employing residents from the surrounding communities, supporting local businesses, contracting local companies for service works (e.g. trucking, sewage and waste disposal) and supporting the local economy through payment of property taxes. The proposed project will support the employment of five new employees. Therefore, the potential effect to the regional economy was determined to be positive. As such no mitigation or follow-up activities are proposed (Table 13).

5.4.2 BUSINESS OPPORTUNITIES

Additional business opportunities will be created for local contractors associated with the contract for harvesting merchantable timber, constructing the access road, transporting harvested peat, disposal of sewage and domestic wastes as well eventual site restoration. The potential effects were determined to be positive. As such no mitigation or follow-up measures have been proposed (Table 13).

5.4.3 TRAFFIC

Construction and operation activities will result in an increase in traffic. A small and temporary increase in traffic will occur during construction at the site (tree clearing, ditching, and access road construction). Subsequently, during operation (harvesting), transportation of peat from the harvest area to the processing facility will result in a seasonal increase in traffic volumes on roadways. Increased traffic will increase dust on gravel roads (fire road, Springfield Road 63N, Colony Road 47E), will further degrade the road requiring more frequent road maintenance and has the potential to increase the number of vehicle accidents (evaluated further in Section 5.5.2) and vehicle-wildlife interactions. When the full 123.8 ha area in Julius Lake West is being harvested, approximately 621 truckloads would be required annually, which is equivalent to approximately 21 trucks/week, or 2.96 trucks/day based on the proposed 7 days/week operation schedule from April to October. Additional vehicles will be on the highways due to employees driving to the harvest site. Project-related vehicle volumes are low relative to available average traffic data on PTH 15 and PTH 11 (up to 1% increase) (Manitoba Infrastructure, 2020). No traffic data is available for Springfield Road 63N, Colony Road 47E or the fire road. The potential adverse effects associated with the traffic were assessed to



be moderate. Proposed mitigation measures include dust control on the gravel/access road by using an approved suppressant such as water, reducing the number of vehicles during high wind events, directing all traffic associated with the development to drive according to road conditions and adhere to the posted speed limits, operating transport trucks during daylight hours and providing wildlife awareness information to drivers. Follow-up measures proposed include recording the number of vehicles associated with the peat harvesting operation and any public complaints and vehicle accidents. Further action will be considered as warranted. The residual effect was determined to be not significant (Table 13).

5.4.4 NOISE AND VIBRATION

Construction and operation activities including the use of heavy equipment and transport trucks will result in increased noise and vibration levels in the local area. Transport trucks will also result in noise and vibration on the highways. There is a buffer zone of forest between the proposed harvest area and the sub-area boundary. Additionally, the Julius Lake West sub-area is in a remote area approximately 3.5 km from the nearest residence. However, the transport trucks will overlap in time and space with local people traveling on the same highway and therefore the potential adverse effects were assessed to be minor. Proposed mitigation includes muffling vehicles and equipment, limiting unnecessary long-term idling and requiring a high standard of maintenance for heavy equipment. Proposed follow-up involves monitoring and periodically tracking noise levels and public complaints. The residual effects of noise and vibration during construction and operating were determined to be not significant (Table 13).

5.4.5 HUMAN HEALTH

Due to the relatively sparse population density within the vicinity of the Julius Lake West sub-area, there are very few people that would be affected by the operational activities. Regardless, the increased noise, vibrations and dust generated from the traffic transporting peat may affect the public attitude toward the project and may adversely affect their well-being. Additionally, with the traffic there is risk of vehicle collisions that could adversely affect the public and workers health. The potential adverse effects on human health and general public attitude/wellbeing were assessed to be moderate. Proposed mitigation measures include applying dust control such as water, reducing the number of vehicles traveling during high wind events, driving according to road conditions, adhering to the posted speed limits and operating transport trucks during daylight hours. Proposed follow-up involves monitoring dust and tracking any public complaints. Further action will be considered as warranted. The residual effect on human health was determined to be not significant (Table 13).

Indoor air quality inside the lunchroom and shop facilities could potentially be affected by VOC and carbon monoxide, propane gas and dust. VOC and carbon monoxide in the shop is of particular concern. VOCs and carbon monoxide may be a concern when in close proximity to operating machinery. The potential adverse effects on human health associated with air quality were determined to be minor. Mitigation measures proposed include providing adequate ventilation of buildings and ensuring a high standard of equipment maintenance. Follow-up includes regular maintenance of equipment. The residual effect was determined to be not significant (Table 13).

Construction and operation of the proposed peat development may have adverse effects on public and worker safety. Due to the remote location and limited access to the project site, security measures will be



limited. Signs indicating 'No Trespassing' and a locked gate will be installed on the main access road to the Julius Lake West sub-area. The gate will remain locked at night and during inactivity at the site. As well, the main ditches surrounding the harvesting areas will limit access to trespassers. Due to the inaccessibility of the site to the public the potential adverse effects on public safety are negligible, whereas the effects on worker safety were assessed as minor. Proposed mitigation to reduce worker safety includes compliance with Manitoba Workplace Safety and Health regulations, development and enforcement of standard operation procedure guidelines, provision of training to employees and ensuring all visitors to the site have reported in and are accompanied by an employee. Follow-up proposed includes recording the occurrence of workplace accidents/incidents and updating employee training and safety guidelines as required. The residual effect was determined to be not significant (Table 13).

5.4.6 AESTHETIC VALUES

The proposed peat harvesting operation is located in a relatively remote location with very few local residents and is unlikely to be seen by regional visitors. Additionally, the Julius Lake West sub-area will only be accessible via the locked gated access road. Therefore, any potential effects of the project on aesthetics are primarily associated with transportation of peat. The truck traffic on the existing access road will contribute to covering vegetation in a layer of dust between rain events. The potential adverse effects of the project on aesthetic values were assessed to be minor. Proposed mitigation measures include utilizing dust control methods and covering loads during transport to and from the site. While not visible to the public revegetation of the harvest area in accordance with the PRP (Vertex, 2018) will return the aesthetics in the area to a natural environment after peat harvesting. Proposed follow-up includes observing dust levels and debris and recording public complaints. The residual effect of decreased aesthetics was determined to be not significant (Table 13).

5.4.7 ABORIGINAL AND TREATY RIGHTS

The proposed peat harvest area is located within Crown land and therefore can be used for hunting, trapping, and other traditional harvesting practices as part of Aboriginal and Treaty rights. As such, development of the project may reduce access to lands that could be used to enact Aboriginal and Treaty rights. No First Nation communities are located within the regional study area; however, several communities are situated within 100 km of the site (see Section 4.2.2). These communities may have interest in the Julius Lake West bog area and possible traditional land use in the area based on their proximity. The Peguis First Nation CIZ falls within the regional and project study area on the west side of the Julius Lake West sub-area. The nearest Peguis First Nation land parcel is situated approximately 49 km north-west of the site, while the main Reserve is situated approximately 160 km north-west of the sub-area. The Julius Lake West sub-area is located within the Recognized Metis Harvesting Area. The current or historic use of the Julius Lake West sub-area for Aboriginal and Treaty rights is not known. As part of the Indigenous and public engagement program, Sun Gro reached out to communities in the area to examine if the proposed harvest area is used for Aboriginal and Treaty rights (see Section 3.0). At the time of submission of this EAP, no specific information related to resource use in the area was available. The Julius Lake West sub-area is in a relatively remote location and access to the site is limited. Additionally, the Julius Lake West sub-area does not contain unique habitat as peat bogs are regionally abundant and the area to be cleared (123.8 ha) is relatively small in comparison to the surrounding Agassiz Provincial Forest (79,500 ha). With the exception of initial site preparation which



occurs in the winter, peat harvesting activities at the sub-area will generally be limited to the summer, therefore not overlapping with hunting and trapping activities in the late fall to spring period. The potential adverse effects of the project on Aboriginal and Treaty rights were assessed to be minor. Proposed mitigation measures include minimizing the area cleared, restoring the harvest area to pre-harvest conditions (peat-accumulating bog) once harvesting is complete, and maintaining buffer zones around the sub-area boundaries. Additional mitigation measures will be considered if warranted, and based on ongoing communication with First Nation and Metis groups that may use the area for Aboriginal and Treaty rights. Follow-up measures include ensuring adherence to license terms and conditions. The residual effect of decreased access to lands for Aboriginal and Treaty rights practices was determined to be not significant (Table 13).

Construction and operation of the proposed project may have adverse effects on resources harvested as part of Aboriginal and Treaty rights, such as vegetation, mammals and birds. As previously described, the harvest area is very small relative to the surrounding Agassiz Provincial Forest, and the harvest area is not unique in the area as peat bogs are regionally abundant. Additionally, no protected species were identified as part of the baseline biological surveys at the site. The potential adverse effects of the project on vegetation, mammals and birds and their habitat were assessed to be minor to moderate (Sections 5.3.6, 5.3.7, 5.3.8). Therefore, the potential adverse effects of the project on resources harvested as part of Aboriginal and Treaty rights was assessed to be minor. Mitigation measures include those identified to protect vegetation, mammals, and birds (Sections 5.3.6, 5.3.7, 5.3.8) such as minimizing the loss and disturbance of vegetation, protecting vegetation along the perimeter of the cleared areas from blow-down, limiting construction activities to designated areas, maintaining habitat around the sub-area, maintaining 100 m buffer zone around the sub-area boundary, and re-vegetating disturbed or reclaimed areas during and after operation. Additionally, Sun Gro will maintain ongoing communications with First Nation and Metis groups with respect to use of the area for Aboriginal and Treaty rights. Proposed follow-up includes those identified to protect vegetation, mammals, and birds (Section 5.3). The residual effect of impacts to Aboriginal and Treaty rights was determined to be minor (Table 13).

5.4.8 RECREATION/TOURISM

The traffic associated with peat hauling on the highways and the generation of dust have the potential to affect tourism and recreational vehicle use in the area. However, as previously described the increase in traffic will be minimal and seasonal. As such, the potential adverse effects of the peat harvesting operation on recreational areas were assessed to be minor. Proposed mitigation measures are those previously outlined for controlling dust and driving safely which include applying dust control such as water, covering loads during transport to and from the site, reducing the number of vehicles traveling during high wind events, driving according to road conditions, adhering to the posted speed limits and operating transport trucks during daylight hours. Proposed follow-up includes tracking public complaints. The residual effect was determined to be not significant (Table 13).

5.4.9 AREAS OF INTEREST

The proposed project is situated in a region rich in natural resources with current land use in the regional study area consisting of natural resource harvesting including forestry, agriculture, and hunting. As such, the proposed project to harvest natural resources is commensurate with the current land use in the regional



area. With the measures proposed to mitigate the environmental effects of the project, the effect on land use will be minor. The proposed project is also located near various areas of interest such as the Agassiz Provincial Forest, the Peguis First Nation CIZ, and several Areas of Special Interest (see Sections 4.2.6, 4.2.7). The proposed harvesting areas will be occupying land that may be used for hunting and trapping, which would make them no longer accessible for this purpose during the summer, although the surrounding land would still be accessible. The potential adverse environmental effect of the project on these areas of interest was assessed as minor. Proposed mitigation measures include limiting construction activities to designated areas, protecting adjacent trees from blow-down and re-using timber from clearing. Follow-up measures include periodically tracking the site during construction for signs of potential disturbances and ensuring construction crews adhere to designated areas. Residual environmental effects of the proposed development site on land use and areas of interest were evaluated to be not significant (Table 13).

5.4.10 HERITAGE RESOURCES

The Historic Resources Branch of Manitoba Culture, Heritage and Tourism has indicated that there are no known heritage sites within the sub-area and there is a low potential to impact significant resources and therefore has no concerns with the project at this time (Appendix F). The potential adverse effects on cultural resources were assessed to be minor. In the event that heritage resources are encountered, construction will cease, and the Historic Resources Branch will be notified immediately. If this occurs, construction would only resume as directed by the Historic Resources Branch. Therefore, the potential for adverse environmental effects of the project on cultural resources is unlikely and assessed as not significant (Table 13).

5.5 Effects of Accidents and Malfunctions

5.5.1 FIRES AND EXPLOSIONS

Fires and explosions may result from spontaneous combustion, lightning strikes, equipment malfunctions, improper handling and storage of hazardous materials, as well as various construction and operation activities. Diesel fuel and small quantities of gasoline may be stored, transported and dispensed as part of peat harvesting. Small quantities of hazardous materials and potentially flammable materials will be stored on-site. Fires and explosions can cause serious harm to staff, construction workers, contractors, the public and the environment. Potential adverse environmental effects of fires and explosions were assessed to be major. Proposed mitigation includes complying with applicable provincial and municipal legislation, codes and guidelines, maintaining the First Responder Committee, providing and testing fire suppression equipment on-site, preparing, exercising and implementing an emergency response plan that includes peat fire response procedures (Sun Gro, 2024) and notifying Manitoba Environment and Climate Change immediately if a fire or explosion occurs. Follow-up proposed includes adhering to licence terms and conditions, regular inspections for fire risk, routine examination of fire suppression equipment, and periodic testing and evaluation of the fire response procedures. The residual effect of fires and explosions was determined to be not significant.

5.5.2 TRANSPORTATION ACCIDENTS

Heavy equipment, specialty equipment, large trucks and support vehicles are used during peat harvesting activities. Construction equipment and some materials will be brought onto the project site during



construction. Once the peat harvesting development is operational, large trucks will haul peat to the processing plant. There is a risk of accidents involving trucks and other vehicles accessing the peat harvest site operated by Sun Gro staff, the public and others. Accidents may also occur while transporting other materials to the site. The potential adverse effects of ground transportation accidents were assessed to be moderate. Mitigation proposed includes following safe transportation routes, adhering to speed restrictions and signage, compliance with applicable provincial and municipal legislation, preparing, exercising and implementing an emergency spill response plan that includes transportation accident prevention and response. Proposed follow-up includes adhering to licence terms and conditions, periodic testing and evaluation of the emergency response plan, ensuring that dangerous goods carriers are licensed and inspecting all shipments for compliance with regulatory requirements. The residual effect of ground transportation accidents on the environment was determined to be not significant.

5.5.3 LEAKS AND SPILLS OF FUEL AND HAZARDOUS MATERIALS

Fuels and other hazardous substances may be released during site preparation and operation. Common hazardous substances include fuels (diesel, gasoline and propane), waste oils and lubricants as well as chemicals and solvents. Releases of hazardous substances may impair air quality, cause soil, surface water and groundwater contamination, and affect worker and public health depending on the type of product as well as the nature, size and location of the spill. The effects of these were evaluated under the effects on soil, groundwater and surface water in Section 5.3.3, 5.3.4 and 5.3.5, respectively.

5.6 Effects of the Environment on the Project

5.6.1 CLIMATE

The cold continental climate of southern Manitoba produces very harsh environmental conditions for buildings, infrastructure and facilities. The Pinawa weather station, located approximately 37 km north-east of the project site, is the closest active weather station. The mean annual air temperature at the weather station is 2.6°C and the daily mean temperature ranges between 19.0°C in July and -16.2°C in January (Environment Canada, 2024). The lowest temperature recorded between 1990 and 2020 was -43.9°C in January 2017 whereas the highest was 35.4°C in August 2011 (Environment Canada, 2024). Any equipment or infrastructure on-site must be designed to withstand extreme low and high temperatures, damaging winds, significant precipitation events and hail, and even tornadoes.

High wind velocities can cause increased dust and blow loose peat materials off the property. Mitigation measures include limiting stockpiled material during high wind events, orienting peat stockpiles in the prevailing wind direction to minimize the area exposed, observing wind directions before unloading and loading of peat, ensuring peat stockpiles has a crusted layer on top, using a tree or brush buffer to act as a windbreak, modifying and equipping peat harvesters to reduce peat dust emissions, covering peat transport trucks with tarps to eliminate dust emissions during transport, instructing employees in proper harvesting equipment operation to reduce dust emissions and suspending operations during high wind events.

Heavy rains or abrupt snowmelt can potentially flood the peatland area, cause soil erosion and create unsafe working conditions, slippery surfaces, and reduced visibility. The resulting high volumes of surface water runoff can erode off-site drainage channels and wash out roads and culverts. Proposed mitigation includes



designing adequate drainage channels, installing a gated culvert to control drainage release from the sedimentation pond, providing additional on-site pumping capacity, suspending work during high precipitation events and including flooding in the emergency preparedness plan.

Manitoba is in a low seismic hazard area in Canada. Further consideration of the effects of an earthquake on the project is not warranted in this environmental assessment.

5.6.2 FLOODING

The proposed peat harvesting development site is not normally subjected to significant overland flooding during spring runoff or following significant precipitation events. The site is typically wet in low lying locations, but peat contains a large capacity for absorption. Once on- site drainage has been constructed, all surface water within the site will drain west toward existing drainage ditching which eventually drains into the Brokenhead River. Temporary flooding may occur from extreme precipitation events if on-site drainage becomes overwhelmed. Mitigation measures are the same as those proposed to deal with heavy rains as noted in Section 5.6.1.

5.6.3 WILDFIRE

Wildfire is common in the Lake of the Woods and Interlake Plain ecoregions. Operation and construction of the proposed project can potentially be interrupted in the event of a forest fire burning near the site. Forest fires risk the safety and health of workers and may damage equipment. Proposed mitigation measures include providing fire suppression equipment at construction areas and within buildings during operation and implementing an emergency response plan that includes fire prevention, notification and response. Follow-up includes periodic testing of fire suppression equipment during construction and operation, periodic assessment of wildfire risk during construction and operation and periodically updating the emergency response plan.



6.0 MITIGATIVE SUMMARY

Mitigation measures is defined under the *Impact Assessment Act* as measures to eliminate, reduce, control or offset the adverse effects of a project or designated project, and includes restitution for any damage caused by those effects through replacement, restoration, compensation or any other means. Mitigation measures to address potential effects of the peat harvesting development are identified in Sections 5.3, 5.4 and 5.5 and are summarized in Table 14. The nature of the mitigation measures, whether they are design, proposed, regulatory or management is shown in the table and described in the following sections.

6.1 Design Mitigation

Design mitigation includes measures that are either already included in the design of the proposed development or are to be addressed as a result of this environmental assessment. The design of the proposed development incorporates components, systems, controls and features that will mitigate potential adverse environmental effects typically associated with peat harvesting operations. Design mitigation measures for the proposed project are summarized in Table 14. Responsibility for implementing design mitigation rests with the proponent and their contractors.

6.2 Proposed Mitigation

Proposed mitigation includes measures that are identified in the environmental assessment report to address potential adverse environmental effects. These mitigation measures, while not required by legislation, serve to eliminate, reduce and control potential adverse environmental effects and render them not significant. These measures are summarized in Table 14. For the most part, the measures are operational in nature and require incorporation into specifications for construction and standard operational procedures.

6.3 Regulatory Requirements

The proposed peatland development is subject to various federal and provincial environmental legislations. Regulatory requirements serve to mitigate adverse environmental effects, which may have potentially significant environmental and human health consequences. Environmental legislation applicable to this development includes the following:

Manitoba

- The Peatland Stewardship Act
- The Environment Act
 - Peat Smoke Control Regulation
 - Litter Regulation
 - Waste Disposal Grounds Regulation
- The Dangerous Goods Handling and Transportation Act
 - o Environmental Accident Reporting Regulations
 - o Storage and Handling of Petroleum Products and Allied Products Regulation



- o Generator Registration and Carrier Licensing Regulation
- Manifest Regulation
- The Public Health Act
 - Atmospheric Pollution Regulation
 - Protection of Water Sources Regulation
- The Ozone Depleting Substances Act and Regulations
- The Forest Act
 - Forest Use and Management Regulations
- The Workplace Safety and Health Act and Regulations
- The Contaminated Sites Remediation Act
- The Climate and Green Plan Act
- The Endangered Species and Ecosystems Act
- The Highway Traffic Act and Regulations
- The Water Protection Act

Canada

- Impact Assessment Act
- Canadian Environmental Protection Act and Regulations
- Fisheries Act
- Species at Risk Act
- Migratory Birds Convention Act

Regulatory mitigation applies to site preparation activities, harvesting operations, transport and storage of hazardous substances, reporting of spills and accidental releases, reporting as a licence condition, worker and public safety, etc. Table 14 includes mitigation measures that are regulatory in nature.

Guidelines followed in the preparation of an EAP for peat harvesting developments include the following:

- Manitoba Environment Act Proposal Report Guidelines
- Manitoba Water Quality Standards, Objectives, and Guidelines
- Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, Summary of Guidelines for Fresh Water Aquatic Life

6.4 Management Practices

Good environmental management practices can further protect the environment and human health and safety from potentially adverse effects of peat harvest site preparation and operation activities. While many of the practices are not required by legislation, various policies, guidelines and procedures exist that provide direction in relation to environmental protection, environmental stewardship and sustainable development principles and guidelines. Examples of good management practices are summarized in Table 14.

Implementation of mitigation measures proposed by Sun Gro will be carried out through development of an Environmental Protection Plan that includes mitigation measures, follow-up requirements, licence and



permit terms and conditions, and other related requirements. The Environmental Protection Plan also provides for effective integration of environmental assessment results into operational procedures.

6.5 Recovery Plan

A PRP has been developed and submitted for Sun Gro's Peat Harvest Licence No. 3, in accordance with requirements of *The Peatlands Stewardship* Act of the Forestry and Peatlands Branch of Manitoba Conservation and Climate (Vertex, 2018). The recovery plan outlines the restoration process of harvest areas when harvesting is complete. As Sun Gro did not initially plan to harvest at the Julius Lake West sub-area within the PHL license term, the PRP will be amended to include additional information regarding the restoration of Julius Lake West sub-area.



7.0 FOLLOW-UP

Follow-up is defined under the *Impact Assessment Act* as a program to verify the accuracy of the impact assessment of a project and determine the effectiveness of any mitigation measures. Follow-up requirements identified for the proposed peat harvesting development in Sections 5.3, 5.4 and 5.5 are summarized in Table 15. The primary nature of the follow-up, whether they are inspecting, monitoring, record keeping or reporting is shown in the table and described in the following sections.

7.1 Inspecting

Inspecting involves periodic or regular observations of the project and local area during site preparation, construction and operation activities to determine whether mitigation measures are implemented and if they are effective in eliminating, reducing or controlling adverse environmental effects. Inspecting includes surveillance to identify problems, issues and concerns, and environmental effects not predicted in the environmental assessment report. Inspections may involve the use of checklists and should be maintained at the project site. Inspection requirements for the proposed peatland development during site preparations and construction are summarized in Table 15. Sun Gro staff is typically responsible for the inspections during the site preparation and operation phases.

7.2 Monitoring

Monitoring includes periodic or regularly scheduled collection or sampling for environmental information in the development or project area. Monitoring may be required by the environmental assessment or it may become necessary as a result of inspections that are carried out after the assessment. Follow-up monitoring for the proposed development during site preparation includes surface water quality after spring thaw. Monitoring during site operation includes surface water quality at the discharge location monthly or as directed by Manitoba Environment and Climate Change in the Environment Act Licence.

7.3 Record Keeping

Record keeping includes maintaining files and documentation related to mitigation measures and follow-up implemented as well as recording public complaints. Record keeping requirements for the proposed development include monitoring and tracking complaints from local residents, submission of SDSs for all products used, number of vehicle-wildlife interactions, number of problem or nuisance wildlife situations, number of amphibians and reptiles observed on the site, fuel volumes delivered and used, maintaining peat transportation manifests, number of monitoring and testing samples collected and analytical data generated, details of incidents requiring implementation of the emergency response plan and updating the emergency response plan following testing.



7.4 Reporting

Reporting in the context of environmental assessment follow-up includes documentation and communication that mitigation measures and follow-up are implemented and whether or not they have been effective. Such reports are normally required by the Manitoba Environment and Climate Change Environment Act Licence and are submitted to the Province. Reporting is also required in the event of an accidental spill or release of hazardous substances. Reporting requirements for the proposed development will also likely include an annual compliance surface water quality report, summary of annual generation of peat and a detailed report following incidents that require implementation of the emergency response plan. Sun Gro will be responsible for submitting all required reports to Manitoba Environment and Climate Change as specified in the Environment Act Licence.



8.0 CONCLUSIONS

KGS Group was retained by Sun Gro to prepare an EAP for the proposed peat harvesting development at the Julius Lake West sub-area to obtain a Manitoba Environmental Act License. An EAP is required for environmentally significant developments within the province of Manitoba, under *The Environment Act* (C.C.S.M. c. E125). The report followed the requirements of the environmental assessment and licensing process under *The Environment Act* (Manitoba). A peat harvesting operation such as the one proposed by Sun Gro is considered a mining development under the Classes of Development Regulation 164/88 and is therefore considered a Class 2 Development. The EAP was completed in accordance with the Manitoba *Environment Act Proposal Report Guidelines* (Manitoba Environment and Climate, 2023).

The environmental assessment of the proposed peat project was carried out based on project information provided by Sun Gro, information acquired from literature, internet searches, and publications by the Canadian peat industry and environmental organizations; contacts with provincial government representatives; Indigenous and public engagement; and site investigations by the project team. Potential environmental effects of the proposed peat harvesting project were identified using scoping methods, public comments, advice from specialists and professional judgment. Effects of the environment on the project were also determined. Mitigation measures were identified to eliminate, reduce and control environmental effects determined to be adverse. Follow-up monitoring was proposed to verify the accuracy of the assessment and determine the effectiveness of the mitigation measures. Significance of the residual environmental effects remaining after mitigation was then evaluated.

Based on the available information on the project and the environment, the assessment of environmental effects outlined in this assessment, and the application of proposed mitigation measures and the conduct of follow-up monitoring, the proposed project is not expected to result in any significant residual adverse environmental effects.



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TABLES

TABLE 1 ESTIMATED PEAT PRODUCTION SCHEDULE

Production Year	Active Harvesting	Total Volume (m³) Harvested/Year	Truckloads/ Year
2025	61.9	52,615	311
2026	123.8	105,230	621
2027	123.8	105,230	621
2028	123.8	105,230	621
2029	123.8	105,230	621
2030	123.8	105,230	621
2031	123.8	105,230	621
2032	123.8	105,230	621
2033	123.8	105,230	621
2034	123.8	105,230	621
2035	123.8	105,230	621
2036	123.8	105,230	621
2037	61.9	52,615	311
2038	0	0	0
Total	-	1,262,760	7,453



TABLE 3 FIELD CHEMISTRY

						Paramete	er		
Sample ID	Date	Time	Water Source	Temperature (°C)	pH (pH units)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Turbidity (NTU)
JLW SW-01	02-Jun-22	11:30	Peat	8.6	3.74	74.5	6.19	55.5	1.13
JLW SW-02	02-Jun-22	13:30	Peat	8.9	3.64	99.2	2.29	19.7	1.31
JLW SW-03	02-Jun-22	12:40	Pond	12.5	7.21	279.3	1.09	10.0	1.93
JLW SW-04	02-Jun-22	14:30	Drainage Ditch	12.1	7.63	271.7	5.24	48.7	7.87
JLW SW-05	02-Jun-22	16:30	Brokenhead River	13.6	8.03	307.8	6.10	58.6	2.50
Manitoba Wate	r Quality Standard	s, Objectives, and	Guidelines ⁽¹⁾						
Freshwater Aqua	atic Life			-	6.5 - 9.0	-	(2)	-	-

Notes:

NTU = Nephelometric Turbidity Units

1. Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28, 2011.

2. MWQSOG lowest acceptible dissolved oxygen concentration (mg/L):

Ecosystem	Early Life Stages	Mature Life Stages
Cool Water (>5°C)	6.0	5.5
Cold Water (≤5°C)	9.5	6.5

- Exceedance of MSWQOG



TABLE 4GENERAL WATER QUALITY

			Water Source							Paramete	r					
Sample ID	Date	Duplicate ID		pH (units)	E.C.	Alkalinity as CaCO ₃	Bicarbonate as HCO ₃	Carbonate as CO ₃	Hydroxide (OH)	Hardness as CaCO ₃	Chloride (Cl) - Dissolved	Sulphate (SO ₄) - Dissolved	Total Ammonia (N)	Nitrate & Nitrite (as N) - Dissolved	Nitrate (as NO ₃) - Dissolved	Nitrate (as N) - Dissolved
				-	μS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	2_lun_22		Post	3.82	69	<1.0	<1.0	<1.0	<1.0	12	3.5	<1.0	<0.015	<0.10 ⁽¹⁾	<0.44	<0.10
JLW 3W-01	2-Juii-22	JLW SW-100	reat	3.85	68	<1.0	<1.0	<1.0	<1.0	11	3.6	<1.0	<0.015	<0.25 (1)	<1.1	<0.25
JLW SW-02	2-Jun-22		Peat	3.69	97	<1.0	<1.0	<1.0	<1.0	<0.50	7.0	14	<0.15 (1)	<0.25 (1)	<1.1	<0.25
JLW SW-03	2-Jun-22		Pond	7.39	270	150	180	<1.0	<1.0	170	1.3	<5.0 (1)	0.015	< 0.050 (1)	<0.22	<0.050
JLW SW-04	2-Jun-22		Drainage Ditch	7.91	270	120	150	<1.0	<1.0	170	1.3	<4.0 (2)	0.024	< 0.050 (1)	<0.22	<0.050
JLW SW-05	2-Jun-22		Brokenhead River	8.02	310	160	190	<1.0	<1.0	150	3.4	<2.0 (1)	0.021	<0.010	<0.044	<0.010
Laboratory Detection Limits		N/A	2.0	1.0	1.0	1.0	1.0	0.50	1.0	1.0-5.0	0.015-0.15	0.010-0.25	0.044-1.1	0.010-0.25		
Manitoba Water Q	uality Standards, (bjectives, and Guic	lelines ⁽⁴⁾													
Freshwater Aquation	6.5 - 9.0	-	-	-	-	-	-	-	-	(5)	-	-	13			

			Water Source							Paramete	r					
				Nitrite	Nitrite	Calcium	Magnesium	Potassium	Sodium	Iron	Manganese		Total			
Sample ID	Date	Duplicate ID		(NO ₂) -	(as N) -	(Ca) -	(Mg) -	(К) -	(Na) -	(Fe) -	(Mn) -	B.O.D.	Dhosphorus	T.D.S.	T.S.S.	T.K.N.
				Dissolved	Dissolved	Dissolved	Dissolved	Dissolved	Dissolved	Dissolved	Dissolved		Phosphorus			
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
II \\/ S\\/_01	2-lun-22		Peat	<0.033	<0.010	4.6	<2.0	<3.0	<5.0	<0.60	0.096	<2.0	< 0.30 (3)	170	<1.0	<10
JEW 3W-01	2-3011-22	JLW SW-100	reat	<0.033	<0.010	4.4	<2.0	<3.0	<5.0	0.62	0.10	<2.0	< 0.30 (3)	190	8.9	<10
JLW SW-02	2-Jun-22		Peat	<0.033	<0.010	<6.0	<4.0	<6.0	<10	<1.2	<0.080	<2.0	< 0.30 (3)	270	2.8	<10
JLW SW-03	2-Jun-22		Pond	<0.033	<0.010	47	14	6.5	<5.0	<0.60	0.17	5.2	0.44 ⁽³⁾	250	14	1.9
JLW SW-04	2-Jun-22		Drainage Ditch	<0.033	<0.010	41	16	2.6	3.1	<0.30	<0.020	<2.0	0.025 ⁽³⁾	230	6.0	1.73
JLW SW-05	2-Jun-22		Brokenhead River	<0.033	<0.010	40	13	2.0	3.4	0.072	0.011	<2.0	< 0.30 (3)	230	2.3	1.27
Laboratory Detection Limits			0.033	0.010	0.30-6.0	0.20-4.0	0.3-6.0	0.5-10	0.060-1.2	0.0040-0.080	2.0	0.015-0.30	10-17	0.97-1.0	0.020-10	
Manitoba Water Q	uality Standards, C	Objectives, and Guid	delines ⁽⁴⁾													
Freshwater Aquation	: Life			-	0.06	-	-	-	-	0.3	-	-	0.025/0.05 (6)	-	(7)	-

Notes:

E.C. = Electrical Conductivity

B.O.D. = Biochemical Oxygen Demand

T.D.S. = Total Dissolved Solids

T.S.S. = Total Suspended Solids

T.K.N. = Total Kjeldahl Nitrogen

1. Detection limit raised based on sample volume used for analysis.

2. Detection limits raised due to matrix interference. Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.

3. Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

4. Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28 2011.

5. MWQSOG Surface Water Ammonia Guideline for Aquatic Life, Cool Water, All Periods (Eq. 3). Manitoba Water Stewardship, November 2011.

6. For general guidance, unless it can be demonstrated that total phosphorus is not a limiting factor, total phosphorus should not exceed 0.025 mg/L in any reservoir, lake, or pond, or in a tributary at the point where it enters such bodies of water. In other streams, total 7. Total Suspended Sediment Guidelines:

5 mg/L Induced Change over 30 days from background TSS <= 25 mg/L

25 mg/L Induced Change over 1 day from background TSS <= 250 mg/L

10% Induced Change over 1 day from background TSS > 250 mg/L



Exceedance of MWQSOG
 Laboratory Detection Limit exceeds MWQSOG



TABLE 5 METALS IN WATER

Sample ID Date Duplicate			Water Source		Parameter ⁽¹⁾															
Sampie ib			Water Source	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Lithium	Magnesium	Manganese	Mercury
11.10/ \$10/-01	II \\\/ \$\\/_01 2_lun_22		Peat	0.49	<0.012	<0.0040	<0.20	<0.020	<0.40	<0.00040	20	<0.020	<0.0060	<0.020	1.8	<0.0040	<0.40	12	0.18	0.000029
JEW 3W-01	Z-JUII-ZZ	JLW SW-100	Peat	0.62	<0.012	<0.0040	<0.20	<0.020	<0.40	<0.00040	8.4	<0.020	<0.0060	<0.020	1.2	<0.0040	<0.40	<4.0	0.16	0.000031
JLW SW-02	2-Jun-22		Peat	0.95	< 0.012	<0.0040	<0.20	<0.020	<0.40	<0.00040	6.0	<0.020	<0.0060	<0.020	1.7	<0.0040	<0.40	<4.0	0.090	0.000043
JLW SW-03	2-Jun-22		Pond	0.037	<0.00060	0.00092	0.022	<0.0010	0.024	0.000024	41	<0.0010	0.00050	<0.0010	0.14	<0.00020	<0.020	14	0.23	<0.000019
JLW SW-04	2-Jun-22		Drainage Ditch	0.023	<0.00060	0.00084	0.017	<0.0010	<0.020	<0.000020	39	<0.0010	<0.00030	< 0.0010	0.068	<0.00020	<0.020	17	0.029	< 0.000019
JLW SW-05	2-Jun-22		Brokenhead River	0.044	<0.00060	0.0013	0.034	<0.0010	<0.020	<0.000020	47	<0.0010	<0.00030	0.0010	0.15	<0.00020	<0.020	17	0.019	0.0000036
Laboratory Dotocti	ion Limits ⁽²⁾			0 0030-0 060	0.00060-	0.00020-	0.010-0.20	0.0010-	0 020-0 40	0.000020-	0 30-6 0	0.0010-	0.00030-	0.0010-	0.060-	0.00020-	0 020-0 40	02-40	0 0040-0 08	0 000019
Luboratory Detecti	UN LINIILS			0.0030-0.000	0.012	0.0040	0.010-0.20	0.020	0.020-0.40	0.0004	0.30-0.0	0.020	0.0060	0.020	1.2	0.0040	0.020-0.40	0.2-4.0	0.0040-0.08	0.000019
Manitoba Water C	Quality Standa	ards, Objective	s, and Guidelines ⁽³⁾																	
Freshwater Aquation	c Life			0.005/0.1 (4)	-	0.15/0.34 (5)	-	-	1.5/29 ⁽⁶⁾	(7a)	-	-	-	(7b)	0.3	(7c)	-	-	-	0.000026

Sample ID	Sample ID Date Duplicate ID		Water Source								Paramet	er ⁽¹⁾							
		Bupileate IB		Molybdenum	Nickel	Phosphorus	Potassium	Selenium	Silicon	Silver	Sodium	Strontium	Sulphur	Thallium	Tin	Titanium	Uranium	Vanadium	Zinc
11.14/ \$14/-01	2-lun-22		Peat	<0.0040	<0.010	<2.0	<6.0	<0.0040	5.9	<0.0020	26	<0.40	17	<0.0040	<0.020	<0.020	<0.0020	<0.020	<0.060
JLVV 3VV-01	JLW	JLW SW-100	Peat	<0.0040	<0.010	<2.0	<6.0	<0.0040	4.9	<0.0020	<10	<0.40	<4.0	<0.0040	<0.020	<0.020	<0.0020	<0.020	< 0.060
JLW SW-02	2-Jun-22		Peat	<0.0040	<0.010	<2.0	<6.0	<0.0040	3.6	<0.0020	<10	<0.40	<4.0	<0.0040	<0.020	<0.020	<0.0020	<0.020	< 0.060
JLW SW-03	2-Jun-22		Pond	<0.00020	0.00075	0.65	6.7	0.00034	8.4	<0.00010	<0.50	0.059	0.35	<0.00020	<0.0010	0.0011	<0.00010	<0.0010	0.0085
JLW SW-04	2-Jun-22		Drainage Ditch	<0.00020	<0.00050	<0.10	2.7	<0.00020	11	<0.00010	3.2	0.077	4.5	<0.00020	<0.0010	<0.0010	<0.00010	<0.0010	0.0039
JLW SW-05	2-Jun-22		Brokenhead River	0.00039	<0.00050	<0.10	2.6	<0.00020	10	0.0014	4.1	0.074	1.9	<0.00020	<0.0010	0.0025	0.00017	<0.0010	0.0099
Laboratory Datacti	ion Limita			0.00020-	0.00050-	0 10 2 0	0 20 6 0	0.00020-	0120	0.00010-	0 50 10	0.020.0.40	0 20 4 0	0.00020-	0.0010-	0.0010-	0.00010-	0.0010-	0.0030-
Luboratory Detecti				0.0040	0.010	0.10-2.0	0.30-0.0	0.0040	0.1-2.0	0.0020	0.30-10	0.020-0.40	0.20-4.0	0.0040	0.020	0.020	0.0020	0.020	0.060
Manitoba Water O	Quality Standa	ards, Objective	s, and Guidelines ⁽³⁾																
Freshwater Aquation	c Life			0.073	(7d)	-	-	0.001	-	0.0001	-	-	-	0.0008	-	-	0.015/0.033 (8)	-	(7e)

Notes:

"-" = No Data

1. All values are expressed in milligrams per litre (mg/L) unless otherwise specified.

2. Detection limit raised based on sample volume used for analysis.

3. Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28 2011.

4. If pH<6.5, guideline is 0.005 mg/L. If pH>6.5, guideline is 0.1 mg/L.

5. Arsenic Tier II Objectives:

0.15 mg/L = Duration 4 Days, Not more than once each 3 years, on average

0.34 mg/L = Duration 1 Hour, Not more than once each 3 years, on average

6. Short-term exposure = 29 mg/L; Long-term exposure = 1.5 mg/L.

7. Tier II - Water Quality Objectives, Manitoba Water Quality Standards, Objectives, and Guidelines, Manitoba Water Stewardship, November 28 2011.

Guideline is variable based on hardness and is calculated with equations. For the following equations, hardness is expressed as CaCO3 in mg/L and the guideline is in mg/L exposure.

Metal	Exposure	Guideline Formula
Cadmium ^(a) -	4 Days	(EXP(0.7409*(LN(Hardness))-4.719)*((1.101672-((LN(Hardness)*(0.041838))))))/1000
	1 Hour	(EXP(1.0166*(LN(Hardness))-3.925)*(1.136672-((LN(Hardness)*(0.041838)))))/1000
Copper ^(b)	4 Days	(EXP(0.8545*(LN(Hardness))-1.702))*0.96/1000
	1 Hour	(EXP(0.9422*(LN(Hardness))-1.7))*0.96/1000
	4 Days	EXP(1.273*(LN(Hardness))-4.705)*((1.46203-((LN(Hardness)*(0.145712)))))/1000
Lead	1 Hour	EXP(1.273*(LN(Hardness))-1.46)*((1.46203-((LN(Hardness)*(0.145712)))))/1000
	4 Days	(EXP(0.846*(LN(Hardness))+0.0584))*0.997/1000
NICKEL	1 Hour	(EXP(0.846*(LN(Hardness))+2.255))*0.998/1000
Zinc ^(e)	4 Days	(EXP(0.8473*(LN(Hardness))+0.884))*0.986/1000
	1 Hour	(EXP(0.8473*(LN(Hardness))+0.884))*0.978/1000

8. Short-term exposure = 0.033 mg/L; Long-term exposure = 0.015 mg/L



Exceedance of MWQSOG
 Laboratory Detection Limit exceeds MWQSOG

Sun Gro Horticulture Canada Ltd. Julius Lake West Peat Harvesting Environment Act Proposal


TABLE 6 VEGETATION SPECIES LIST

Spec	cies		Ranking		F	Protection					
Common Name	Latin Name	Global	National	Provincial	The Endangered Species and Ecosystems Act	Species At Risk Act	COSEWIC				
Trees		05	NE	6465		1					
American elm	Ulmus americana	65	N5	5455	-	-	-				
Balsam fir	Abies balsamea	G5	N5	\$5	-	-	-				
Balsam poplar	Populus balsamifera	G515	N5	\$5	-	-	-				
Black ash	Fraxinus nigra	G5	N5	\$2\$3	-	-	Threatened				
Black spruce	Picea mariana	G5	N5	\$5	-	-	-				
Jack pine	Pinus banksiana	G5	N5	\$5	-	-	-				
Paper (white) birch	Betula papyrifera	G5	N5	\$5	-	-	-				
Tamarak (American larch)	Larix laricina	G5	N5	\$5	-	-	-				
I rembling aspen	Populus tremuloides	G5	N5	\$5	-	-	-				
White spruce	Picea glauca	G5	N5	S5	-	-	-				
Shrubs						1					
Mountain maple	Acer spicatum	G5	N5	\$5	-	-	-				
Speckled alder (river alder)	Alnus incana ssp. rugosa	G515	N5	\$5	-	-	-				
Green alder	Alnus viridis	G5	N5	\$5	-	-	-				
Saskatoon	Amelanchier alnifolia	G5	N5	S5	-	-	-				
Bog rosemary	Andromeda polifolia	G5	N5	\$5	-	-	-				
Bog birch	Betula glandulosa	G5	N5	S5	-	-	-				
Leather leaf	Chamaedaphne calyculata	G5	N5	S5	-	-	-				
Red-osier dogwood	Cornus sericea	G5T5	N5	S5	-	-	-				
Beaked hazel	Corylus cornuta	G5	N5	S5	-	-	-				
Northern bush-honeysuckle	Diervilla lonicera	G5	N5	S5	-	-	-				
Creeping snowberry	Gaultheria hispidula	G5	N5	S4S5	-	-	-				
Pale (Bog) laurel	Kalmia polifolia	G5	N5	S5	-	-	-				
Chokecherry	Prunus virginiana	G5	N5	S5	-	-	-				
Alderleaf buckthorn	Rhamnus alnifolia	G5	N5	S5	-	-	-				
Common Labrador tea	Rhododendron groenlandicum	G5	N5	S5	-	-	-				
Northern black currant	Ribes hudsonianum	G5	N5	S5	-	-	-				
Swamp red currant	Ribes triste	G5	N5	S5	-	-	-				
Prickly rose	Rosa acicularis	G5	N5	S5	-	-	-				
Raspberry	Rubus idaeus	G5	N5	S5	-	-	-				
Bebb's willow	Salix bebbiana	G5	N5	S5	-	-	-				
Pussy willow	Salix discolor	G5	N5	S5	-	-	-				
Sandbar willow	Salix interior	G5	N5	S5	-	-	-				
Balsam willow	Salix pyrifolia	G5	N5	S4S5	-	-	-				
Soapberry	Shepherdia canadensis	G5	N5	S5	-	-	-				
Snowberry	Symphoricarpos albus	G5	N5	S4S5	-	-	-				
Late lowbush blueberry	Vaccinium angustifolium	G5	N5	S4	-	-	-				
Velvetleaf blueberry	Vaccinium myrtilloides	G5	N5	S5	-	-	-				
Small cranberry	Vaccinium oxycoccos	G5	N5	S5	-	-	-				
Mountain cranberry (lignonberry)	Vaccinium vitis-idaea	G5	N5	S5	-	-	-				
Highbush-cranberry	Viburnum opulus	G5	N5	S5	-	-	-				
Herbaceous											
Common water-plantain	Alisma triviale	G5	N5	S5	-	-	-				
Canada anemone	Anemone canadensis	G5	N5	S5	-	-	-				
Cut-leaved anemone	Anemone multifida	G5	N5	S5	-	-	-				
Wild columbine	Aquilegia canadensis	G5	N5	S5	-	-	-				
Wild sarsaparilla	Aralia nudicaulis	G5	N5	S5	-	-	-				
Field milkvetch	Astragalus agrestis	G5	N5	S5	-	-	-				
Canadian milkvetch	Astragalus canadensis	G5	N5	S5	-	-	-				
Nodding beggar-ticks	Bidens cernua	G5	N5	S5	-	-	-				
Wild calla (water arum)	Calla palustris	G5	N5	S5	-	-	-				
Marsh marigold	Caltha palustris	G5	N5	S5	-	-	-				
Fireweed	Chamerion angustifolium	G5	N5	S5	-	-	-				
Prince's-pine	Chimaphila umbellata	G5	N5	S4S5	-	-	-				
Spotted water-hemlock	Cicuta maculata	G5	N5	S4S5	-	-	-				
Marsh cinquefoil	Comarum palustre	G5	N5	S5	-	-	-				
Goldthread	Coptis trifolia	G5	N5	S4S5	-	-	-				



Spec	cies	Ranking Protection					
Common Name	Latin Name	Global	National	Provincial	The Endangered Species and Ecosystems Act	Species At Risk Act	COSEWIC
Dwarf dogwood (Bunchberry)	Cornus canadensis	G5	N5	S5	-	-	-
Bunchberry	Cornus canadensis	G5	N5	S5	-	-	-
Round-leaved sundew	Drosera rotundifolia	G5	N5	S4S5	-	-	-
Spotted Joe Pye weed	Eutrochium maculatum	G5	N5	S5	-	-	-
Common horsetail	Fauisetum arvense	G5	N5	\$5	-	-	-
Wild strawberry	Fragaria vesca	G5	N5	\$4\$5	-	-	_
Northern bedstraw	Galium horeale	G5	N5	\$155	_	-	-
Sweet-scented bedstraw	Galium triflorum	G5	N5	\$5	_	-	-
Northern comandra	Geocaulon lividum	G5	N5	\$5	_	_	_
Vellow avens	Geum alennicum	65	N5	\$5	_	_	_
Blueflag		65	N5	\$354	_	_	_
Northern starflower	Ins versicolor	65	N5	5554			
Tufted loosestrife	Lysimachia thyrsiflora	65	N5	55			
Wild life of the valley	Agianthamum canadansa	GS	NE	33 CE	-	-	_
	Maianthemum canadonso	CF	IND NE	55	-	-	_
Two-leaved Solomon S-Seal	Maianthemum canadense	GS	IN5	35	-	-	-
Inree-leaved faise Solomon's seal	Maatha an adagais	G5	N5	55	-	-	-
	Mentha canadensis	65	N5	55	-	-	_
Naked bishop's cap	Mitella nuda	G5	N5	55	-	-	-
Smooth sweet sicely	Osmorhiza longistylis	G5	N5	\$5	-	-	-
Virginia creeper	Parthenocissus quinquefolia	G5	N4?	SNA	-	-	-
Palmate-leaved colt's-foot	Petasites frigidus var. palmatus	G5T5	N5	S5	-	-	-
Arrowleaf sweet-colt's-foot	Petasites frigidus var. sagittatus	G5	N5	S5	-	-	-
Blunt leaved bog-orchid	Platanthera obtusata	G5	N5	S5	-	-	-
Silverweed	Potentilla anserina	G5	N5	S5	-	-	-
Cloudberry	Rubus chamaemorus	G5	N5	S5	-	-	-
Dwarf raspberry	Rubus pubescens	G5	N5	S5	-	-	-
Hooded skullcap	Scutellaria galericulata	G5	N5	S5	-	-	-
Missouri goldenrod	Solidago missouriensis	G5	N5	S5	-	-	-
Field goldenrod	Solidago nemoralis	G5	N5	S5	-	-	-
Stiff goldenrod	Solidago rigida	G5	N5?	S5	-	-	-
Boreal aster	Symphyotrichum boreale	G5	N5	S4S5	-	-	-
Many-flowered aster	Symphyotrichum ericoides	G5	N5	S4	-	-	-
Purple-stemmed aster	Symphyotrichum puniceum	G5	N5	S5	-	-	-
Tall or purple meadow-rue	Thalictrum dasycarpum	G5	N5?	S5	-	-	-
Small cranberry	Vaccinium oxycoccos	G5	N5	S5	-	-	-
American vetch	Vicia americana	G5	N5	S5	-	-	-
Canada violet	Viola canadensis	G5	N5	S5	-	-	-
Northern bog violet	Viola nephrophylla	G5	N5	S5	-	-	-
Graminoid							
American sloughgrass	Beckmannia syzigachne	G5	N5	S5	-	-	-
Fringed brome	Bromus ciliatus	G515	N5	\$5	-	-	-
Bluejoint	Calamagrostis canadensis	G5	N5	\$5	-	-	-
Northern reedgrass	Calamagrostis stricta	G5	N5	55	-	-	-
Water sedge	Carex aquatilis	G5	N5	\$5	-	-	-
Short sedge	Carex canescens	G5	N5	S5	-	-	-
Beaked sedge	Carex rostrata	G5	N5	S4	-	-	-
Ihree-sided sedge	Carex trisperma	G515	N5	\$4\$5	-	-	-
Canada wildrye	Elymus canadensis	G5	N5	5455	-	-	-
Slender wildrye	Elymus trachycaulus	G5	N5	55	-	-	-
Narrowleaf cotton-grass	Eriophorum angustifolium	G5	N5	\$5	-	-	-
Baltic rush	Juncus arcticus var. balticus	G5T5	N5	S5	-	-	-
White-grained mountain-ricegrass	Oryzopsis asperifolia	G5	N5	S5	-	-	-
Fowl bluegrass	Poa palustris	G5	N5	S5	-	-	-
Purple oatgrass	Schizachne purpurascens	G5	N5	\$5	-	-	-
Woolgrass bulrush	Scirpus atrovirens	G5	N5	SU	-	-	-
Broad-leaved cattail	i ypna latifolia	G5	N5	5455	-	-	-
Non-Native Species	Bremus in errorie	CETE	NINI A	CNIA			
Sitiooth brome	Bromus inermis	6515	NNA	SNA	-	-	-
		CND	ININA	SINA	-	-	-
				SINA	-	-	-
Vellow sweet clover	Lightus repetits				-	-	-
I CHOW SWEEL CIUVEI		GINK	ININA	ANC	-	-	-



Spec	cies		Ranking		F	Protection						
Common Name	Latin Name	Global	National	Provincial	The Endangered Species and Ecosystems Act	Species At Risk Act	COSEWIC					
Reed canarygrass	Phalaris arundinacea	G5	N5	S5	-	-	-					
Kentucky bluegrass	Poa pratensis	G5	N5	S5	-	-	-					
Curly dock	Rumex crispus	GNR	NNA	SNA	-	-	-					
Field sow-thistle	Sonchus arvensis	GNR	NNA	SNA	-	-	-					
Common dandelion	Taraxacum officinale	G5T5	NNA	SNA	-	-	-					
Alsike clover	Trifolium hybridum	GNR	NNA	SNA	-	-	-					
Non-Vascular Plant Species												
Gray reindeer lichen	Cladonia rangiferina	S5	N5	G5	-	-	-					
Spinulose shield fern	Dryopteris carthusiana	G5	N5	S5	-	-	-					
Stiff club moss	Lycopodium annotinum	G5	N5	S5	-	-	-					
Ground pine	Lycopodium obscurum	G5	N5	S4	-	-	-					
Red-stemmed feather Moss	Pleurozium schreberi	G5	N5	S4S5	-	-	-					
Knight's-plume moss	Ptilium crista-castrensis	G5	N5	S4S5	-	-	-					
Peat moss	Sphagnum sp.	G5	N5	S5	-	-	-					

Notes:

Provincial Status (S-Rank) and National Statis (N-Rank): S1/N1 = Critically Imperiled, S2/N2 = Imperiled, S3/N3 = Vulnerable, S4/N4 = Apparently

Secure, S5/N5 = Secure, S#S#/G#G# indicates range of uncertainty in status. Global Status (G-rank): G1= Critically Imperiled, G2= Imperiled, G3= Vulnerable, G4= Apparently Secure, G5= Secure, G#G# indicates range of uncertainty in status.

Status modifiers: U = unrankable, SNR - status not yet assessed, T - interspecific taxon

"-" = Species Not Listed



TABLE 7 WILDLIFE SPECIES LIST

Species			Ranking		Protection					
Common Name	Latin Name	Global	National	Provincial	The Endangered Species and Ecosystems Act	Species At Risk Act	COSEWIC			
Amphibians										
Boreal Chorus Frog	Pseudacris maculata	G5	N5	S5	-	-	-			
Gray Treefrog	Hyla versicolor	G5	N5	S4S5	-	-	-			
Spring Peeper	Pseudacris crucifer	G5	N5	S5	-	-	-			
Mammals					1					
American Black Bear	Ursus americanus	G5	N5	S5	-	-	-			
Gray Wolf	Canis lupus	G5	N5	S5	-	-	-			
Moose	Alces americanus	G5	N5	\$5	-	-	-			
Red Squirrel	Tamiasciurus hudsonicus	G5	N5	\$5	-	-	-			
Snowshoe Hare	Lepus americanus	G5	N5	\$5	-	-	-			
White-tailed Deer	Odocoileus virginianus	G5	N5	\$5	-	-	-			
Avian	A second state to section	65		CE D						
Mallard	Anas platyrhynchos	G5	N5B,N5N,N5M	S5B	-	-	-			
Ruby-throated Hummingbird	Archilochus colubris	G5	N5B,N5M	S5B	-	-	-			
Cedar Waxwing	Bombycilla cearorum	GS	INSB,INSIN,INSIVI	SSB,SUN	-	-	-			
Ruffed Grouse	Bonasa umbellus	G5		5455	-	-	-			
Canada Goose	Branta canadensis	GS		55B	-	-	-			
Broad-winged Hawk	Buteo platypterus	GS		55B	-	-	-			
Fermit Inrush	Catharus guttatus	G5		55B	-	-	- Encoial Concorn			
Eastern wood-pewee	Contopus virens	GS		S4B	-	Special Concern	Special Concern			
American Crow	Corvus brachyrnynchos	G5	N5B,N5N,N5IVI	55B,SUN	-	-	-			
Common Raven	Corvus corax	GS		55	-	-	-			
Blue Jay		65		35	-	-	-			
Alder Elyesteber	Dryocopus pileatus	GS		22	-	-	-			
Alder Flycatcher	Empidonax amorum	GS		33B	-	-	-			
Least Elycatcher	Empidonax minimus	65	N5B N5M	55B	-	-	-			
Brower's Blackbird	Emplaonax minimas	65		55B	_	-	_			
Wilson's Snine	Callingao delicata	65		55B	_	-	-			
Mourning Warbler	Geothlynis nhiladelnhia	65	N5B N5M	55B	_	_	_			
Common Vellowthroat	Geothlynis trichas	65	N5B N5M	55B	_		_			
Sandhill Crane	Grus canadensis	G5	N5B N1N N5M	55B	_	-	_			
Bald Fagle	Haliaeetus leucocenhalus	G5	N5B N5N N5M	S5B SUN	_	-	_			
Baltimore Oriole	Icterus aalbula	G5	N5B.N5M	S4B	-	-	-			
Swamp Sparrow	Melospiza aeoraiana	G5	N5B.NUN.N5M	S5B	-	-	-			
Song Sparrow	Melospiza melodia	G5	N5B.N5N.N5M	S5B	-	-	-			
Black-and-white Warbler	Mniotilta varia	G5	N5B.N5M	S5B	-	-	-			
Great Crested Flycatcher	Mviarchus crinitus	G5	N5B.N5M	S4B	-	-	_			
Connecticut Warbler	Oporornis agilis	G4G5	N5B,N4N5M	S4B	-	-	-			
Nashville Warbler	Oreothlypis ruficapilla	G5	N5B,N5M	S5B	-	-	-			
Gray Jay	Perisoreus canadensis	G5	N5B,N5N,NUM	S5	-	-	-			
Rose-breasted Grosbeak	Pheucticus Iudovicianus	G5	N5B,N5M	S5B	-	-	-			
Black-capped Chickadee	Poecile atricapillus	G5	N5	S5	-	-	-			
Ruby-crowned Kinglet	Regulus calendula	G5	N5B,N5N,N5M	S5B	-	-	-			
Golden-crowned Kinglet	Regulus satrapa	G5	N5B,N5N,N5M	S4B	-	-	-			
Ovenbird	Seiurus aurocapilla	G5	N5B,N5M	S5B	-	-	-			
Yellow-rumped Warbler	Setophaga coronata	G5	N5B,N4N,N5M	S5B	-	-	-			
Chestnut-sided Warbler	Setophaga pensylvanica	G5	N5B,N5M	S5B	-	-	-			
Yellow Warbler	Setophaga petechia	G5	N5B,N5M	S5B	-	-	-			
Black-throated Green Warbler	Setophaga virens	G5	N5B,N5M	S4B	-	-	-			
Red-breasted Nuthatch	Sitta canadensis	G5	N5B,N5N,N5M	S5	-	-	-			
Yellow-bellied Sapsucker	Sphyrapicus varius	G5	N5B,N5M	S5B	-	-	-			
Clay-colored Sparrow	Spizella pallida	G5	N5B,N5M	S5B	-	-	-			
Winter Wren	Troglodytes hiemalis	S5B	N5B,N5M	G5	-	-	-			
Red-eyed Vireo	Vireo olivaceus	G5	N5B,N5N,N5M	S5B	-	-	-			
Mourning Dove	Zenaida macroura	G5	N5B,N5N,N5M	S4B	-	-	-			
White-throated Sparrow	Zonotrichia albicollis	G5	N5B,N5N,N5M	S5B	-	-	-			



Notes:

Provincial Status (S-Rank) and National Statis (N-Rank): S1/N1 = Critically Imperiled, S2/N2 = Imperiled, S3/N3 = Vulnerable, S4/N4 = Apparently Secure, S5/N5 = Secure, SNA = Conservation status not applicable, S#S#/G#G# indicates range of uncertainty in status.

Global Status (G-rank): G1= Critically Imperiled, G2= Imperiled, G3= Vulnerable, G4= Apparently Secure, G5= Secure, G#G# indicates range of uncertainty in status.

Status modifiers: For a migratory species B = rank applies to the breeding population in the province, N = rank applies to the non-breeding population in the province, M = rank applies to the transient population, U = unrankable, T - Infraspecific taxon

"-" = Species Not Listed



TABLE 10 CATEGORIES OF ADVERSE BIOPHYSICAL, SOCIO-ECONOMIC AND CULTURAL EFFECTS

Adversity Category	Biophysical	Socio-Economic	Physical and Cultural Heritage
Negligible	Effect on the population or a specific group of individuals at a local project area and/or over a short period in such a way as to be similar to small random changes in the population due to environmental irregularities but having no measurable effect on the population as a whole.	Effect of either very short duration or affects a small group of people or which occurs in the local project area in a manner similar to small random changes to extraneous irregularities, but having no measurable effect on the population as a whole.	Effect on physical and cultural heritage resources of short duration and in the local project area. The effect on physical and cultural resources is not detectable. The resources are not publicly recognized or protected by legislation.
Minor	Effect on a specific group of individuals in a population in the project area and/or over a short period (one generation or less), but not affecting other trophic levels or the integrity of the population itself.	Effect either of short-term duration or affects a specific group of people in the local project area but not necessarily affecting the integrity of the entire group itself.	Effect on physical and cultural heritage resources of short duration but over the adjacent local area. The effect on physical and cultural resources is minor or repairable. The resources are publicly recognized but not protected by legislation.
Moderate	Effect on a portion of a population that results in a change in abundance and/or distribution over one or more generations of that portion of the population or any population dependent upon it, but does not change the integrity of any population as a whole. The effect may be localized.	Effect either of medium-term duration (which affects one or two generations and/or the portion of the population dependent upon it) or affects a moderate portion of the population without affecting the integrity of the population as a whole.	Effects on physical and cultural heritage resources of moderate duration. Resources affected over the adjacent local area. The effect on physical and cultural resources is reversible. The resources are protected by legislation.
Major	Effect on a whole stock or population of a species in sufficient magnitude to cause a decline in abundance and/or change in distribution beyond which natural recruitment would not return that population or species dependent upon it, to its former level within several generations.	Effect either of long duration (lasting several generations) or affecting an entire definable group of people in sufficient magnitude to cause severe change in economic, physical or psychological well-being or long established activity patterns that would not return to pre-project levels or patterns within several generations.	Effect on physical and cultural heritage resources of long duration. Resources affected over large regional area. There is an irreversible effect on physical/cultural resources. The resources are protected by legislation.



TABLE 11 CRITERIA AND RATINGS FOR EVALUATING SIGNIFICANCE

Critoria		Rating	
	1	2	3
a) Societal value of the affected environmental components – includes nature and degree of protection provided	Not valuable (no designation)	Moderately valuable (designated or protected locally, regionally or provincially)	Highly valuable (designated or protected nationally or internationally)
b) Ecological value – includes rarity and uniqueness, fragility, importance within ecosystem, importance to scientific studies	Not valuable	Moderately valuable	Highly valuable
c) Duration – length of time the project activity will last	Short-term (less than 1 year)	Moderate (between 1 and 100 years)	Long-term (more than 100 years)
d) Frequency – rate of reoccurrence of the project activity causing the effect	Rarely (less than once per year)	Sporadically (less than once per month)	Frequently (more than once per week)
e) Geographic extent – area over which the effect will occur	Single point	Localized	Regional or greater
f) Magnitude – predicted disturbance compared to existing conditions	No measurable disturbance	Measurable disturbance but no loss of function	Measurable disturbance with loss of function
g) Reversibility – time the environmental component will take to recover after the source of the effect ceases	Less than a year	Between 1 and 100 years	Irreversible

TABLE 12ESTIMATED GREENHOUSE GAS EMISSIONS

Production		Area	ı (ha)		Area	(km ²)	Annual GHG from Land Use Change (tonne - CO ² equivalent)					
Year	Opened	Closed	Harvesting	Total Disturbed	Harvesting	Cumulative Restoration ⁽¹⁾	Harvesting Activities ⁽²⁾	Restoration Activities ⁽³⁾	Total			
2024	0	0	0	0	0	0	0	0	0			
2025	61.9	0	61.9	61.9	0.619	0	657	0	657			
2026	61.9	0	123.8	123.8	1.238	0	1314	0	1314			
2027	0	0	123.8	123.8	1.238	0	1314	0	1314			
2028	0	0	123.8	123.8	1.238	0	1314	0	1314			
2029	0	0	123.8	123.8	1.238	0	1314	0	1314			
2030	0	0	123.8	123.8	1.238	0	1314	0	1314			
2031	0	0	123.8	123.8	1.238	0	1314	0	1314			
2032	0	0	123.8	123.8	1.238	0	1314	0	1314			
2033	0	0	123.8	123.8	1.238	0	1314	0	1314			
2034	0	0	123.8	123.8	1.238	0	1314	0	1314			
2035	0	0	123.8	123.8	1.238	0	1314	0	1314			
2036	0	0	123.8	123.8	1.238	0	1314	0	1314			
2037	0	61.9	61.9	123.8	0.619	0.619	657	797	1454			
2038	0	61.9	0	123.8	0	1.238	0	1595	1595			
2039	0	0	0	123.8	0	1.238	0	1595	1595			
2040	0	0	0	123.8	0	1.238	0	1595	1595			
2041	0	0	0	123.8	0	1.238	0	1595	1595			
2042	0	0	0	123.8	0	0.619	0	797	797			
2043	0	0	0	123.8	0	0	0	0	0			
Totals							15,762	7,973	23,735			

Notes:

1 - Assumes that a restored field returns to net neutral GHG flux 6 years after restoration (ie 5 years cumulative area)

2 - Calculated using the Cleary et. al. GHG Flux for Peatland Under Extraction of 1061 t / km² / yr

3 - Calculated using the Cleary et. al. GHG Flux for Cutover Peatland Under Restoration of 1288 t / km^2 / yr





TABLE 13 ENVIRONMENTAL EFFECTS ANALYSIS SUMMARY FOR THE PROPOSED PEAT DEVELOPMENT

	Adversity	Adversity Mitigation Measures		Significance (S)* (see								
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up	а	b	C	able d	e 11 e	.) f	g	S	
Microclimate	1											
Changes in airflow, wind speed	Minor	Install snow fences to control snow	Observe for changes in airflow	1	2	2	2	2	2	2	Ν	
and snow deposition pattern		deposition on the property if required	patterns and snow deposition periodically									
Air Quality												
Increased fugitive dust from	Moderate	Use approved dust suppressant	Observe site periodically for fugitive	2	1	2	3	2	2	1	Ν	
site preparation, construction,		Minimize peat handling activities during high	dust levels									
operation and reclamation		wind events	Perform inspections of local area for									
activities		Reduce exposed peat area (harvesting fields	accumulated dust									
		and peat stockpiles) to prevailing winds	Track public complaints									
		Control vehicle speeds										
		Instruct employees on proper harvest										
		equipment operation to minimize dust										
		Cover loads being hauled from the site										
		Re-vegetate harvested areas										
		Utilize windbreaks (tree and brush barriers)										
Increased levels of NO _x , SO ₂ ,	Minor	Use low sulphur fuels	Perform periodic inspections of air	2	1	2	3	2	2	1	Ν	
GHGs and VOCs from		Require a high standard of maintenance of	quality during construction									
equipment/vehicle emissions		equipment and vehicles	Record maintenance of heavy									
during site preparation, peat		Limit unnecessary long-term idling	equipment									
harvesting and transporting		Use appropriate fuel dispensing equipment	Require submission of SDSs for all									
activities, construction			products used									
materials and fuel use												
Increased releases of GHGs	Minor	Minimize the areas cleared	Adhere to licence terms and	3	1	2	3	2	1	2	Ν	
into the atmosphere from		Implement the Peatland Recovery Plan to	conditions									
clearing and peat-harvesting		restore the area to a carbon sink condition										
activities												

Environmental Effect	Adversity	/ Mitigation Measures Follow-up		5	Sign	ifica	anc able	e (S	5)* ()	see	
Environmental Enect	(Table 10)	Mitigation Measures	Follow-up	а	b	C	d	e	.) f	g	S
Soils											
Loss and disturbance of	Major	Minimize the surface area disturbed	Monitor annually and report on	1	2	2	3	2	3	3	Ν
surface soil during site		Leave non-commercial peat reserves in place	implementation of progressive								
preparation and harvesting		Implement the Peatland Recovery Plan to	restoration activities								
activities		restore the area to natural conditions									
Contamination of soils from	Moderate	Prevent leaks, spills and releases	Perform periodic inspections for	3	1	2	1	1	2	1	Ν
leaks and accidental spills and		Comply with fuel storage and dispensing	leaks, spills and releases								
releases of fuel or other		regulations and storing hazardous materials	Ensure construction and operation								
hazardous substances during		in approved containers (secondary	crews adhere to designated areas								
site preparation and		containment)	Remediate and record fuel spills and								
harvesting activities		Require drip trays for equipment	releases								
		Designate re-fueling areas	Update the emergency spill								
		Ensure equipment arrives to site in good	response plan periodically								
		condition	Adhere to licence terms and								
		Provide spill clean-up equipment and	conditions								
		materials									
		Provide an emergency spill response plan									
Groundwater											
Contamination of groundwater	Minor	Prevent leaks, spills and releases	Perform periodic inspections for	3	1	2	1	1	1	2	Ν
from leaks and accidental spills		Comply with fuel storage and dispensing	leaks, spills and releases								
and releases of fuels or other		regulations and storing hazardous materials	Remediate and record fuel spills and								
hazardous substances during		in approved containers (secondary	releases								
site preparation and		containment)	Update emergency response plan								
harvesting activities		Require drip trays for equipment	periodically								
		Provide spill clean-up equipment and	Adhere to licence terms and								
		materials	conditions								
		Provide an emergency spill response plan									



	Adversity Fifeet		5	Sign	ifica	ance	e (S))* (see		
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up	2	h	Ta C	able	211) f	a	ç
Surface Water				a	U		u	e	•	g	3
Loss of small intermittent	Moderate	Minimize the area disturbed	Perform periodic inspections of	1	2	2	3	2	3	1	Ν
ponds and drainage swales		Maintain water levels on adjacent	surface waters								
due to site drainage for peat		undisturbed lands	Report annually on implementation								
harvesting operations		Implement the Peatland Recovery Plan to	of the restoration activities								
		restore pre-development water levels									
Modified surface water runoff	Minor	Installation of 0.3 m diameter gated outlet	Monitor outlet pipe to ensure	2	1	2	3	2	2	1	Ν
flow rate due to site drainage		control discharge pipe to limit outflow from	proper operation								
and land profiling activities		the peat development to less than or equal to	Monitor discharge flow rates from								
during construction and		the existing conditions	peat development according to								
operation			licence terms and conditions								
Increased suspended sediment	Minor	Install gated culvert to control water	Collect surface water samples from	3	2	2	3	2	2	1	Ν
levels in surface water during		discharge and manage suspended sediment if	the outlet monthly for analysis of								
construction and operation		required	suspended sediment levels								
			Conduct additional water monitoring								
			if required in consultation with								
			Manitoba								
			Clean drainage ditches and								
			sedimentation ponds on a regular								
			basis								
			Perform periodic inspections for								
			evidence of erosion								
			Adhere to licence terms and								
			conditions								
Alteration of surface water	Minor	Install gated culvert to control water	Collect surface water samples from	3	2	2	3	2	1	1	Ν
chemistry of downstream		discharge	the outlet monthly for pH analysis								
receiving waters during		If necessary, install a limestone or carbonate-	Conduct additional water monitoring								
construction and operation		lined drainage ditch to increase pH of	if required in consultation with								
		draining bog water	Manitoba								



	Advorsity	tv l		9	Sign	ifica	ance	e (S)	* (9	see	
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up			Та	able	11)		
				а	b	С	d	e	f	g	S
Contamination of surface	Moderate	Prevent leaks, spills and releases	Perform periodic inspections for	3	2	2	1	1	2	2	Ν
water from leaks and		Comply with fuel storage and dispensing	leaks, spills and releases								
accidental spills and releases		regulations and storing hazardous materials	Remediate and record fuel spills and								
of fuels or other hazardous		in approved containers (secondary	releases								
substances during		containment)	Update the emergency response								
construction and operation		Require drip trays for equipment	plan periodically								
		Provide spill clean-up equipment and	Adhere to licence terms and								
		materials	conditions								
		Prepare an emergency spill response plan									
Vegetation											
Loss and disturbance of	Moderate	Minimize loss and disturbance of vegetation	Perform periodic inspections for	1	2	2	3	2	2	2	Ν
terrestrial vegetation during		Protect vegetation along the perimeter of the	vegetation stress and mortality								
site preparation and		cleared areas from blow-down	around the cleared area								
construction		Limit construction activities to designated	Perform periodic inspections for								
		areas	invasion of nuisance or weed species								
		Utilize timber removed from site	Report annually on restoration								
		Re-vegetate disturbed or reclaimed areas	activities implemented								
Impairment of vegetation from	Minor	Control dust using approved suppressant	Perform periodic inspections of local	1	2	2	2	2	1	1	Ν
dust accumulation during		Curtail construction and operation during	area for accumulated dust								
construction and operation		high wind events									
Risk of fire during construction	Major	Adhere to fire response procedures	Examine firefighting equipment in	2	3	1	1	3	2	2	Ν
and operation		Provide fire suppression equipment on-site	accordance with the fire response								
		(extinguishers, shovels, hose, pumping	procedure								
		equipment, etc.)	Conduct periodic testing, evaluation								
		Notify Manitoba Environment and Climate	and updating of the emergency								
		Change immediately if a fire or explosion	preparedness plan								
		occurs	Provide employee education and								
			training in the use of this equipment								
			regularly								



	Advorcity	tv		5	Sign	ific	anc	e (S)* (!	see	
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up			Ta	able	e 11)		
				а	b	С	d	е	f	g	S
Mammals / Habitat											
Loss and disturbance of	Minor	Minimize loss and disturbance to vegetation	Perform periodic inspections during	1	2	2	2	2	2	2	Ν
mammal habitat during site		Limit construction to area designated	construction and operation								
preparation activities		Limit operation activities to areas disturbed	Maintain re-vegetated areas								
		during construction	Ensure adherence to environmental								
		Re-vegetate disturbed or reclaimed areas	guidelines and protocols								
Loss and disturbance of large,	Minor	Minimize the area of disturbance by limiting	Adhere to licence terms and	1	2	2	3	2	2	2	Ν
small and burrowing mammals		construction to designated areas	conditions								
during construction and		Limit operation activities to areas disturbed	Maintain re-vegetated areas								
operation activities		during construction									
		Maintain habitat around the sub-area									
		Implement the Peatland Recovery Plan to									
		restore wildlife habitat							_	_	
Increased wildlife-vehicle	Minor	Operate trucks during daylight hours	Maintain records of vehicle-wildlife	1	1	2	3	3	1	2	Ν
interactions during peat		Provide wildlife awareness information to	interactions								
transportation		drivers									
	N.A	Adhere to posted speed limits		4	4	2	2	2	4	4	
Attraction of problem or nuisance animals	Minor	facilities	nuisance wildlife	T	1	2	3	2	T	T	N
		Use animal deterrents such as noisemakers,	Adhere to licence terms and								
		reflectors and scents if required	conditions								
Birds / Habitat											
Loss and disturbance of bird	Minor	Minimize loss and disturbance of vegetation	Perform periodic inspections during	1	2	2	3	2	1	1	Ν
habitat during site preparation		Complete tree clearing in the winter in	construction and operation for signs								
activities		accordance with the Migratory Birds	of potential effects								
		Convention Act (outside of critical nesting and	Maintain buffer zones								
		rearing periods of April 14 to August 28)	Maintain re-vegetated areas								
		Limit construction to designated areas	Ensure adherence to environmental								
		Limit operation activities to areas disturbed	guidelines and protocols								



	Adversity		_ "		Sign	ifica	ince	e (S)	* (s	ee	
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up			Та	ble	11))		
				a	b	С	d	e	f	g S	
		during construction									
		Maintain 100 m buffer zone around sub-area									
		boundaries									
		Re-vegetate disturbed or reclaimed areas									
		during and after operation									
Disturbance of migratory and	Minor	Locate peat harvesting components away	Adhere to licence terms and	1	2	2	2	2	1	2 1	۱
other bird nesting during		from critical migratory bird habitat	conditions								
construction and operation		Schedule construction activities outside of									
activities from equipment		critical nesting and rearing periods									
noise and vibration		Maintain buffer zones around sub-area									
		boundaries									
Aquatic Biota / Habitat											
Disturbance to aquatic biota	Minor	Install gated culvert to control water	Perform periodic inspections of	3	2	2	3	2	1	1 1	١
and habitat due to elevated		discharge if needed to manage suspended	outlet ditch for debris								
levels of suspended sediment		sediment	Clean drainage ditches on a regular								
in peatland drainage water			basis								
			Monitor water discharge on a								
			regular basis								
Amphibians and Reptiles / Habi	tat										
Loss and disturbance to	Minor	Minimize the area of disturbance by limiting	None proposed	1	2	2	2	2	1	2 1	٧
amphibians and reptiles and		construction to designated areas									
their habitat		Limit operation activities to areas disturbed									
		during construction									
Economic Conditions											
Creation of employment and	Positive	None proposed	None proposed	3	1	2	3	3	1	2 1	1
introduction of money to the											
regional economy											

	Advorsity			S	Sign	ifica	ance	e (S)	* (see	
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up			Ta	ble	11)			
				а	b	С	d	e	f	g	S
Business Opportunities											
Creation of jobs and contracts	Positive	None proposed	None proposed	3	1	2	2	3	1	2	Ν
for construction and operation											
requirements											
Traffic											
Traffic may cause dust, result	Moderate	Utilize dust control on the access road	Monitor the number of vehicles	2	1	2	3	3	2	1	Ν
in increased road maintenance		Reduce the number of vehicles traveling	traveling associated with peat								
and increase the number of		during high wind events	harvesting operation								
vehicle accidents and vehicle-		Reduce speed and follow posted limits	Record public complaints and								
wildlife interactions		Only travel during daylight hours	vehicle accidents								
		Provide wildlife information to drivers	Consider further action as warranted								
Noise and Vibration											
Increased noise and vibration	Minor	Muffle vehicles and equipment	Monitoring and periodically tracking	2	1	2	3	2	2	1	Ν
in the regional area and on		Limit unnecessary long-term idling	noise levels and public complaints								
highways		Require a high standard of maintenance for									
		heavy equipment									
Human Health											
Risk of adverse effects on	Moderate	Utilize dust control methods	Monitor dust levels	3	1	2	3	2	2	1	Ν
public attitude and general		Reduce number of vehicles travelling during	Track public complaints								
health and well-being due		high wind events	Consider further action as warranted								
noise, vibrations and dust		Drive according to road conditions									
generated		Adhere to posted speed limits									
		Operate transport trucks only during daylight									
		hours									
Risk of effects to worker	Minor	Provide adequate ventilation	Conduct regular maintenance of	3	1	2	3	3	2	1	Ν
health associated with poor		Ensure a high standard of equipment	equipment								
indoor air quality from VOCs,		maintenance									
carbon monoxide, propane gas											
and dust											



	Advorcity			2	Sign	ifica	ance	e (S)	* (s	ee	
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up			Ta	ble	11))		
				а	b	с	d	e	f	g	S
Potential threat to public and	Public -	Locked gate signed with no trespassing	Record occurrence of workplace	3	1	2	3	2	2	1	Ν
worker safety during	Negligible	Compliance with Manitoba Workplace Safety	accidents/incidents								
construction and operation	and	and Health regulations	Update employee training and safety								
activities	Worker -	Develop and enforce standard operation	guidelines as required								
	Minor	procedure guidelines									
		Provide training to employees									
		Ensure visitors have reported in and are									
		accompanied by an employee									
Aesthetic Values											
Impaired aesthetic during peat	Minor	Utilize dust control methods and cover loads	Observe dust and debris levels	2	1	2	3	2	2	1	Ν
harvesting from transport		during transport to and from the site	Record public complaints								
trucks and dust		Re-vegetate the peat fields in accordance									
		with the Peatland Recovery Plan									
Aboriginal and Treaty Rights											
Reduced access to lands for	Minor	Minimize area cleared	Adhere to licence terms and	3	1	2	3	2	2	2	Ν
practicing traditional		Re-store site to pre-harvest conditions (peat-	conditions								
harvesting activities such as		accumulating bog) once harvesting is									
hunting, trapping and		complete									
gathering of plants		Maintain buffer zones around sub-area									
		boundary									
		Additional mitigation measures will be									
		considered, if warranted, and based on									
		ongoing communication with First Nation and									
		Metis groups that may use the area for									
		Aboriginal and Treaty rights									
Reduction of traditional	Minor	Follow mitigation measures identified for	Ensure adherence to environmental	3	1	2	3	2	1	2	Ν
resources available for		vegetation, mammals, birds, such as:	guidelines and protocols								
hunting, trapping and other		Minimize loss and disturbance of vegetation	Adhere to licence terms and								
traditional harvesting practices		Protect vegetation along the perimeter of the	conditions								



	Adversity			5	Sign	ifica	ance	(S) [*]	* (se	e
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up			Ta	ble	11)		
				а	b	С	d	e	fg	S
		cleared areas from blow-down	Maintain buffer zones							
		Limit construction activities to designated								
		areas								
		Maintain habitat around the sub-area								
		Maintain 100 m buffer zone around sub-area								
		boundaries								
		Re-vegetate harvest area to natural								
		conditions								
		Maintain ongoing communications with First								
		Nation groups and the MMF with respect to								
		use of the area for Aboriginal and Treaty								
		rights								
Recreation / Tourism	A 41		T 1 1 1 1 1 1 1 1	2	4	2	2	2	2 4	
Iruck traffic and resulting dust	Minor	Utilize dust control methods	Track public complaints	2	1	2	2	3	2 1	N
could cause decline in tourism		Cover loads during transport to and from the								
to nearby recreational areas		site								
		Reduce number of vehicles travelling during								
		high wind events								
		Drive according to road conditions								
		Adhere to posted speed limits								
		Operate transport trucks only during daylight								
August of last suggest		nours								
Areas of Interest	Minor	Limit construction activities to designated	Designing the increase the site during	2	1	2	2	2		NI
the Agencia Dravingial Forest	WIIIOI		construction for signs of notantial	Э	T	2	5	2	2 2	IN
the Agassiz Provincial Forest,		dieds	disturbances							
and numing and trapping		Protect aujacent trees from blow-down	usul Dalles							
ατινιτγ		Re-use umber from clearing	ensure construction crews adhere to							
			designated areas							



- · · · · · · · · · · · · · · · · · · ·	Adversity		Follow-up	Significance (S)* (se							e
Environmental Effect	(Table 10)	Mitigation Measures	Follow-up	a	b	c	d d	e 11 e	.) f	g	S
Heritage Resources	1					1					
Impact to heritage sites within	Minor	If heritage resources are encountered,	Construction would only resume as	2	1	2	1	2	1	3	Ν
the sub-area		construction will cease and Historic Resource	directed by the Historic Resource								
		Branch will be notified immediately	Branch								
Fires and Explosions											
Potential for fires and	Major	Complying with applicable provincial and	Adhering to licence terms and	2	2	2	1	3	2	2	Ν
explosions from spontaneous		municipal legislation, codes and guidelines	conditions								
combustion, lightning strikes,		Maintaining the First Responders Committee	Regular inspections for fire risk								
equipment malfunctions,		Providing and testing fire suppression	Routine examination of fire								
improper handing and storage		equipment on-site	suppression equipment								
of hazardous materials, as well		Preparing, exercising and implementing an	Periodic testing and evaluation of								
as various construction and		emergency response plan that includes peat	the fire response procedures								
operation activities		fire response procedures									
		Notify Manitoba Environment and Climate									
		Change immediately if a fire or explosion									
		occurs									
Transportation Accidents											
Risk of vehicular accidents	Moderate	Following safe transportation routes	Adhering to licence terms and	2	1	2	3	1	1	3	Ν
during construction activities		Adhering to speed restrictions and signage	conditions, periodic testing and								
and transporting peat		Compliance with applicable provincial and	evaluation of the emergency								
		municipal legislation	response plan, ensuring that								
		Preparing, exercising and implementing an	dangerous goods carriers are								
		emergency spill response plan that includes	licensed and inspecting all								
		transportation accident prevention and	shipments for compliance with								
		response	regulatory requirements								

* S = significance

Y = significant - rated a "3" for at least four criteria, at least one of which must be criteria a or b; or rated "2" or "3" for all criteria

N = not significant

TABLE 14 MITIGATION MEASURES SUMMARY FOR THE PROPOSED PEAT DEVELOPMENT

Mitigation Measures	Design	Proposed	Regulatory	Management
Microclimate				
Install snow fences to control snow deposition on the property if required		•		
Air Quality				
Use an approved dust suppressant and control vehicle speed		•		•
Limit peat handling activities during high wind events				•
Orient peat harvesting and stockpiles with prevailing winds	•	•		
Instruct employees on proper equipment operation to minimize dust				•
Cover loads being hauled		•		
Re-establish vegetation on disturbed areas		•		
Utilize windbreaks (tree and brush barriers)	•	•		
Require a high standard of maintenance for construction equipment and vehicles, use low sulphur-				-
containing fuels and limit unnecessary idling				•
Use appropriate fuel dispensing equipment			•	•
Minimize the area cleared	•			
Implement the Peatland Recovery Plan that addresses greenhouse gas emissions		•		•
Soils				
Minimize the surface area disturbed	•			
Leave non-commercial peat reserves in place	•			•
Implement the Peatland Recovery Plan to restore the area to natural conditions			•	•
Prevent leaks, spills and releases	•			
Comply with provincial fuel storage and dispensing regulations and storing hazardous materials in			-	
approved containers (secondary containment)				•
Provide drip trays for equipment and spill clean-up equipment and materials	•			•
Designate refueling areas	•			•
Ensure equipment arrives to site in good condition				•
Prepare an emergency (spill) response plan		•		•
Groundwater				
Prevent leaks, spills and releases	•			
Comply with provincial fuel storage and dispensing regulations and storing hazardous materials in			•	
approved containers (secondary containment)				
Provide drip travs for equipment and spill clean-up equipment and materials	•			•



Mitigation Measures	Design	Proposed	Regulatory	Management
Preparing an emergency (spill) response plan		•		•
Surface Water				
Limit surface area disturbance	•			
Maintain water levels on undisturbed areas		•		•
Implement the Peatland Recovery Plan to restore pre-harvesting water levels			•	•
Install a 0.3 m gated outlet control pipe to limit outflow from the peat development	•			•
Install gated culvert to control water discharge if needed to manage suspended sediment	•			
If necessary, install a limestone or carbonate-lined drainage ditch to increase pH of draining bog water			•	•
Prevent leaks, spills and releases and provide fuel storage secondary containment	•			•
Comply with provincial fuel storage and dispensing regulations and storing hazardous materials in				
approved containers (secondary containment)			•	•
Provide drip trays for equipment and spill clean-up equipment and materials	•			•
Prepare an emergency (spill) response plan		•		•
Vegetation				
Minimize vegetation loss or disturbance		•		
Protect vegetation along perimeter from blow-down		•		
Restrict activities to designated areas	•			
Utilizing timber removed from site		•		•
Re-vegetate disturbed and reclaimed areas during and after operation	•			
Use an approved dust suppressant and limit construction activity during high wind events	•	•		•
Adhere to an fire response procedures		٠		•
Provide on-site fire suppression equipment		٠		•
Notify Manitoba Environment and Climate Change immediately in event of a fire or explosion				•
Mammals / Habitat				
Minimize habitat (vegetation) loss or disturbance		•		
Limit construction to designated areas and operation activities to areas disturbed during construction	•			
Maintain habitat around the sub-area		•		
Provide wildlife awareness information to drivers	•			•
Implement the Peatland Recovery Plan to revegetate disturbed areas after harvesting is complete	•		•	•
Transport peat during daylight hours, post signs to warn and educate drivers to avoid wildlife on the				-
highway and adhere to posted speed limits				•
Regular disposal of waste at existing waste facilities		•		
Animal deterrents such as noise makers, reflectors and scents if required		•		



Mitigation Measures	Design	Proposed	Regulatory	Management
Birds / Habitat				
Minimize habitat (vegetation) loss or disturbance		•		
Complete tree clearing in the winter in accordance with the Migratory Birds Convention Act (outside of	•			
critical nesting and rearing periods of April 14 to August 28)	•		•	•
Limit construction to designated areas and operation activities to areas disturbed during construction	•			
Maintain habitat buffer zones around sub-area boundary		•		
Locate peat harvesting components away from critical migratory bird habitat	•			
Implement a restoration plan to revegetate disturbed and reclaimed areas after harvesting is complete	•		•	•
Aquatic Biota / Habitat				
Install gated culvert to control water discharge if needed to manage suspended sediment	•			
Amphibians and Reptiles / Habitat				
Minimize the area of disturbance by limiting construction to designated areas		•		
Limit operation activities to areas disturbed during construction	•			
Economic Conditions				
No mitigation proposed				
Business Opportunities				
No mitigation proposed				
Traffic				
Reduce accidents and wildlife interactions by traveling only during daylight hours and providing wildlife		•		•
information to drivers				
Road dust control by approved dust suppressant, reducing speed, following posted limits and reducing		•		•
the number of vehicles during wind events				
Noise and vibration Require a high standard of maintenance for construction equipment and vehicles, muffle vehicles and				
equinment and limit unnecessary idling				•
Human Health				
Utilize dust control methods, reduce number of vehicles travelling during high winds, adhere to posted				
speed limits, drive according to road conditions and operate transport trucks during the day		•	•	•
Provide adequate ventilation in any buildings	•			
Require a high standard equipment maintenance	•			•
Locked gate with no trespassing signs on access road	•			
Comply with Manitoba Workplace Safety and Health regulations			•	•
Provide employee training and develop and enforce standard operation procedure guidelines			•	•
Ensure all visitors have reported in and are accompanied by an employee				•



Mitigation Measures	Design	Proposed	Regulatory	Management
Aesthetic Values				
Utilize dust control methods and cover loads during transport to and from the site		•		
Re-vegetate the harvest areas in accordance with the Peatland Recovery Plan	•			
Aboriginal and Treaty Rights				
Minimize area cleared and disturbed, maintain buffer around sub-area boundary, protect vegetation		•	•	
along the perimeter of the cleared area from blow-down	•	•	•	
Restore site to pre-harvest conditions (peat-accumulating bog) once harvesting is complete		•	•	
Limit construction activities to designated areas		•		
Additional mitigation measures will be considered, if warranted, and based on ongoing communication		_		
with First Nation and Metis groups that may use the area for Aboriginal and Treaty rights		•		•
Recreation/Tourism				
Limit dust generation by using water, covering loads, reducing vehicle travel during high winds, driving				
according to road conditions, adhering to posted speed limits and operate transport trucks during		•	•	•
daylight hours				
Areas of Interest				
Limit construction activities to designated areas, protect adjacent trees from blow-down and re-use	•	•		
timber from clearing		-		
Heritage Resources				
If heritage resources are encountered, cease construction and notify Historic Resources Branch with			•	•
additional construction occurring as directed by the Historic Resources Branch				
Fires and Explosions				
Complying with applicable provincial and municipal legislation, codes and guidelines			•	•
Maintaining the First Responder Committee				•
Providing and testing fire suppression equipment on-site			•	•
Preparing , exercising and implementing an emergency response plan that includes peat fire response			_	
procedures				•
Notify Manitoba Environment and Climate Change immediately if a fire or explosion occurs			•	•
Transportation Accidents				
Following safe transportation routes		•		
Adhering to peed restrictions and signage			•	•
Compliance with applicable provincial and municipal legislation			•	•
Preparing, exercising and implementing an emergency spill response plan that includes transportation				
accident prevention and response			•	•



TABLE 15FOLLOW-UP SUMMARY FOR THE PROPOSED PEAT DEVELOPMENT

Follow-up	Inspecting	Monitoring	Record Keeping	Reporting
Microclimate				
Periodic observation for changes in airflow and snow deposition patterns	•			
Air Quality				
Observe fugitive dust levels during construction and accumulated dust during operation	•			
Perform periodic inspections of adjacent properties and access roads for dust and debris	•			
Track complaints from local residents			•	
Perform periodic inspections of air quality during construction	•			
Record maintenance of equipment			•	
Require submission of Safety Data Sheets for all products used			•	
Adhere to licence terms and conditions	•			
Soils				
Conduct annual monitoring and report on implementation of the progressive restoration activities		•	•	•
Perform periodic inspections for leaks, spills and releases	•			
Ensure construction and operation crews adhere to designated areas	•			
Remediate and record fuel spills and releases	•		•	•
Update the emergency response plan periodically			•	
Adhere to licence terms and conditions	٠			
Groundwater				
Perform periodic inspections for leaks, spills and releases	•			
Remediate and record fuel spills and releases	٠		•	٠
Update the emergency (spill) response plan periodically			•	
Adhere to licence terms and conditions	•			
Surface Water				
Perform periodic inspections of surface water bodies	٠			
Report on implementation of the progressive restoration activities annually	•		•	٠
Monitor surface water runoff flows from the harvest area		•	•	
Monitor 0.3 m diameter outlet control pipe to ensure proper operation	•			
During operation collect water samples from the outlet monthly for analysis of suspended sediment and pH		•	•	
Conduct additional water monitoring as developed with Manitoba Environment and Climate Change		•	•	•
Clean drainage ditches and sedimentatin pond on a regular basis	•			



Follow-up	Inspecting	Monitoring	Record Keeping	Reporting
Perform periodic inspections for evidence of erosion	•			
Perform periodic inspections for leaks, spills and releases	•			
Remediate and record fuel spills and releases	•		•	•
Update the emergency (spill) response plan periodically			•	
Adhere to licence terms and conditions	•			
Vegetation				
Perform periodic inspections for vegetation stress and mortality around cleared area and invasion of nuisance or	•			
weed species				
Observe accumulated dust on plants during operation	•			
Examine fire fighting equipment in accordance with the fire respose procedure	•		•	
Conduct periodic assessments of fire risk and updates to emergency preparedness plan and fire response			•	
Conduct employee training in the use of this equipment regularly			•	
Mammals / Habitat				
Perform periodic inspections of habitat during construction and operation	•			
Maintain re-vegetated areas and buffer zones	•			
Ensure adherence to environmental guidelines and protocols	•			
Maintain records of vehicle-wildlife interactions			•	
Maintain records of problem or nuisance wildlife situations			•	
Adhere to licence terms and conditions	•			
Birds / Habitat				
Perform periodic inspections of habitat during construction and operation	•			
Maintain re-vegetated areas and buffer zones	•			
Ensure adherence to environmental guidelines and protocols	•			
Adhere to licence terms and conditions	•			
Aquatic Biota / Habitat				
Perform periodic inspections of outlet ditch for debris	•			
Clean drainage ditches regularly	•			
Monitor water discharge on a regular basis		•	•	٠
Amphibians and Reptiles / Habitat				
No follow-up proposed				
Economic Conditions				
No follow-up proposed				



Follow-up	Inspecting	Monitoring	Record Keeping	Reporting
Business Opportunities				
No follow-up proposed				
Traffic				
Monitor the number of vehicles travelling associated with the peat harvesting	•		•	
Record public complaints and vehicle accidents			•	
Monitor situation and take further action as warranted	•			
Noise and Vibration				
Observe and periodically track noise levels and public complaints	•		•	
Human Health				
Observe dust levels	•			
Track health complaints from local residents			•	
Monitor situation and take further action as warranted	•			
Conduct regular maintenance of equipment	•		•	
Record workplace accidents			•	
Update employee training and safety guidelines as required			•	
Aesthetic Values				
Observe dust and debris levels	•			
Track public complaints			•	
Aboriginal and Treaty Rights				
Ensure adherence to environmental guidelines and protocols	•			
Maintain re-vegetated areas and buffer zones	•			
Adhere to licence terms and conditions	•			
Recreation/Tourism				
Track public complaints			•	
Areas of Interest				
Inspect site during construction for signs of potential disturbances	•			
Ensure crews adhere to designated construction areas	•			
Heritage Resources				
If heritage resources are encountered, cease construction and notify Historic Resources Branch with additional				
construction occurring as directed by the Historic Resources Branch			~	-



Follow-up	Inspecting	Monitoring	Record Keeping	Reporting
Fires and Explosions				
Adhering to licence terms and conditions	•		•	•
Regular inspections for fire risk	•		•	
Routine examination of fire suppression equipment	•		•	
Periodic testing	•		•	
Evaluation of the emergency response plan			•	•
Transportation Accidents				
Adhering to licence terms and conditions	•	•	•	•
Periodic testing and evaluation of the emergency response plan	•		•	
Ensuring dangerous goods carriers are licensed and inspecting	•		•	•
Inspecting all shipments for compliance with regulatory requirements	•		•	•

FIGURES







- Major Road
- Street
- Railway
- River
- Ditch
 - Rural Municipality Boundary
 - Provincial Forests
 - Community Interest Zone

 \Box

NOTES: 1. All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

	1,000		0	1,000	2,00	00	3,000	4,0	000		
	Metres										
SCALE: 1:100,000 METRIC 11"x17"											
	24/07/16		ISSUED	WITH FINAL	REPOR	т		DL	SFM		

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		Ī	REVISIONS	/ ISSUE			
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JL EN	ILIUS LA	AKE V IMENT	VEST FACT PR	OPOSAL			
RE	EGIONA	AL SITI	E LOCAT	ION			
JULY 2024			4	FIGURE	01	REV:	0

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LEGEND: Julius sub-area boundary Bog Road Finger Drains Staging Area <u>rz</u>i Donor Area access road Main Drain Direction









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APPENDIX A

Peat Harvest Licence



Licence No. / Licence nº: 3

Issue Date / Date de délivrance : June 15, 2015

REVISED/REVISE:

REVISED/REVISE:

Issued to:

SUN GRO HORTICULTURE CANADA LTD.

Issued for:

All those portions of sections 09-13-10, 17-13-10, 08-13-10, 32-11-09, 33-11-09, 28-11-09, 29-11-09, 29-12-10, 32-12-10, 30-12-10, 31-12-10, 10-12-10, 02-12-10, 11-12-10, 03-12-10, 23-11-09, 24-11-09, 25-11-09, 26-11-09, 13-11-09, 04-12-10, 06-12-10 and 05-12-10 EPM as shown on the map attached as Schedule "A" to this Licence;

(collectively the "Licence Area").

Licence term:

This Licence is valid until December 31, 2030

This Licence is issued in accordance with and subject to The Peatlands Stewardship Act, its regulations, both as may be amended from time to time, and the terms and conditions set out in this Licence.



DIRECTOR THE PEATLANDS STEWARDSHIP ACT

DEFINITIONS

In this Licence,

"Active Area" means the area(s) within a Licence Area that are experiencing activities related to the peat harvesting process, such as, but not limited to, clearing of brush or trees, ditching, or the removal of materials. Also, an Active Area requires an Environment Act Licence and triggers the requirements for the restoration security under the Regulation;

"Crown" means Her Majesty the Queen in right of the Province of Manitoba, as represented by the Forest and Peatlands Management Branch of Manitoba Conservation and Water Stewardship, or such successor branch or agency of the Government of Manitoba;

"Crown Peat Return" means the statutory declaration required by the Regulation, as amended from time to time;

"Director" means the person appointed as the director of peatlands stewardship under The Peatlands Stewardship Act, or such successor to that person;

"The Peatlands Stewardship Act" or the **"Act"** means The Peatlands Stewardship Act (C.C.S.M., c. P31), as amended from time to time; and

"Regulation" means the Peatlands Stewardship Regulation (M.R. 82/2015), as amended from time to time.

AUTHORIZATION

- Subject to the terms and conditions of this Licence, the Licencee is authorized to engage in peat harvesting by removing peat from Crown peatland within the Licence Area for commercial purposes, including any activity undertaken on or in respect of the Licence Area to facilitate the removal of peat from the Licence Area, continued vertically downward.
- 2. Thirty (30) days prior to making an area within the Licence Area active (Active Area), the Licencee shall notify the Director of its plan and provide the security required under clause 9 of this Licence.

PLANNING

i. PEATLAND MANAGEMENT PLAN

- 3. The Licencee shall submit to the Director a peatland management plan in accordance with the Act. The Licencee shall manage the Licence Area in accordance with the approved management plan.
- ii. PEATLAND RECOVERY PLAN
- 4. The Licencee shall submit to the Director a peatland recovery plan in accordance with the Act. The Licencee must ensure that the activities set out in the approved peatland recovery plan are undertaken in the Licence Area and completed at the time set out in the plan.
- 5. Until the peatland recovery plan is approved by the Director, the Licencee shall comply with the Environment Act Licence requirements respecting the mine closure plan it prepared under the *Mine Closure Regulation 67/99*.
- 6. Any alteration of a peatland management plan or peatland recovery plan is subject to submission to the Director or a proposed alteration to that plan and approval by the Director of that alteration.

FEES AND CHARGES

- 7. The Licencee shall pay to the Crown an annual land reservation charge in accordance with the Regulation.
- 8. The Licencee shall pay to Crown the prescribed royalty fee by March 1st each year in accordance with the Regulation.
- In accordance with the Regulation, the Licencee shall provide to the Director the form of security approved by the Director before any activity under this Licence begins in any Active Area.

RECORDS AND REPORTING

- 10. The Licencee shall make, maintain and submit to the Crown such records as are required by the Act and Regulation.
- 11. The Licencee shall make, maintain and submit to the Crown such reports as are required by the Act and Regulation.

- 12. The Licencee shall submit to the Director a Crown Peat Return, setting out the information required by the Regulation.
- 13. The Licencee shall meet with the Director, or his or her representatives, in each year of the Licence term. The Licencee will present its annual reports and annual plan at the meeting. The annual meeting may be held concurrently with any meeting required under The Environment Act Licence.

LIABILITY

- 14. The Licencee shall indemnify and save harmless Her Majesty the Queen in Right of the Province of Manitoba, her Ministers, officers, agents and employees from and against any and all claims, liability and demands for or by reason of anything done or omitted to be done by the Licencee or its agents or employees with respect to the Licence Area.
- 15. This Licence shall in no way limit Manitoba Hydro's or the Government of Manitoba's right to raise or lower the water levels on any body of water which may affect the Licence Area and Manitoba Hydro or the Government of Manitoba shall not be held liable for changes in the water level. This Licence does not imply any guarantee of water levels at the Licence Area.

GENERAL TERMS AND CONDITIONS

- 16. This Licence may be suspended, cancelled or its renewal refused in accordance with the Act and the Regulation.
- 17. In addition to the rights under clause 16 of this Licence, the Director may cancel this Licence if the Licencee makes an assignment for the benefit of creditors, becomes bankrupt or insolvent, takes the benefit of, or becomes subject to, any statutes that may be in force relating to bankrupt or insolvent debtors (the appointment of a receiver or receiver and manager of the assets of the Licencee being conclusive evidence of insolvency), or if any certificate or order is made or granted for the winding-up or dissolution of the Licencee, voluntarily or otherwise.
- 18. This Licence does not provide any other authority that may be required under federal or provincial enactments that may apply to the Licence Area or the Licencee's activities. The Licencee shall obtain and comply with all other authorizations as may be necessary for its activities on the Licence Area, including, but not limited to, a Licence under The Environment Act.
We, the undersigned Licencee, or duly authorized representative of the Licencee, have read, in their entirety, the terms and conditions contained in this Licence. We understand the rights and responsibilities attached to this Licence, and we further understand that failure to comply with any Licence terms and conditions may result in the suspension or cancellation of the Licence, or any other enforcement actions as provided for in The Peatlands Stewardship Act.

THE LICENCEE



I/We have authority to bind the Licencee.

Schedule "A" Map

Peat Harvest Licence No. 3

Company: SUN GRO HORTICULTURE CANADA LTD

Licence Group: Julius

Sub Area: Evergreen 1 Sub Area: Evergreen 2 Sub Area: Evergreen 3 Sub Area: Julius Lake West Sub Area: South Julius 1 Sub Area: South Julius 2 Sub Area: Moss Spur 1 Sub Area: Moss Spur 2 Sub Area: Moss Spur 3 Sub Area: North Julius

-10E1		SIM 20.012.10E1	SE-29-013-10E1	SW-28-013-10E1	SE-28-013-10E1
NW-19-013-10E1 8w-30-013	SE-30-013-10E1	NW-20-013-10E1	NE-20-013-10E1	NW-21-013-10E1	NE-21-013-10E1
SW-19-013-10E1	SE-19-013-10E1	SW-20-013-10E1	SE-20-013-10E1	SW-21-013-10E1	SE-21-013-10E1
NW-18-013-10E1	NE-18-013-10E1	NW-17-073-70E7	NE-17-013-10E1 Sub Area: Evergreen 1	NW-16-013-10E1	NE-16-013-10E1
SW-18-013-10E1	SE-18-013-10E1	SW-17-013-10E1	<u>SE-17-01</u> B-10E1	SW-16-013-10E1	SE-16-013-10E1
NW-07-013-10E1	NE-07-013-10E1	NW-08-013-10E1	NE-08-073-10E1	NW-09-013-10E1	HUL-E10-60 Sub Area: Evergreen 3 3
SW-07-013-10E1	SE-07-013-10E1	SW-08-013-10E1	Evergreen SE-08-013-10E1	SW-09-013-10E1	SE-09-013-10E1
Com	bany: SUN GRO HORTI	ICULTURE CANADA LTD.			N

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Sub Area: Evergreen 1

SE-19-013-10E1	5	SW-20-013-10E1	SE-20-013	-10E1	SW-21-013-10E1	S	E-21-013-10E1	SW-2:	2-013-10E1
NE-18-013-10E1		NW-17-073-70E1	NE-17-01 Sub Area: Evergreen 1	3-10E1	VW-16-013-10E1	1	NE-16-013-10E1		NW-15-013-10E1
SE-18-013-10E1		<u>SW-17-013-10E1</u>	SE-17-0	13-10E1	SW-16-013-10E1		SE-16-013-10E1		SW-15-013-10E1
NE-07-013-10E1		NW-08-013-10E1	NE-08-	013-10E1	NW-09-013-10E1		NE-09-013-10E1 Sub-Area: Evergreen 3 3		NW-10-013-10E1
SE-07-013-10E1		SW-08-013-10E1	SE-0	Evergreen 2 Evergreen 2	SW-09-013-10E1		SE-09-013-10E1		SW-10-013-10E1
NE-06-013-10E1		NW-05-013-10E1	NE-	.05-013-10E1	NW-04-013-10E1		NE-04-013-10E1		NW-03-013-10E1
SE-06-013-10E	1	SW-05-013-10E1	S	E-05-013-10E1	SW-04-013-10E1		SE-04-013-10E1		SW-03-013-10E1

Sub Area: Evergreen 2

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1.2 Kilometers

	SE-20-013-10E1	SW-21-013-10E1	SE-21-013-10E1	SW-22-013-10E1	SE-22-013-10E1
	UU OF FO FO FO FO FO FO FO FO FO FO FO FO	WW-16-013-10E1	NE-16-013-10E1	NW-15-013-10E1	NE-15-013-10E1
	SE-17-013-10E1	SW-16-013-10E1	SE-16-013-10E1	SW-15-013-10E1	SE-15-013-10E1
1301-503-10E1	NE-08-013-10E1	NW-09-013-10E1	NE-09-013-10E1 Sub Area: Evergreen 3 3	NW-10-013-10E1	NE-10-013-10E1
SW-08-013-10E1	Sub Area Evergreen 2 SE-08-043-10E1	SW-09-013-10E1	SE-09-013-10E1	SW-10-013-10E1	SE-10-013-10E1
NW-05-013-10E1	NE-05-013-10E1	NW-04-013-10E1	NE-04-013-10E1	NW-03-013-10E1	NE-03-013-10E1
SW-05-013-10E1	SE-05-013-10E1	SW-04-013-10E1	SE-04-013-10E1	SW-03-013-10E1	SE-03-013-10E1

Sub Area: Evergreen 3





1.2 Kilometers

NE-06-012-09E1	NW-05-012-09E1			1
SE-00-012-03E1	SW-05-012-09E1	SE-05-012-09E1	SW-04-012-09E1	1360-210-09E1
NE-31-011-09E1	NW-32-011-09E1	NE-32-011-09E1	NW-33-011-09E1	NE-33-011-09E1
SE-31-011-09E1	SW-32-011-09E1	SE-32-011-09E1 Sub Area:	SW 33-011-09E1	SE-33-011-09E1
NE-30-011-09E1	NW-29-011-09E1	Lake West	₩₩-28-011-09E1	NE-28-011-09E1
SE-30-011-09E1	SW-29-011-09E1	SE-29-011-09E1	SW-28-011-09E1	SE-28-011-09E1
NE-19-011-09E1	NW-20-011-09E1	NE-20-011-09E1	NW-21-011-09E1	NE-21-011-09E1
		SE-20-011-09E1	SW-21-011-09E1	SE-21-011-09E1

Sub Area: Julius Lake West



W S E

	SE-03-012-09E1	SW-02-012-09E1	SE-02-012-09E1	SW-01-012-09E1	SE-01-012-09E1	
	NE-34-011-09E1	NW-35-011-09E1	NE-35-011-09E1	NW-36-011-09E1	NE-36-011-09E1	NW-31-011-10E1
	SE-34-011-09E1	SW-35-011-09E1	SE-35-011-09E1	SW-36-011-09E1	SE-36-011-09E1	SW-31-011-10E1
	NE-27-011-09E1	NW-26-011-09E1	NE 26.011-09E1 Sub Area: South Julius 1	NW-25-011-09E1	NE-25-011-09E1	NW-30-011-10E1
SW-27-011-09E1	SE-27-011-09E1	SW-26-011-09E1	SE-26-011-09E1	SW 25-011-09E1	SE-25-011-09E1	
VW-22-011-09E1	NE-22-011-09E1	NW-23-011-09E1	NE-23-011-09E1 Sub A Sou	real the s 2	NE-24-011-09E1	
SW-22-011-09E1	SE-22-011-09E1	SW-23-011-09E1	SE-23-011-09E1	SW-24-011-09E1	SE-24-011-09E1	

Sub Area: South Julius 1

1.2 Kilometers ^{0.6} 1:20,000 0 0.3



NE-27-011-09E1	NW-26-011-09E1	NE-26-011-09É1 Sub Area: South Julius 1	NW-25-011-09E1	NE-25-011-09E1	NW-30-011-10E1
SE-27-011-09E1	SW-26-011-09E1	SE-26-011-09E1	SW 25-0 11-09E1	SE-25-011-09E1	SW-30-011-10E1
NE-22-011-09E1	AV4/ 23-011-09E1	NE-23-011-09E1	NWK-24-041-09E1	NE-24-011-09E1	NW-19-011-10E1
SE-22-011-09E1	SW-23-011-09E1	SE 23-011-09E1	Suth South Julius 2 SW-24-011-09E1	SE-24-011-09E1	SW-19-011-10E1
NE-15-011-09E1	NW-14-011-09E1	NE-14-011-09E1	1360-110-61-MM	NE-13-011-09E1	NW-18-011-10E1
SE-15-011-09E1	SW-14-011-09E1	SE-14-011-09E1	SW-13-011-09E1	SE-13-011-09E1	SW-18-011-10E1
Company:	SUN GRO HORTICULTUR	NE-11-011-09E1	NW-12-011-0	09E1 NE-12-011-09E1	NW-07-011-10E1

0.6 1:20,000

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1.2 Kilometers

21-012-10E1	SE-21-012-10E1	SW-	-22-012-	10E1	SE-2	22-012-10E1	SW-	23-012-10E1	SE	-23-012-10E1	SW-	24-012-10E1	SE-2	4-012-10E1	1E1
NW-16-012-10E1	NE-16-012-10E1		NW-15-012-10E1			NE-15-012-10E1	NM	V-14-012-10E1	NE	E-14-012-10E1	NW	13-012-10E1	NE-	13-012-10E1	012-11E1 NW-19-012-1
SW-16-012-10E1	SE-16-012-10E1		SW-15-012-10E1			SE-15-012-10E1	SW-14-012-10E1 S		SE-14-012-10E1		SW-13-012-10E1		SE	-13-012-10E1	NW-18012-11E1 SW-19-
NW-09-012-10E1	NE-09-012-10E1	M	W-10-01	2-10E1	NE		The second secon	W 11 012 10E1		NE-11-012-10E1	N	V-12-012-10E1	NE	-12-012-10E1	_
SW-09-012-10E1	SE-09-012-10E1	s	5W-10-0	12-10E1	s	£=10-012-10€1		SW-11-012-10E1	T	8E-11-012-19E1	s	W-12-012-10E1	SE	-12-012-10E1	
M-04-012-1DE1	NE-OF-OR-10E			100 210-210-Ed	Y	NE-03-012-10E1		rea: pur 1 NW-02-012-10E	1	NE-02-012-10E		NW-01-012-10E1		NE-01-012-10E1	
W-04-012-10E1	Sub Area: Moss Spur 2 SE-04-012-10	El		SW-03-012-10E1		SE-03-012-10E1		SW-02-012-10	E1	SE-02-012-10E	1	SW-01-012-10E1		SE-01-012-10E1	
V-33-011-10E1	NE-33-011-10	DE1	NW-3	4-011-10	E1	NE-34-011-10	DE1	NW-35-011-10	DE1	NE-35-011-10	Ξ1	NW-36-011-10	E1	NE-36-011-10E1	
-33-011-10E1	SE-33-011-1	0E1	SW-3	34-011-10	DE1	SE-34-011-1	0E1	SW-35-011-1	0E1	SE-35-011-10	E1	SW-36-011-10	DE1	SE-36-011-10E1	
NW-28-01	1-10E1 NE-28-011-1	0E1	NW-	27-011-1	0E1	NE-27-011-	10E1	NW-26-011-	10E	1 NE-26-011-1	0E1	NW-25-011-1	0E1	NE-25-011-10E	E1

Sub Area: Moss Spur 1

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1.8 Kilometers

8-012-10E1	NW-1	7-012-10E1	NE-17-012-10E1	NW-	-16-012-10E1	NE-1	6-012-10E1	NW-1	5-012-10E1	NE-1	5-012-10E1	NW-	14-012-10E1
E-18-012-10E1	SW-1	17-012-10E1	SE-17-012-10E1	SW	-16-012-10E1		SE-16-012-10E1		SW-15-012-10E1		SE-15-012-10E1		SW-14-012-10E1
E-07-012-10E1	NW-	08-012-10E1	NE-08-012-10E1	NN	V-09-012-10E1	NE	-09-012-10E1	NN	V-10-012-10E1	NE	10-012-1951	NW	.11-012-10E1
-07-012-10E1	SW	-08-012-10E1	SE-08-012-10E1	s	SW-09-012-10E1	I SI	E-09-012-10E1	s	W-10-012-10E1	SE	z-10-012-10E1		SW-11-012-10ET
06-012-70E7	NW	V-05-012-10E1 YArea:	NE-05-012-10E1		WV-04-012-10E1	Sub	NE-04-012-10E4		NW 03-012-10ET	Y	Moss Spu		NW-02-012-10E1
-06-012-10E1	Mose	s Spúr 3 W-05-012-10E1	SE-05-012-10E	=1	SW-04-0 12-10E1	Moss	SE-04-012-10E	7	SW-03-012-10E1	X	SE-03-012-10E1		SW-02-012-10E1
-31-011-10E1	,	vw-32-011-10E1	NE-32-011-10E	=1	NW-33-011-10	DE1	NE-33-011-10	E1	NW-34-011-10	E1	NE-34-011-10	E1	NW-35-011-10E1
-31-011-10E1		SW-32-011-10E	SE-32-011-10E	1	SW-33-011-1	0E1	SE-33-011-10	DE1	SW-34-011-10	DE1	SE-34-011-10	DE1	SW-35-011-10E1
-30-011-10E1		NW-29-011-10	NE-29-011-1	0E1	NW-28-011-	10E1	NE-28-011-10E1		NW-27-011-1	0E1	NE-27-011-1	0E1	NW-26-011-10E1
لي SE-30-011-10	DE1	SW-29-011-10	DE1 SE-29-011-	10E1	SW-28-011-	10E1	SE-28-011-1	0E1	SW-27-011-	10E1	SE-27-011-1	0E1	SW-26-011-10E1

Sub Area: Moss Spur 2





13-012-09E1	NE-13-01	2-09E1	NW-1	8-012-10E1	NE-18-	-012	-10E1	NW	/-17-012-10E1	NE	-17-012-10E1	NW-	16-012-10E1	NE-1	6-012-10E1	1 NW-15-012-10E1
SW-13-012-09E1 NW-	SE-13-0	12-09E1	SW-	18-012-10E1	SE-18	-012	-10E1	SN	SW-17-012-10E1		E-17-012-10E1	SW-16-012-10E1		SE-16-012-10E1		10E1 SW-15-012-10E
NW-12-012-09E1		NE-12-012-09E1	NW	1-07-012-10E1	NE-0	7-01	2-10E1	NI	N-08-012-10E1	NE	E-08-012-10E1	NV	V-09-012-10E1	NE	-09-012-10E1	NW-10-012-
12-012-09E1		SE-12-012-09	SI	N-07-012-10E1	SE-0)7-01	12-10E1	S	W-08-012-10E1	S	SE-08-012-10E1	s	W-09-012-10E1	SI	E-09-012-10E1	
V-01-012-09E1	NE-0	Щ 1-012-09Е	1 N	IW-06-012-10E1	NE-	NE-06-012-10E1		Mo	WW-05-012-10E1 ub Area: ss Spur 3	N	IE-05-012-10E1		NW-04-012-10E1	Sub	<u>Г. 04-01</u> , 10Е Агеа Spur 2	
V-01-012-09E1	SE-0	01-012-09E	7 5	SW-06-012-10E1	SE	SE-06-012-10E1			SW-05-012-10E1		SE-05-012-10E	1	SW-04-0 12-085	A	SE-04-012-10E	
<i>V-36-011-09E1</i>		NE-36-011-09E1		NW-31-011-10E	1 N	E-31	1-011-10E	1	NW-32-011-10E	1	NE-32-011-10E	1	NW-33-011-10	DE1	NE-33-011-10E1	
N-36-011-09E1		SE-36-011-09E1		SW-31-011-10	E1	SE-3	31-011-10	E1	SW-32-011-10	E1	SE-32-011-10E1		SW-33-011-10	DE1	SE-33-011-10E1	
W-25-011-09E1	~	IE-25-011-0	99E1	NW-30-011-1	0E1	NE	-30-011-1	0E1	NW-29-011-10	0E1	NE-29-011-10	DE1	NW-28-011-1	10E1	NE-28-011-10E1	
≥ SW-25-01	11-09E1 S	E-25-011-0)9E1	SW-30-011-1	0E1	SE	-30-011-10	0E1	SW-29-011-1	0E1	SE-29-011-1	0E1	SW-28-011-	10E1	SE-28-011-10	Ξ1

Sub Area: Moss Spur 3

0.45 0.9 1:30,000

0

1.8 Kilometers



Sub Area: North Julius





APPENDIX B

Site Photographs



Photo 1: Existing access trail on west side of Julius Lake West sub-area.



Photo 3: View within sub-area along existing trail on east side.



Photo 5: Standing water within peat. Water sampling location JLW SW-01.



Photo 2: North side of bog along cut trail, looking south into bog site.



Photo 4: View of trees within sub-area on west side.



Photo 6: Existing outlet ditch from Julius Lake West sub-area flowing west.





Photo 7: Downstream culverts at the Colony Rd and Garven Rd intersection, where existing outlet ditch flows (west of sub-area).



Photo 8: Downstream culvert under Garven Rd west of Colony Rd intersection, where existing outlet ditch flows (west of sub-area).



APPENDIX C

Hydrologic and Hydraulic Assessment of Drainage Impacts and Design Mitigation Measures



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July 16, 2024

Sun Gro Horticulture Canada Ltd. #52080 Peat Moss Road Elma, Manitoba, R0E 0Z0

Attention: Mr. Tim North Natural Resource Manager

Re: Julius Lake West Peat Harvesting Environmental Act Proposal Hydrologic and Hydraulic Assessment of Drainage Impacts and Design of Mitigation Measures

Dear Mr. North:

KGS Group is pleased to submit our Hydraulic and Hydraulic Assessment of Drainage Impacts and Design of Mitigation Measures report in support of the Peat Harvesting Environmental Act Proposal for the proposed Julius Lake peat harvesting development.

1.0 INTRODUCTION

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained by Sun Gro Horticulture Canada Ltd. (Sun Gro) to prepare a Manitoba Environment Act Proposal (EAP) to obtain the required Environment Act Licence for peat harvesting at the Julius Lake sub area. As part of this environmental assessment, the potential effects of the project to downstream peak flows were evaluated, the resulting changes to flow conditions at downstream infrastructure was assessed, and mitigation measures to reduce downstream impacts are proposed.

2.0 EXISTING HYDROLOGIC CONDITIONS

The 1.24 km² Julius Lake development area is located within a sub-watershed draining into an Unnamed Drain, located within the larger the Brokenhead River watershed, which drains into Lake Winnipeg and eventually the Hudson Bay via the Nelson River. The sub-watershed area contributing to the Unnamed Drain at the Rd 66N and Rd 47E culvert crossings was delineated using available topographic and hydrographic information and was



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calculated to have an area of 26.3 km² (Figure 1). In general, the Unnamed Drain sub-watershed is poorly drained, consisting primarily of wetlands (marshes and treed/open bog) and forested areas, with a smaller area within the downstream portion of the drainage area having been developed for agricultural production. The Unnamed Drain continues northwest for 7.1 km through agricultural land use area before joining with the Brokenhead River.

FIGURE 1: UNNAMED DRAIN DRAINAGE AREA AT RD 66N AND RD 47E CROSSINGS



Frequency-flows were determined for the drainage area contributing to the culverts Colony Road (Rd 47E) and Garvin Road (Rd 66N), which includes the 123.8 ha peat development. The drainage area was delineated using available topographic and hydrographic information as 26.3 km². MTI's Transitional Method, which is applicable to drainage areas between 13 km² and 39 km², was used to define the frequency flows at the crossing site. The method requires the computation of frequency flows using both the Regional Method and the Rational Method, which are then interpolated based on drainage area at the project site. Water Survey of Canada (WSC) gauge 05SA002 (Brokenhead River near Beausejour), which is located downstream of the crossing site, was selected as



the index station for defining the Regional Method frequency-flows. Frequency-flow estimates for this gauge were taken from MTI's "*Province of Manitoba's Regional Coefficients for All Zones (April 16, 2020)*" spreadsheet. Rational method frequency-flows were calculated based on the topographic and physiographic characteristics of the watershed, utilizing the coefficients published in MTI's "*Rational Method Revisions and Extensions*". The estimated annual peak mean daily frequency-flows are presented in Table 1 below:

TABLE 1: FREQUENCY OF FLOWS FOR RD 47E AND RD 66N CROSSING SITES

Flood Frequency	Mean Daily Flow at Crossing Site (m ³ /s)
100 Year	5.7
50 Year	4.8
20 Year	3.7
10 Year	3.0
5 Year	2.0
2 Year	1.0
3dQ10	2.6

Instantaneous peak frequency-flows were also determined for the 1.24 km² peat bog development area only to facilitate comparison with the proposed conditions (Section 4.0). These frequency-flows and associated hydrograph timings were determined using the Soil Conservation Service (SCS) Unit Hydrograph method and verified using the rational method. An SCS Curve Number (CN) of 61 was used to represent the peat under the existing and a two-hour rainfall event was assumed, as it was estimated that this would be the most critical event under the proposed conditions. This analysis also considered the shape and slope of the development area, as well as rainfall Intensity-Duration-Frequency (IDF) curves developed from 60 years (1961-2021) of rainfall data from Winnipeg.

The instantaneous peak outflow from the 1.24 km² peat bog development area was estimated for the 5-year and 25-year rainfall runoff events, as shown in Table 2.

TABLE 2: PRE-PROJECT FREQUENCY OF FLOWS IMMEDIATELY DOWNSTREAM OF PEAT BOG DEVELOPMENT

Flood Frequency	Instantaneous Peak Flow (m ³ /s)
25 Year	0.52
5 Year	0.10



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3.0 EXISTING HYDRAULIC CONDITIONS

A 1-dimensional HEC-RAS hydraulic model was developed to assess the Rd 47E and Rd 66N culvert crossings which pass over the unnamed drain downstream of the peat development. The Rd 47E crossing consists of two 1.2 m diameter corrugated steel pipes, while the Rd 66N crossing consists of a single 1.2 m diameter corrugated steel pipe. Municipal road crossings are typically designed to satisfy hydraulic design criteria during the 5% runoff event. These criteria include a maximum culvert opening velocity of 1.8 m/s, a maximum headloss of 0.21 m, and a minimum clearance from the upstream soffit elevation to the headwater level of 0.3 m (however under some conditions, a maximum upstream soffit submergence of 0.3 m is accepted). Additionally, since the unnamed drain is considered Class B fish habitat at the crossing site, culvert opening velocities should be limited to 1.0 m/s at the fish passage design discharge (3DQ10). Tables 3 and 4 summarize the hydraulic performance of the Rd 47E and Rd 66N culvert crossings, respectively, under the existing conditions.

Flood Frequency	Mean Daily Flow at Crossing Site (m ³ /s)	Upstream Water Level (m)	Downstrea m Water Level (m)	Head Loss (m)	Clearance* (m)	Velocity (m/s)
1%	5.7	260.82 (overtopping)	260.46	0.36	-1.42	1.6
2%	4.8	260.77 (overtopping)	260.44	0.33	-1.37	1.6
5%	3.7	260.73 (overtopping)	260.41	0.32	-1.33	1.5
10%	3.0	260.26	260.03	0.23	-0.86	1.3
20%	2.0	259.78	259.65	0.14	-0.38	1.1
50%	1.0	259.36	259.16	0.23	0.04	1.3
3dQ10	2.6	260.04	259.88	0.17	-0.64	1.2

TABLE 3: RD 47E OVER UNNAMED CREEK - HYDRAULIC PERFORMANCE UNDER EXISTING CONDITIONS

*Note: Negative clearance indicates soffit submergence



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TABLE 4: RD 66N OVER UNNAMED CREEK - HYDRAULIC PERFORMANCEUNDER EXISTING CONDITIONS

Flood Frequency	Mean Daily Flow at Crossing Site (m ³ /s)	Upstream Water Level (m)	Downstrea m Water Level (m)	Head Loss (m)	Clearance* (m)	Velocity (m/s)
1%	5.7	260.45 (overtopping)	259.10	1.30	-1.05	3.1
2%	4.8	260.44 (overtopping)	259.04	1.36	-1.04	3.2
5%	3.7	260.41 (overtopping)	258.96	1.42	-1.01	3.3
10%	3.0	260.03	258.79	1.20	-0.63	3.0
20%	2.0	259.64	258.67	0.95	-0.24	2.6
50%	1.0	259.13	258.46	0.66	0.27	2.1
3dQ10	2.6	259.87	258.74	1.09	-0.47	2.8

*Note: Negative clearance indicates soffit submergence

As shown in Tables 3 and 4, the Rd 47E and Rd 66N culvert crossings do not meet hydraulic design criteria at the 5% design discharge. The Rd 66N crossing in particular is significantly undersized, as it includes a single 1.2 m diameter pipe, unlike the upstream Rd 47E crossing which includes two 1.2 diameter pipes. Fish passage criteria are also exceeded at both crossing sites.

4.0 HYDROLOGIC CHANGES AFTER CONSTRUCTION OF PEAT DRAINAGE AND PROPOSED MITIGATION

Field drainage ditches will be constructed to remove interstitial water within the peat and prepare the peat surface for harvesting after clearing. A network of parallel lateral ditches will be cut through the bog in a "V" shaped geometry. Each field ditch is excavated to 1.5 m deep and 1.5 m wide and spaced approximately 33 m apart. Field drainage ditches will typically be constructed at 90° angles to the main drainage ditches.

The constructed drainage at the harvesting area will discharge water to the west, consistent with the existing drainage patterns. During initial drainage and subsequent ditch deepening, there will be a temporary increase to downstream flows resulting from the removal of interstitial water within the peat, as discussed in Section 5.0.



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After construction of the field drains, it is uncertain whether the peat drainage will result in an increase or decrease to downstream peak flows following future precipitation events. Some reporting (Daigle, J. and Gautreau-Daigle, H., 2001) suggests that downstream peak flows tend to be reduced following peatland drainage due to the increased available pore space (i.e. storage) in the drained peat. Conversely, Landy and Rochefort (2012) summarize peatland drainage research from various authors and lists numerous reasons to explain how peatland drainage can both increase and decrease downstream peak flows, depending on the drainage technique used, the type of peatland, and its placement in the landscape. Similarly, Holden et al. (2004) reviews a number of conflicting studies on this topic and emphasizes the importance of considering the ditch network design and peat properties when determining the effects of artificial drainage on water storage and runoff generation from peatlands.

Considering the range of uncertainty in the literature and science for determining the effects of peat drainage to downstream peak flows, KGS Group completed a hydrologic assessment of the potential impacts of the peat drainage. Hydrologic conditions were assessed for the outlet of the 1.24 km² peat development under the existing and proposed conditions. As discussed in Section 2.0, this assessment utilized the SCS Unit Hydrograph method, and for the proposed (drained) conditions, used an SCS Curve Number of 96 (minimal abstraction) to represent the drained peat area. A two-hour storm duration was utilized, as this was estimated to be the time of concentration for the drained peat bog. Based on these assumptions, it is anticipated that there would be some increase to downstream peak flows if the effects the peat drainage were left unmitigated.

As such, KGS Group considered the following options for mitigating the effects of the peat drainage on downstream peak flows:

- 1. Limit outflow from the drained peat using a properly sized outlet pipe. This would be relatively easy to install, but may result in some delay to harvesting operations after a large rainfall.
- 2. Direct drainage to the north. This would avoid land use and infrastructure immediately west of the site, however would still pass by / through potentially sensitive land use areas / infrastructure and would be changing the natural drainage pattern which would have other environmental implications.
- 3. Construct a retention basin to provide temporary storage downstream of the site. This would prevent any limitation of drainage from the peat bog development, but would require additional costs, maintenance, and would require a relatively large footprint which could have environmental implications.
- Upgrade downstream crossings. This could address drainage impacts at road crossings, but there would still be a potential for increased flooding, and flooding issues could be further worsened downstream. Additional hydraulic assessments and permitting may also be required for these upgrades extending beyond the project area.

For the reasons discussed above, options 2 and 4 were quickly removed from consideration. After preliminary analysis of various configurations of Options 1 and 3, as well as discussions with Sun Gro on May 24, 2024, Option 1, which consists of limiting flow from the drained peat with a properly sized outlet pipe, was ultimately selected as the preferred mitigation option. This option was assessed using an Excel routing model which



considered the rate of drainage from the peat using the modified Glover-Dumm equation, the storage provided by the lateral and main drains using a stage-storage curve, and the rating curve of the outlet control pipe determined using HEC-RAS. It was estimated that to limit outflow from the peat development to less than or equal to the existing conditions during the (two-hour) 5-year and 25-year rainfall events, the outlet control pipe would need to be 0.3 m in diameter (or less) and be installed 0.7 m below the lowest invert of the lateral drains (or higher). A comparison of instantaneous peak flows under the pre-project conditions and the mitigated post project conditions (with proposed outlet control pipe) is provided in Table 5.

TABLE 5: PRE AND POST-PROJECT FREQUENCY OF FLOWS IMMEDIATELY DOWNSTREAM OF PEAT BOG DEVELOPMENT

Flood Frequency	Pre-Project Instantaneous Peak Flow (m³/s)	Post-Project Instantaneous Peak Flow With Mitigation (m³/s)
25 Year	0.52	0.11
5 Year	0.10	0.10

As shown in Table 5, it is anticipated that the proposed outlet control pipe will successfully reduce downstream peak flows to less than or equal to those under the existing conditions for the 5-year and 25-year rainfall events. This analysis suggests that it will take approximately 2.5 days for the water level in the drains to be reduced to below the lateral drain invert elevations following a 2-year rainfall event, 4.5 days following a 5-year rainfall event, and 6.5 days following a 25-year rainfall event. If the hydraulic conductivity of the peat was overestimated or abstraction was underestimated (e.g. if there was significant near-surface drying due to evaporation prior to a rainfall event), these durations could be less.

5.0 TEMPORARY HYDROLOGIC CHANGES FOLLOWING INITIAL DRAIN CONSTRUCTION AND DRAIN DEEPENING

As discussed in Section 4.0, field drainage ditches will be constructed to remove interstitial water within the peat and prepare the peat surface for harvesting. It is understood that approximately half of the 1.24 km² development will be drained during each of the first two years of operation (0.62 km² per year), and that the construction of drainage channels will be completed in winter, when the peat is frozen. As such, the melting of the interstitial water within the peat and the resulting discharge from the drainage channels will likely coincide with spring runoff occurring throughout the rest of the catchment area.

Changes to the hydraulic conditions immediately following the initial drain construction were assessed in terms of peak mean daily flows at the Rd 47E and Rd 66N crossing site, as discussed in Section 2.0. Conditions were



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assessed at this location, instead of at the outlet of the peat development, so that the relative snowmelt /runoff timings of the drained peat area and the rest of the catchment could be considered. The snowmelt hydrograph duration at the Rd 47E and Rd 66N crossing site was assumed to be 1.5 weeks with a peak flow which is approximately three times the mean daily flow over this period.

The storage volume of interstitial peat water within the development area was calculated to estimate the potential water discharge following the initial drainage from a 0.618 km² area of peat. Based on field ditches being cut to a depth of 1.5 m, the total volume of peat to be drained is approximately 927,000 m³. This volume of peat will hold approximately 880,700 m³ of water assuming an average 95% moisture content before drainage. Moisture content generally varies between 60 to 85% following drainage after the field ditches are cut (Thibault, 1998). Therefore, assuming an average of 70% moisture content remains after drainage (25% drains), the volume of drainage water from opening 0.62 km² of peatland will total approximately 232,000 m³.

The increase to downstream peak flows is dependent on the rate at which the peat drains, which may be controlled by several factors. Sun Gro has indicated that based on their field experience, it typically takes approximately three weeks for the peat to drain during the snowmelt period following the initial drainage. For the purposes of this assessment, KGS Group has assumed that the initial peat drainage will occur over this three week period, and that the peak contribution to downstream flows will be approximately three times the average contribution. It was conservatively assumed that outflows from the peat bog development contribute directly to flows at the crossing site, however in reality, there would be some degree of routing ("dampening") of the development outflow hydrograph. Based on these assumptions, it is anticipated that there would be some increase to downstream peak flows during the spring freshet period if left unmitigated.

Several options for mitigating the effects of the initial drainage, similar to those discussed in Section 4.0, were assessed. Following discussions with Sun Gro on May 24, 2024, it was determined that installing the 0.3 m diameter outlet pipe (Option 1 / preferred option for mitigating impacts to downstream flows during operation) prior to the initial drainage would be the most favourable mitigation option, due to its effectiveness and the limited additional cost/effort. As shown in Table 6, with the proposed mitigation, downstream peak flows are effectively reduced to less than the pre-project conditions for the 10 year event and larger. For the 2 year and 5 year events, downstream peak flows would be anticipated to increase by 6% and 1%, respectively. To mitigate this increase during these smaller runoff events, it is recommended that the flow rate from the 0.3 m diameter outlet pipe be reduced by partially closing a gate on the culvert at the peak of the spring freshet following the initial drainage.



TABLE 6: PRE AND POST-PROJECT FREQUENCY OF FLOWS AT RD 47EAND RD 66N CROSSING SITES

Flood Frequency	Pre-Project Peak Mean Daily Flows (m³/s)	Pre-Project Peak Mean Daily Flow With Mitigation (m ³ /s)
100 Year	5.7	5.55
50 Year	4.8	4.69
20 Year	3.7	3.64
10 Year	3.0	2.98
5 Year	2.0	2.02*
2 Year	1.0	1.06*

*To be decreased to less than existing conditions with flap gate operation.

As the peat is harvested, the drainage ditches must be deepened to maintain their depth. It is understood that the ditches are typically deepened by approximately 0.15 m every second year, and that they are deepened during the summer months. For the purposes of this assessment, it was assumed that the rate of drain deepening would not exceed 0.06 km² (6 hectares) per day. Based on these assumptions, the estimated increase to downstream flows would be approximately 0.03 m³/s. Since the contribution to downstream peak flows resulting from drain deepening is much less than that resulting from the initial drainage construction and since it is unlikely that the flows from the drain deepening coincide with the annual peak flow (would not coincide with spring freshet and unlikely drains are deepened during a precipitation event), it is not anticipated that drain deepening will result in an increase to downstream peak flows.

6.0 CONCLUSIONS

As described in the sections above, drainage infrastructure downstream of the peat development appears to be undersized, and without mitigation, it is anticipated that the proposed peat drainage could result in an increase to downstream peak flows. However, with the proposed installation and operation of a 0.3 m diameter outlet control pipe to mitigate the effects of the peat drainage, as described in the above sections, it is estimated that downstream peak flows will be less than or equal to the existing conditions during the operation of the peat bog.



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7.0 REFERENCES

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STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

This report has been prepared for Sun Gro Horticulture Canada Ltd. (Sun Gro) in accordance with the agreement between KGS Group and Sun Gro (the "Agreement"). This report represents KGS Group's professional judgment and exercising due care consistent with the preparation of similar reports. The information, data, recommendations, and conclusions in this report are subject to the constraints and limitations in the Agreement and the qualifications in this report. This report must be read as a whole, and sections or parts should not be read out of context.

This report is based on information made available to KGS Group by Sun Gro. Unless stated otherwise, KGS Group has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith. KGS Group shall not be responsible for conditions/issues it was not authorized or able to investigate or which were beyond the scope of its work. The information and conclusions provided in this report apply only as they existed at the time of KGS Group's work.

Third Party Use of Report

Any use a third party makes of this report or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.

APPENDIX D

Community Engagement Report



Sun Gro Horticulture Canada Ltd.

COMMUNITY ENGAGEMENT REPORT

Environment Act Proposal for a Peatland Development

At Julius Lake West



Introduction

KGS Group (KGS), in partnership with Scatliff + Miller + Murray (SMM), is preparing an Environment Act Proposal (EAP) on behalf of Sun Gro Horticulture Canada Ltd. (Sun Gro) for a proposed peatland development at the Julius Lake West bog. The sub-area is located on Provincial Crown land within the Rural Municipality of Reynolds and Agassiz Provincial Park, north of Highway 15, south of Highway 44, and east of the Brokenhead River. The sub-area is within an existing Sun Gro Peat Harvest Licence (PHL) 3 area, near existing harvesting operations at the South Julius 2 and Evergreen sub-area.

The sub-area is 177 hectares, of which up to 124 hectares may be harvested, considering buffer areas around sub-area boundaries. There are no water bodies within this sub-area boundary.

The sub-area has an estimated 13 years of peat capacity under ideal harvesting conditions. The scope of the project will include:

- Site preparation and access (vegetation clearing; installing access to-from the subarea; establishing staging and buffer areas),
- Ground and surface water management (ditching and drainage; overland flow siltation),
- Harvesting and shipping (field harrowing; harvesting; on-site stockpiling and transport to the processing plant near Elma, MB; shipping to customers), and
- Progressive site recovery.

EAPs are required for all proposed environmentally significant developments within Manitoba under The Environment Act (C.C.M.S. c. E125). This includes proposed peat harvesting operations. In accordance with EAP requirements, KGS is in the process of assessing potential environmental interactions (within a 3-kilometre radius of the project sub-area) and socio-economic interactions (within a 10-kilometre radius of the project subarea). The EAP will then identify mitigation measures to either eliminate or control potential adverse effects.

Community and stakeholder engagement are also critical to the EAP process. Sun Gro proactively engaged with all identified stakeholders and rightsholders prior to the submission of the EAP to keep these communities informed and document concerns. The enclosed report prepared by SMM outlines the communications and engagement activities undertaken by SMM, KGS and Sun Gro representatives (project team) from January to April 2024 in support of this EAP. It outlines the process objectives, which guided the engagement methods and activities, and summarizes what was heard and the feedback received. This report informs the final EAP submission prepared by Sun Gro for the province.

Engagement Planning

1.1 Engagement Plan

The engagement plan was developed to define the engagement process, including goals and objectives as well as communication and engagement tools. The plan, which is attached to this report in Appendix A, was guided by the principles of transparency and openness, and represented a roadmap for all communication and engagement events in support of this EAP.

The engagement goals and objectives were as follows:

- Ensure an open and transparent process with clear communication,
- Establish trust and relationships with engagement participants,
- Provide key information clearly and consistently,
- Provide opportunities for early and meaningful engagement,
- Understand and address local community concerns pertinent to the project, and
- Gather information from neighbouring Indigenous communities to address any impacts to their Treaty Rights for hunting, fishing, trapping, and gathering, as well as significant cultural or spiritual areas.

As part of the engagement plan, SMM also created a Rightsholder and Stakeholder Profile (Profile) to identify relevant rightsholder and stakeholder groups (participants), based on the following attributes:

- Geography and proximity to the sub-area, and
- Interests in the sub-area and/or issues with the project.

The Profile organized community contacts to assist in connecting with relevant parties and promoting engagement activities. An EAP was prepared for Sugar Creek sub-areas B, C, D, and E (as well as two additional harvesting areas associated with Ramsay Point Bog) at the same time as the EAP for Julius Lake West. Several of the participants identified were affected by both projects (hereafter referred to as "Combination").

The Profile was reviewed and updated as necessary based on input from the project team, other government organizations, and the liaison with the participants.

1.2 Engagement Activities

Communications Log

Throughout the project, SMM documented all inquiries, contact information, dates, follow-ups, responses, and action items in a Communications Log. It is attached to this report in Appendix B.

Letter Campaign and Phone Calls

On January 17, 2024, SMM launched a letter campaign to the participants identified in the Profile. The intent of this letter was as follows:

- Provide information about the project and the EAP process to interested and affected stakeholders and rightsholders,
- Determine stakeholder and rightsholder interest in engaging with the project team about the project, and
- Arrange opportunities for engagement.

Participants were advised of the following engagement options:

- Leadership Meeting An in-person or virtual meeting with Chief and Council, Elders/RM Council members/Association members and other community members, to introduce key project information and respond to comments and questions regarding the proposed development from members of leadership, or
- **Community Meeting** An in-person or virtual event with the community with a presentation by the project team to introduce the project, provide context and information about peat processing in Manitoba, and describe the potential effects and mitigation methods to reduce potential effects of the harvesting process.

A sample of this letter is attached to this report in Appendix C. In addition, an example of the letter that was sent to Combination Participants is attached to this report in Appendix D.

Following receipt of the letter and fact sheet, SMM contacted each group by phone to determine if and how they wished to be engaged. The outcome of these phone calls is shown on the Communications Log in Appendix B.

As a result of the letter campaign and phone calls, SMM was contacted by the Manitoba Métis Federation, RM of Reynolds, Brokenhead Ojibway Nation, and

Sagkeeng First Nation (SFN). Except SFN, all other communities requested a meeting with the project team.

Corey Shefman, of Olthius Kleer Townshend LLP (OKT), represented SFN, who are rightsholders for both Sugar Creek and Julius Lake projects. OKT initiated a discussion with SMM regarding the status of the EAP and the potential to enter into an impact benefit agreement (IBA) with Sun Gro. A summary of communications can be found in Appendix B, and the full correspondence can be found in Appendix E.

Stakeholder and Rightsholder Meetings

2.1 Meeting Details

Based on feedback, the project team hosted three leadership meetings:

- One virtual (Julius Lake and Sugar Creek combination) meeting on February 20, 2024, held with representatives from the Manitoba Métis Federation (MMF) via Teams. Additional correspondence was exchanged between the MMF and project team leading up to this meeting. This correspondence is attached to this report in Appendix F. It includes:
 - A letter from MMF, received via email, dated January 18, 2024, which focused on MMF's position that this EAP should adhere to Resolution 8, which was adopted by the MMF in 2007, and sets out the framework for engagement, consultation, and accommodation with the Métis Community; and
 - A letter in response from SMM, dated January 31, 2024, which clarified that the intent of the outreach by the project team was to be proactive and initiate engagement with the MMF as part of the EAP process.
 - A letter from MMF, dated April 8, 2024, detailing a proposed Work Plan and Budget to complete the next steps of Resolution 8.
- One in-person (Julius Lake West only) meeting on March 11, 2024, with the R.M. of Reynolds council. The meeting was held at the R.M. of Reynolds office in Hadashville, MB.
- One virtual (combination) meeting on March 27, 2024, with Brokenhead Ojibway Nation's (BON) acting lands manager via Microsoft Teams.

At the meetings, the project team presented informational slide decks, which are attached to this report in Appendix G (Julius Lake) and Appendix H (Combination). The presentations focused on the following topics: an introduction to the project; an overview of the peatland industry in Canada and Manitoba; corporate highlights of Sun Gro; the project itself (context, location, and description); the EAP process; typical environmental issues and mitigation measures related to proposed peat harvesting operations; and a project timeline.

At the conclusion of each presentation, the project team answered questions and listened to feedback from the participants about the project. The meeting summaries are attached to this report in Appendix I.

2.2 Meeting Results

Rightsholder and stakeholder feedback from the three meetings is summarized and grouped as follows:

(A) The legislative context:

•	Question:	Does the peat harvesting industry have requirements or opportunities for purchasing carbon credits?
	Response:	Sun Gro is not able to purchase carbon credits. Sun Gro creates reports to quantify their greenhouse gas (GHG) emissions. The emissions from peat harvesting are relatively small compared to the end users. The lifecycle GHG emissions from peat harvesting is change in land use (15%), harvesting (4%), transport (10%), and decomposition from end users (71%). Sun Gro is held to a standard for emissions and is audited every two years. The average annual emission for Julius Lake West would be an estimated 0.0006% of Canada's annual emissions.
•	Comment:	MMF stated that the next step (Phase 2) in the Resolution 8 process is discussing how to obtain feedback from the Red River Métis community members and what capacity of funding would be required to provide the feedback to Sun Gro.
	Response:	KGS asked MMF to put a proposal together for Phase 2, which would then be discussed by the project team to move forward. The intent of this engagement process is to identify concerns and interests of Indigenous communities, keeping in mind that there is a formal duty to consult process with the Province of Manitoba.
•	Question:	Who is Sun Gro engaging with at the Province to obtain this licence?
	Response:	The EAP will be submitted to the director of the Environmental Approvals Branch. However, a primary point of contact person has not yet been assigned. Sun Gro will work with the Peatland Stewardship Branch to update peatland management and recovery plans.
•	Question:	Does Sun Gro have any existing or past agreements with any Indigenous community?
	Response:	No, Sun Gro does not and has never had any formal agreements with any Indigenous communities. Sun Gro is not in partnership with any communities but has worked with RMs and First Nations for job creation and funding

opportunities for local amenities and activities like in the Town of Beausejour. However, outside of this, Sun Gro does not have formal opportunities in place with any local communities.

Engagement with Indigenous communities has been previously conducted for the Evergreen 1 Bog peat harvesting site and a similar process is being conducted for the Julius Lake West and Sugar Creek EAPs. During this first stage of the process, where Sun Gro is preparing the EAP, engagement stage is not required by the Province, however, Sun Gro is pre-emptively engaging with impacted communities to mitigate concerns where possible. These rightsholder and stakeholder meetings were conducted as a part of Sun Gro's EAP proposal submission process. Feedback from the meetings will be included in this engagement report developed by SMM, and the EAP document will have a section referencing results of stakeholder and rights holder engagement.

• Question: Has there been agreements or engagements with First Nations or any other communities in past peat harvesting projects?

Response: Engagement with Indigenous communities has been previously conducted for the Evergreen 1 Bog peat harvesting site and a similar process is being conducted for the Julius Lake West EAP.

> During this first stage of the process, where Sun Gro is preparing the EAP, engagement stage is not required by the Province, however, Sun Gro is pre-emptively engaging with impacted communities to mitigate concerns where possible. These rightsholder and stakeholder meetings were conducted as a part of Sun Gro's EAP proposal submission process. Feedback from the meetings will be included in this engagement report developed by SMM, and the EAP document will have a section referencing results of stakeholder and rights holder engagement.

- Question: Response:
 Is the purpose of this meeting informational? Yes, it is. Sun Gro wants to share the EAP details prior to the EAP submission. In addition, Sun Gro also wanted to collect any feedback and concerns to address in the proposal, if possible.
- Question: What is the review and input process for the EAP?
 Response: Sun Gro is currently in the first stage of the process, working with KGS and SMM to prepare the EAP. Once the EAP is submitted to the Province and determined complete, the
final report will be available to download on the public registry. This begins a 30-day public review period during which anyone, including the public, can review the document and provide further comments directly to the Province.

(B) The project context:

•	Question:	How many Sun Gro projects are currently in the Agassiz Provincial Forest?
	Response:	The current peat harvesting locations are Evergreen Bog and South Julius Bog. Elma, Moss Spur, and North Julius Lake are in the recovery phase.
•	Question: Response:	Will the site be staffed overnight? No, it will not be.
•	Question: Response:	How will the site be serviced with electricity? The site will be serviced with a combined system, which will include solar power and an on-site generator.
•	Question: Response:	Will Sun Gro maintain the ditches in and around the site? Sun Gro will maintain all ditches within the sub-area. Maintaining ditches outside of the site, like along Colony Road, is outside Sun Gro's jurisdiction.
•	Question:	Are there many trees in the peat harvesting areas and what happens to the trees and lumber cleared during site preparation?
	Response:	There are few trees, mostly tamarack and small black spruce. If and/or when they need to be removed, a permit would be obtained, and Sun Gro would work with a local forester.
		Most of the trees are small Black Spruce or Tamaracks, which are typically not merchantable timber. As a part of the licence, a study of the timber and its merchantability is conducted. If the timber is merchantable, it goes back to the Province. If not, it is used for various on-site construction needs like road construction. Nothing is wasted.
•	Comment:	MMF would likely be interested in collaborating on recovery areas or emission reduction areas.
	Response:	Comment was noted.
•	Question:	BON expressed concerns regarding traditional territory and land management as they have a recognized ecological reserve and are familiar with peatlands. They are concerned

Response:	about losing use within their traditional territory, both for their community and other First Nations with whom they are connected. These communities are losing out on land that they can utilize. Loss in any of the surrounding First Nations effects BON's economy and community, and vice versa. Currently, KGS's surveys have not identified any species at risk. There are plants that Indigenous communities use in the Sugar Creek and Julius Lake West areas that have been identified, but they are commonly found species in the areas. Since these sites are not easily accessible, i.e. there are no access roads currently, the intent is that the impact is minimal on hunting and trapping activities. However, if BON is aware of hunting and trapping areas or sacred plants in the areas, Sun Gro would appreciate the information.
Question:	BON inquired if Sun Gro gives tours of their facilities.
Response:	Sun Gro will invite BON on a tour of harvesting and

- processing facilities, as well as a site in the recovery phase. BON is interested and will likely invite leadership.
- Question: Does Sun Gro have an emergency response plan?
 Response: Yes, the Emergency Response Plan was created by Sun Gro and submitted to the Province's local Conservation Officer.
- Question: Response:
 How are operations managed when it is overly hot and dry? Sun Gro does not operate in these conditions, as per provincial requirements. Since 2021, the Province provides detailed real-time weather information four days in advance, allowing peat harvesting operators to better plan operations. Additionally, Sun Gro also has internal restrictions to prevent any emergencies during these conditions, which is noted in Sun Gro's Emergency Response Plan.
- Question: In case of a fire emergency, how will Sun Gro get water to dissipate any fires on site?
 Response: Sediment ponds and the ditches hold sufficient water to deal with any on-site emergencies.
- Question: Response:
 How will restoration work be conducted at the site? Sun Gro noted that last Spring, 43,000 trees were planted in the restoration at their other sites and planting 18,000 proposed trees this year (2024). Sun Gro prioritizes on-site sustainability and restoration. Sun Gro also clarified that restoration activities will happen continuously in smaller sections as peat harvesting capacity

is reached in those areas rather than waiting until the harvesting is complete for the entire Julius Lake West area.

(C) The environmental context:

- What is the frequency, type, and location of water quality Question: testing? Response: Under the Manitoba Environment Act license for Ramsay Point Bog, regular water quality testing is mandated. Typically, water is tested at two locations: (i) weekly at the sedimentation pond outlet, (ii) two times a year at a creek/stream approximately 5km south of the site, where the ditch crosses the road, entering Lake Winnipeg, and (iii) a full parameter water test three times a year at the sedimentation outlets. Water testing monitors (i) pH, (ii) water hardness, (iii) conductivity, (iv) Total Suspended Sediments (TSS), which includes peat, and (v) dissolved metals, like lead and aluminium. The baseline TSS, against which the sample water is compared, is established from water quality samples taken from water pockets in the peat, and from downstream receiving water bodies prior to any disturbance. As per current regulation, TSS is currently allowed an increase of 25mg/L over the baseline conditions which is set by the Canadian Council Ministry of Environment as a national standard of increase in suspended sediments. This is determined via scientific studies that consider toxicity and habitat effects. In Sun Gro's experience, it is rare for the discharge water from outlets to go above this set level. Water in Bogs is naturally acidic, with a range of acceptable pH. Sun Gro remediates acidic water using limestone which will help raise the pH of the water being discharged from the bogs. Question: Where can the water monitoring reports be accessed by the
 - QuestionMunicipality and the public?Response:Results of monitoring are submitted to the Province's
Environment and Climate Change department and can be
accessed by contacting the Province's local Environment
Officer (Kim Kmet). In addition, the licence requirements can
be accessed by visiting the online Manitoba Public Registry
to view Environment Act Licenses for all of Manitoba
(https://www.gov.mb.ca/sd/eal/registries/index.html).
Schedule B of the Environment Act Licence provides the full

		list of parameters that are required to be monitored three times per year, which can be found at the following link: <u>2964er.pdf (gov.mb.ca)</u> .
•	Question:	Will the excess water run-off affect communities west and south of the site like St. Rita and ditches along Colony Road and Springfield Road?
	Response:	In-depth hydrology studies are ongoing to understand the effects of water drainage on the larger watershed surrounding the sub areas for Julius Lake West. The water will drain west of the sub-area. In this study, the effects of change in hydrology will be assessed for the local watershed, including culverts and ditches downstream. LiDAR imagery will be used along with watershed boundaries and topographic studies for a full assessment. Total volume of water discharged the first year and the following years will be quantified, and their impacts assessed for the final EAP report. Currently no issues have been identified that will affect the communities identified by the Municipality. However, if concerns are identified during the studies the Municipality will be informed and it will be documented in the EAP. Concerns along Colony Road and Springfield Road are noted, and the hydrology studies will investigate impacts on these local travel routes.
•	Question:	For Indigenous communities, it is important to think about the forest as a whole and how the larger scale is being impacted. How is Sun Gro considering this in their proposal?
	Response:	The extents of peat harvesting proposed is much smaller than the extents of tree harvesting and forested zones in the area.
•	Comment:	BON expressed the importance of wetlands and bogs as the source of important medicines and plants. The plants are connected to BON and other Indigenous communities' ways of life.
	Response:	Comment was noted.
•	Question:	Does peat harvesting release CO2? If so, how much? How does Sun Gro estimate its total CO2 emissions for the lifespan of their sites?
	Response:	Yes, CO ₂ is released during the entire life cycle of the peat which includes change in land use (15%), harvesting (4%), transportation (10%), and methods of end use/decomposition from end users (71%).

CO₂ emissions and carbon impacts are estimated as part of the EAP and will be available as a part of that documentation submitted to the Province. Using these numbers, the Province reviews what Sun Gro is proposing to develop. The calculations will be in the final EAP submission and this document will be made available to the public as a part of this process by the Province. The IISD completed a cumulative impacts analysis that looks at nutrient loading and greenhouse gas emissions from peatland harvesting in the Interlake area. The report can be found at the following link: <u>Peatland Mining in Manitoba's</u> Interlake.

(D) The socio-economic context:

Question: How many people does Sun Gro employ, and how many people will potentially be employed at Julius Lake West?
 Response: 86 people are employed in total across Manitoba in all Sun Gro facilities. Initially, a small workforce is employed and then scaled up as harvesting begins, potentially leading to 15-20 employees over time. A similar set-up is expected at Julius Lake with some full-time employees supported by many seasonal employees. Initially 2-3 people will be hired in the development stage with 5-6 people hired during initial harvesting once the site is fully developed.

Next Steps

Once the EAP has been filed with the Manitoba Environment and Climate Change Environmental Approvals Branch, the Provincial government will determine if additional stakeholder engagement, including engagement with affected Indigenous communities as part of the Province's Duty to Consult obligations under the Canadian constitutional framework, is required.

Should this EAP be approved, Sun Gro will then be able to begin preparing the site, and then engage harvesting and progressive site recovery activities, in accordance with the PHL.

Prepared by: Scatliff + Miller + Murray

Elise Ouellette, B. Env. D., M.L.Arch. Landscape Designer, Public Engagement Specialist



Sanjana Mada, B.Arch., M.P.L. Urban Planner, Public Engagement Specialist

APPENDIX A

Sun Gro Julius Lake West – Environment Act Proposal

PUBLIC, STAKEHOLDER AND RIGHTSHOLDER ENGAGEMENT PLAN

The Sun Gro Julius Lake West Peat Harvesting Project will include the preparation of the Environmental Act Proposal (EAP) and associated works to obtain the required Environment Act Licence for peat harvesting at the Julius Lake West sub area within the Peat Harvesting Licence (PHL) 3. The preparation of an EAP is required for all environmentally significant developments within the province of Manitoba under The Environment Act (C.C.M.S. c. E125). A peat harvesting operation is considered a Class 2 Development under Manitoba Regulation 164/88. KGS Group will conduct an environmental assessment of the proposed peat harvesting operation and prepare the required EAP in accordance with Manitoba Environment, Climate and Parks Information Bulletin – Environment Act Proposal Report Guidelines. The EAP will include the following.

- Introduction and background describing the need for and purpose of the project.
- Description of proposed development.
- Description of existing environment in the project area.
- Description of environmental effects of the proposed development.
- Description of the human health effects of the proposed development.
- Mitigation measures to protect the environment and human health, and residual environmental effects.

This engagement plan focuses on public, stakeholder and rightsholder engagement activities to be undertaken by Scatliff + Miller + Murray (SMM), in collaboration with KGS Group. This engagement plan will act as a road map for all community engagement and will define the goals, objectives, communication techniques, and engagement methods that will be employed to deliver outcomes. It will highlight the tactics that will be employed to achieve the outlined goals. SMM is committed to the core values of public participation outlined in the IAP2 Code of Ethics. For us, this commitment not only means following best practices, but also creating distinctive strategies of engagement that are unique to each project.

The community engagement process will involve two rounds of engagement activities involving stakeholders and rightsholders with vested interests in the project, as well as the general public (referred to collectively hereafter as "participants"). Indigenous and community concerns relating to peat harvesting has increased as per KGS's previous experience developing similar peat harvesting EAPs in Manitoba. Therefore, Indigenous and community involvement is an important part of the environmental assessment process to identify and address potential concerns early in the project approval process. SMM understands that an effective engagement strategy must fulfill the project goals as set out by EAP. This will be accomplished through a comprehensive communication and engagement framework, derived through a collaborative process with Sun Gro and the project team.

SMM will lead the engagement program and will be responsible for executing the public, stakeholder and rightsholder engagement plan, maintaining a communications log, developing a Participant Profile

of key stakeholders and rightsholders, and the design, coordination, and facilitation of participant meetings and public events. SMM's role will include the following.

- Providing participants with introductory project information regarding the proposed peat harvesting development.
- Providing participants with two options to select how they wish to be consulted.
- Gathering input from participants and the public about potential impacts, concerns, and general feedback.
- Communicating how input was addressed by the mitigation measures detailed in the EAP.

OVERALL ENGAGEMENT OBJECTIVES

The overall engagement objectives will be developed with and reviewed by the Project Team and may include, but not be limited to the following.

- Ensure an open and transparent process with clear communication.
- Establish trust and relationships with engagement participants.
- Provide key information clearly and consistently.
- Provide opportunities for early and meaningful engagement.
- Understand and address local community concerns pertinent to this project.
- Gather information from neighbouring First Nations to address any impacts to their Aboriginal Treaty Rights for hunting, fishing, trapping and gathering, as well as significant cultural or spiritual areas.

ENGAGEMENT EVENTS AND ACTIVITIES

Public, Stakeholder and Rightsholder Engagement Timeline



1. PROJECT TEAM COMMUNICATION METHODS AND MEETINGS

All project communication methods and materials will be vetted through KGS Group and Sun Gro. Check-in Sessions will be scheduled with the group and will be valuable for bringing flexibility to the project in both timing and technique. The goal is to ensure that project information is communicated to interested and affected parties and is suitable, consistent, and timely. SMM will coordinate and facilitate participant meetings and public events either in-person or virtually using the Zoom platform, pending current public health orders and preferences of participants.

The kick-off meeting will define project roles, refine/confirm project scope, gather input, and finalize the schedule. Subsequent meetings will take place prior to and between rounds of meetings to gain feedback and input on our process. SMM will coordinate information sharing which include email updates, scheduling and facilitating meetings with the Project Team.

2. MAINTAIN COMMUNICATIONS LOG

Throughout the project, SMM will document all inquiries, contact information, dates, follow-ups, responses, and action items etc. through a Communications Log. This Communications Log will be included in the final Engagement and Consultation Report. We will work together with the project team to refine our system accordingly and ensure consistent and timely responses. Where applicable, SMM will provide recommendations of mitigation measures in response to participant needs, wants, and concerns.

3. PARTICIPANT PROFILE

Before coordinating any engagement activities, SMM will create a Participant Profile listing possible participants with a particular interest in the project and the engagement process, their contact details, and their relationship to the project. The Participant Profile will identify all those with vested interest in the project, recognize their level of impact, and the identified the methods of engagement. This profile will be a living document and can be changed throughout the evolution of the project. Participants will be contacted directly to be informed of the upcoming ways to participate. The list of potential participants who will be invited to participate includes:

Indigenous Communities:

- Black River First Nation
- Brokenhead Ojibway Nation
- Sagkeeng Anicinabe First Nation
- Peguis First Nation
- Shoal Lake 40 First Nation
- Shoal Lake 39/ Iskatewizaagegan #39 Independent First Nation
- Manitoba Metis Federation

Communities and Municipalities:

- Rural Municipality of Brokenhead
- Rural Municipality of Lac du Bonnet
- Rural Municipality of Reynolds
- Rural Municipality of Springfeild
- Rural Municipality of Whitemouth
- Town of Beausejour
- Manitoba Trapper's Association Zone 4
- Snowman Inc. the Snowmobilers of Manitoba
- Brokenhead River Game and Fish Range
- All Terrain Vehicle Association of Manitoba

Other local organization:

SMM will collaborate with the project team to identify any additional stakeholders or rightsholders who may potentially be affected by the project. For more detail, refer to the Participant Profile document.

4. PARTICIPANT MEETINGS AND PUBLIC EVENTS

SMM will design, coordinate, and facilitate two rounds of engagement activities with all stakeholders and rightsholders from the finalized Participant Profile in the first round and with interested participants based on responses from the first round of engagement, along with members of the public, in the second round. The project team will meet with all interested participants in the requested format.

For in-person meeting requests, SMM will book all meeting venues, select the date and time of meetings and events, coordinate invitations to all stakeholders and rightsholders as identified in the Participant Profile, and develop any engagement materials necessary. Meetings will likely be held in a community hall, or similar venue. However, SMM is also prepared to quickly pivot to online engagement methods pending a sudden change in Covid-19 public health orders.

Additionally, SMM will document all comments and feedback received over the course of each meeting or event and prepare notes to be circulated amongst the wider project team following each round of engagement.

A. ROUND 1: LETTER AND PHONE CALLS CAMPAIGN

Goal:

Introduce the project to interested and affected parties, gather input on engagement preferences, foster project awareness, and share ideas.

Objectives

- Connect with interested and affected parties
- Provide information about the project location and process
- Determine interest in engagement
- Arrange opportunities for public engagement

Technique

A letter and project fact sheet will introduce the project and inform participants about the project and invite them to receive more information and offer feedback. The letter will suggest two common and effective options for consultation:

- i. A PowerPoint presentation with RM council, Chief and Council, or select members of their organization's leadership; or
- ii. A community meeting with the public-at-large or all community members.

The letter will be accompanied by a two-page fact sheet which will offer information on the project such as location of the peat bog, scope of impacts of peat harvesting activities, and opportunities for public engagement. Following the receipt of the letter, all stakeholders and

rightsholders will receive a follow up phone call to receive initial feedback and discuss about how they would like to be engaged.

B. ROUND 2: PARTICIPANT ENGAGEMENT (TWO OPTIONS)

Based on our experience from the Ramsay Bog, Evergreen 1, and other Interlake peat harvesting developments, we have provided two options for participants to further engage on the project, with opportunities to meet directly with leadership in government, or more broadly with the public-at-large, or community members of First Nations. The two options for engagement in round two are detailed below.

Option 1: Meeting with Government Leadership (Chief and Council or RM Council)

Goals:

To share project information and identify community priorities and concerns.

Objectives:

- Share key information on the project process, impacts, and mitigation measures
- Gain understanding of interests, needs, wants, and concerns
- Obtain feedback on process
- Review timeline and next steps
- Respond to comments and questions

Techniques:

An in-person or virtual meeting with representatives of community leadership (First Nations or Rural Municipality) will be hosted and facilitated SMM in collaboration with KGS Group. Depending on the desires of the community, this meeting may include a PowerPoint presentation with key project information or may be a structured conversation to discuss how the community would like to be engaged. KGS Group / SMM team members and Sun Gro personnel will be present to answer any question regarding the proposed development and respond to potential concerns.

Discussion and feedback from these meetings will be documented and summarized for distribution to the client and will be included in the final engagement report.

Additional consultation meetings and events will be facilitated, should they be requested by stakeholders or rightsholders, with approval from Sun Gro.

Option 2: Community Meetings with the public, stakeholders and rightsholders

Goals:

To share project information and identify community priorities and concerns.

Objectives:

- Share key information on the project process, impacts, and mitigation measures
- Gain understanding of interests, needs, wants, and concerns

- Obtain feedback on process
- Review timeline and next steps
- Respond to comments and questions

Techniques:

An in-person event or a virtual presentation using the ZOOM platform will be hosted by KGS Group and SMM staff. This presentation will include relevant images and graphics necessary to introduce the project, provide history and timeline information about peat processing in Manitoba, and describe the potential impacts and subsequent mitigation methods of the harvesting process.

Following a presentation, SMM will facilitate a discussion and invite participants to share their feedback, including how they may be impacted by the project and express their concerns, wants, and needs.

After the presentation, an online survey will be circulated to participants through which they can offer feedback on aspects of the project and the engagement process.

The meeting/presentation will be promoted throughout the community through email, posters, mailbox drops, radio ads, and social media posts.

5. Engagement and Consultation Report

The entire engagement program, including all engagement activities and communication materials, will be summarized in this report, along with all results from the participant meetings and public events. All materials will be documented in the report, including: the project fact sheet and letter, communication log, meeting and event invitations, participant meeting and public event presentation material, attendance records, presentation maps and figures, and all engagement activity notes. The report will provide data on and summarize the following.

- All individuals, groups, organizations, and communities that have been invited to engagement activities and have attended.
- The nature, scope, and content of engagement, including examples of the project fact sheet and letter.
- Information received by Sun Gro from the individuals, groups, organizations, and communities, including but not limited to concerns, issues, questions, advice (ecosystem and other), traditional land and resource use, and current land and resource use.
- Responses to concerns, issues, questions, and information provided to the Proponent, including meeting summaries and the Communication Log.
- As applicable, project changes that were made to accommodate concerns and issues raised, including potential impact to Treaty and Aboriginal rights.

APPENDIX B

Sun Gro Peat Harvesting - Julius Lake updated June 3, 2024 (EO)

Communication Log

Participant / Group	Contact Person	Email	Phone No.	Contact Type (i.e email, phone) [Contact Person] Date	Notes
Shoal Lake 40 First Nation (JL01)			1		
Shoal Lake 39/ Iskatewizaagegan #39 Independent First Nation					
RM of Brokenhead					
RM of Lac du Bonnet					
RM of Reynolds					

Engagement Plan	Meeting Notes Issued to Participants

Sun Gro Peat Harvesting - Julius Lake updated June 3, 2024 (EO)

Communication Log

Participant / Group	Contact Person	Email	Phone No.	Contact Type (i.e email, phone) [Contact Person] Date	Notes	Engagement Plan	Meeting Notes Issued to Participants
PM of Springfield							
	-						
RM of Whitemouth							
RW of Winterhouth							
	_						
T							
Town of Beausejour							
Brokenhead River							
Game and Fish							
Association							

۱ م ار Phone Call Notes

Name of Organization/FN/RM:	Shoal Lake 40 FN
Who did you speak with?	
Who is the best person to spea	k with?
Do they want a meeting?	YES / NO

Details/Comments:



If they need the info sent again, what is their correct contact info?



Other Notes:

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Sun Gro Peat Harvesting - Sugar Creek + Julius Lake Combined Participants updated June 3 2024 (EO)

Communication Log

Participant / Group	Contact Person	Email	Phone No.	Contact Type (i.e email, phone) [Contact Person] Date		Notes
		T	Ι	1	T	
Black River First Nation (SCJL01)						
Brokenhead Ojibway Nation						
	_					
Peguis First Nation						
(SCJL05)						
Sagkeeng First Nation (SCJL02)						

Engagement Plan	Meeting Notes Issued to Participants

Sun Gro Peat Harvesting - Sugar Creek + Julius Lake Combined Participants updated June 3 2024 (EO)

Communication Log

Participant / Group	Contact Person	Email	Phone No.	Contact Type (i.e email, phone) [Contact Person] Date	Notes	Engagement Plan	Meeting Notes Issued to Participants
Manitoba Metis Federation							
Manitoba Trappers Association Zone 4 (SCJL03)							
Snoman Inc. (SCJL04)							
All Terrain Vehicle Association							

SCJL 01

Phone Call Notes

Name of Organization/FN/RM	Black	River	First	Nation	
Who did you speak with? _					
Who is the best person to spea	ں k with?				
Do they want a meeting?	YES / NO				

Details/Comments:

If they need the info sent again, what is their correct contact info?

Other Notes:

SCJL 02

Phone Call Notes

Name of Organization/FN/RN	1: Saakeen	o First	Nation	<u> </u>		
Who did you speak with?						
Who is the best person to spe	ak with?	<u>.</u>	<u> </u>	<u> </u>	-	_
Do they want a meeting?	YES / NO					

Details/Comments:

If they need the info sent again, what is their correct contact info?

_	

Other Notes:

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SCJL 03

Phone Call Notes

Name of Organization/FN/RM: Manitoba Trappens Association	<u>م</u>
Who did you speak with?	
Who is the best person to speak with?	
Do they want a meeting? YES / NO	
· · · · · · · · · · · · · · · · · · ·	

Details/Comments:



·_____

If they need the info sent again, what is their correct contact info?

Other Notes:

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SCJLOY

Phone Call Notes

Name of Organization/FN/RM:	
Who did you speak with?	
Who is the best person to speak with?	
Do they want a meeting? (YES) NO	
Details/Comments:	

If they need the info sent again, what is their correct contact info?

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-	

Other Notes:

scs। ०४५ Phone Call Notes

Name of Organization/FN/RM	1: Pequis	First	Nation		
Who did you speak with? _				 	<u> </u>
Who is the best person to spe	ak with?			 	
Do they want a meeting?	YES / NO				

Details/Comments:

al matrixed style and the styl
f they need the info sent again, what is their correct contact info?

Other Notes:

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APPENDIX C

Harvesting Process:



Existing surface vegetation is removed from the site.



Drainage systems are constructed to lower the water content of the peat to be harvested.



The harvest area is leveled, crowned, and harrowed.



Peat is now able to be harvested.

Why is Peat Harvesting Important?

Peat is used for:



Improving Green Spaces

Plants are nurtured by peat moss, beautifying our parks, green spaces, gardens and patios. Plant-filled green spaces improve our outdoor environment.



Producing Food

Many of North America's commercial growers rely on high-quality peat moss and peat-based growing medium to produce food, such as tomatoes.



Starting Seeds

Peat moss is valued by horticulturalists because it can retain a high level of moisture and oxygen without becoming waterlogged or heavy. It is an ideal choice to start seeds.

Peat Moss Facts:

- Canada has more than 113 million hectares of peatlands (25% of the world's supply).
- Less than 0.03% of Canadian peatlands have been harvested
- The amount of peat moss harvested from Canadian peatlands every year is nearly 60 times less than the total annual accumulation of new peat moss.



Our Expertise is Growing[®]



Who is Sun Gro Horticulture?

Sun Gro is committed to maintaining Canadian peatlands as an abundant renewable resource. Only bogs that can be restored are selected to be harvested, and are restored as soon as possible after harvesting. **Mission:** Sun Gro Horticulture's mission is to be an industry leader in soilless growing mixes, serving horticultural professionals, retailers, and gardeners with superior quality, branded growing mixes that yield exceptional results.

Environmental Values:

Sun Gro employs the newest research, developments and management practices to ensure this valuable natural resource remains plentiful and renewable.

PAGE 1

What is the Julius Lake West Project?





The Project

The proposed project includes harvesting up to 124 ha of peat at the Julius Lake West sub-area, within the existing the Peat Harvesting Licence (PHL) 3. The harvest area is anticipated to be in operation for 13 years.

Harvested peat will be transported to a peat processing facility where it is prepared and packaged for horticultural purposes. Obtaining an Environment Act Licence is a requirement for proposed peat harvesting developments.

KGS will be assessing:

- Air quality
- Soil integrity/quality
- Surface water quality
- Wetland health
- Groundwater quality
- Aquatic & terrestrial vegetation
- Wildlife
- Fish & fish habitats
- Social & economic considerations



We want to hear from you.

KGS Group and Scatliff + Miller + Murray would like to invite you to provide feedback regarding the proposed development.

Your responses may be addressed, mitigated and/ or incorporated into the Environment Act Proposal. If you have questions or comments, please do not hesitate to contact Elise Ouellette at Scatliff + Miller + Murray.

(204) 927-3444 ext. 251
 ☑ EOuellette@scatliff.ca



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visionary urban design + landscapes

January 17, 2024

Rural Municipality of Brokenhead PO Box 490 72013 Road 42E Beasujour, Manitoba R0E 0C0

Attention: Sheila Mowat (CAO)

RE: Sun Gro Horticulture Canada Ltd. Environment Act Proposal Julius Lake West Peat Harvesting

Dear Sheila Mowat:

KGS Group (KGS) and Scatliff + Miller + Murray (SMM) are submitting this letter on behalf of Sun Gro Horticulture Canada Ltd. (Sun Gro). We are preparing an Environment Act Proposal (EAP) for peat harvesting of the Julius Lake West sub-area within an existing Sun Gro Peat Harvest Licence (PHL) 3. Obtaining an Environment Act Licence is a requirement for proposed peat harvesting developments. KGS and SMM are issuing this letter, and accompanying fact sheets to provide a brief description of the project.

KGS and SMM would like to offer Rural Municipality (RM) of Brokenhead the opportunity to provide comments or questions they have regarding the proposed development to be addressed and incorporated into the EAP. We would like to offer some options for facilitating a conversation, providing project information, identifying your community's priorities, and hearing your feedback. You may select one or both of your choosing. Here are two engagement choices we offer for your consideration:

- 1. Leadership Meeting An in-person or virtual meeting with RM Council members and other community members (as identified by RM Council), to learn about key project information, and to hear comments and questions regarding the proposed development from members of leadership.
- 2. Community Meeting An in-person or virtual event with the community that will include a presentation by our team with relevant images and graphics to introduce the project, provide context and information about peat processing in Manitoba, and describe the potential effects and mitigation methods to reduce potential effects of the harvesting process.

The Environmental Assessment process will consider environmental concerns for the project, and be carried out based on project information provided by Sun Gro and advisory documents from Manitoba Environment and Climate. Additional considerations will include: environmental information acquired from published and online literature, publications by the peat industry and environmental organizations, discussions with federal and provincial government representatives, engagement with stakeholders, and site investigations which have been conducted by the project team. The proposed peat development is located in the Rural Municipality (RM) of Reynolds, north of Highway 15 and east of the Brokenhead River (see fact sheet map). The sub-area is 177 ha in size, within which up to 124 ha may be harvested, considering buffer areas at sub-area boundaries. Direct and indirect biological and physical environmental effects of the project will be considered within the project study areas, covering a 3 km radius beyond the sub-area boundary (4,606 ha). Socio-economic effects will be considered in the regional study area, covering a 10 km radius beyond the sub-area boundary (36,894 ha; Figure 1).

Further information can be found on the attached fact sheet about Peat Harvesting, Sun Gro, and Julius Lake West Bog.

The scope of the project will include planning, designing, constructing, operating, and maintaining, as well as the eventual decommissioning and restoration of the proposed peat harvesting at Julius Lake West sub-area.

Julius Lake West has an estimated 13 years of peat capacity which can be harvested over that time, starting once licensing and permitting requirements have been fulfilled. Major project activities will include: providing site access, clearing vegetation and surface soils, constructing drainage systems, stockpiling unprocessed peat; and transporting, restoring, and reclaiming harvested peatland.

The assessment for the proposed development will include identification, analysis, and mitigation of adverse environmental effects of the project, and evaluation of the significance of residual environmental effects. This will consist of both direct and indirect biophysical and socio-economic effects. The need for the project, alternatives, and requirements for a follow-up will be considered in the assessment.

Potential environmental concerns being considered in the EAP include: air quality; soil integrity and quality; surface water quality; wetland health; groundwater quality; aquatic and terrestrial vegetation (with special emphasis on species of conservation concern); wildlife (with special emphasis on species of conservation concern); fish and fish habitat; and social and economic conditions associated with the proposed development.

If you are interested in a **Leadership Meeting** and/or **Community Meeting**, please let us know as soon as possible, or at the latest, by February 16, 2024. We would love to meet with you between February 26 - March 8, 2024.

After the meeting, if you prefer to submit your comments in writing, please do so within one month of the meeting date, as a draft of the EAP will be issued for review soon after that time. Any comments received after that date will only be included into the final EAP submission to Manitoba Environment and Climate who will post the document on the Public Registry for review.

Should you have any questions or comments, please do not hesitate to contact the undersigned at (204)-927-3444 ext. 251 or via email at EOuellette@scatliff.ca.

Sincerely,

Elise Ouellette Public Engagement Support Scatliff+Miller+Murray

APPENDIX D

Harvesting Process:



Existing surface vegetation is removed from the site.



Drainage systems are constructed to lower the water content of the peat to be harvested.



The harvest area is leveled, crowned, and harrowed.



Peat is now able to be harvested.

Why is Peat Harvesting Important?

Peat is used for:



Improving Green Spaces

Plants are nurtured by peat moss, beautifying our parks, green spaces, gardens and patios. Plant-filled green spaces improve our outdoor environment.



Producing Food

Many of North America's commercial growers rely on high-quality peat moss and peat-based growing medium to produce food, such as tomatoes.



Starting Seeds

Peat moss is valued by horticulturalists because it can retain a high level of moisture and oxygen without becoming waterlogged or heavy. It is an ideal choice to start seeds.

Peat Moss Facts:

- Canada has more than 113 million hectares of peatlands (25% of the world's supply).
- Less than 0.03% of Canadian peatlands have been harvested
- The amount of peat moss harvested from Canadian peatlands every year is nearly 60 times less than the total annual accumulation of new peat moss.



Our Expertise is Growing[®]



Who is Sun Gro Horticulture?

Sun Gro is committed to maintaining Canadian peatlands as an abundant renewable resource. Only bogs that can be restored are selected to be harvested, and are restored as soon as possible after harvesting. **Mission:** Sun Gro Horticulture's mission is to be an industry leader in soilless growing mixes, serving horticultural professionals, retailers, and gardeners with superior quality, branded growing mixes that yield exceptional results.

Environmental Values:

Sun Gro employs the newest research, developments and management practices to ensure this valuable natural resource remains plentiful and renewable.

PAGE 1

What is the Sugar Creek Project?

Timeline



The Project

The proposed project includes harvesting up to 750 ha of peat at the Sugar Creek B, C, D and E subareas within the existing the Peat Harvesting Licence (PHL) 4. The harvest area is anticipated to be in operation for 37 years. Harvested peat will be transported to a peat processing facility where it is prepared and packaged for horticultural purposes. Obtaining an Environment Act Licence is a requirement for proposed peat harvesting developments.

KGS will be assessing:

- Air quality
- Soil integrity/quality
- Surface water quality
- Wetland health
- Groundwater quality
- Aquatic & terrestrial vegetation
- Wildlife
- Fish & fish habitats
- Social & economic considerations



What is the Julius Lake West Project?





The Project

The proposed project includes harvesting up to 124 ha of peat at the Julius Lake West sub-area, within the existing the Peat Harvesting Licence (PHL) 3. The harvest area is anticipated to be in operation for 13 years.

Harvested peat will be transported to a peat processing facility where it is prepared and packaged for horticultural purposes. Obtaining an Environment Act Licence is a requirement for proposed peat harvesting developments.

KGS will be assessing:

- Air quality
- Soil integrity/quality
- Surface water quality
- Wetland health
- Groundwater quality
- Aquatic & terrestrial vegetation
- Wildlife
- Fish & fish habitats
- Social & economic considerations



We want to hear from you.

KGS Group and Scatliff + Miller + Murray would like to invite you to provide feedback regarding the proposed development.

Your responses may be addressed, mitigated and/ or incorporated into the Environment Act Proposal. If you have questions or comments, please do not hesitate to contact Elise Ouellette at Scatliff + Miller + Murray.

(204) 927-3444 ext. 251
 ☑ EOuellette@scatliff.ca



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Dauphin		
Lake Manitoba		
Brandon	Winnipeg	75
		km

LEGEND:

	Road
	Railway
	Provincial Road
	River
	Sugar Creek Sub-Area Boundary
	Study Area
	Regional_Area
$\overline{}$	First Nation
	Provincial Forest
	Rural Municipality
	Rural Municipality Boundary
	Provincial Parks
	Wildlife Managment Areas

- NOTES: 1. All units are metric and in metres unless otherwise specified Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).
- Entire map extent is within the Peguis First Nation Community Interest Zone with the exception of the small area within the Hecla/Grindstone Provincial Park



SCALE: 1:128,000 METRIC 11"x17"

All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

22/11/10 ISSUED FOR REVIEW SFM DL DESCRIPTION ISSUED CHECK BY BY REVISIONS / ISSUE KGS SUNGIO SUGAR CREEK ENVIRONMENT ACT PROPOSAL REGIONAL SITE LOCATION

NOVEMBER 2022

FIGURE 01

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JULIUS LAKE WEST FIGURE 01, PAGE 5

FIGURE 01

А
visionary urban design + landscapes

January 17, 2024

All Terrain Vehicle Association of Manitoba PO Box 40110, RPO Lagimodiere Winnipeg, Manitoba R2C 4P3

Attention: All Terrain Vehicle Association of Manitoba (ATVMB) President

RE: Sun Gro Horticulture Canada Ltd. Environment Act Proposal Sugar Creek & Julius Lake West Peat Harvesting

Dear ATVMB President:

KGS Group (KGS) and Scatliff + Miller + Murray (SMM) are submitting this letter on behalf of Sun Gro Horticulture Canada Ltd. (Sun Gro). We are preparing an Environment Act Proposal (EAP) for a peatland development of the Sugar Creek sub-areas B, C, D, and E, and conducting engagement for two additional harvesting areas associated with Ramsay Point Bog within an existing Sun Gro Peat Harvest Licence (PHL) 4, and peat harvesting of the Julius Lake West sub-area within an existing Sun Gro PHL 3.

Obtaining an Environment Act Licence is a requirement for proposed peat harvesting developments. KGS and SMM are issuing this letter and accompanying fact sheets to provide a brief description of the project.

KGS and SMM would like to offer ATVMB the opportunity to provide comments or questions they have regarding the proposed developments to be addressed and incorporated into the EAP. We would like to offer some options for facilitating a conversation, providing project information, identifying your community's priorities, and hearing your feedback. You may select one or both of your choosing. Here are two engagement choices we offer for your consideration:

- 1. Leadership Meeting An in-person or virtual meeting with ATVMB's leadership and other community members (as identified by the leadership), to learn about key project information, and to hear comments and questions regarding the proposed development from members of leadership.
- 2. **Community Meeting** An in-person or virtual event with the community that will include a presentation by our team with relevant images and graphics to introduce the project, provide context and information about peat processing in Manitoba, and describe the potential effects and mitigation methods to reduce potential effects of the harvesting process.

The Environmental Assessment process will consider environmental concerns for the project, and be carried out based on project information provided by Sun Gro and advisory documents from Manitoba Environment and Climate. Additional considerations will include: environmental information acquired from published and online literature, publications by the peat industry and environmental organizations, discussions with federal and provincial government representatives, engagement with stakeholders, and site investigations which have been conducted by the project team.

Proposed Peat Development Locations

The proposed Sugar Creek peat development is located on Provincial Crown land within the Rural Municipality of Bifrost-Riverton and the Moose Creek Provincial Forest, west of Lake Winnipeg in close proximity to Washow Bay (Fact Sheet Figure 1). The sub-areas are 1,810 ha in size, within which up to 750 ha may be harvested, considering buffer areas at sub-area boundaries. Direct and indirect biological and physical environmental effects of the project will be considered within the project study areas, covering a 3 km radius beyond the sub-area boundary (10,736 ha). Socio-economic effects will be considered in the regional study area, covering a 10 km radius beyond the sub-area boundary (53,339 ha; Sugar Creek Figure 01).

Sugar Creek has an estimated 37 years of peat capacity which can be harvested over that time, starting once licensing and permitting requirements have been fulfilled. Major project activities will include: providing site access, clearing vegetation and surface soils, constructing drainage systems, stockpiling unprocessed peat; and transporting, restoring, and reclaiming harvested peatland.

Sun Gro also wishes to develop two additional harvesting areas associated with the existing Ramsay Point Bog Environment Act Licence (EAL; License #2964 ER). At the time of issuing the EAL for Ramsay Point Bog, the Province was in the process of transitioning to new regulations and Quarry Leases (QLs) which were in progress were included in Schedule B of the Manitoba Peatland Stewardship Act. QLs 2441 (65 ha) and 2460 (64 ha) are not currently included in PHL 4, however, licenced peat harvest areas can be amended by including QLs listed on Schedule B. Sun Gro wish to engage communities on the amendment of the PHL 4 to include the two QLs noted above.

The proposed Julius Lake West peat development at Julius Lake West sub-area is located in the Rural Municipality (RM) of Reynolds, north of Highway 15 and east of the Brokenhead River (see fact sheet map). The sub-area is 177 ha in size, within which up to 124 ha may be harvested, considering buffer areas at sub-area boundaries. Direct and indirect biological and physical environmental effects of the project will be considered within the project study areas, covering a 3 km radius beyond the sub-area boundary (4,606 ha). Socio-economic effects will be considered in the regional study area, covering a 10 km radius beyond the sub-area boundary (36,894 ha; Julius Lake West Figure 01).

Julius Lake West has an estimated 13 years of peat capacity which can be harvested over that time, starting once licensing and permitting requirements have been fulfilled. Major project activities will include: providing site access, clearing vegetation and surface soils, constructing drainage systems, stockpiling unprocessed peat; and transporting, restoring, and reclaiming harvested peatland.

Project Scope & More Information

The scope of the projects will include planning, designing, constructing, operating, and maintaining, as well as the eventual decommissioning and restoration of the proposed peat harvesting at Sugar Creek sub-areas B, C, D, and E, and at the Julius Lake West sub-area.

Further information can be found on the attached fact sheet about Peat Harvesting, Sun Gro, Sugar Creek, and Julius Lake West.

The assessment for the proposed developments will include identification, analysis, and mitigation of adverse environmental effects of the project, and evaluation of the significance of residual environmental effects. This will consist of both direct and indirect biophysical and socio-economic effects. The need for the project, alternatives, and requirements for a follow-up will be considered in the assessment.

Potential environmental concerns being considered in the EAPs include: air quality; soil integrity and quality; surface water quality; wetland health; groundwater quality; aquatic and terrestrial vegetation (with special emphasis on species of conservation concern); wildlife (with special emphasis on species of conservation concern); wildlife (with special emphasis on species of conservation concern); fish and fish habitat; and social and economic conditions associated with the proposed development.

If you are interested in a **Leadership Meeting** and/or **Community Meeting**, please let us know as soon as possible, or at the latest, by February 16, 2024. We would love to meet with you between February 26 - March 8, 2024.

After the meeting, if you prefer to submit your comments in writing, please do so within one month of the meeting date, as a draft of the EAP will be issued for review soon after that time. Any comments received after that date will only be included into the final EAP submission to Manitoba Environment and Climate who will post the document on the Public Registry for review.

Should you have any questions or comments, please do not hesitate to contact the undersigned at (204)-927-3444 ext. 251 or via email at EOuellette@scatliff.ca.

Sincerely,

Elise Ouellette Public Engagement Support

APPENDIX E



Hi

Thank you for your patience. At this time, we are conducting proponent-led engagement. While this is not a requirement of the EAP process, it is being conducted with the objective of identifying Indigenous interests and concerns with the project so that we can propose accommodation and mitigation measures early in the process.

The purpose of our initial meeting with Sagkeeng is to present project information and obtain initial feedback prior to completing and submitting the EAP. Currently, there are no technical documents to provide Sagkeeng prior to the meeting, as the EAP is the technical document that will be prepared assessing project effects. However, we can provide the draft Aquatic Assessment that was completed for Sugar Creek, and the draft Vegetation and Wildlife Species Summary Tables completed for both Sugar Creek and Julius Lake.

So far, funding has not been provided to any other communities we met with for the initial meeting. We believe this initial meeting will help us discuss all the points put forward by you in your previous email with the Sun Gro representatives. Would you be amenable to scheduling the first meeting during which Sagkeeng can identify additional steps required and their associated budget needs based on the information? This will be evaluated by Sun Gro prior to the EAP submission to identify accommodation and mitigation measures early in the process. Once the EAP is submitted, the Province will initiate the formal Duty to Consult process through which provincial funding is made available.

The first meeting will give Sagkeeng the opportunity to initiate the conversation regarding the IBA, to be followed up by Sun Gro.

Please let me know if you would like to proceed with setting up this initial meeting and your team's availability over the next two weeks for coordination.

Kind regards,

Elise Ouellette (she/her), BEnvD, MLA Landscape Designer



visionary urban design + landscapes

204.927.3444 ext 251 I <u>eouellette@scatliff.ca</u> I <u>www.scatliff.ca</u> 1120-201 Portage Avenue I Winnipeg, Manitoba I R3B 3K6



Sent: Wednesday, March 27, 2024 11:15 AM To: Elise Ouellette

Cc:

Subject: RE: Sun Gro EAP - Sugar Creek and Julius Lake West

Hi Elise,

Thanks for the reply. Sagkeeng wants to make sure that the engagement process is meaningful, and not just checking boxes. To make sure it's meaningful, they'll need to be provided with the relevant technical documents in advance, and an understanding of what potential impacts might result from the project to Sagkeeng's rights, and the environment. This is best done by providing your technical documents, and funding for Sagkeeng to retain an independent technical advisor, but can also happen through a preliminary meeting where your team presents the information. After that, Sagkeeng will take the necessary steps to collect feedback from leadership and community members, and provide its knowledge to you in a way that will best facilitate protection of its rights.

I would suggest planning for at least 3 meetings – one for you to present the initial proposal and potential impacts, a second to discuss those potential impacts and Sagkeeng's views on them, and the third to discuss potential accommodation measures/changes to the project to prevent, mitigate and/or compensate/offset for those impacts.

Sagkeeng will need to be provided with a budget to fund this work. The budget will cover meeting costs, including honoraria for elders.

If that works for your team, I can get dates from Council for when they're available for the first meeting.

In terms of the IBA – Impact Benefit Agreements are standard practice in natural resource projects across Canada, including Manitoba. They provide companies with certainty that their project will be supported by its Indigenous neighbours (sometimes called 'social license') and in exchange, assures the affected Indigenous communities that their rights will be protected, and that they will benefit from the resources being extracted from their territory. Premier Kinew has spoken several times since his recent election about the Manitoba government's support for IBAs, and their importance to ensuring successful projects. Happy to share more information if there are specific questions.

Thanks very much,



Partner at Olthuis Kleer Townshend LLP.



Good afternoon

Thank you for you email dated March 19. I appreciate your patience in my response.

The EAP has not yet been submitted and there is still time to organize a meeting with Sagkeeng. Could you please verify whether they want a community meeting or a leadership meeting and provide possible dates that would work for them.

Sun Gro has indicated that they want further clarification about the IBA – could you please provide me with more information, and I will pass to them. Alternatively, this can be discussed at the meeting.

Thank you,

Elise Ouellette (she/her), BEnvD, MLA Landscape Designer

SCATLIFF + MILLER + MURRAY

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204.927.3444 ext 251 I <u>eouellette@scatliff.ca</u> I <u>www.scatliff.ca</u> 1120-201 Portage Avenue I Winnipeg, Manitoba I R3B 3K6

From:

Sent: Tuesday, March 19, 2024 11:14 AMTo: Elise OuelletteSubject: Sun Gro EAP - Sugar Creek and Julius Lake West

Hello Elise,

I am writing on behalf of Sagkeeng First Nation in response to your letter dated January 17, and received by Sagkeeng on February 7th. Can you please advise on the status of the EAP, and whether there is an opportunity for Sagkeeng to be consulted on its development?

Sagkeeng is also interested in speaking with your client (the proponent) directly to discuss the possibility of an impact benefit agreement (IBA) with respect to this project. Could you please put us in touch with them?



Partner at Olthuis Kleer Townshend LLP.

Click here to schedule a meeting with me: Don't you hate going back and forth by email to schedule a quick check-in? Just click here to access my availability, find a time that works for you, and have an invite automatically sent to both our calendars.

250 University Avenue, 8th Floor Toronto, ON M5H 3E5

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APPENDIX F



MANITOBA MÉTIS FEDERATION

300 - 150 Henry Ave., Winnipeg, Manitoba R3B 0J7 Phone: (204) 586-8474 Fax: (204) 947-1816 Website: www.mmf.mb.ca

David Chartrand, LL.D. (hon), O.M. President

January 18, 2024

VIA E-MAIL

Ms. Elise Ouellette Landscape Designer Scatliff + Miller + Murray Suite 1120-201 Portage Avenue Winnipeg, MB R3B 3K6

Dear Ms. Ouellette:

Re: Sun Gro Horticulture Canada Ltd. Environmental Act Proposal ("EAP"), Peatland Development, Sugar Creek sub-areas B, C, D, and E, and Engagement regarding Ramsay Point Bog and Julius Lake West Bog

I am writing to you on behalf of the Manitoba Métis Federation ("MMF")—the National Government of the Red River Métis, also known as the Manitoba Métis—to outline the MMF's concerns with respect to the preparation of an EAP for peatland development and engagement regarding peat harvesting within Ramsay Point Bog and Julius Lake West Bog. A project-specific response will be forthcoming.

Specifically, the MMF is deeply concerned with the lack of respect shown by Sun Gro Horticulture Canada Ltd., KGS Group, and Scatliff + Miller + Murray towards the Red River Métis and our constitutionally protected rights and interests because of your failure to follow the Resolution No. 8 despite our previous correspondence.

The Red River Métis are a distinct Indigenous People, Canada's Negotiating Partner in Confederation and Founders of the Province of Manitoba. As you are aware, in 2007 the MMF adopted Resolution No. 8, setting out the framework for engagement and consultation with the Red River Métis. In engaging the MMF, on behalf of the Red River Métis, the Resolution No. 8 framework calls for the implementation of five phases.

Phase I: Notice and Response; Phase II: Research and Capacity; Phase III: Engagement and Consultation; Phase IV: Partnership and Accommodation; and, Phase V: Implementation. The Engagement and Consultation Department works to ensure a distinctions-based approach and sets out the community's expectations for appropriate consultation and engagement by the Crown and Proponents. The Department ensures any decision or project that may affect our collective Métis rights, interests and claims is addressed in matters related to engagement, consultation, and accommodation.

The proposed Projects are located within the Recognized Métis Harvesting Area - an area in which the provincial Crown has recognized the *Section 35* Métis harvesting rights of our Community, including hunting, trapping, fishing and gathering for food and domestic use. Our Citizens, including harvesters, continue to use and rely on this area to exercise their rights today. Therefore, a full, proper, and meaningful engagement process with the MMF on behalf of the Red River Métis community through the processes as set out above will need to be followed.

Please note the MMF Project lead will be Madelynn Perry, Mines and Minerals Coordinator within our Energy, Infrastructure, and Resource Management Department. Please contact her via telephone at 204-955-4098, or via email at <u>madelynn.perry@mmf.mb.ca</u> if you have any questions regarding this letter.

The MMF looks forward to working collaboratively with KGS Group and Scatliff + Miller + Murray on this Project to ensure that Métis-specific information and concerns are gathered from the Community through a full, proper, and meaningful engagement.

Best regards,

Original signed by

Jasmine Langhan Director of Engagement & Consultation

/MS

Cc: MMF President's Office Marci Riel; Senior Director, EIRM Madelynn Perry; Mines and Mineral Coordinator, EIRM

SCATLIFF + MILLER + MURRAY

visionary urban design + landscapes

January 31, 2024

Ms. Madelynn Perry Mines and Minerals Coordinator Manitoba Metis Federation 300-150 Henry Avenue Winnipeg, MB R3B 0J7

RE: Sun Gro Horticulture Canada Ltd. Environment Act Proposal, Peatland Development, Sugar Creek sub-areas B, C, D, and E, and Engagement regarding Ramsay Point Bog and Julius Lake West Bog

Dear Ms. Perry:

Our sincere thanks to the Manitoba Metis Federation (MMF) for the response and confirmation of receipt of Scatliff + Miller + Murray's (SMM) letter, on behalf of KGS Group, regarding Sun Gro Horticulture Canada Ltd. (Sun Gro) Environment Act Proposal (EAP). The EAP is in preparation for peatland development of the Sugar Creek sub-areas B, C, D, and E, and conducting engagement for two additional harvesting areas associated with Ramsay Point Bog within an existing Sun Gro Peat Harvest Licence (PHL) 4, and peat harvesting of the Julius Lake West sub-area within an existing Sun Gro PHL 3.

We recognize the distinctive identity of the Manitoba Metis Community with rights and interests that are protected in Section 35 of the *Constitution Act, 1982,* throughout Manitoba. We extend our sincere apologies for not adhering to Resolution No. 8. It was never our intention to disrespect the Red River Métis. We acknowledge the need to strengthen our internal understanding of Resolution 8 and its application within the context of this EAP. Steps are being taken to better educate our team.

Since your response on January 18, 2024, we have collaborated internally to assess how we can modify the current engagement process to align with MMF's Resolution 8 more closely. We understand that the resolution advocates for a distinctions-based approach to engagement in the Province and outlines the community's expectations for appropriate consultation and engagement through the implementation of the five phases mentioned in your letter. We also recognize that each phase must be successfully completed before progressing to the next, as they engage different levels of the MMF governance structure. We are committed to working collaboratively with the MMF, making sure that we are better adhering to Resolution 8 hereafter, as we continue to prepare this EAP.

We kindly request your consideration to:

- Initiate Phase 1: Notice and Response of Resolution 8 based on our submitted letter and factsheets regarding Julius Lake and Sugar Creek dated January 17, 2024.
- Table questions concerning engagement dates and time until after the completion of Phase 2: Research and Capacity.

We will initiate Phase 2 of Resolution 8 only after MMF has had the opportunity to conduct a preliminary technical review of the information provided, identifying appropriate rights holders for engagement during this EAP preparation. We appreciate your understanding and cooperation as we strive to ensure meaningful engagement with the Red River Métis Community.

Kindly let us know if you are amenable to this modification and the subsequent steps to continue this engagement process.

Thank you for your time and consideration.

Should you have any questions or comments, please do not hesitate to contact me at (204)-927-3444 ext. 242 or via email at smada@scatliff.ca.

Sincerely,



On behalf of Elise Ouellette Sanjana Mada, M.Plan Public Engagement Specialist

Cc: MMF President's Office Jasmine Langhan, Director of Engagement & Consultation, MMF Marci Riel, Senior Director, EIRM Madelynn Perry, Mines and Mineral Coordinator, EIRM Shaun Moffatt, Senior Environmental Scientist, KGS Group Cheryl Dixon, Public Engagement Specialist, SMM Elise Ouellette, Public Engagement Specialist, SMM

MANITOBA MÉTIS FEDERATION WORK-PLAN AND BUDGET

April 8, 2024

Red River Métis Engagement

The Manitoba Métis Federation (MMF) intends to undertake Red River Métis engagement specific to Sun Gro's Environment Act Proposal (EAP) for peatland development of the Sugar Creek sub-areas B, C, D, and E, two additional harvesting areas associated with Ramsay Point Bog within an existing Sun Gro Peat Harvest Licence (PHL) 4, and peat harvesting of the Julius Lake West sub-area within an existing Sun Gro PHL 3. The engagement will consist of a community meeting that will focus on Sun Gro's EAP, long-term planning, harvesting, and road access development in the proposed peatland development areas. Through the engagement, the MMF will document Red River Métis comments, questions, concerns, and recommendations.

The capacity support will also be used to prepare a high-level summary of Red River Métis specific perspectives that includes the results from the community engagement meeting.

Meeting Format

- 1. MMF staff opens and facilitates the meeting.
- 2. Present information and answer questions relevant to the proposed EAP and the additional harvest areas within PHL 3 and 4.
- 3. MMF meets with Red River Métis Citizens to discuss the information and collect comments, questions, concerns, and recommendations to mitigate or accommodate potential impacts.

ITEM	DETAILED BREAKDOWN (of Total Cost)	SUBTOTAL	TOTAL COST
Honoraria Includes honoraria paid for Red River Métis Citizens	 Honoraria Honoraria for community meetings with up to 50 participants \$50.00 per meeting/interview 	\$2,500	\$2,500
Travel Includes travel, accommodation, and meal costs for Citizens and staff to attend meeting	50 Red River Métis Citizens - Travel = \$0.40 per km x 50 km x 50 participants = \$1,000	\$1,000	\$1,000

Meeting Facilities and Catering	Meeting facility - \$1,000 Catering - \$1,000	\$1,000 \$1,000	\$2,000
Community Meeting Costs associated with community meeting, printing, and promotion	 Meeting Materials Creation of outreach materials, including survey Coordination of community meeting with Red River Métis Citizens 	\$2,000	\$2,000
Documentation and Reporting One report	The report will summarize Red River Métis traditional knowledge, land use and occupancy within proposed peatland development areas and summarize Red River Métis comments, questions, concerns and recommendations to mitigate or accommodate potential impacts identified during the engagement meeting.	\$9,000	\$9,000
Administrative	Clerical and financial support services associated with managing funds, monitoring invoices, dispersing payments, tracking expenditures, and ensure activities are within agreed deliverables and budget.	\$2,475	\$2,475
Total:			\$18,975

APPENDIX G

Environment Act Proposal for a peatland development at Julius Lake West

March, 2024



Presentation Outline

- 1. Our Process
- 2. Overview of Peatland Development
- 3. Who is Sun Gro Horticulture?
- 4. The Projects
- 5. The Environmental Assessment Process
- 6. Typical Environmental Issues and Mitigation Measures
- 7. Questions?



SCATLIFF + MILLER + MURRAY



Our Process

- KGS Group is:
 - preparing seperate Environment Act Proposal (EAP) for the following peatland development site:
 - i. Julius Lake West (JLW) sub-area



Our Process

- The EAP process will consider biophysical environmental effects of the project (3km radius surrounding the sub-area)
- The EAP process will consider Socio-Economic effects of the project (10km radius surrounding the sub-area)
- We want to hear your comments and feedback as part of the EAP process



Peatlands in Canada & Manitoba

Canada

- covers 113 million ha (25% of global peatlands)
- 70 million tonnes of new peat created per year
- < 0.03% has been harvested to date
- more peat is created than is harvested (60 times more)

Manitoba:

- covers 20 million ha (or 17% of Canada's peatlands)
- peat harvesting started in 1940 at Julius Bog
- Manitoba = 13% of national production
- see map for active peat producers



Current Manitoba Peat Harvest Licences (April 2015)

How is Peat Harvested?



Remove existing surface vegetation



2 Construct drainage to lower water content of peat



Levelling, crowning, harrowing, and drying of harvest area



4 Dried surface peat is vacuum harvested, screened, baled, packaged, and shipped

Why is Peat Harvesting Important?



Improves Growing Conditions

- regulates moisture, air, and nutrients around plant roots.
- loosens heavy soils which enables proper root growth.
- helps bind and retain moisture and nutrients in sandy soils.



Improves Green Spaces

Plants are nurtured by peat moss, which helps improve our environment.



Saves Water During Growing

Peat moss retains up to 20 times its weight in moisture and releases water slowly as seeds and plants need it.



Food Production

Commercial growers rely on high quality peat moss and peat based growing media to produce food.

Industries Sun Gro's Peat Products Support





Who is Sun Gro Horticulture?

History:

Formed in 1929, Sun Gro currently operates 22 production facilities across North America and handles thousands of tons of peat per year.

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To be an industry leader in soilless growing mixes, serving horticultural professionals, retailers, and gardeners with superior quality, branded growing mixes that yield exceptional results.

A commercial grower leader:

Sun Gro has created the highest quality, most advanced mixes, and peat products for consumers and professional growers across North America.





sustainable peatland management







Sun Gro's Values

Environment:

- maintain Canadian peatlands as an abundant renewable resource
- employ the newest research, development, and management practices to ensure peatlands remain plentiful and renewable
- only select bogs that can be restored as soon as possible after harvesting

Local Communities:

 committed to training and hiring local residents for jobs that are safe and pay a fair wage (82 employees in the Interlake and Southeastern Manitoba are locally hired).

Sharing Knowledge:

• Sun Gro finds ways to improve business for the benefit of all by learning from others and sharing knowledge

Long-Term Thinking:

• frames our decision-making to help secure a brighter future



Sun Gro's Values

Sun Gro is Committed to Supporting On-Going Research Aligning With Their Values



Environment



Local Communities



Sharing Knowledge

2



Long-Term Thinking



Fen peatland restoration and ecotone creation in south-eastern Manitoba By Pete Whittington, PhD, & Maria Strack, PhD

Conducted at Sun Gro's Elma bog area FEN RESTORATION IN MANITOBA FINAL REPORT Presented to forceinty and Practiceds Methods Soutainable Development



Editabili group, the FERG researchers Line Rochefert, Maria Strack, Ante Weitzglor and their research taxes. Martin L: Branned, Laurence Turner Counterion, Melonia Haues & Marte-Clare Lettics, How 30, 2027 **Fen restoration in Manitoba** By Peatland Ecology Research Group (PERG)

Conducted at Sun Gro's South Julius, Moss Spur and Elma bog areas

The Julius Lake West Bog Project Context

Location:

- Provincial Crown land within the Rural Municipality of Reynolds and Agassiz Provincial Park, north of Highway 15, south of Highway 44, and east of the Brokenhead River
- within an existing Sun Gro Peat Harvest Licence (PHL) 3 area
- near existing peat harvesting operations (South Julius 2 Sub-Area)

Existing Conditions:

- 177ha total, up to 124ha of peat will be harvested at maximum (due to sub-area boundary buffers)
- no water bodies within the sub-area boundary



Julius Lake West Bog Sub-area: Regional Landcover LEGEND:

Agriculture Undeveloped Upland Forest

Wetland/Bog Areas

Vater Body Built Environment

March, 2024

Sun Gro Peat Harvesting Projects Description

Typical development includes the following components:

- 1. site preparation and access 3. harvesting and shipping

2. water management

4. recovery



Julius Lake West Bog Site Preparation and Access

Site Preparation:

• the full 124 ha area to be harvested will be cleared at the same time

Access Roads:

- an approximately 1.3km road will be constructed from the staging area to an existing fire road east of the sub-area
- portions of the Fire Road and Springfield Road may require upgrades
- ditching on each side of the access road will be installed outside of bog area only
- culverts will be installed, where required, to maintain existing drainage



Julius Lake Bog Sub-Area: Site Access



Road Cross-section

March, 2024

Julius Lake West Bog Site Preparation and Access

Staging area of 4 ha in size will be developed along the east side consisting of:

- shop / office / lunchroom building (one building) - for equipment maintenance, refueling and for employees
- gravel surface
- no groundwater wells will be installed



Site Preperation



Julius Lake Bog Sub-Area: Site Preparation

March, 2024

Water Management

Ground and surface water management requires:

- field drainage ditches
- main drainage ditches
- overland flow siltation



Example of sedimentation ponds



Field Drain Construction with Typical Profile of 1.5m x 1.5m at ~33m Intervals

Harvesting and Shipping

Four phases:

- 1. field harrowing
- 2. harvesting
- 3. on-site stockpiling and transport to the processing plant near:
 - Elma, MB for Julius Lake West Bog
- 4. shipped to customers



Peat Harvesting at Existing Sun Gro Sites



Peat Harvesting at Existing Sun Gro Sites

Recovery

Process:

- Peatland Restoration Plan under the Peatland Stewardship Act
- recovery plan to replace elements lost due to peat harvesting (e.g. vegetation)
- recovery is progressive and based on research and guidelines



North Moss Spur Shortly After Restoration (1996)



North Moss Spur Nine (9) Years After Restoration (2005)

Environmental Assessment Process

Under *The Environment Act*, an EAP is required for all environmentally significant projects in MB.



Prepare a project description:

- types and quantities of materials
- harvesting operation methods
- harvesting schedule
- site layout (drainage management)
- environmental controls (e.g. noise)
- resource usage (e.g. water)
- waste management (e.g. sewage)



Assess environmental factors

- air quality
- soil integrity and quality
- surface water quality
- wetland health
- groundwater quality
- vegetation
- wildlife / fish / fish habitat
- socio-economic considerations


Environmental Assessment Process (contd.)



Engage the public, stakeholders and Indigenous communities:

• letters and factsheets sent by email and regular post on January 17, 2024



Assess effects:

• effects of the project on the environment and vice versa



Identify mitigation measures:

• to eliminate or reduce adverse project effects to acceptable levels





Prepare and file the Final EAP Report to Manitoba Environment and Climate Change (MECC) Environmental Approvals Branch for review / approval



Monitor the effectiveness of the mitigation measures during project implementation

Typical Environmental Issues and Mitigation Measures

Concerns:

- accidents
- soil loss
- surface water contamination
- dust emissions
- noise
- drainage changes
- wildlife / habitat loss
- loss of wetlands / vegetation
- CO₂ emissions
- public opposition

Mitigation Measures:

- operations-maintenance/emergency manuals
- harvested area
 - Julius Lake West: (124ha) < Sub-Area (177 ha)
- project drainage
- peat creation > peat harvesting
- progressive recovery plans
- reduce dust (e.g. moisten stockpiles)
- local jobs / economic development

Project Timeline



Thank You

Questions?

March, 2024

APPENDIX H

Environment Act Proposals

for a peatland development at Julius Lake West & Sugar Creek sub-areas B, C, D, and E

Engagement

for two additional harvesting areas associated with Ramsay Point Bog

March, 2024



Presentation Outline

- 1. Our Process
- 2. Overview of Peatland Development
- 3. Who is Sun Gro Horticulture?
- 4. The Projects
- 5. The Environmental Assessment Process
- 6. Typical Environmental Issues and Mitigation Measures
- 7. Questions?



SCATLIFF + MILLER + MURRAY



Our Process

- KGS Group is:
 - preparing seperate Environment Act Proposals (EAP) for the following two peatland development sites:
 - i. Julius Lake West (JLW) sub-area
 - ii. Sugar Creek (SC) sub-area B, C, D, and E
 - conducting engagement for two additional sub-areas associated with Ramsay Point Bog



Our Process

- The EAP process will consider biophysical environmental effects of the project (3km radius surrounding the sub-area)
- The EAP process will consider Socio-Economic effects of the project (10km radius surrounding the sub-area)
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Editorial group: the PIMG researchers Line Rochefort, Maria Istack, Anter Weittrighter and Beter research taxer. Martin L: Bravened, Jauresee Tarnel-Coursheave, Medicine Hauer & Martie-Claim Lettrice. Here 30, 2027 **Fen restoration in Manitoba** By Peatland Ecology Research Group (PERG)

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Location:

- Provincial Crown land within the Rural Municipality of Reynolds and Agassiz Provincial Park, north of Highway 15, south of Highway 44, and east of the Brokenhead River
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- near existing peat harvesting operations (South Julius 2 Sub-Area)

Existing Conditions:

- 177ha total, up to 124ha of peat will be harvested at maximum (due to sub-area boundary buffers)
- no water bodies within the sub-area boundary



Julius Lake West Bog Sub-area: Regional Landcover LEGEND:

Agriculture
Undeveloped Upland Forest

Wetland/Bog Areas

Water Body Built Environment

Peat Harvest Area

The Sugar Creek Sub-Area B, C, D, & E Bog Project

Context

Location:

- Provincial Crown land within the Rural Municipality of Bifrost-Riverton and the Moose Creek Provincial Forest, west of Lake Winnipeg in close proximity to Washow Bay
- adjacent to existing peat harvesting operations (Ramsay Point Bog)

Existing Conditions:

- 1,810 ha total, up to 750 ha of peat will be harvested (due to sub-area boundary buffers)
- no water bodies within sub-area boundaries



Sugar Creek Bog Sub-Area B, C, D, & E: Regional Landcover LEGEND:

Agriculture Undeveloped Upland Forest Peat Harvest Area Bog Areas

The Ramsay Point Bog Engagement

Context

Location:

- adjacent to Provincial Road 234
- west of Beaver Creek Provincial Park and east of Moose Creek Provincial Forest

Existing Conditions:

- two additional harvesting areas associated with the existing Ramsay Point Bog Environment Act Licence (EAL; License #2964 ER)
- former Quarry Leases were not included in PHL 4
- amendment of the PHL 4 to include the two highlighted sub-areas



Ramsay Point Bog Sub-Area: Location

Sun Gro Peat Harvesting Projects Description

Typical development includes the following components:

- 1. site preparation and access 3. harvesting and shipping

2. water management

4. recovery



Julius Lake West Bog Site Preparation and Access

Site Preparation:

• the full 124 ha area to be harvested will be cleared at the same time

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Julius Lake Bog Sub-Area: Site Access



Road Cross-section

Julius Lake West Bog Site Preparation and Access

Staging area of 4 ha in size will be developed along the east side consisting of:

- shop / office / lunchroom building (one building) - for equipment maintenance, refueling and for employees
- gravel surface
- no groundwater wells will be installed



Site Preperation



Julius Lake Bog Sub-Area: Site Preparation

Sugar Creek Bog Site Preparation and Access

Site Preparation:

 approximately 80 ha will be cleared per year

Access Roads:

- an approximately 7.8km access road will be constructed from PR 325 to the SW corner of sub-area E
- 6km of the access road will follow an existing trail that will need to be upgraded
- ditching on each side of the access road will be installed outside of bog area only
- culverts will be installed, where required, to maintain existing drainage



Sugar Creek Bog Sub-Area: Site Access



Road Cross-section

Sugar Creek Bog Site Preparation and Access

Staging area of 4 ha in size will be developed the SW corner of subarea E consisting of:

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- gravel surface
- no groundwater wells will be installed



Site Preperation



Sugar Creek Bog Sub-Area: Site Preperation

Water Management

Ground and surface water management requires:

- field drainage ditches
- main drainage ditches
- overland flow siltation

Imapct to local hydrology:

- initial construction of drainage will result in a temporary (3 week) increase in local runoff
- during operation there will be no change in the volume runoff



Example of sedimentation ponds



Field Drain Construction with Typical Profile of 1.5m x 1.5m at ~33m Intervals

Harvesting and Shipping

Four phases:

- 1. field harrowing
- 2. harvesting
- 3. on-site stockpiling and transport to the processing plant near:
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 - Elma, MB and Vassar, MB for Sugar Creek Bogs
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Peat Harvesting at Existing Sun Gro Sites

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Assess environmental factors

- air quality
- soil integrity and quality
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Environmental Assessment Process (contd.)



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6

Prepare and file the Final EAP Report to Manitoba Environment and Climate Change (MECC) Environmental Approvals Branch for review / approval



Monitor the effectiveness of the mitigation measures during project implementation

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Concerns:

- accidents
- soil loss
- surface water contamination
- dust emissions
- noise
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- loss of wetlands / vegetation
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- public opposition

Mitigation Measures:

- operations-maintenance/emergency manuals
- harvested area
 - Julius Lake West: (124ha) < Sub-Area (177 ha)
 - Sugar Creek: (750ha) < Sub-Area (1,810ha)
- project drainage
- peat creation > peat harvesting
- progressive recovery plans
- reduce dust (e.g. moisten stockpiles)
- local jobs / economic development

Project Timeline



Thank You

Questions?

March, 2024

APPENDIX I

SCATLIFF + MILLER + MURRAY

visionary urban design + landscapes

Manitoba Métis Federation Meeting

Sun Gro Peat Harvesting EAP and Engagement

Date/Time of Meeting:	February 20, 2024 – 11:00 AM – 12:30 PM
Location:	Teams Meeting

In Attendance:	Representing:
Isaac Manness (IM)	<i>Forestry Technician</i> (Department of Energy, Infrastructure & Resource Management), Manitoba Métis Federation (MMF)
Madelynn Perry (MP)	Mines, Minerals & Traditional Economies Coordinator (Department of Energy, Infrastructure & Resource Management), Manitoba Métis Federation
Riley Bartel (RB)	<i>Policy Analyst</i> (Department of Energy, Infrastructure & Resource Management), Manitoba Métis Federation
Tim North (TN)	<i>West/Central Bog Operations Manager,</i> Sun Gro Horticulture Canada Ltd. (Sun Gro)
Brad Keller (BK)	Northern Bog Operations Manager, Sun Gro Horticulture Canada Ltd.
Shaun Moffatt (SMo)	Senior Environmental Scientist, KGS Group (KGS)
Sanjana Mada (SMa)	<i>Engagement Specialist & Urban Planner</i> , Scatliff + Miller + Murray (SMM)
Elise Ouellette (EO)	<i>Engagement Support & Landscape Designer</i> , Scatliff + Miller + Murray

Regrets: Marci Riel (MMF), Cheryl Dixon (SMM)

Distribution: Above

ltem	Description	Action	
1.0	Meeting Opening	INFO	
	1.1. SMa opened meeting at 11:02 a.m.		
	1.2. SMa asks MMF if they consent to recording the meeting for note-		
	taking purposes. RB accepts.		
	1.3. Land acknowledgement, and meeting / project overview by SMa.		
	1.4. SMa reiterates the purpose of this meeting to begin Phase 1 of Resolution 8, with the intent of moving forward onto Phases 2-4		
	with MMF.		
	1.5. Introductions		
2.0	PowerPoint Presentation		
	2.1 Presentation opened by SMa.		
	2.2 SMo spoke to the presentation slides.		
	Item	Description	Action
---	------	---	---------
1		2.3 During presentation, TN asked if MMF would be interested in being involved with Peatland Ecology Research Group (PERG) or recovery of other Sun Gro bog recovery projects. MP expressed interest in learning more. Sun Gro to email more information to MP.	Sun Gro
	3.0	Question Period	
		3.1 MP asked to clarify that Sun Gro wanted feedback from stakeholders and rightsholders by Spring to help inform the EAP before submission. SMo confirmed.3.2 MP stated that the next step in the Resolution 8 process is	INFO
		discussing how they will get the feedback from Red River Métis community members and what capacity of funding would be required to provide the feedback to Sun Gro. Smo asked for MMF to put a proposal together for proceeding with Phase 2, which would then be discussed by the project team to decide on how to move forward. Smo explained intent of engagement is to identify concerns and interests of Indigenous communities, keeping in mind that there is a formal duty to consult process with the Province of Manitoba	MMF
		3.3 Smo explained process of finishing previous EAP to move forward with current process. Current project is behind schedule, so Spring application for EAP is ideal but acknowledged that it is important to honour MMF's process.	INFO
		3.4 MP explains MMF's preference to be engaged before submission of EAP to involve their citizens and respond to their feedback and concerns. Noted that it is in everyone's best interest to do engagement work at the beginning.	
		3.5 MP explains MMF's process might involve (1) a community meeting with MMF's citizens; (2) conducting traditional knowledge and land use studies to understand how citizens are using the land in the project areas; and (3) understanding how economic partnerships can be made during the length of the process.	
		3.6 RB asked how many Sun Gro projects are currently in the Agassiz Provincial Forest. BK responded current peat harvesting locations are Evergreen Bog and South Julius Bog; Elma, Moss Spur, and North Julius Lake are in the recovery phase. RB responded on the importance of thinking about the forest as a whole and how the larger scale is being impacted. SMo noted that the extents of peat harvesting is much smaller than the extents of tree harvesting in the	
		 3.7 MP inquired about requirements for purchasing carbon credits. SMo explained Sun Gro is not able to purchase carbon credits. Sun Gro creates reports to quantify their greenhouse gas (GHG) emissions. The emissions from peat harvesting are relatively small compared to the end users. The lifecycle GHG emissions from peat harvesting is: change in land use (15%), harvesting (4%), transport (10%), and 	

ltem	Description	Action
	 decomposition from end users (71%). BK explained that Sun Gro is held to a standard for emissions and is audited every two years. SMo notes the average annual emission for Julius Lake West would be 0.0006% of Canada's annual emissions. 3.8 MP mentions that MMF would likely be interested in ways to collaborate on recovery areas or emission reduction areas. 3.9 RB asked if there were many trees in peat harvesting areas. BK responds that there are few trees, mostly tamarack and small black spruce. SMo added that a permit would be obtained and they would work with a local forester. 	SunGro/ MMF
4.0	Meeting Close 4.1 SMa closed the meeting. SMM to send notes, presentation slides and recording. We will wait for MMF to get back to us regarding moving on to Phase 2 of Resolution 8.	SMM

Please review and notify the Writer immediately of any errors, omissions, or discrepancies. For the sake of clarity, discussion items shown above have been organized and therefore may not reflect the order in which they actually occurred.

Per: **SCATLIFF + MILLER + MURRAY**

Elise Ouellette, B.Env.D, MLA

SCATLIFF + MILLER + MURRAY

visionary urban design + landscapes

Rural Municipality of Reynolds In-Person Leadership Meeting Sun Gro Julius Lake West EAP

Date/Time of Meeting:	March 11, 2024 - 04:30 PM - 06:00 PM
Location:	Rural Municipality of Reynolds Office
Format:	In-person Leadership Meeting

In Attendance:	Representing:
Russ Gawluk (GR)	Reeve, Rural Municipality of Reynolds (RMR)
Jessica Thurston (JT)	Deputy Reeve and Ward 1 Councillor, RMR
Kim Furgala (CAO)	Chief Administrative Officer (CAO), RMR
Curtis J. Buley (CJB)	Ward 2 Councillor, RMR
Curt Stelmack (CS)	Ward 3 Councillor, RMR
Blaine Webster (WB)	Ward 4 Councillor, RMR
Michael Huzel (MH)	Ward 5 Councillor, RMR
Kim Zalitach (KZ)	Ward 6 Councillor, RMR
Harriet Yarmill (HY)	Ward 7 Councillor, RMR
Tim North (TN)	<i>West/Central Bog Operations Manager,</i> Sun Gro Horticulture Canada Ltd. (Sun Gro)
Shaun Moffatt (KGS)	Senior Environmental Scientist, KGS Group (KGS)
Sanjana Mada (SMM)	Engagement Specialist & Urban Planner, Scatliff + Miller + Murray (SMM)

Regrets: Elise Ouellette (SMM)

Distribution: Above

ltem	Description	Action
1.0	 Meeting Opening 1.1. SMM opened meeting at 04:35 PM 1.2. SMM asked RMR if they consent to voice recording the meeting for note-taking purposes. RMR Council accepted. 1.3. Project overview and meeting objectives provided by SMM. 1.4. Introductions 	rmr info
2.0	PowerPoint Presentation2.1Presentation opened by SMM.2.2KGS spoke to the presentation slides.	INFO

ltem	Description	Action
3.0	Question Period3.1. Site Operations and Maintenance3.1.1. How will the site be serviced with electricity?• Site will be serviced with a combined system which will include including solar power and an on-site generator.	INFO
	 3.1.2. How many people does employ, and how many people will potentially be employed at Julius Lake West? 86 people are employed in total across Manitoba in all Sun Gro facilities. Initially, a small work force is employed and then scaled up as harvesting begins, potentially leading to 15-20 employees over time. A similar set-up is expected at Julius Lake with some full-time employment supported by a lot of seasonal employment. Initially 2-3 people will be hired in the development stage and that will scale up to 5-6 people during initial harvesting once the site is fully developed. 	
	 3.1.1. What happens to the trees and lumber cleared during site preparation? Most of the trees are really small Black Spruce or Tarmacs which are typically not merchantable timber. As a part of the licence, a study of the timber and if it is merchantable is conducted. If the timber is merchantable it goes back to the Province. If not, it is used for various on-site construction needs like road construction. Nothing is wasted. 	
	3.1.1. Will the site be manned overnight, during off hours?No, it will be not.	
	 3.2. Water Quality 3.2.1. What is the frequency, type, and location of water quality testing? Under the Manitoba Environment Act license, regular water quality testing is mandated. Typically, water is tested at two locations: (i) weekly at the sedimentation pond outlet, (ii) two times a year at a creek/stream approximately 5km south of the site, where the ditch crosses the road, entering Lake Winnipeg, and (iii) a full parameter water test three times a year at the sedimentation outlets. Water testing monitors (i) pH, (ii) water hardness, (iii) conductivity, (iv) Total Suspended Sediments (TSS), which includes peat, and (v) dissolved metals, like lead and aluminium. The baseline TSS, against which the sample water is compared, is established from water quality samples taken from water pockets in the peat, and from downstream receiving water 	

ltem	Description	Action
	 bodies prior to any disturbance. As per current regulation, TSS is currently allowed an increase of 25mg/L over the baseline conditions which is set by the Canadian Council Ministry of Environment as a national standard of increase in suspended sediments. This is determined via scientific studies that consider toxicity and habitat effects. In Sun Gro's experience, It is rare for the discharge water from outlets to go above this set level. Water in Bogs is naturally acidic, with a range of acceptable pH. Sun Gro remediates acidic water using limestone which will help raise the pH of the water being discharged from the bogs. 	
	 3.2.2. Where can the water monitoring reports be accessed by the Municipality and the public? Results of monitoring are submitted to the Province's Environment and Climate Change department and can be accessed by contacting the Province's local Environment Officer (Kim Kmet). In addition, the licence requirements can be accessed by visiting the online Manitoba Public Registry to view Environment Act Licenses for all of Manitoba (https://www.gov.mb.ca/sd/eal/registries/index.html). Schedule B of the Environment Act Licence provides the full list of parameters that are required to be monitored three times per year, which can be found at the following link; <u>2964er.pdf</u> (gov.mb.ca). 	INFO
	 3.3. Hydrology and Drainage 3.3.1. How will the hydrology in and around the site be impacted by the peat harvesting operations? Year 1 of operations: In the first year of harvesting, as the water levels in the sub-areas are reduced for harvesting over the course of approximately three weeks in the spring (during initial drainage construction), the rate of water discharged from the harvesting site will be temporarily increased. Following years of operation: After the initial drainage construction, no additional volume of water will be discharged with the snow melt and rain run-off from the developed site being the same volume that would have runoff if the site were not developed/disturbed. The local hydrology will be minimally affected after the first year of peat harvesting both in water quantity and direction of flow. Within the harvesting site, the water will flow through the sedimentation ponds to reduce total TTS before being discharged into the surrounding bogs via the outlet at the western end of the site as illustrated in the presentation. 	
	 3.3.2. Will Sun Gro maintain the ditches in and around the site? Sun Gro will maintain all ditches within the sub-area. 	

ltem	Description	Action
	 Maintaining ditches outside of the site, like along Colony Road, is outside Sun Gro's jurisdiction. 	
	 3.3.3. Will the excess water run off affect communities west and south of the site like St. Rita and along ditches along Colony Road and Springfield Road? In-depth hydrology studies are ongoing to understand effects of water drainage on the larger watershed surrounding the sub areas for Julius Lake West. The water will drain west of the sub- 	INFO
	area. In this study, the effects of change in hydrology will be studies in the larger watershed, including culverts and ditches downstream. LiDAR imagery will be used along with watershed boundaries and topography studies for a full assessment. Total volume of water discharged the first year and the following years will be quantified and their impacts to the surrounding topography assessed as a best case/worst case scenario for the final EAP report.	
	 Currently no issues have been identified that will affect the communities identified by the Municipality. However, if concerns are identified during the studies the Municipality will be informed and it will be documented in the EAP submitted to the province. Concerns along Colony Road and Springfield Road are noted and the hydrology studies will look into impacts on these local travel routes. 	Sun Gro
	 3.4. Opportunities for input within the EAP Process 3.4.1. What is the review and input process for the EAP? We are currently in the first stage of this process where Sun Gro is preparing the EAP. Engagement at this stage is not required by the Province, however, Sun Gro is pre-emptively engaging with impacted communities to mitigate concerns where possible. This meeting is a part of this process by Sun Gro. These responses will be included in the engagement report developed by SMM, and the EAP document will have a section referencing results of Indigenous, public, and stakeholder engagement. Once the EAP is submitted to the province and determined as complete the final report will be posted to the public registry, and available for download. This begins a 30-day review period during which anyone, including the public, can review the document and provide further comments directly to the province. 	
	 3.5. Emergency Response 3.5.1. How are operations managed when it is overly hot and dry? Sun Gro does not operate in these conditions, as per provincial requirements. Since 2021, the Province provides detailed real-time weather information four days in advance, allowing peat harvesting operators to better plan operations. In addition, Sun 	

ltem	Description	Action
	Gro also has internal restrictions to prevent any emergencies during these conditions which is noted in Sun Gro's Emergency Response Plan.	
	 3.5.2. In case of a fire emergency, how will Sun Gro get water to dissipate any fires on site. Sediment ponds and the ditches hold sufficient water to deal with any on-site emergencies. 	INFO
	 3.5.3. Does Sun Gro have an emergency response plan? Yes, created by Sun Gro and submitted to the Province's local Conservation Officer. 	
	 3.6. Sustainability and Site Recovery 3.6.1. How will restoration work be conducted at the site? Sun Gro noted that last Spring, 43,000 trees were planted as a part of restoration at their other sites, with another 18,000 tree planting proposed for this year. Sustainability and restoration od the site in a priority for Sun Gro. Sun Gro also clarified that restoration activities will happen continuously in smaller sections as peat harvesting capacity is reached in those areas rather than waiting until the harvesting is complete for the entire Julius Lake West area. 3.6.2. Does peat harvesting release CO2? If so, how much? How does Sun Gro estimate its total CO2 emissions for the lifespan of their sites? 	
	 Yes, CO2 is released during the entire life cycle of the peat which includes harvesting, transportation, and methods of end use. Harvesting peat, which Sun Gro is involved in, accounts for 7% of CO2 released during its entire life cycle. CO2 emissions and carbon impacts are estimated as part of the EAP and will be available as a part of that documentation submitted to the Province. Using these numbers, the Province reviews what Sun Gro is proposing to develop. The calculations will be in the final EAP submission and this document will be made available to the public as a part of this process by the Province. The IISD completed a cumulative impacts analysis that looks at nutrient loading and greenhouse gas emissions from peatland harvesting in the Interlake area. The report can be found at the following link: Peatland Mining in Manitoba's Interlake. 	
4.0	 Meeting Close 4.1 SMM closed the meeting. SMM confirmed that presentation has been shared with the CAO. SMM to send meeting notes and recording in the upcoming weeks. 	SMM

Please review and notify the Writer immediately of any errors, omissions, or discrepancies. For the sake of clarity, discussion items shown above have been organized and therefore may not reflect the order in which they actually occurred.

Per: SCATLIFF + MILLER + MURRAY

Sanjana Mada, MPL, B.Arch

SCATLIFF + MILLER + MURRAY

visionary urban design + landscapes

Brokenhead Ojibway Nation Online Leadership Meeting

Sun Gro Julius Lake West and Sugar Creek EAP and Engagement

Date/Time of Meeting:	March 27, 2024 - 02:00 PM - 03:30 PM
Format:	Online Leadership Meeting

In Attendance:	Representing:
Dylan Kensick (DK)	Lands Manager, <i>Lands Department,</i> Brokenhead Ojibway Nation (BON)
Tim North (TN)	<i>West/Central Bog Operations Manager,</i> Sun Gro Horticulture Canada Ltd. (Sun Gro)
Brad Keller (BK)	<i>Northern Bog Operations Manager,</i> Sun Gro Horticulture Canada Ltd.
Samantha Simmonds Applin (SSA)	Sun Gro Horticulture Canada Ltd.
Steff Doiron (SD)	Sun Gro Horticulture Canada Ltd.
Shaun Moffatt (KGS)	Senior Environmental Scientist, KGS Group (KGS)
Elise Ouellette (EO)	<i>Engagement Specialist & Urban Planner</i> , Scatliff + Miller + Murray (SMM)
Sanjana Mada (SMM)	<i>Engagement Specialist & Urban Planner</i> , Scatliff + Miller + Murray (SMM)

Regrets: Cheryl Dixon (SMM)

Distribution: Above

ltem	Description	Action
1.0	Meeting Opening	INFO
	1.1. SMM opened meeting at 02:00 PM	
	 SMM asked BON if they consent to voice recording the meeting for note-taking purposes. DK accepted. 	
	1.3. Project overview and meeting objectives provided by SMM.	
	1.4. Introductions	
2.0	PowerPoint Presentation	INFO
	2.1 Presentation opened by SMM.	
	2.2 KGS spoke to the presentation slides.	

ltem		Description	Action
3.0	Question	Period	
	3.1	 Who is Sun Gro engaging with at the Province to obtain this licence? The EAP will be submitted to the director of the environmental approvals branch. However, a primary point of contact person has not yet been assigned. Sun Gro will work with the Peatland Stewardship Branch to update peatland management and recovery plans. 	INFO
	3.2	 Does Sun Gro currently have any existing or past agreements with any indigenous community? No, Sun Gro does not and has never had any formal agreements with any indigenous communities. Sun Gro is not in partnership with any communities, but has worked with RMs and First Nations for job creation and funding opportunities. However, outside of this, Sun Gro does not have formal opportunities in place with any local communities. 	
	3.3	 Has there been agreements or engagements with First Nations or any other communities in past peat harvesting projects? Engagement with Indigenous communities has been previously conducted for the Evergreen 1 Bog peat harvesting site. The same process is being conducted for the Sugar Creek and Julius Lake West EAPs. We are currently in the first stage of this process where Sun Gro is preparing the EAP. Engagement at this stage is not required by the Province, however, Sun Gro is pre-emptively engaging with impacted communities to mitigate concerns where possible. This meeting is a part of this process by Sun Gro. These responses will be included in the engagement report developed by SMM, and the EAP document will have a section referencing results of Indigenous, public, and stakeholder engagement. 	
	3.4	 Is the purpose of this meeting informational? Yes, it is. Sun Gro wants to share the EAP details pre-emptive of the EAP submission. In addition, Sun Gro also wanted to collect any feedback and concerns, if any, to address it in the proposal if possible. 	
	3.5	 Traditional indigenous values and cultural practices are intrinsically connected to the land and in turn, the local flora and fauna. How will these systems be protected? <i>Currently, KGS's surveys have not identified any species at risk. There are plants that Indigenous communities use in the Sugar</i> 	

ltem	Description	Action
	 Creek and Julius Lake West areas that hey are commonly found species in the Since these sites are not easily accessible roads currently, we are hoping that the on hunting and trapping activities. How hunting and trapping areas or sacred performance of the second sec	ave been identified, but areas. e, i.e. there are no access re won't be a large impact rever, if BON is aware of lants in the areas, Sun
	3.6 Can Sun Gro share the biological survey irYes, the information will be shared w meeting.	Iformation? th BON post this KGS
	 3.7 Does Sun Gro do tours of their facilities? I interested in a tour of an existing active si Yes, Sun Gro can do a site tour of the BON leadership and administration. coordinated with DK post this meeting 	yes, BON would be te and facility. Moss Spur facility with This tour will be g.
4.0	Meeting Close 4.1 SMM closed the meeting. SMM to send bi meeting notes in the upcoming weeks.	ological studies and SMM

Please review and notify the Writer immediately of any errors, omissions, or discrepancies. For the sake of clarity, discussion items shown above have been organized and therefore may not reflect the order in which they actually occurred.

Per: SCATLIFF + MILLER + MURRAY

Sanjana Mada, MPL, B.Arch

APPENDIX E

Manitoba Conservation Data Centre Tracked Species within the Lakes of the Woods Ecoregion and Interlake Plain Ecoregion

InterbergNucl. Sugar. Caplera, and JournalObjekaOperational Superational 	ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	A SAR A	COSEWI C	TRACK _STATL S
InternationAmonetanyCapacity one of physicansSampo max and sampoSampo max and sampo<	Interlake Plain	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Botrychium campestre	Prairie Moonwort	S1	NNR	GNR	NL	NL	NL	Y
IntractageMonotyseMonotyseStatyseStatyseStatyseStaty	Interlake Plain	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Botrychium lunaria var. lunaria	Common Moonwort	S3S4	N5	G5TNR	NL	NL	NL	W
Indicate NameAlter - Sogna, Gago, Gago, Gago, Gago, San, Maran, Maraman, Mar	Interlake Plain	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Botrychium matricariifolium	Daisy-leaved Moonwort	SU	N5	G5	NL	NL	NL	W
IndersetIndersetAddit </td <td>Interlake Plain</td> <td>Adder's-tongues, Grapeferns, and Moonworts</td> <td>Ophioglossaceae</td> <td>Botrychium simplex</td> <td>Least Grapefern</td> <td>S1</td> <td>N4?</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Y</td>	Interlake Plain	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Botrychium simplex	Least Grapefern	S1	N4?	G5	NL	NL	NL	Y
mediase holesSafer - timesSafer	Interlake Plain	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Ophioglossum pusillum	Northern Adder's-tongue	S1	N4	G5	NL	NL	NL	Y
InstantionArroysbarseArroysbars	Interlake Plain	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Sceptridium multifidum	Leathery Grapefern	S3	N5	G5	NL	NL	NL	Y
mortanyPerphanyAngloarnamyAngloarnamyMany angloarnamyMany a	Interlake Plain	Amphibians	Ambystomatidae	Ambystoma laterale	Blue-spotted Salamander	S3S4	N5	G5	NL	NL	NL	W
Incritantional Instantional Instantional Instantional Instantional Instantional Instantional Instantional Instantional Instantional Instantional Instantional Instantional 	Interlake Plain	Amphibians	Ambystomatidae	Ambystoma mavortium	Western Tiger Salamander	S4S5	N5	G5	NL	SC	SC	Y
Interface <td>Interlake Plain</td> <td>Amphibians</td> <td>Ambystomatidae</td> <td>Ambystoma tigrinum</td> <td>Eastern Tiger Salamander</td> <td>\$3?</td> <td>N1</td> <td>G5</td> <td>NL</td> <td>E</td> <td>E</td> <td>Y</td>	Interlake Plain	Amphibians	Ambystomatidae	Ambystoma tigrinum	Eastern Tiger Salamander	\$3?	N1	G5	NL	E	E	Y
InstrateInstra	Interlake Plain	Amphibians	Ranidae	Lithobates pipiens	Northern Leopard Frog	S4	N5	G5	NL	SC	SC	Y
Instanterbard InstanterbardSindiguadiaAdvantage/adva accelerationOrderator Social Social 	Interlake Plain	Birds	Accipitridae	Accipiter cooperii	Cooper's Hawk	S4S5B	N5B,N5N	G5	NL	NL	NL	N
Instraktorial Instraktorial	Interlake Plain	Birds	Podicipedidae	Aechmophorus occidentalis	Western Grebe	S3S4B	N3N4B,N2N	G5	NL	SC	SC	Y
IncredeIncrede/textIndex	Interlake Plain	Birds	Passerellidae	Ammodramus savannarum	Grasshopper Sparrow	S2S3B	N4N5B	G5	NL	NL	NL	Y
InstruktorExtenStateNameStateII <td>Interlake Plain</td> <td>Birds</td> <td>Motacillidae</td> <td>Anthus spragueii</td> <td>Sprague's Pipit</td> <td>S2B</td> <td>N3N4B</td> <td>G3G4</td> <td>Т</td> <td>Т</td> <td>Т</td> <td>Y</td>	Interlake Plain	Birds	Motacillidae	Anthus spragueii	Sprague's Pipit	S2B	N3N4B	G3G4	Т	Т	Т	Y
InterfacionPindAdvisionAdvisionAdvisionConstraintSindNie </td <td>Interlake Plain</td> <td>Birds</td> <td>Caprimulgidae</td> <td>Antrostomus vociferus</td> <td>Eastern Whip-poor-will</td> <td>S2S3B</td> <td>N4B,N3M</td> <td>G5</td> <td>Т</td> <td>Т</td> <td>SC</td> <td>Y</td>	Interlake Plain	Birds	Caprimulgidae	Antrostomus vociferus	Eastern Whip-poor-will	S2S3B	N4B,N3M	G5	Т	Т	SC	Y
Interdac PainNoiseAdvanceOpen BuilsmannSpin Builsmann <th< td=""><td>Interlake Plain</td><td>Birds</td><td>Ardeidae</td><td>Ardea alba</td><td>Great Egret</td><td>S3B</td><td>N3B</td><td>G5</td><td>NL</td><td>NL</td><td>NL</td><td>Y</td></th<>	Interlake Plain	Birds	Ardeidae	Ardea alba	Great Egret	S3B	N3B	G5	NL	NL	NL	Y
Interface PainStrigtenAire ParentonStort are OtivQ2358MR AND.MAMG5.TG7. </td <td>Interlake Plain</td> <td>Birds</td> <td>Ardeidae</td> <td>Ardea herodias</td> <td>Great Blue Heron</td> <td>S5B</td> <td>N5B,N4N</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Ardeidae	Ardea herodias	Great Blue Heron	S5B	N5B,N4N	G5	NL	NL	NL	Р
Interface PianSection SystemSection SystemSecti	Interlake Plain	Birds	Strigidae	Asio flammeus	Short-eared Owl	S2S3B	N4B,N3N,N4M	G5	Т	SC	Т	Y
Introduce Pluni Broks Penulóse Candelhan constanos Constano selas Sina VAIDANA G.S. V Introduce Pluni Birds Chanad ridade Chanadridade Chanadridade <t< td=""><td>Interlake Plain</td><td>Birds</td><td>Accipitridae</td><td>Buteo lagopus</td><td>Rough-legged Hawk</td><td>S2S3B,S4M</td><td>N5B,N5N</td><td>G5</td><td>NL</td><td>NL</td><td>NL</td><td>Y</td></t<>	Interlake Plain	Birds	Accipitridae	Buteo lagopus	Rough-legged Hawk	S2S3B,S4M	N5B,N5N	G5	NL	NL	NL	Y
Interface Pain Brids Openda pergagina Opendapergagina <	Interlake Plain	Birds	Parulidae	Cardellina canadensis	Canada Warbler	S3B	N4B,N3M	G5	Т	Т	SC	Y
Interdake Plan Binds Obtandinities Obtandinities Obtandinities Pinter Pinter Pinter Pinter </td <td>Interlake Plain</td> <td>Birds</td> <td>Apodidae</td> <td>Chaetura pelagica</td> <td>Chimney Swift</td> <td>S2B</td> <td>N3B,N4M</td> <td>G4G5</td> <td>Т</td> <td>Т</td> <td>Т</td> <td>Y</td>	Interlake Plain	Birds	Apodidae	Chaetura pelagica	Chimney Swift	S2B	N3B,N4M	G4G5	Т	Т	Т	Y
Interfake Plain Binds Lardian Optimality Binds Carlos No. No. <t< td=""><td>Interlake Plain</td><td>Birds</td><td>Charadriidae</td><td>Charadrius melodus circumcinctus</td><td>Piping Plover</td><td>S1B</td><td>N3B</td><td>G3T3</td><td>E</td><td>E</td><td>E</td><td>Y</td></t<>	Interlake Plain	Birds	Charadriidae	Charadrius melodus circumcinctus	Piping Plover	S1B	N3B	G3T3	E	E	E	Y
Interface Pain Birds Capitaligate Operating Pain Starts Starts <td>Interlake Plain</td> <td>Birds</td> <td>Laridae</td> <td>Chlidonias niger</td> <td>Black Tern</td> <td>S4B</td> <td>N5B</td> <td>G4G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Laridae	Chlidonias niger	Black Tern	S4B	N5B	G4G5	NL	NL	NL	Р
Interlake Plain Birds fringIldar Conctinuations symperitums Vening Grobesk S233 N4MS G5 M. SC SC Y Interlake Plain Birds Tyrannidan Contiguar cooperi Birds G10 S238 N4BS G5 N. SC Y Interlake Plain Birds Cantiguar vinnes Eastern Wood peovee S38 NABR_NLM G4 R N. SC Y Interlake Plain Birds Cantiguar vinnes Y Hour Mark S38 NABR_NLM G4 R N. SC SC Y Interlake Plain Birds Acatifica Option Scattarior Y Hour Mark S348 NABR_NLM G5 N. N. SC SC Y Interlake Plain Birds Addition	Interlake Plain	Birds	Caprimulgidae	Chordeiles minor	Common Nighthawk	S2S3B	N4N5B,N5M	G5	Т	SC	SC	Y
Interlake Plain Birds Tyranidae Contopus cooperi Dilve sided Flycatcher S238 N48 G4 T T T C V Interlake Plain Birds Tyranidae Contopus vients Eastern Wood-provee S18 N48 G4 N SC V Interlake Plain Birds Railidae Contopus vients Feldow Rail S38 N485.NN G4 R SC V Interlake Plain Birds Analdae Opyrus bucchator Trumpeter Svan S28 M4455.NN G4 R N N N V Interlake Plain Birds Hirundinidae Hirundo rustica Barn Svallow S38 N485.NN G5 N <	Interlake Plain	Birds	Fringillidae	Coccothraustes vespertinus	Evening Grosbeak	S2S3	N4N5	G5	NL	SC	SC	Y
Interlake Plain Birds Tyrannidae Contopus views Eastern Wood-pewee S18 N48 C5 NL SC C Y Interlake Plain Birds Ralidae Caturnicops noveboracensis Yellow Rall S18 N3N4B,NUM G4 NL SC SC Y Interlake Plain Birds Anatidae Caturnicops noveboracensis Yellow Rall S18 NMAB,NAM G4 NL SC SC Y Interlake Plain Birds Anatidae Optichony orybrous Bololnik S148 NBNAMSM G5 NL T SC Y Interlake Plain Birds Laridse Hirundinidae Hirundo nastra Barni Swailow S148 NSNAMSM G5 NL NL<	Interlake Plain	Birds	Tyrannidae	Contopus cooperi	Olive-sided Flycatcher	S2S3B	N4B	G4	Т	Т	SC	Y
Interlake Plain Birds Calumicops newboracensis Yellow Pall S18 NNHAB NUM G4 NL S2 SC Y Interlake Plain Birds Analide Cygnus buccinator Irrumpeter Swan S28 NBMSB,NSM G4 NL NL VC VC Interlake Plain Birds Literdiase Dichenya orgitarous Babolink S384 NSB,NSM G5 NL T SC V Interlake Plain Birds Laridae Hydrogrope cargita Casplan Fern S384 NSHAB,NSM G5 NL NL VC YC Interlake Plain Birds Laridae	Interlake Plain	Birds	Tyrannidae	Contopus virens	Eastern Wood-pewee	S3B	N4B	G5	NL	SC	SC	Y
Interlake Plain Birds Anatidae Cygnus buccinator Trumpeter Swan S28 N4MSB, NSN G4 E NL NL Y Interlake Plain Birds Lictraidae Dicitonyn orgynarus Bobolink S3548 NSB, NANSM G5 NL T SC Y Interlake Plain Birds Hirundinutica Hirundinutica Barn Swallow S48 NMASB G5 NL NL NL P Interlake Plain Birds Laridae Hydroprogne caspia Caspian Tern S5368 NJM48, NSM G5 NL NL NL P Interlake Plain Birds Lanidae Lanidae Lanis Indovicianus migrans Migrant Logenhead Strike S48 NM8B G4130 E NL NL P Interlake Plain Birds Laridae Lanis Indovicianus migrans Migrant Logenhead Strike S48 NM8B G5130 NL NL PL PL PL PL PL PL PL <td< td=""><td>Interlake Plain</td><td>Birds</td><td>Rallidae</td><td>Coturnicops noveboracensis</td><td>Yellow Rail</td><td>S3B</td><td>N3N4B,NUM</td><td>G4</td><td>NL</td><td>SC</td><td>SC</td><td>Y</td></td<>	Interlake Plain	Birds	Rallidae	Coturnicops noveboracensis	Yellow Rail	S3B	N3N4B,NUM	G4	NL	SC	SC	Y
Interlake Plain Birds Leteriade Dolichonyx oryzivorus Bobolink S354B NEB_N4M5M C5 NL T SC Y Interlake Plain Birds Hirundinidae Hirundinizae Barrs Swallow S4B NANBB C5 NL T SC Y Interlake Plain Birds Laridae Hydporprogre capia Caspian Tern S34B NANBA,MSM G5 NL NL NL PL Interlake Plain Birds Ardeidae Lanius Ludoricinus migrars Migrant Loggerhead Strike SXB NARB G4C5 E T T Y Interlake Plain Birds Laridae Larus argentatus Herring Gull S38 NSB,NSN G5 NL NL NL PL Interlake Plain Birds Laridae Larus argentatus Frankin's Gull S38 NSB,NSN G5 NL NL NL NL PL Interlake Plain Birds Laridae Larus darus argentatus	Interlake Plain	Birds	Anatidae	Cygnus buccinator	Trumpeter Swan	S2B	N4N5B,N5N	G4	E	NL	NL	Y
Interlake PlainBirdsHirundinidaeHirundo rusticaBarn SwallowS4BN4M5BC5NLTSCYInterlake PlainBirdsLandaeHydrogrogen caspiaCaspian TemS334BN3M4B.N5MC5NLNLNLPLInterlake PlainBirdsArdeldaeJoborychus exilisLeast BitternS338N4BG5NLNLNLPLInterlake PlainBirdsLandaeLanus ludovicianus migransMigrant Loggerhead ShrikeS5BNBB.NUG5NLNLNLPLInterlake PlainBirdsLaridaeLarus californicusCalifornia GuilS3BNBB.NUG5NLNLPLInterlake PlainBirdsLaridaeLarus californicusCalifornia GuilS4BN4B.SE.NUNG5NLNLPLInterlake PlainBirdsLaridaeLarus delawarensisRing-billed GuilS4BN4B.SE.NUNG5NLNLNLPLInterlake PlainBirdsPcidaeMelanarpes arythrocephalusRed-haaded WoodpeckerS4BN4B.NUNG5NLNLNLPLInterlake PlainBirdsPelecanidaePelecanidaePelecanidaeDublic-crested CorromantS4BN4B.NUNG5NLNLNLPLInterlake PlainBirdsPelecanidaePelecanidaePelecanidaeDublic-crested CorromantS4BN4B.NUNG5NLNLPLInterlake Plain </td <td>Interlake Plain</td> <td>Birds</td> <td>Icteridae</td> <td>Dolichonyx oryzivorus</td> <td>Bobolink</td> <td>S3S4B</td> <td>N5B,N4N5M</td> <td>G5</td> <td>NL</td> <td>Т</td> <td>SC</td> <td>Y</td>	Interlake Plain	Birds	Icteridae	Dolichonyx oryzivorus	Bobolink	S3S4B	N5B,N4N5M	G5	NL	Т	SC	Y
Interlake PlainBirdsLaridaeHydrogrogne caspiaCaspian TermS3S4BN3N4B,N5MG5NLNLNLPInterlake PlainBirdsArdeidaehobrychub weillsLeast BitternS2S3N4BG4G5ETTYInterlake PlainBirdsLaridaeLanus ludoviciarus migransMigrant Loggerhead ShrikeS4BNNBG4T30EETTYInterlake PlainBirdsLaridaeLarus argentausHerring GulS5BN5B,N5NG5NLNLNLPInterlake PlainBirdsLaridaeLarus delawarensisCalifornia GulS3BN5B,NUNG5NLNLNLPInterlake PlainBirdsLaridaeLeucophaeus pipicanFranklin's GulS4BN4BR/NUNG5NLNLNLPInterlake PlainBirdsPicidaeMelanerpes erythrocophalusRed-headed WoodpeckerS3BN3B,N3NG5TEEYInterlake PlainBirdsPelecanidaePelecanidaePelecanidaeMaencrowa antrusBiack-crowned Night-heronS4BN4B,N3NG5NLNLNLPInterlake PlainBirdsPalacrocoracidaePhalacrocorax antrusDouble-crested CormorantS4BN5B,N3NG5NLNLNLPInterlake PlainBirdsPodicpedidaePodicpes auritusHorend CrebeS3BN5B,N4NG5NLNLNL <td>Interlake Plain</td> <td>Birds</td> <td>Hirundinidae</td> <td>Hirundo rustica</td> <td>Barn Swallow</td> <td>S4B</td> <td>N4N5B</td> <td>G5</td> <td>NL</td> <td>Т</td> <td>SC</td> <td>Y</td>	Interlake Plain	Birds	Hirundinidae	Hirundo rustica	Barn Swallow	S4B	N4N5B	G5	NL	Т	SC	Y
Interlake PlainBirdsArdeidaebabrychus exilisLeast Bittern\$253.8N4BG4G5ETTYInterlake PlainBirdsLanidaeLanidaeLanidaeMigrant Loggerhead ShrikeSKBNNRBG4T30EENLYInterlake PlainBirdsLaridaeLarius argentatusHerring GullSSBNSB,NSNG5NLNLNLNLPInterlake PlainBirdsLaridaeLarius californicusCalifornia GullSSBNSB,NSNG5NLNLNLPInterlake PlainBirdsLaridaeLarus delawarensisRing-billed GullS4BN4M5B,NUNG5NLNLNLPInterlake PlainBirdsLaridaeLarus delawarensisRed-headed WoodpackerS3BNSB,NSNG5NLNLNLPInterlake PlainBirdsArdeidaeMyctorax nycticoraxBlack-crowned Night-heronS4BN4B/SNUNG5NLNLNLPInterlake PlainBirdsPelecanidaePelecanus erythrorhynchosAmerican White PelicanS4BNSB,N3NNG4NLNLNLPInterlake PlainBirdsPalacrocoracidaePalacrocora auritusDouble-crested CormorantS5BNSB,N3NNG5NLNLNLNLPInterlake PlainBirdsPodicepedidaePodicepe nigricollisEared GrebeS3S4BNSB,N3NNG5NLNLNL <td>Interlake Plain</td> <td>Birds</td> <td>Laridae</td> <td>Hydroprogne caspia</td> <td>Caspian Tern</td> <td>S3S4B</td> <td>N3N4B,N5M</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Laridae	Hydroprogne caspia	Caspian Tern	S3S4B	N3N4B,N5M	G5	NL	NL	NL	Р
Interlake PlainBirdsLanildaeLanius ludovicianus migransMigrant Loggerhead ShrikeSXBNNRBG4T30EENVInterlake PlainBirdsLaridaeLarius argentatusHerring GullS5BN5B,N5NG5NLNLNLPInterlake PlainBirdsLaridaeLarus argentatusCalifornia GullS3BN5B,N5NG5NLNLNLNLPInterlake PlainBirdsLaridaeLarus californicusCalifornia GullS3BN5B,N5NG5NLNLNLNLPInterlake PlainBirdsLaridaeLeucophaeus pipxcanFranklin's GullS4BN4NSB,NUNG5NLNLNLNLPInterlake PlainBirdsArdeidaeNycticorarx nyreticoraxBack-crowned Night-heronS4BN4B,N3NG5NLNLNLNLPInterlake PlainBirdsPelecanidaePelecanus erythrorhynchosAmerican White PelicanS4BN5B,N3N4N,N5MG5NLNLNLNLPInterlake PlainBirdsPalaerocoracidaePhalaerocorax auritusDouble-crested CormorantS5BN5B,N3N4N,N5MG5NLNLNLNLNLPInterlake PlainBirdsPodicipedidaePodiceps auritusHorned GrebeS34BN5B,N3NG5NLNLNLNLNLNLNLNLNLNLNLNLNLNLNL <td>Interlake Plain</td> <td>Birds</td> <td>Ardeidae</td> <td>Ixobrychus exilis</td> <td>Least Bittern</td> <td>S2S3B</td> <td>N4B</td> <td>G4G5</td> <td>E</td> <td>Т</td> <td>Т</td> <td>Y</td>	Interlake Plain	Birds	Ardeidae	Ixobrychus exilis	Least Bittern	S2S3B	N4B	G4G5	E	Т	Т	Y
Interlake PlainBirdsLaridaeLarus argentatusHerring GullSSBN5B, N5NG5NLNLNLPInterlake PlainBirdsLaridaeLarus californicusCalifornia GullS3BN5B, NUNG5NLNLNLPInterlake PlainBirdsLaridaeLarus californicusRing-billed GullS4BN4BS, NUNG5NLNLNLPInterlake PlainBirdsLaridaeLarus calawarensisRing-billed GullS4BN4BS, NUNG5NLNLNLPInterlake PlainBirdsLaridaeLarus calawarensisRed-headed WoodpeckerS3BN3B, N3NG5TEEYInterlake PlainBirdsPicidaeMelanzpes erythrocephalusRed-headed WoodpeckerS3BN3B, N3NG5NLNLNLPInterlake PlainBirdsArdeldaeNycticorax nycticoraxBlack-crowned Night-heronS4BN4B, N2NG5NLNLNLPInterlake PlainBirdsPelecanidaePhalarcocoraca uritusDouble-crested CormorantS5BN5B, N3M, N5MG5NLNLNLPInterlake PlainBirdsPodicipedidaePodiceps auritusHorned GrebeS34BN4B, N3NG5NLNLNLNLPInterlake PlainBirdsPodicipedidaePodiceps auritusHorned GrebeS34BN4B, N5M, M5MG5NLNLNLNL <t< td=""><td>Interlake Plain</td><td>Birds</td><td>Laniidae</td><td>Lanius Iudovicianus migrans</td><td>Migrant Loggerhead Shrike</td><td>SXB</td><td>NNRB</td><td>G4T3Q</td><td>E</td><td>E</td><td>NL</td><td>Y</td></t<>	Interlake Plain	Birds	Laniidae	Lanius Iudovicianus migrans	Migrant Loggerhead Shrike	SXB	NNRB	G4T3Q	E	E	NL	Y
Interlake PlainBirdsLaridaeLarus californicusCalifornia GullS3BN5B,NUNG5NLNLNLPInterlake PlainBirdsLaridaeLarus delawarensisRing-billed GullS5BN5B,N5NG5NLNLNLPInterlake PlainBirdsLaridaeLeucophaeus pipkcanFranklin's GullS4BN4M5B,NUNG5NLNLNLPInterlake PlainBirdsPicidaeMelanerpes arythrocephalusRed-headed WoodpeckerS3BN3B,N3NG5NLNLNLNLPInterlake PlainBirdsArdeidaeNycticorax nycticoraxBlack-crowned Night-heronS4BN4B,N3NG4NLNLNLPInterlake PlainBirdsPelecanidaePelecanus erythrorphynchosAmerican White PelicanS4BN5B,N3NG4NLNLNLPInterlake PlainBirdsPhalacrocoracidaePhalacrocorax auritusDouble-crested CormorantS5BN5B,N3NG5NLNLNLPInterlake PlainBirdsPodicipedidaePodiceps nigricollisEastern TowheeS3ABN4B,N3NG5NLNLNLPInterlake PlainBirdsPodicipedidaePodiceps nigricollisEared GrebeS3ABN5B,N4NSNG5NLNLNLPInterlake PlainBirdsPodicipedidaePodiceps nigricollisEared GrebeS3ABN5B,N4NSNG5NLNL <td>Interlake Plain</td> <td>Birds</td> <td>Laridae</td> <td>Larus argentatus</td> <td>Herring Gull</td> <td>S5B</td> <td>N5B,N5N</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Laridae	Larus argentatus	Herring Gull	S5B	N5B,N5N	G5	NL	NL	NL	Р
Interlake PlainBirdsLaridaeLarus delawarensisRing-billed GullS5BN5B,N5NG5NLNLNLPInterlake PlainBirdsLaridaeLeucophaeus pipixcanFranklin's GullS4BN4N5B,NUNG5NLNLNLPInterlake PlainBirdsPicidaeMelanerpes crythrocephalusRed-headed WoodpeckerS3BN3B,N3NG5TEEYInterlake PlainBirdsArdeidaeNycticorax nycticoraxBlack-crowned Night-heronS4BN4B,N2NG5NLNLNLNLPInterlake PlainBirdsPelecanidaePelecaniae erythrorhynchosAmerican White PelicanS4BN5B,N3NG4NLNLNLPInterlake PlainBirdsPhalacrocoracidaePhalacrocora auritusDouble-crested CormorantS5BN5B,N3N4N,N5MG5NLNLNLNLNLPInterlake PlainBirdsPasserellidaePipilo erythrophthalmusEastern TowheeS3BN5B,N4N5NG5NL <td>Interlake Plain</td> <td>Birds</td> <td>Laridae</td> <td>Larus californicus</td> <td>California Gull</td> <td>S3B</td> <td>N5B,NUN</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Laridae	Larus californicus	California Gull	S3B	N5B,NUN	G5	NL	NL	NL	Р
Interlake PlainBirdsLaridaeLeucophaeus pipixcanFranklin's GullS4BN4N5B,NUNG5NLN	Interlake Plain	Birds	Laridae	Larus delawarensis	Ring-billed Gull	S5B	N5B,N5N	G5	NL	NL	NL	Р
Interlake PlainBirdsPicidaeMelanerpes erythrocephalusRed-headed WoodpeckerS3BN3B,N3NG5TEEEVInterlake PlainBirdsArdeidaeNyclicorax nyclicoraxBlack-crowned Night-heronS4BN4B,N2NG5NLNLNLNLPInterlake PlainBirdsPelecanidaePelecanus erythrochynchosAmerican White PelicanS4BN5B,N3NG5NLNLNLNLPInterlake PlainBirdsPhalacrocracidaePhalacrocrax auritusDouble-crested CornorantS5BN5B,N3N4N,N5MG5NLNLNLPInterlake PlainBirdsPodicipedidaePodiceps auritusDouble-crested CornorantS3BN5B,N4N5NG5NL	Interlake Plain	Birds	Laridae	Leucophaeus pipixcan	Franklin's Gull	S4B	N4N5B,NUN	G5	NL	NL	NL	Р
Interlake PlainBirdsArdeidaeNycticorax nycticoraxBlack-crowned Night-heronS4BN4B,N2NC5NLNLNLNLPInterlake PlainBirdsPelecanidaePelecaniaePelecanus erythrorhynchosAmerican White PelicanS4BN5B,N3NG4NLNLNLNLPInterlake PlainBirdsPhalacrocoracidaePhalacrocorax auritusDouble-crested CormorantS5BN5B,N3N4N,N5MG5NL	Interlake Plain	Birds	Picidae	Melanerpes erythrocephalus	Red-headed Woodpecker	S3B	N3B,N3N	G5	Т	E	E	Y
Interlake PlainBirdsPelecanidaePelecanus erythrorhynchosAmerican White PelicanS4BN5B,N3NG4NLNLNLNLPInterlake PlainBirdsPhalacrocoracidaePhalacrocorax auritusDouble-crested CormorantS5BN5B,N3N4N,N5MG5NL <td>Interlake Plain</td> <td>Birds</td> <td>Ardeidae</td> <td>Nycticorax nycticorax</td> <td>Black-crowned Night-heron</td> <td>S4B</td> <td>N4B,N2N</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Ardeidae	Nycticorax nycticorax	Black-crowned Night-heron	S4B	N4B,N2N	G5	NL	NL	NL	Р
Interlake PlainBirdsPhalacrocoracidaePhalacrocora vuritusDouble-crested CormorantS5BN5B,N3N4N,N5MG5NL	Interlake Plain	Birds	Pelecanidae	Pelecanus erythrorhynchos	American White Pelican	S4B	N5B,N3N	G4	NL	NL	NL	Р
Interlake PlainBirdsPasserellidaePiplio erythrophthalmusEastern TowheeS3S4BN4B,N3NG5NL </td <td>Interlake Plain</td> <td>Birds</td> <td>Phalacrocoracidae</td> <td>Phalacrocorax auritus</td> <td>Double-crested Cormorant</td> <td>S5B</td> <td>N5B,N3N4N,N5M</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Phalacrocoracidae	Phalacrocorax auritus	Double-crested Cormorant	S5B	N5B,N3N4N,N5M	G5	NL	NL	NL	Р
Interlake PlainBirdsPodicipedidaePodiceps auritusHorned GrebeS3BN5B.N4N5NG5NLSCSCYInterlake PlainBirdsPodicipedidaePodiceps nigricollisEared GrebeS354BN5B.N3NG5NLNLNLNLPInterlake PlainBirdsHirundinidaeRiparia ripariaBank SwallowS4BN4N5B,N5MG5NLTTTYInterlake PlainBirdsLaridaeSterna forsteriForster's TernS4BN5BN5B,NUNG5NLNLNLPInterlake PlainBirdsLaridaeSterna hirundoCommon TernS5BN5B,NUNG5NLNLNLPInterlake PlainBirdsStrigidaeStrix nebulosaGreat Gray OwlS354N55G5NLNLNLVInterlake PlainBirdsStrigidaeStrix variaBarred OwlS344N55G5NLNLNLVInterlake PlainBirdsPhasinidaeTympanuchus phasianellusSharp-tailed GrouseS5N5G5NLNLNLV	Interlake Plain	Birds	Passerellidae	Pipilo erythrophthalmus	Eastern Towhee	S3S4B	N4B,N3N	G5	NL	NL	NL	W
Interlake PlainBirdsPodicipedidaePodiceps nigricollisEared GrebeS354BN5B. N3NG5NLNLNLNLNLInterlake PlainBirdsHirundinidaeRiparia ripariaBank SwallowS4BN4N5B,N5MG5NLTT <td< td=""><td>Interlake Plain</td><td>Birds</td><td>Podicipedidae</td><td>Podiceps auritus</td><td>Horned Grebe</td><td>S3B</td><td>N5B,N4N5N</td><td>G5</td><td>NL</td><td>SC</td><td>SC</td><td>Y</td></td<>	Interlake Plain	Birds	Podicipedidae	Podiceps auritus	Horned Grebe	S3B	N5B,N4N5N	G5	NL	SC	SC	Y
Interlake PlainBirdsHirundinidaeRiparia ripariaBank SwallowS4BN4N5B,N5MG5NLTT <td>Interlake Plain</td> <td>Birds</td> <td>Podicipedidae</td> <td>Podiceps niaricollis</td> <td>Eared Grebe</td> <td>S3S4B</td> <td>N5B.N3N</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Р</td>	Interlake Plain	Birds	Podicipedidae	Podiceps niaricollis	Eared Grebe	S3S4B	N5B.N3N	G5	NL	NL	NL	Р
Interlake PlainBirdsLaridaeSterna forsteriForster's TernS4BN5BG5NL	Interlake Plain	Birds	Hirundinidae	Riparia riparia	Bank Swallow	S4B	N4N5B.N5M	G5	NL	Т	T	Y
Interlake PlainBirdsLaridaeSterna hirundoCommon TernS5BN5B,NUNG5NL	Interlake Plain	Birds	Laridae	Sterna forsteri	Forster's Tern	S4B	N5B	G5	NL	NL	NL	Р
Interlake Plain Birds Strigidae Strix nebulosa Great Gray Owl S354 N5 G5 NL	Interlake Plain	Birds	Laridae	Sterna hirundo	Common Tern	S5B	N5B,NUN	G5	NL	NL	NL	Р
Interlake Plain Birds Strigidae Strik varia Barred Owl S354 N5 G5 NL NL NL V Interlake Plain Birds Phasianidae Tympanuchus phasianellus Shared Owl S5 N5 G5 NL NL NL V	Interlake Plain	Birds	Strigidae	Strix nebulosa	Great Gray Owl	\$3\$4	N5	G5	NL	NL	NL	Y
Interlake Plain Birds Phasianidae Tympanuchus phasianellus Sharp-tailed Grouse S5 N5 G5 NL NL NL P	Interlake Plain	Birds	Strigidae	Strix varia	Barred Owl	S3S4	N5	G5	NL	NL	NL	W
	Interlake Plain	Birds	Phasianidae	Tympanuchus phasianellus	Sharp-tailed Grouse	S5	N5	G5	NL	NL	NL	Р
Interlake Plain Birds Parulidae Vermivora chrysoptera Golden-winged Warbler S2S3B N3B G4 T T T Y	Interlake Plain	Birds	Parulidae	Vermivora chrysoptera	Golden-winged Warbler	S2S3B	N3B	G4	Т	Т	Т	Y

ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATU S
Interlake Plain	Bumble Bees	Apidae	Bombus bohemicus	Ashton Cuckoo Bumble Bee	S1	N2N3	G3G5	NL	E	E	Y
Interlake Plain	Bumble Bees	Apidae	Bombus terricola	Yellow-banded Bumble Bee	\$3\$5	N4?	G3G4	NL	SC	SC	Y
Interlake Plain	Butterflies and Skippers	Nymphalidae	Danaus plexippus	Monarch	S3S4B	N3B,NUM	G4	NL	E	E	Y
Interlake Plain	Butterflies and Skippers	Hesperiidae	Erynnis martialis	Mottled Duskywing	S1	N1N2	G3	NL	E	E	Y
Interlake Plain	Butterflies and Skippers	Hesperiidae	Hesperia dacotae	Dakota Skipper		N2	G2	Т	E	E	Y
Interlake Plain	Butterflies and Skippers	Hesperiidae	Oarisma poweshiek	Powesheik Skipperling	S1	N1	G1	E	E	E	Y
Interlake Plain	Butterflies and Skippers	Nymphalidae	Phyciodes tharos	Pearl Crescent	S2S3	N4N5	G4G5	NL	NL	NL	Y
Interlake Plain	Butterflies and Skippers	Hesperiidae	Wallengrenia egeremet	Northern Broken-dash	S1	N5	G5	NL	NL	NL	Y
Interlake Plain	Clubmosses	Lycopodiaceae	Huperzia selago	Northern Firmoss	S2S3	NNR	G5	NL	NL	NL	Y
Interlake Plain	Crayfishes	Cambaridae	Faxonius immunis	Calico Crayfish	S3	N4	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Orobanchaceae	Agalinis aspera	Rough Agalinis	S2S3	N2N3	G5	E	E	E	Y
Interlake Plain	Dicots	Orobanchaceae	Agalinis gattingeri	Gattinger's Agalinis	S1	N2N3	G4	E	E	E	Y
Interlake Plain	Dicots	Orobanchaceae	Agalinis tenuifolia	Narrow-leaved Agalinis	S3	N4N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Rosaceae	Agrimonia gryposepala	Common Agrimony	S1S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Fabaceae	Amorpha fruticosa	False Indigo	S1S2	N1N2	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Asteraceae	Antennaria plantaginifolia	Plantain-leaved Pussytoes	S1S2	N1N2	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Orobanchaceae	Aphyllon fasciculatum	Clustered Broomrape	S3	N5	G4G5	NL	NL	NL	Y
Interlake Plain	Dicots	Orobanchaceae	Aphyllon ludovicianum	Louisiana Broomrape	S2	N3	GNR	NL	NL	NL	Y
Interlake Plain	Dicots	Brassicaceae	Arabidopsis lyrata ssp. lyrata	Lyre-leaved Rockcress	S1S2	N4N5	G5T5	NL	NL	NL	Y
Interlake Plain	Dicots	Araliaceae	Aralia racemosa	Spikenard	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Asteraceae	Arnica fulgens	Hillside Arnica	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Aristolochiaceae	Asarum canadense	Wild Ginger	S3S4	N5	G5	NL	NL	NL	W
Interlake Plain	Dicots	Apocynaceae	Asclepias verticillata	Whorled Milkweed	S3	N4	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Fabaceae	Astragalus australis	Southern Milkvetch	S1S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Fabaceae	Astragalus neglectus	Neglected Milkvetch	S1	N3	G4	NL	NL	NL	Y
Interlake Plain	Dicots	Fabaceae	Astragalus pectinatus	Narrow-leaved Milkvetch	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Asteraceae	Boltonia asteroides var. recognita	White Doll's-daisy	S2S3	N3	G5T3T5	NL	NL	NL	Y
Interlake Plain	Dicots	Asteraceae	Canadanthus modestus	Great Northern Aster	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Brassicaceae	Cardamine bulbosa	Bulbous Bittercress	SH	N4	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Berberidaceae	Caulophyllum thalictroides	Blue Cohosh	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Rhamnaceae	Ceanothus herbaceus	New Jersey Tea	S2S3	N4	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Saxifragaceae	Chrysosplenium iowense	lowa Golden-saxifrage	S1	N4	G4	NL	NL	NL	Y
Interlake Plain	Dicots	Ranunculaceae	Clematis ligusticifolia	Western Virgin's-bower	S1	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Ranunculaceae	Clematis virginiana	Virgin's-bower	S2?	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Amaranthaceae	Corispermum americanum var. americanum	American Bugseed	S3	N4	G5?T5?	NL	NL	NL	Y
Interlake Plain	Dicots	Amaranthaceae	Corispermum villosum	Hairy Bugseed	\$1\$2	N4	G4?	NI	NI	NI	Y
Interlake Plain	Dicots	Fabaceae	Desmodium canadense	Canada Tick-trefoil	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Droseraceae	Drosera anglica	Oblong-leaved Sundew	\$3\$4	N5	G5	NL	NL	NL	W
Interlake Plain	Dicots	Onagraceae	Epilobium brachycarpum	Tall Annual Willowherb	SU	N5	G5	NI	NI	NI	W
Interlake Plain	Dicots	Oleaceae	Fraxinus nigra	Black Ash	S2	N4	G5	NI	NI	т	Y
Interlake Plain	Dicots	Gentianaceae	Gentiana rubricaulis	Closed Gentian	S3	N4	G4?	NI	NI	NI	Ŷ
Interlake Plain	Dicots	Geraniaceae	Geranium maculatum	Wild Crane's-hill	S1	N5	G5	NI	NI	NI	Y
Interlake Plain	Dicots	Asteraceae	Helianthus giganteus	Large Sunflower	\$3	N5	G5	NI	NI	NI	Ŷ
Interlake Plain	Dicots	Asteraceae	Helianthus pauciflorus ssp. pauciflorus	Stiff Sunflower	SU	NU	G5T5?	NI	NI	NI	w
Interlake Plain	Dicots	Cistaceae	Hudsonia tomentosa	False Heather	\$3	N4	G5T50	NI	NI	NI	v
Interlake Plain	Dicots	Asteraceae	Krigia hiflora	Two-flowered Dwarf-dandelion	\$2\$3	N2N3	G5	NI	NI	NI	v
Interlake Plain	Dicots	Asteraceae	Lactuca canadensis	Canada Lettuce	\$3	N5	G5	NI	NI	NI	Ŷ
Interlake Plain	Dicots	Asteraceae	Lactura floridana	Woodland Lettuce	SH	N1N2	G5	NI	NI	NI	v
Interlake Plain	Dicots	Cistaneae	Lechea intermedia var. intermedia	Large-nod Pinweed	\$12	N4N5	G5T4T5	NI	NI	NI	v
Interlake Plain	Dicots	Solanaceae	Leucophysalis grandiflora	Large White-flowered Ground-cherry	\$3\$4	N3N4	G42	NI	NI	NI	w
Interlake Diain	Dicots	Linaceae	Linum sulcatum	Grooved Vellow Flax	5334	N2	G5	NI	NU	NI	V
Interlake Plain	Dicots	Aniaceae	Linum succium	Hairy-fruited Parsley	23	N5	CSTE	NI	NU	NI	v
IIII I I I I I I I I I I I I I I I I I	Dicots	npiaceae	Eomatium toeniculaceum ssp. Toeniculaceum	rian y-fluiteu raisiey	55	NU	0010	INL	L'NL	INL	<u> </u>

ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATU S
Interlake Plain	Dicots	Apiaceae	Lomatium macrocarpum	Long-fruited Parsley	S2S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Primulaceae	Lysimachia quadriflora	Whorled Loosestrife	S2	N4	G5?	NL	NL	NL	Y
Interlake Plain	Dicots	Onagraceae	Oenothera perennis	Sundrops	S1	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Fabaceae	Oxytropis lambertii	Purple Locoweed	S3	N3	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Asteraceae	Packera tridenticulata	Three-toothed Groundsel	S2	N2	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Urticaceae	Parietaria pensylvanica	American Pellitory	S3S4	N5	G5	NL	NL	NL	W
Interlake Plain	Dicots	Celastraceae	Parnassia parviflora	Small Grass of Parnassis	S1	N4N5	G5?	NL	NL	NL	Y
Interlake Plain	Dicots	Penthoraceae	Penthorum sedoides	Ditch-stonecrop	S1S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Phrymaceae	Phryma leptostachya var. leptostachya	American Lopseed	S3	N4N5	G5T5	NL	NL	NL	Y
Interlake Plain	Dicots	Lamiaceae	Physostegia virginiana ssp. virginiana	False Dragonhead	S4	N4	G5T5	NL	NL	NL	N
Interlake Plain	Dicots	Polygalaceae	Polygala verticillata	Whorled Milkwort	S2	N3?	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Ericaceae	Pyrola americana	Round-leaved Pyrola	S2?	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Ranunculaceae	Ranunculus hispidus var. caricetorum	Bristly Buttercup	S2	N5	G5T5	NL	NL	NL	Y
Interlake Plain	Dicots	Salicaceae	Salix eriocephala	Heart-leaved Willow	S2S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Asteraceae	Solidago mollis	Velvety Goldenrod	\$3	N4	G5	NL	NL	NL	Y
Interlake Plain	Dicots	Asteraceae	Solidago riddellii	Riddell's Goldenrod	S2S3	N3	G5	Т	SC	SC	Y
Interlake Plain	Dicots	Asteraceae	Symphyotrichum ericoides var. ericoides	White Heath Aster	\$3?	N5	G5T5	NI	NI	NI	w
Interlake Plain	Dicots	Asteraceae	Symphyotrichum sericeum	Western Silvery Aster	\$2\$3	N2N3	G5	T	T	Т	Y
Interlake Plain	Dicots	Lamiaceae	Teucrium canadense var. occidentale	American Germander	\$3	N4	G5T5?	NI	NI	NI	Y
Interlake Plain	Dicots	Ranunculaceae	Thalictrum amphibolum	Waxleaf Meadow-rue	S1	N3	G5	NI	NI	NI	Y
Interlake Plain	Dicots	Lentibulariaceae	Utricularia corputa	Horned Bladderwort	\$3\$4	N5	G5	NI	NI	NI	w
Interlake Plain	Dicots	Lentibulariaceae	Utricularia minor	Lesser Bladderwort	\$3	N5	65	NI	NI	NI	v
Interlake Plain	Dicots	Ericaceae	Vaccinium cesnitosum	Dwarf Bilberry	55	N5	65	NI		NI	v
Interlake Plain	Dicots	Plantaginaceae	Vaccinium cespitosum	Culver's-root	55 \$1\$2	N2	G4	T	NI	NI	v
Interlake Plain	Dicots	Violaceae	Viola labradorica	Early Blue Violet	\$152	N5	G5	NI	NI	NI	v
Interlake Plain	Dicots	Violaceae	Viola nuttallii	Vollow Prairie Vielet	55	NA	05	NI	NI	NI	v
Interlake Flain	Dicots	Vitacoao	Vitis riparia	Pivorbank Crano	55	N6	05	NI	NI	NI	1
Interlake Flain	Dicuts	Comphidae	Arigomphus corputus	Horped Clubteil	5334	NA	65	NI	NI	NI	V
Interlake Flain	Dragonflios and Damselflios	Gompridae	Enithece canis	Reaverpord Paskettail	55	N6	04	NI	NI	NI	v
IIIteriake Pialii	Eishes - Freshwater and Anadromous Bony	Cordunidae	Epineca canis	Beaverpoild Baskettall	33	CI	65	INL	INL		T
Interlake Plain	Cartilaginous; Lampreys	Salmonidae	Coregonus zenithicus	Shortjaw Cisco	S2	N2	G3	NL	NL	т	Y
	Fishes - Freshwater and Anadromous Bony,								1		
Interlake Plain	Cartilaginous; Lampreys	Petromyzontidae	Ichthyomyzon castaneus	Chestnut Lamprey	SU	NU	G4	NL	NL	NL	Y
Intorlako Diain	Fishes - Freshwater and Anadromous Bony,	Cuprinidae	Maarbubancis storesiana	Silver Chub	CE	NE	CE	NI	NII	NII	N
IIIteriake Pialii	Eishes - Freshwater and Anadromous Bony	сурппиае			30	CI	65	INL	INL		IN
Interlake Plain	Cartilaginous; Lampreys	Cyprinidae	Notropis dorsalis	Bigmouth Shiner	S4	N4	G5	NL	NL	NL	N
Interlake Plain	Freshwater Mussels	Unionidae	Amblema plicata	Threeridge	S3	N4	G5	NL	NL	NL	Y
Interlake Plain	Freshwater Mussels	Unionidae	Fusconaia flava	Wabash Pigtoe	S3	N3	G5	NL	NL	NL	Y
Interlake Plain	Freshwater Mussels	Unionidae	Lasmigona complanata	White Heelsplitter	\$3	N4	G5	NL	NL	NL	Y
Interlake Plain	Freshwater Mussels	Unionidae	Lasmigona compressa	Creek Heelsplitter	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Freshwater Mussels	Unionidae	Lasmigona costata	Flutedshell	\$2	N5	G5	NL	NL	NL	Y
Interlake Plain	Freshwater Mussels	Unionidae	Liaumia recta	Black Sandshell	\$3	N3	G4G5	NL	NL	NL	Y
Interlake Plain	Freshwater Mussels	Unionidae	Ouadrula quadrula	Mapleleaf Mussel	S1	N2	G5	F	T	т	Y
Interlake Plain	Freshwater Mussels	Unionidae	Strophitus undulatus	Creeper	\$5	N5	G5	NI	NI	NI	N
Interlake Plain	Giant Silkworm and Royal Moths	Saturniidae	Anisota manitobensis	Manitoba Qakworm Moth	S2	N2	G20	NI	NI	SC	Y
Interlake Plain	Giant Silkworm and Royal Moths	Saturniidae	Hemileuca nevadensis	Nevada Buckmoth	53	N3	G5	NI	NI	NI	Y
Interlake Plain	Leptosporangiate Ferns	Osmundaceae	Clavtosmunda clavtoniana	Interrupted Fern	\$2\$3	N5	G5	NI	NI	NL	Ŷ
Interlake Plain	Leptosporangiate Ferns	Onocleaceae	Onoclea sensibilis	Sensitive Fern	\$3?	N5	G5	NI	NI	NI	Y
Interlake Plain	Leptosporangiate Ferns	Pteridaceae	Pellaea gastonvi	Gastony's Cliffbrake	\$1	N3N4	G3	F	NI	NI	y.
Interlake Plain	Leptosporangiate Ferns	Pteridaceae	Pellaea glabella ssp. occidentalis	Western Dwarf Cliffbrake	\$2	N3	G5T4	NI	NI	NI	· Y
Interlake Plain	Lichens	Teloschistaceae	Teloschistes chrysophthalmus	Golden-eve Lichen	\$3\$4	N3N4	G4G5	NI	SC	SC	· Y
Interlake Plain	Mammals	Bovidae	Rison hison athabascae	Wood Bison	SNA	N3	G4T20	NI	т	sc	N
Interlake Plain	Mammals	Geomvidae	Geomys hursarius	Plains Pocket Conher	\$3	N3	65	NI	NI	NI	v
	indiminals.	Soonijiuuc	ooonijo oaroanao	i lans i solot oppioi				CAL.		1. · ·	1

ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATU S
Interlake Plain	Mammals	Vespertilionidae	Myotis lucifugus	Little Brown Myotis	S2N,S5B	N2N4B,NNRN,NNRM	G3G4	E	E	E	Y
Interlake Plain	Mammals	Vespertilionidae	Myotis septentrionalis	Northern Myotis	S3S4N,S4B	N2N4B,NNRN,NNRM	G2G3	E	E	E	Ρ
Interlake Plain	Mammals	Cervidae	Odocoileus hemionus	Mule or Black-tailed Deer	S3	N5	G5	Т	NL	NL	Y
Interlake Plain	Mammals	Cervidae	Rangifer tarandus caribou	Woodland Caribou	S2S3	N4N5	G5T5	Т	Т	Т	Y
Interlake Plain	Mammals	Mustelidae	Taxidea taxus taxus	American Badger	S4	N4	G5T5	NL	SC	SC	Y
Interlake Plain	Monocots	Poaceae	Achnatherum richardsonii	Richardson's Needlegrass	S1S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Alismataceae	Alisma gramineum	Grass-leaved Water-plantain	S1	N4	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Arethusa bulbosa	Dragon's-mouth Orchid	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Bouteloua curtipendula	Side-oats Grama	S2	N3	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Bromus kalmii	Wild Chess	S2S3	N4	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Bromus porteri	Porter's Chess	S2S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Calamagrostis montanensis	Plains Reedgrass	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Calopogon tuberosus var. tuberosus	Tuberous Grass-pink	S2	N5	G5T5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex conoidea	Field Sedge	S1	N4	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex crawei	Crawe's Sedge	\$3?	N4	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex cryptolepis	Northeastern Sedge	S1	N4	G4G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex douglasii	Douglas' Sedge	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex flava	Yellow Sedge	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex hystericina	Porcupine Sedge	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex livida	Livid Sedge	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex parryana	Parry's Sedge	S3	N5?	G4G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex pedunculata	Long-stalked Sedge	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex sterilis	Sterile Sedge	S2	N4	G4G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex stricta	Tussock Sedge	S1	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex supina ssp. spaniocarpa	Weak Arctic Sedge	S2S3	N5	G5T5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex tetanica	Rigid Sedge	S3	N3	G4G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Carex vulpinoidea	Fox Sedge	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Cladium mariscoides	Smooth Twig-rush	S2S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Corallorhiza striata var. striata	Striped Coralroot	S3S4	N5	G5T5	NL	NL	NL	W
Interlake Plain	Monocots	Cyperaceae	Cyperus erythrorhizos	Red-rooted Flatsedge	S1	N4	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Cyperus houghtonii	Houghton's Flatsedge	S2S3	N3	G4?	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Cypripedium arietinum	Ram's-head Lady's-slipper	S2S3	N3	G3	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Cypripedium candidum	Small White Lady's-slipper	S2	N2	G4	E	Т	Т	Y
Interlake Plain	Monocots	Poaceae	Elymus lanceolatus	Thick-spike Wildrye	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Elymus lanceolatus ssp. lanceolatus	Thick-spike Wildrye	S3	N5	G5TNR	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Festuca hallii	Plains Rough Fescue	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Goodyera tesselata	Checkered Rattlesnake-plantain	S2	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Hesperostipa curtiseta	Western Porcupine Grass	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Hypoxidaceae	Hypoxis hirsuta	Yellow Stargrass	S3S4	N3N4	G5	NL	NL	NL	W
Interlake Plain	Monocots	Orchidaceae	Liparis loeselii	Loesel's Twayblade	S3S4	N4N5	G5	NL	NL	NL	W
Interlake Plain	Monocots	Asparagaceae	Maianthemum racemosum	Large False Solomon's Seal	SH	N5	G5T5	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Malaxis monophyllos var. brachypoda	White Adder's-mouth	S2?	N4	G5T4T5	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Malaxis paludosa	Bog Adder's-mouth	S1?	N3N4	G3G4	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Malaxis unifolia	Green Adder's-mouth	S2?	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Muhlenbergia andina	Foxtail Muhly	S1	N3	G4	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Muhlenbergia mexicana var. filiformis	Slim-stemmed Mexican Muhly	S3	N4N5	G5T4T5	NL	NL	NL	Y
Interlake Plain	Monocots	Poaceae	Nassella viridula	Green Needlegrass	S3S4	N5	G5	NL	NL	NL	W
Interlake Plain	Monocots	Poaceae	Pascopyrum smithii	Western Wheatgrass	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Orchidaceae	Platanthera orbiculata	Round-leaved Bog Orchid	S3S4	N5	G5T5	NL	NL	NL	W
Interlake Plain	Monocots	Orchidaceae	Platanthera praeclara	Western Prairie Fringed Orchid	S1	N1	G3	E	E	E	Y
Interlake Plain	Monocots	Cyperaceae	Rhynchospora alba	White Beakrush	S3	N5	G5	NL	NL	NL	Y
Interlake Plain	Monocots	Cyperaceae	Rhynchospora capillacea	Horned Beakrush	S2S3	N4	G4G5	NL	NL	NL	Y
L		/						•	bbb	<u>ــــــــــــــــــــــــــــــــــــ</u>	

IndepicNaces<	ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATU S
mrane mater metale mater particle mater metale mater 	Interlake Plain	Monocots	Iridaceae	Sisyrinchium campestre	Prairie Blue-eyed-grass	S3	N3	G5	NL	NL	NL	Y
mraneprotect <th< td=""><td>Interlake Plain</td><td>Monocots</td><td>Orchidaceae</td><td>Spiranthes magnicamporum</td><td>Great Plains Ladies'-tresses</td><td>S1S2</td><td>N3?</td><td>G3G4</td><td>E</td><td>NL</td><td>NL</td><td>Y</td></th<>	Interlake Plain	Monocots	Orchidaceae	Spiranthes magnicamporum	Great Plains Ladies'-tresses	S1S2	N3?	G3G4	E	NL	NL	Y
mranemethodSizeMethodSizeMethod <td>Interlake Plain</td> <td>Other Bees</td> <td>Apidae</td> <td>Epeoloides pilosulus</td> <td>Macropis Cuckoo Bee</td> <td>S1</td> <td>N1</td> <td>GU</td> <td>NL</td> <td>E</td> <td>E</td> <td>Y</td>	Interlake Plain	Other Bees	Apidae	Epeoloides pilosulus	Macropis Cuckoo Bee	S1	N1	GU	NL	E	E	Y
mether methermether mether mether mether mether mether methermether mether mether mether mether mether mether methermether mether mether mether mether mether mether mether mether methermether mether mether mether mether mether mether mether mether mether mether mether mether mether mether mether mether methermether mether mether mether mether mether methermether mether mether methermether mether mether mether methermether mether mether methermether mether mether methermether mether mether methermether mether mether methermether mether mether methe	Interlake Plain	Other Beetles	Coccinellidae	Coccinella transversoguttata richardsoni	Transverse Lady Beetle	\$3\$5	N5	G5T5	NL	SC	SC	W
Include pointSystem<	Interlake Plain	Other Flies and Keds	Calliphoridae	Phormia regina	Black Blow Fly	S2S3	NNR	GNR	NL	NL	NL	Y
Interplex <td>Interlake Plain</td> <td>Reptiles</td> <td>Colubridae</td> <td>Opheodrys vernalis</td> <td>Smooth Greensnake</td> <td>\$3\$4</td> <td>N5</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>W</td>	Interlake Plain	Reptiles	Colubridae	Opheodrys vernalis	Smooth Greensnake	\$3\$4	N5	G5	NL	NL	NL	W
Interlay Interlay Interlay Interlay 	Interlake Plain	Reptiles	Colubridae	Thamnophis radix	Plains Gartersnake	S4	N5	G5	NL	NL	NL	Р
InterfactionRelations<	Interlake Plain	Reptiles	Colubridae	Thamnophis sirtalis	Common Garter Snake	S4	N5	G5	NL	NL	NL	Р
IntendersionSphemson and AllownSphemson and Allown<	Interlake Plain	Reptiles	Colubridae	Thamnophis sirtalis parietalis	Red-sided Gartersnake	S4	N5	G5T5	NL	NL	NL	Р
Internation Internation Internation Internation Internation Internation Internation Internation Internation Internation Internation InternationSystem Internation <br< td=""><td>Interlake Plain</td><td>Spikemosses and Quillworts</td><td>Selaginellaceae</td><td>Selaginella densa</td><td>Prairie Spikemoss</td><td>S3</td><td>N5</td><td>G5T5</td><td>NL</td><td>NL</td><td>NL</td><td>Y</td></br<>	Interlake Plain	Spikemosses and Quillworts	Selaginellaceae	Selaginella densa	Prairie Spikemoss	S3	N5	G5T5	NL	NL	NL	Y
Intrine I	Interlake Plain	Spikemosses and Quillworts	Selaginellaceae	Selaginella selaginoides	Low Spikemoss	S3S4	N5	G5	NL	NL	NL	W
InstanderInstandOptigalization <td>Interlake Plain</td> <td>True Bugs, Cicadas, Hoppers, Aphids and Allies</td> <td>Cicadellidae</td> <td>Aflexia rubranura</td> <td>Red-tailed Prairie Leafhopper</td> <td>S2S3</td> <td>N2N3</td> <td>G3G4</td> <td>NL</td> <td>SC</td> <td>SC</td> <td>Y</td>	Interlake Plain	True Bugs, Cicadas, Hoppers, Aphids and Allies	Cicadellidae	Aflexia rubranura	Red-tailed Prairie Leafhopper	S2S3	N2N3	G3G4	NL	SC	SC	Y
Line of the Worksh Dirish Accepter corporation Corport NamA SSSR MSRAM O.S. No. M. N. No.	Interlake Plain	Turtles	Chelydridae	Chelydra serpentina	Snapping Turtle	S3	N4	G5	NL	SC	SC	Y
Jack of InvokodiInfoJourginionAnglinic congranitOpen VisionState of InvokodiVision <td></td>												
Jake of the WoodsSindsPergenerational Pergenerational Alter of the WoodsSindWind <t< td=""><td>Lake of the Woods</td><td>Birds</td><td>Accipitridae</td><td>Accipiter cooperii</td><td>Cooper's Hawk</td><td>S4S5B</td><td>N5B,N5N</td><td>G5</td><td>NL</td><td>NL</td><td>NL</td><td>N</td></t<>	Lake of the Woods	Birds	Accipitridae	Accipiter cooperii	Cooper's Hawk	S4S5B	N5B,N5N	G5	NL	NL	NL	N
Jake of the Woods Binds Additystalisa Additystalis	Lake of the Woods	Dicots	Papaveraceae	Adlumia fungosa	Climbing Fumitory	SH	N4?	G4	NL	NL	NL	Y
Jake of twoodsOrganities and ImmuNifiesAndenionAndenio ConfrictSince <t< td=""><td>Lake of the Woods</td><td>Birds</td><td>Podicipedidae</td><td>Aechmophorus occidentalis</td><td>Western Grebe</td><td>S3S4B</td><td>N3N4B,N2N</td><td>G5</td><td>NL</td><td>SC</td><td>SC</td><td>Y</td></t<>	Lake of the Woods	Birds	Podicipedidae	Aechmophorus occidentalis	Western Grebe	S3S4B	N3N4B,N2N	G5	NL	SC	SC	Y
Date of the Woods Digetime and Damoeffines Andrea unforosa? Applies and Damoeffines No. No	Lake of the Woods	Dragonflies and Damselflies	amselflies Aeshnidae Aeshna constricta Lance-tipped Darner S3		S3	N5	G5	NL	NL	NL	Y	
Jake of the Woods Double-bacese Applitions Number of the Woods Sint Number of the Woods	Lake of the Woods	Dragonflies and Damselflies	Aeshnidae Aeshnida constructa Cance-tipped Darner S3 Aeshnidae Aeshna umbrosa Shadow Darner S3		S3	N5	G5	NL	NL	NL	Y	
Inter of Invosors Participant Supports Analystormatisa Ana	Lake of the Woods	Dicots	Orobanchaceae	Agalinis tenuifolia	Narrow-leaved Agalinis	\$3	N4N5	G5	NI	NI	NI	Y
Inter of twoods Integration Integration Paper and Still Stipper S1 M406 S5 M N N V bale of the Woods Amphitians Animytemalidae Antoportant Lynnum Scient Tiger Salamander S77 N1 S5 N N E Y Jake of the Woods Amphitians Bandiee Linkows Grown Trage Salamander S77 N1 S5 N	Lake of the Woods	Amphibians	Ambystomatidae	Ambystoma laterale	Blue-spotted Salamander	\$3\$4	N5	G5	NI	NI	NI	W
Like of the Woods. Amplitations Amplitations Easter Tage Salamander S17 N1 CS N. E F	Lake of the Woods	Butterflies and Skippers	Hesperiidae	Amblyscirtes heavn	Pepper and Salt Skipper	\$3	N4N5	G5	NI	NI	NI	Y
Instruction	Lake of the Woods		Ambystomatidae	Ambystoma tigrinum	Fastern Tiger Salamander	\$32	N1	65	NI	F	F	v
Instruction Discrite of the Works Discrite of the Works <thdiscrite of="" th="" the="" works<=""> Discrite of the Works Discri</thdiscrite>	Lake of the Woods	Amphibians	Ranidae	Lithohates clamitans	Green From	\$1\$2	N5	65	NI	NI	NI	v
Index of the Woods Binds Description Description <thdescription< th=""> <thdescription< th=""></thdescription<></thdescription<>	Lake of the Woods	Dicots	Rosaceae	Amelanchier spicata	Running Serviceberry	\$1	N5	65	NI	NI	NI	v
Lake of the Woods Data Description Data Number Dist Dist <thdis< th=""> <thdist< th=""> Dist</thdist<></thdis<>	Lake of the Woods	Birds	Passerellidae	Ammodramus savannarum	Grasshopper Sparrow	\$2\$3B	N4N5B	65	NI	NI	NI	v
Jake of the Woods Gland Silveorm and Royal Moths Salurniade Anishtan analobensis Makrintoba Gakovern Moths S2 NR2 C62 NL NL SC Lake of the Woods Dicols Anternaria plantaginifican Plantian-leaved Pussyloes S12 N1N2 G5 NL NL NL SC Lake of the Woods Dicols Anternaria plantaginifican Plantain-leaved Pussyloes S132 N4N2 G5 NL NL NL YC Lake of the Woods Dicols Antel Robornia Artele Robornia S238 M4N2 G6 NL NL NL YC Lake of the Woods Dicols Artele Robornia Gradit Burentine Gapornine S34 MA G4 NL NL VL YC Lake of the Woods Dicols Corporniphilae Arterae Arterae Arterae Gapornine S34 MA ML NL NL <td< td=""><td>Lake of the Woods</td><td>Dicate</td><td>Fabaceae</td><td>Amorpha fruticosa</td><td>Ealse Indigo</td><td>S1S2</td><td>N1N2</td><td>G5</td><td>NI</td><td>NI</td><td>NI</td><td>v</td></td<>	Lake of the Woods	Dicate	Fabaceae	Amorpha fruticosa	Ealse Indigo	S1S2	N1N2	G5	NI	NI	NI	v
Lake of the Woods Disclos Alternative and organization Disclos Nin Circ C	Lake of the Woods	Ciant Silkworm and Royal Moths	Saturniidae	Aniorpha in alicosa Anisota manitohensis	Manitoba Oakworm Moth	\$132	N1N2	620	NI	NI	SC SC	v
Lake of the Woods Binds Cardination functional plannabule Distance Distance <thdistance< th=""></thdistance<>	Lake of the Woods	Dicots	Asteraceae		Plantain-leaved Pussytoes	52 \$1\$2	N1N2	620	NI	NI	NI	v
Lake of the Woods Binds Card of Line Woods Binds Card of Line Woods Restance Application Application Card of Line Woods Note Name Cord Sint Woods Note Name Cord Sint Woods Note Name Cord Sint Woods Note Name Note	Lake of the Woods	Birde	Caprimulaidae	Antennana plantagininolia	Fightanii-leaved Fussyloes	5152		GJ CF	T	T	INL SC	v
Lake of the Woods Biclass Winds Girls Winds Minds Minds Minds Minds Minds Minds Minds Minds <td>Lake of the Woods</td> <td>Directo</td> <td>Drassiaasaa</td> <td>Antrostonius vocinerus</td> <td>Aretia Dackeross</td> <td>3233D 6262</td> <td>IN4D,IN3IVI</td> <td>G5 C4CE</td> <td>I NII</td> <td>I NII</td> <td>SC NI</td> <td>T V</td>	Lake of the Woods	Directo	Drassiaasaa	Antrostonius vocinerus	Aretia Dackeross	3233D 6262	IN4D,IN3IVI	G5 C4CE	I NII	I NII	SC NI	T V
Lake of the Woods Bords Probabate	Lake of the Woods	Dicots	DidSSildlede	Ardee beredies	Arctic Rockcress	3233 CED	NED NAN	G4G5	NI	NIL	INL NI	
Lake of the Woods Indification S.2 No. G.3 N.	Lake of the Woods	bilds	Arueiuae	Ai dea riel odias		200	NOD,IN4IN	GD	INL.	INL	INL	P
Lake of the Woods Didgotities and Dathieslines Control Production S3 N4 C4 NL	Lake of the Woods		Orchidaceae	Arethusa bulbosa	Dragon s-mouth Orchid	52	NO NA	65	INL.	INL	NL NI	Y V
Lake of the WoodsMondoulsMalestiteMalestiteMiniprindjack-fit-inte-pupilitS152NSG51NLNLNLTLake of the WoodsDicotsAristolochiaceeAsarum canadenseSind GingerS334N5G5NLNLNLNLVLLake of the WoodsDicotsStrigidaeAsini dameusShort-eared OwlS238N4B,N3N,N4MG5TSCTYLake of the WoodsDicotsAsteraceaeBidens backiiBeack Mater-marigoidS3N5G5NLNLNLVLLake of the WoodsBumble BeesApidaeBornbus bohemicusAshton Cuckoo Bumble BeeS1N2N3G3G4NLSCSCYLake of the WoodsAdder's-tongues, Grapeferns, and MoonvortsOphioglosaceaeBortychium simplexLeast GrapefernS1N47G5<	Lake of the Woods	Dragonnies and Damseinies	Gomphidae	Arigomphus cornutus	Horned Clubtall	53	N4	G4	INL.	INL	NL NI	Y V
Lake of the Woods Birds Antstonchiaceae Astrun canadense Wind Linger S.S.4 N.S G.S N. N.L N.L <th< td=""><td>Lake of the Woods</td><td>Monocots</td><td>Araceae</td><td>Arisaema tripnylium ssp. tripnylium</td><td>Jack-In-the-pulpit</td><td>5152</td><td>NO</td><td>6515</td><td>INL</td><td>INL</td><td>NL</td><td>Y</td></th<>	Lake of the Woods	Monocots	Araceae	Arisaema tripnylium ssp. tripnylium	Jack-In-the-pulpit	5152	NO	6515	INL	INL	NL	Y
Lake of the WoodsBirdsMdS,NSN,NAMGSISCIVLake of the WoodsDisonsDisonsAeshnidaeBasiaeschna janataSpringtime DarnerS23N5G5NLNLNLVLake of the WoodsDisonsAsteraceaeBildens beckiiBeckis Water-marigoldS3N5G5NLNLNLNLVLake of the WoodsBumble BeesApidaeBombus bohemicusAston Cuckoo Bumble BeeS1N2N3G3G5NLKLKLKLLake of the WoodsAdder's-ongues, Grapeferns, and MoonwortsOphiglossaceaeBorus terricolaYellow-banded Bumble BeeS2SN47G5NLNLNLYLake of the WoodsDicotsAdder's-ongues, Grapeferns, and MoonwortsOphiglossaceaeBorus paries achreberiWater-shieldS1N47G5NLNLNLYLake of the WoodsDicotsCabombaceaeBrasenia schreberiWater-shieldS12N5G5NLNLNLYLake of the WoodsButterflies and SkippersLycaenidaeCalophys henriciHenry's ElfinS2N5G5NLNLNLYLake of the WoodsMonocotsConvolvulaceaeCalopagon tuberosus var. tuberosusTuberous Grass-pinkS2N5G5NLNLNLNLYLake of the WoodsDicotsConvolvulaceaeCalopagon tuberosus var. tuberosusGrast Nrthern AsterS2	Lake of the Woods	Dicots	Aristolochiaceae	Asarum canadense	Wild Ginger	\$3\$4	N5	G5	NL T	NL	NL T	W
Lake of the WoodsDiragomities and JamseimiesAesminadeBasalescona janataSpringtime LatherS2.3N5G5NL<	Lake of the Woods	Birds	Strigidae	Asio fiammeus	Short-eared Owi	S2S3B	N4B,N3N,N4W	G5	1	SC	1	Y
Lake of the WoodsDicotsOtsC5NL<	Lake of the Woods	Dragonflies and Damselflies	Aeshnidae	Basiaeschna janata	Springtime Darner	\$2\$3	N5	G5	NL	NL	NL	Y
Lake of the WoodsBumble BeesApidaeBombus bonemicusApidaeBombus bonemicusApidaeApidaeBombus terricolaYellow-banded Bumble BeeS1NZNSG3C5NLEEYLake of the WoodsAdder's-tongues, Grapeferns, and MoonwortsOphioglossaceaeBombus terricolaYellow-banded Bumble BeeS1N47G3C4NL <td>Lake of the Woods</td> <td>Dicots</td> <td>Asteraceae</td> <td>Bidens beckii</td> <td>Beck's Water-marigold</td> <td>\$3</td> <td>N5</td> <td>G5</td> <td>NL</td> <td>NL</td> <td>NL</td> <td>Y</td>	Lake of the Woods	Dicots	Asteraceae	Bidens beckii	Beck's Water-marigold	\$3	N5	G5	NL	NL	NL	Y
Lake of the WoodsBumble BeesApidaeBombus terriciaYellow-banded Bumble BeesS35N4?G364NLSCSCYLake of the WoodsAdder's-tongues, Grapeferns, and MoonwortsOphiolossaeeaeBotrychium simplexLeast GrapefernS1N4?G5NLNLNLYLake of the WoodsDicotsCabombaceaeBrasenia schreberiWater-shieldS12N5G5NLNLNLYLake of the WoodsMonocotsPoaceaeBromus porteriPorter's ChessS233N5G5NLNLNLYLake of the WoodsButterflies and SkippersLycaenidaeCalophys henriciHenry's ElfinS2N4N5G4G5T45NLNLNLYLake of the WoodsDicotsConvolvulaceaeCalopagon tuberosus var. tuberosusTuberous Grass-pinkS2N4N5G4G5T45NLNLNLYLake of the WoodsDicotsConvolvulaceaeCalopagon tuberosus var. tuberosusLow BindweedSHN4N5G4G5T45NLNLNLYLake of the WoodsDicotsAsteraceaCandanthus modestusGreat Northern AsterS2N5KLNLNLNLYLake of the WoodsBirdsMonocotsCyperaceaeCarex actataConoping Woodiand SedgeS1N5G5NLNLNLYLake of the WoodsMonocotsMonocotsCyperaceaeCarex actataDrooping Woodiand S	Lake of the Woods	Bumble Bees	Apidae	Bombus bohemicus	Ashton Cuckoo Bumble Bee	51	N2N3	G3G5	NL	Ł	E .	Y
Lake of the WoodsAdder's-tongues, Grapeferns, and MoonwortsOphioglossaceaeBortychium simplexLeast GrapefernS1N4?G5NLNLNLVLVLLake of the WoodsDicotsCabombaceaeBrasenia schreberiWater-sheldS122N5G5NLNLNLVLVLLake of the WoodsMonocotsPoaceaBromus porteriPorter's ChessS233N5G5NLNLNLVLVLLake of the WoodsButterflies and SkippersLycaenidaeCalopogon tuberosus var. tuberosusTuberous Grass-pinkS2N4N5G5TNLNLNLVLVLLake of the WoodsDicotsConvolvulaceaeCalopogon tuberosus var. tuberosusTuberous Grass-pinkS2N4N5G6TSNLNLNLVLVLLake of the WoodsDicotsConvolvulaceaeCanadanthus modestusGreat Northern AsterS2N5G5NLNLNLVLVLLake of the WoodsBirdsAdderseCanadanthus modestusGreat Northern AsterS2N5G5NLNLNLVLVLLake of the WoodsBirdsQuerceaeCardellina canadensisCanada WarblerS3BN4B,N3MG5TTS2VLNLNLNLVLVLLake of the WoodsMonocotsConcotsCardez actataeaConoping Woodland SedgeS1N5G5TNLNLNLVLVL	Lake of the Woods	Bumble Bees	Apidae	Bombus terricola	Yellow-banded Bumble Bee	\$3\$5	N4?	G3G4	NL	SC	SC	Y
Lake of the WoodsDicotsCabombaceaeBrasenia schreberiWater-shieldS1S2N5G5NLNLNLNLVLake of the WoodsMonoctsPoaceaeBromus porteriPorter's ChessS2S3N5G5NLNLNLVLake of the WoodsButterflies and SkippersLycaenidaeCallophrys henriciHenry's ElfinS2N4N5G5NLNLNLVLake of the WoodsMonoctsOcnolvulaceaeCalopagon tuberosus var. tuberosusTuberous Grass-pinkS2N5G5NLNLNLVLake of the WoodsDicotsConvolvulaceaeCalopagon tuberosus var. tuberosusLow BindweedSHN4N5G65NLNLNLVLake of the WoodsDicotsConvolvulaceaeCanadanthus modestusGreat Northern AsterS2N5G5NLNLNLVLake of the WoodsBirdsParaceaeCardellina canadensisCanada WarblerS3BN4B,N3MG5TTS2YLake of the WoodsMonocotsCyperaceaeCarex cartaneaConoping Woodland SedgeS1N5G5NLNLNLYLake of the WoodsMonocotsMonocotsCyperaceaeCarex cartaneaDicoping Woodland SedgeS1N5G5NLNLNLYLake of the WoodsMonocotsMonocotsCyperaceaeCarex cartaneaDicoping Woodland SedgeS1N5 <td< td=""><td>Lake of the Woods</td><td>Adder's-tongues, Grapeferns, and Moonworts</td><td>Ophioglossaceae</td><td>Botrychium simplex</td><td>Least Grapefern</td><td>S1</td><td>N4?</td><td>G5</td><td>NL</td><td>NL</td><td>NL</td><td>Y</td></td<>	Lake of the Woods	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Botrychium simplex	Least Grapefern	S1	N4?	G5	NL	NL	NL	Y
Lake of the WoodsMonocotsMonocotsPoaceaeBromus porteriPorteris<Porter's ChessS2S3N5G5NL	Lake of the Woods	Dicots	Cabombaceae	Brasenia schreberi	Water-shield	S1S2	N5	G5	NL	NL	NL	Y
Lake of the WoodsButterflies and SkippersLycaenidaeCallophrys henriciHenry's ElfinS2N4N5G5NL <t< td=""><td>Lake of the Woods</td><td>Monocots</td><td>Poaceae</td><td>Bromus porteri</td><td>Porter's Chess</td><td>S2S3</td><td>N5</td><td>G5</td><td>NL</td><td>NL</td><td>NL</td><td>Y</td></t<>	Lake of the Woods	Monocots	Poaceae	Bromus porteri	Porter's Chess	S2S3	N5	G5	NL	NL	NL	Y
Lake of the WoodsMonocotsOrchidaceaeCalopogon tuberosus var. tuberosusTuberous Grass-pinkS2N5G5T5NL	Lake of the Woods	Butterflies and Skippers	Lycaenidae	Callophrys henrici	Henry's Elfin	S2	N4N5	G5	NL	NL	NL	Y
Lake of the WoodsDicotsConvolvulaceaeCalystegia spithamaea sep. spithamaeaLow BindweedSHN4N5G4G5T4NLN	Lake of the Woods	Monocots	Orchidaceae	Calopogon tuberosus var. tuberosus	Tuberous Grass-pink	S2	N5	G5T5	NL	NL	NL	Y
Lake of the WoodsDicotsAsteraceaeCanadanthus modestusGreet Northern AsterS2N5G5NL <t< td=""><td>Lake of the Woods</td><td>Dicots</td><td>Convolvulaceae</td><td>Calystegia spithamaea ssp. spithamaea</td><td>Low Bindweed</td><td>SH</td><td>N4N5</td><td>G4G5T4T5</td><td>NL</td><td>NL</td><td>NL</td><td>Y</td></t<>	Lake of the Woods	Dicots	Convolvulaceae	Calystegia spithamaea ssp. spithamaea	Low Bindweed	SH	N4N5	G4G5T4T5	NL	NL	NL	Y
Lake of the Woods Birds Parulidae Cardellina canadensis Canada Warbler S38 N4B,N3M G5 T T SC Y Lake of the Woods Monocts Cyperaceae Carex arctata Drooping Woodland Sedge S1 N5 G5 NL NL NL YL Lake of the Woods Monocts Cyperaceae Carex castanea Chestrut Sedge S233 N5 G5 NL NL VL YL Lake of the Woods Monocts Cyperaceae Carex crinita var. crinita Fringed Sedge S1 N5 G575 NL NL NL YL	Lake of the Woods	Dicots	Asteraceae	Canadanthus modestus	Great Northern Aster	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods Monocts Cyperaceae Carex arctata Drooping Woodland Sedge S1 N5 G5 NL NL NL YL Lake of the Woods Monocts Cyperaceae Carex castanea Chestnut Sedge S233 N5 G5 NL NL VL YL Lake of the Woods Monocts Cyperaceae Carex crinita var. crinita Fringed Sedge S1 N5 G57 NL NL VL YL	Lake of the Woods	Birds	Parulidae	Cardellina canadensis	Canada Warbler	S3B	N4B,N3M	G5	Т	Т	SC	Y
Lake of the Woods Monocots Cyperaceae Carex castanea Chestnut Sedge S2S3 N5 G5 NL NL V Lake of the Woods Monocots Cyperaceae Carex castanea Chestnut Sedge S2S3 N5 G5 NL NL V Lake of the Woods Monocots Cyperaceae Carex crinita var. crinita Fringed Sedge S1 N5 G55 NL NL V	Lake of the Woods	Monocots	Cyperaceae	Carex arctata	Drooping Woodland Sedge	S1	N5	G5	NL	NL	NL	Y
Lake of the Woods Monocots Coperaceae Carex crinita var.	Lake of the Woods	Monocots	Cyperaceae	Carex castanea	Chestnut Sedge	S2S3	N5	G5	NL	NL	NL	Y
	Lake of the Woods	Monocots	Cyperaceae	Carex crinita var. crinita	Fringed Sedge	S1	N5	G5T5	NL	NL	NL	Y

ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATL S
Lake of the Woods	Monocots	Cyperaceae	Carex douglasii	Douglas' Sedge	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex emoryi	Emory's Sedge	S2?	N4	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex gracillima	Graceful Sedge	S2S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex intumescens	Bladder Sedge	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex livida	Livid Sedge	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex merritt-fernaldii	Fernald's Sedge	S1	N4	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex pauciflora	Few-flowered Sedge	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex pedunculata	Long-stalked Sedge	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex prairea	Prairie Sedge	S3S4	N5	G5	NL	NL	NL	W
Lake of the Woods	Monocots	Cyperaceae	Carex projecta	Necklace Sedge	\$3?	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex sterilis	Sterile Sedge	S2	N4	G4G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex tetanica	Rigid Sedge	S3	N3	G4G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Carex vulpinoidea	Fox Sedge	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Berberidaceae	Caulophyllum thalictroides	Blue Cohosh	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Rhamnaceae	Ceanothus herbaceus	New Jersey Tea	S2S3	N4	G5	NL	NL	NL	Y
Lake of the Woods	Butterflies and Skippers	Lycaenidae	Celastrina neglecta	Summer Azure	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Birds	Passerellidae	Centronyx bairdii	Baird's Sparrow	S1B	N4B,N4M	G4	E	SC	SC	Y
Lake of the Woods	Birds	Apodidae	Chaetura pelagica	Chimney Swift	S2B	N3B,N4M	G4G5	Т	Т	Т	Y
Lake of the Woods	Birds	Charadriidae	Charadrius melodus circumcinctus	Piping Plover	S1B	N3B	G3T3	E	E	E	Y
Lake of the Woods	Dicots	Plantaginaceae	Chelone glabra	White Turtlehead	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Amphibians	Ranidae	Lithobates pipiens	Northern Leopard Frog	S4	N5	G5	NL	SC	SC	Y
Lake of the Woods	Birds	Caprimulgidae	Chordeiles minor	Common Nighthawk	S2S3B	N4N5B.N5M	G5	Т	SC	SC	Y
Lake of the Woods	Dicots	Onagraceae	Circaea canadensis ssp. canadensis	Large Enchanter's-nightshade	S2	N5	G5T5	NI	NI	NI	Y
Lake of the Woods	Monocots	Cyperaceae	Cladium mariscoides	Smooth Twig-rush	52S3	N5	G5	NI	NI	NI	Y
Lake of the Woods	Leptosporangiate Ferns	Osmundaceae	Claytosmunda claytoniana	Interrupted Fern	\$2\$3	N5	G5	NI	NI	NI	Y
Lake of the Woods	Birds	Fringillidae	Coccothraustes vespertinus	Evening Grosbeak	\$2\$3	N4N5	G5	NI	SC	SC	Y
Lake of the Woods	Dicots	Plantaginaceae	Collinsia parviflora	Small-flowered Blue-eved Mary	S1	N5	G5	NI	NI	NI	Y
Lake of the Woods	Mammals	Talpidae	Condylura cristata	Star-nosed Mole	\$3	N5	G5	NI	NI	NI	Y
Lake of the Woods	Birds	Tyrannidae	Contopus cooperi	Olive-sided Elycatcher	S2S3B	N4B	G4	Т	T	SC	Y
Lake of the Woods	Birds	Tyrannidae	Contopus virens	Eastern Wood-pewee	S3B	N4B	G5	NI	SC	SC	Y
Lake of the Woods	Amphibians	Ranidae	Lithobates septentrionalis	Mink Frog	S3	N5	G5	NI	NI	NI	Y
Lake of the Woods	Dicots	Amaranthaceae	Corispermum americanum var. americanum	American Bugseed	S3	N4	G5?T5?	NI	NI	NI	Y
Lake of the Woods	Dicots	Amaranthaceae	Corispermum villosum	Hairy Burseed	\$1\$2	N4	G4?	NI	NI	NI	Y
Lake of the Woods	Dicots	Cornaceae	Cornus alternifolia	Alternate-leaved Dogwood	\$3	N5	G5	NI	NI	NI	Y Y
Lake of the Woods	Birds	Rallidae	Coturnicons noveboracensis	Vellow Rail	S3B	N3N4B NUM	G4	NI	SC	SC	Y Y
Lake of the Woods	Butterflies and Skinners	l vcaenidae	Cunido comvintas	Eastern Tailed Blue	\$3	N5	65	NI	NI	NI	v
Lake of the Woods	Birds	Anatidae	Cvanus buccinator	Trumpeter Swan	50 52B	N4N5B N5N	G4	F	NI	NI	Y Y
Lake of the Woods	Monocots	Cyperaceae	Cyperus bouabtonii	Houghton's Elatsedge	\$2\$3	N3	G4?	NI	NI	NI	Y Y
Lake of the Woods	Monocots	Cyperaceae	Cyperus schweinitzii	Schweinitz's Elatsedge	\$2	N3N4	65	NI	NI	NI	v
Lake of the Woods	Monocots	Orchidaceae	Cyprinedium arietinum	Ram's-head Lady's-slipper	\$2\$3	N3	63	NI	NI	NI	v
Lake of the Woods	Butterflies and Skinners	Nymphalidae	Danaus plexinnus	Monarch	5255 \$3\$4B	N3B NUM	G4	NI	F	F	v
Lake of the Woods	Sphiny Moths	Sphingidae	Daransa miron	Virginia Creener Sphiny Moth	5354D 53	N5	65	NI	NI	NI	v
Lake of the Woods		Brassicaceae	Descurainia sonhioides	Northern Tapsy Mustard	55	N5	05 C5	NI	NI	NI	v
Lake of the Woods	Dicots	Danaveraceae	Disentra cucullaria	Dutchman's-breeches	52 S1	N5	05 C5	NI	NI	NI	v
Lake of the Woods	Clubmossos	Lycopodiaceae	Disbasiastrum tristachuum	Blue Cround codar	51	NE	05 C5	NI	NI	NI	v
Lake of the Woods	Pirds	Lycopoulaceae	Delichenvicenziverus	Pobolink	55 6204D		G5 C5	NI	T	SC SC	v
Lake of the Woods	Dragonflios and Damsolflios	Comphidae	Dromogomphus spinosus	Black should ared Spipylog	5554D C2	N5D,N4N5IVI	G5 C5	NI	NI	NI	v
Lake of the Woods	Dicate	Drosoraçõas	Drosora applica		52	NE	00	NI		NI	1
Lake of the Woods	Dicote	Drosoracoac	Drosora linearic	Slander lazved Sunder	5334 522	NJ NJ	CACE	NI		NI	v
Lake of the Woods	Lontosporangiato Forns	Dryoptoridaceae	Druoptoris fragrans	Fragrant Woodforn	52 (52 5 4	NF	0400	NI		NI	1
Lake of the Woods		Di yopteriuaceae			5334	NU NU	GD CETE	INL	INL	NIL	VV V
Lake of the Woods		Cyperaceae	Dunchum arundinaceum var. arundinaceum	Divert California	3Z	CVI	6515	INL	INL	INL	1 V
Lake of the Woods	wonocots	cyperaceae	Eleocharis Oblusa	bium spikerusn	31	CNI	65	INL	INL	INL	Ц.

ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATU S
Lake of the Woods	Monocots	Poaceae	Elymus hystrix	Bottle-brush Grass	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Poaceae	Elymus lanceolatus	Thick-spike Wildrye	S3	N5	G5	NL	NL	NL	Υ
Lake of the Woods	Monocots	Poaceae	Elymus lanceolatus ssp. lanceolatus	Thick-spike Wildrye	S3	N5	G5TNR	NL	NL	NL	Υ
Lake of the Woods	Other Bees	Apidae	Epeoloides pilosulus	Macropis Cuckoo Bee	S1	N1	GU	NL	E	E	Y
Lake of the Woods	Dicots	Ericaceae	Epigaea repens	Mayflower	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dragonflies and Damselflies	Corduliidae	Epitheca canis	Beaverpond Baskettail	S3	N5	G5	NL	NL	NL	Υ
Lake of the Woods	Monocots	Eriocaulaceae	Eriocaulon aquaticum	Seven-angled Pipewort	S1	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Eriophorum scheuchzeri	Scheuchzeri's Cottongrass	S2?	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Eriophorum virginicum	Tawny Cottongrass	SU	N5	G5	NL	NL	NL	W
Lake of the Woods	Butterflies and Skippers	Hesperiidae	Erynnis brizo	Sleepy Duskywing	S3	NNR	G5	NL	NL	NL	Y
Lake of the Woods	Butterflies and Skippers	Hesperiidae	Erynnis lucilius	Columbine Duskywing	S3	N5	G3	NL	NL	NL	Y
Lake of the Woods	Butterflies and Skippers	Hesperiidae	Erynnis martialis	Mottled Duskywing	S1	N1N2	G3	NL	E	E	Y
Lake of the Woods	Butterflies and Skippers	Nymphalidae	Euphydryas phaeton phaeton	Baltimore	S2	N4	G4T4	NL	NL	NL	Y
Lake of the Woods	Dicots	Asteraceae	Eurybia macrophylla	Large-leaved Aster	S1	N5	G5	NL	NL	NL	Y
Lake of the Woods	Butterflies and Skippers	Lycaenidae	Feniseca tarquinius	Harvester	\$3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Oleaceae	Fraxinus nigra	Black Ash	S2	N4	G5	NL	NL	Т	Y
	Fishes - Freshwater and Anadromous Bony,										
Lake of the Woods	Cartilaginous; Lampreys	Salmonidae	Coregonus zenithicus	Shortjaw Cisco	S2	N2	G3	NL	NL	Т	Y
Lake of the Woods	Notodontid Moths	Notodontidae	Furcula modesta	Modest Furcula Moth	S3	N5?	G5	NL	NL	NL	Y
Lake of the Woods	Fisnes - Freshwater and Anadromous Bony, Cartilaginous; Lampreys	Fundulidae	Fundulus diaphanus	Banded Killifish	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Rubiaceae	Galium aparine	Cleavers	S3	N5	G5	NL	NL	NL	Р
Lake of the Woods	Dicots	Ericaceae	Gaultheria procumbens	Teaberry	S3S4	N5	G5	NL	NL	NL	W
Lake of the Woods	Dicots	Gentianaceae	Gentiana rubricaulis	Closed Gentian	S3	N4	G4?	NL	NL	NL	Y
Lake of the Woods	Monocots	Poaceae	Glyceria canadensis var. canadensis	Canada Mannagrass	S1	N5	G5T5	NL	NL	NL	Y
Lake of the Woods	Monocots	Orchidaceae	Goodyera tesselata	Checkered Rattlesnake-plantain	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Asteraceae	Helianthus nuttallii ssp. rydbergii	Rydberg's Sunflower	S2	N4	G5T5	NL	NL	NL	Y
Lake of the Woods	Sphinx Moths	Sphingidae	Hemaris gracilis	Slender Clearwing Moth	S2S3	NU	G3G4	NL	NL	NL	Y
Lake of the Woods	Giant Silkworm and Royal Moths	Saturniidae	Hemileuca nevadensis	Nevada Buckmoth	S3	N3	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Ranunculaceae	Hepatica americana	Round-lobed Hepatica	S1	N5	G5T5	NL	NL	NL	Y
Lake of the Woods	Butterflies and Skippers	Hesperiidae	Hesperia sassacus	Sassacus Skipper	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Poaceae	Hesperostipa curtiseta	Western Porcupine Grass	\$3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Pontederiaceae	Heteranthera dubia	Water Star-grass	S2S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Birds	Hirundinidae	Hirundo rustica	Barn Swallow	S4B	N4N5B	G5	NL	Т	SC	Y
Lake of the Woods	Dicots	Cistaceae	Hudsonia tomentosa	False Heather	S3	N4	G5T5Q	NL	NL	NL	Y
Lake of the Woods	Clubmosses	Lycopodiaceae	Huperzia lucidula	Shining Firmoss	SH	N5	G5	NL	NL	NL	Y
Lake of the Woods	Clubmosses	Lycopodiaceae	Huperzia selago	Northern Firmoss	S2S3	NNR	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Ericaceae	Hypopitys monotropa	Pinesap	S1	N5	G5	NL	NL	NL	Y
Lake of the Woods	Fishes - Freshwater and Anadromous Bony, Cartilaginous: Lampreys	Petromyzontidae	Ichthyomyzon castaneus	Chestnut Lamprey	su	NU	G4	NI	NI	NI	Y
Lake of the Woods	Fishes - Freshwater and Anadromous Bony, Cartilaginous; Lampreys	Petromyzontidae	Ichthyomyzon fossor	Northern Brook Lamprey	SU	N3	G4	NL	NL	E	Y
Lake of the Woods	Fishes - Freshwater and Anadromous Bony, Cartilagingus: Lamprays	Petromyzontidae	Ichthyomyzon unicusnis	Silver Lamprey	su	N3	C5	NI	NI	sc	w
Lake of the Woods	Birds	Ardeidae	Ivohnichus exilis	Least Rittern	50 5023B	NAB	G4G5	F	T	т	v
Lake of the Woods	Monocote	Ardeidae			5255D C1	NANE	C403	NI	NI	NI	v
Lake of the Woods	Monocots	Juncaceae			51	NF.	04 C5	NI	NI	NI	N
Lake of the Woods	Dicots	Astoraçõão	Krigia biflora	Two flowered Dwarf dandelion	54	NONO	G5 C5	NI	NI		V
Lake of the Woods	Dicuis	Asteraceae			3233		GO	INL	INL		T
Lake of the woods	Dilus Fishes - Freshwater and Anadromous Rony	Lariuae	Laius aigenialus		ാാല	NCN, DCN	65	INL	INL	INL	r
Lake of the Woods	Cartilaginous; Lampreys	Cottidae	Myoxocephalus thompsonii	Deepwater Sculpin	S5	N5	G5	NL	NL	NL	N
Lake of the Woods	Cartilaginous; Lampreys	Cyprinidae	Notropis percobromus	Carmine Shiner	S1	N2	G5	NL	Е	E	Y
Lake of the Woods	Freshwater Mussels	Unionidae	Amblema plicata	Threeridge	S3	N4	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Cistaceae	Lechea intermedia var. intermedia	Large-pod Pinweed	S1?	N4N5	G5T4T5	NL	NL	NL	Y

ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATU S
Lake of the Woods	Monocots	Poaceae	Leersia oryzoides	Rice Cutgrass	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Lichens	Collemataceae	Leptogium rivulare	Flooded Jellyskin Lichen	S1	N3	G3G5	NL	SC	SC	Y
Lake of the Woods	Dicots	Solanaceae	Leucophysalis grandiflora	Large White-flowered Ground-cherry	\$3\$4	N3N4	G4?	NL	NL	NL	W
Lake of the Woods	Freshwater Mussels	Unionidae	Fusconaia flava	Wabash Pigtoe	S3	N3	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Orchidaceae	Liparis loeselii	Loesel's Twayblade	S3S4	N4N5	G5	NL	NL	NL	W
Lake of the Woods	Freshwater Mussels	Unionidae	Lasmigona complanata	White Heelsplitter	S3	N4	G5	NL	NL	NL	Y
Lake of the Woods	Freshwater Mussels	Unionidae	Lasmigona compressa	Creek Heelsplitter	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Freshwater Mussels	Unionidae	Lasmigona costata	Flutedshell	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Caprifoliaceae	Lonicera canadensis	Canada Fly-honeysuckle	S1	N5	G5	NL	NL	NL	Y
Lake of the Woods	Clubmosses	Lycopodiaceae	Lycopodium clavatum	Running Clubmoss	S3S4	N5	G5	NL	NL	NL	W
Lake of the Woods	Monocots	Asparagaceae	Maianthemum racemosum	Large False Solomon's Seal	SH	N5	G5T5	NL	NL	NL	Y
Lake of the Woods	Monocots	Orchidaceae	Malaxis monophyllos var. brachypoda	White Adder's-mouth	S2?	N4	G5T4T5	NL	NL	NL	Y
Lake of the Woods	Monocots	Orchidaceae	Malaxis unifolia	Green Adder's-mouth	S2?	N5	G5	NL	NL	NL	Y
Lake of the Woods	Birds	Picidae	Melanerpes erythrocephalus	Red-headed Woodpecker	S3B	N3B,N3N	G5	Т	E	E	Y
Lake of the Woods	Dicots	Menispermaceae	Menispermum canadense	Canada Moonseed	S3	N4	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Saxifragaceae	Micranthes pensylvanica	Swamp Saxifrage	S1	N1	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Saxifragaceae	Micranthes virginiensis	Early Saxifrage	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Poaceae	Muhlenbergia mexicana var. filiformis	Slim-stemmed Mexican Muhly	S3	N4N5	G5T4T5	NL	NL	NL	Y
Lake of the Woods	Freshwater Mussels	Unionidae	Ligumia recta	Black Sandshell	S3	N3	G4G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Haloragaceae	Myriophyllum alterniflorum	Water-milfoil	S1S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Haloragaceae	Myriophyllum farwellii	Farwell's Water-milfoil	S1	N4N5	G5	NL	NL	NL	Y
Lake of the Woods	Freshwater Mussels	Unionidae	Strophitus undulatus	Creeper	S5	N5	G5	NL	NL	NL	N
Lake of the Woods	Dicots	Nymphaeaceae	Nymphaea odorata	Fragrant Water-lily	S2?	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Nymphaeaceae	Nymphaea odorata ssp. odorata	Fragrant Water-lily	S2	N5	G5T5	NL	NL	NL	Y
Lake of the Woods	Dicots	Nymphaeaceae	Nymphaea odorata ssp. tuberosa	Tubreous White Water-lily	S1	N3N4	G5T5	NL	NL	NL	Y
Lake of the Woods	Dicots	Nymphaeaceae	Nymphaea tetragona	Small Water-lily	S2?	N3	G5	NL	NL	NL	Y
Lake of the Woods	Mammals	Cervidae	Odocoileus hemionus	Mule or Black-tailed Deer	S3	N5	G5	Т	NL	NL	Y
Lake of the Woods	Other Moths	Noctuidae	Oligia minuscula	Small Brocade	S3	NU	G4	NL	NL	NL	Y
Lake of the Woods	Leptosporangiate Ferns	Onocleaceae	Onoclea sensibilis	Sensitive Fern	\$3?	N5	G5	NL	NL	NL	Y
Lake of the Woods	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Ophioalossum pusillum	Northern Adder's-tongue	S1	N4	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Apiaceae	Osmorhiza claytonii	Hairy Sweet Cicely	S2?	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Betulaceae	Ostrya virginiana	Hop-hornbeam	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Asteraceae	Packera tridenticulata	Three-toothed Groundsel	S2	N2	G5	NL	NL	NL	Y
Lake of the Woods	Papaipema Moths	Noctuidae	Papaipema aweme	Aweme Borer Moth	SU	NU	G3G4	NL	E	NL	Y
Lake of the Woods	Monocots	Poaceae	Pascopyrum smithii	Western Wheatgrass	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Leptosporangiate Eerns	Pteridaceae	Pellaea glabella ssp. glabella	Smooth Cliffbrake	S1?	N4	G5T5	NI	NI	NI	Y
Lake of the Woods	Dicots	Polygonaceae	Persicaria sadittata	Arrow-leaved Tear-thumb	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Birds	Phalacrocoracidae	Phalacrocorax auritus	Double-crested Cormorant	S5B	N5B.N3N4N.N5M	G5	NL	NL	NL	Р
Lake of the Woods	Butterflies and Skippers	Nymphalidae	Phyciodes tharos	Pearl Crescent	\$2\$3	N4N5	G4G5	NI	NI	NI	Y
Lake of the Woods	Conifers	Pinaceae	Pinus resinosa	Red Pine	\$2\$3	N5	G5	NI	NI	NI	P
Lake of the Woods	Conifers	Pinaceae	Pinus strobus	Eastern White Pine	S2	N5	G5	NI	NI	NI	Y
Lake of the Woods	Monocots	Orchidaceae	Platanthera hookeri	Hooker's Fringed Orchid	\$2\$3	N4	G4	NI	NI	NI	Y
Lake of the Woods	Monocots	Orchidaceae	Platanthera lacera	Ragged Fringed Orchid	S1S2	N5	G5	NI	NI	NI	Y
Lake of the Woods	Monocots	Orchidaceae	Platanthera orbiculata	Round-leaved Bog Orchid	\$3\$4	N5	G5T5	NI	NI	NI	w
Lake of the Woods	Monocots	Orchidaceae	Platanthera osvodes	Small Purple Fringed Orchid	\$1	N5	G5	NI	NI	NI	v
Lake of the Woods	Birds	Podicipedidae	Podicens auritus	Horned Grebe	S3B	N5B N4N5N	G5	NI	SC	SC	· Y
Lake of the Woods	Monocots	Orchidaceae	Pogonia ophioglossoides	Rose Pogonia	\$1	N5	G5	NI	NI	NI	· Y
Lake of the Woods	Dicots	Salicaceae	Populus grandidentata	Large-tooth Aspen	\$1\$2	N5	G5	NI	NI	NI	ý
Lake of the Woods	Monocots	Potamonetonaceae	Potamogeton amplifolius	Large-leaved Pondweed	\$3	N5	G5	NI	NI	NI	· Y
Lake of the Woods	Monocots	Potamoretonaceae	Potamogeton illinoensis	Illinois Pondweed	S12	N5	65	NI	NI	NI	v
Lake of the Woods	Monocots	Potamogetopacoao	Potamogeton minuensis	Pohhin's Pondweed	\$253	N5	65	NI	NI	NI	v
Lake of the Woods	Monocots	Potamogetopacoao	Potamogeton i fubbli i si	Eannel-leaved Pondwood	5233 S1	N5	65 65	NI	NI	NI	v
Lake of the WOOds	WOHOCOLS	i otamoyet0naceae	r otamogeton spirmus	i chinel-leaveu Fulluweeu	21	INJ	00	INL	INL	INL	<u>Ľ</u>

ECOREGION	GROUP_TAXON	FAMILY	SCINAME	COMNAME	S_RANK	N_RANK	G_RANK	ESEA	SAR A	COSEWI C	TRACK _STATU S
Lake of the Woods	Dicots	Ericaceae	Pyrola americana	Round-leaved Pyrola	S2?	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Ranunculaceae	Ranunculus fascicularis	Early Buttercup	SH	N4	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Ranunculaceae	Ranunculus hispidus var. caricetorum	Bristly Buttercup	S2	N5	G5T5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Rhynchospora alba	White Beakrush	\$3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Cyperaceae	Rhynchospora capillacea	Horned Beakrush	S2S3	N4	G4G5	NL	NL	NL	Y
Lake of the Woods	Birds	Hirundinidae	Riparia riparia	Bank Swallow	S4B	N4N5B,N5M	G5	NL	Т	Т	Y
Lake of the Woods	Monocots	Alismataceae	Sagittaria rigida	Sessile-fruited Arrowhead	S2?	N4	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Papaveraceae	Sanguinaria canadensis	Bloodroot	S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Sceptridium multifidum	Leathery Grapefern	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Adder's-tongues, Grapeferns, and Moonworts	Ophioglossaceae	Sceptridium oneidense	Blunt-lobed Moonwort	S1	N3?	G4	NL	NL	NL	Y
Lake of the Woods	Dicots	Lamiaceae	Scutellaria parvula var. missouriensis	Small Skullcap	S1?	N3	G4T4	NL	NL	NL	Y
Lake of the Woods	Spikemosses and Quillworts	Selaginellaceae	Selaginella selaginoides	Low Spikemoss	S3S4	N5	G5	NL	NL	NL	W
Lake of the Woods	Birds	Parulidae	Setophaga americana	Northern Parula	S4B	N5B	G5	NL	NL	NL	N
Lake of the Woods	Birds	Parulidae	Setophaga pinus	Pine Warbler	S2S3B	N5B,N3N	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Iridaceae	Sisyrinchium campestre	Prairie Blue-eyed-grass	S3	N3	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Asteraceae	Solidago glutinosa	Sticky Goldenrod	S3	N5	G5T5	NL	NL	NL	Y
Lake of the Woods	Dicots	Asteraceae	Solidago juncea	Early Goldenrod	S1S2	N5	G5	NL	NL	NL	Y
Lake of the Woods	Dicots	Asteraceae	Solidago uliginosa	Bog Goldenrod	S3	N5	G5	NL	NL	NL	Y
Lake of the Woods	Monocots	Typhaceae	Sparganium glomeratum	Clustered Burreed	S1S2	N1N3	G4?	NL	NL	NL	Y
Lake of the Woods	Monocots	Orchidaceae	Spiranthes magnicamporum	Great Plains Ladies'-tresses	\$1\$2	N3?	G3G4	F	NI	NI	Y
Lake of the Woods	Birds	Laridae	Sterna hirundo	Common Tern	S5B	N5B.NUN	G5	NL	NL	NL	P
Lake of the Woods	Reptiles	Colubridae	Storeria occipitomaculata	Northern Redbelly Snake	S3S4	N5	G5	NL	NL	NL	W
Lake of the Woods	Monocots	Liliaceae	Streptopus amplexifolius	Clasping Twisted-stalk	\$2?	N5	G5	NI	NI	NI	Y
Lake of the Woods	Monocots	Liliaceae	Streptopus lanceolatus	Rosy Twisted-stalk	\$3?	N5	G5	NI	NI	NI	Y
Lake of the Woods	Birds	Strigidae	Strix nebulosa	Great Gray Owl	\$3\$4	N5	G5	NI	NI	NI	Y
Lake of the Woods	Birds	Strigidae	Strix varia	Barred Owl	\$3\$4	N5	G5	NI	NI	NI	W
Lake of the Woods	Rentiles	Colubridae	Thampophis sirtalis sirtalis	Eastern Gartersnake	\$3\$4	N5	G5T5	NI	NI	NI	P
Lake of the Woods	Dragonflies and Damselflies	Libellulidae	Sympetrum semicinctum	Band-winged Meadowhawk	\$3	N5	G5	NI	NI	NI	Y Y
Lake of the Woods	Dragonflies and Damselflies	Libellulidae	Sympetrum vicinum	Yellow-legged Meadowhawk	\$3	N5	G5	NI	NI	NI	· Y
Lake of the Woods	Dicots	Asteraceae	Symphyotrichum sericeum	Western Silvery Aster	\$253	N2N3	65	т	т	т	v
Lake of the Woods	Mammals	Mustelidae	Taxidea taxus taxus	American Badger	S4	N4	G5T5	NI	SC .	sc	v
Lake of the Woods	Conifers	Тахасеае	Taxus canadensis	Canada Vew	54 53	N5	65	NI	NI	NI	v
Lake of the Woods		Teloschistaceae	Taloschistes chrysonhthalmus	Colden-eve Lichen	5354	N3N/	G4G5	NI	SC	SC	v
Lake of the Woods		Chelydridae	Chelvdra sementina	Spapping Turtle	2224	NJN4	G5	NI	SC	sc	v
Lake of the Woods	Dicots	Eabaceae	Thermonsis rhombifolia	Golden Bean	5253	N5	65	NI	NI	NI	v
Lake of the Woods	Other Moths	Lasiocampidae	Tolype Jaricis	larch tolvoe moth	\$2.55	N5	G5	NI	NI	NI	v
Lake of the Woods	Monocots	Poaceae	Torrevochloa nallida var. fernaldii	Fornald's False Mannagrass	55	N5	G5T5O	NI	NI	NI	v
Lake of the Woods	Birds	Phasianidae	Tympanuchus phasianellus	Sharp-tailed Grouse	52	N5	65	NI	NI	NI	D
Lake of the Woods	Directo	Loptibulariagoaa		Uproved Bleddersvort	55	NE	GJ CF	NI	NI		
Lake of the Woods	Dicots	Celebiaseee		Formed Bladder wort	5334 CD	N5	GD	NL	NI		vv
Lake of the Woods	NIOTIOCOUS	Friegenege		Sessile-leaved Bellwort	32	N5	G5 CE	INL	NI		T V
Lake of the Woods		Encaceae	Vaccinium cespitosum	Dwart Bilderry	33	NO	65	INL T	INL		Y
Lake of the Woods	Biras	Parulidae	vermivora chrysoptera	Golden-winged warbier	5253B	N3B	G4	1	1	1 NU	Y
Lake of the Woods		Violaceae	Viola labladolica		ა ა იე	CVI	65	INL	INL	INL	T V
Lake of the Woods		violaceae		Long-spurred violet	32	CVI	65	INL	INL	INL	1 V
Lake of the Woods	Dicots	violaceae	Viola soforia	WOOIY BILLE VIOLET	53	CVI NC	65	INL	INL N/	INL	Y VA/
Lake of the Woods		vitaceae	Vius ripana		5354 62		65	INL	INL	INL	VV
Lake of the Woods	Leptosporangiate Ferns	vvoodslaceae		Alpine Woodsia	52	IN4IN5	6465	INL	INL N.	INL	Г И
Lake of the Woods	Leptosporangiate Ferns	Woodsiaceae	Woodsia glabella	Smooth Woodsia	S2	N5	G5	NL	NL	NL	Y

APPENDIX F

Government Correspondence

From: Sent: To: Subject: Attachments: lan Young <iyoung@scatliff.ca> June 27, 2022 9:47 AM

FW: DR I Young Scatliff 20220517 Julius Lake West DR I Young Scatliff 20220517 Julius Lake West.xlsx; JuliusLakeWest and b2k.zip

From: Murray, Colin (ARD) <Colin.Murray@gov.mb.ca> Sent: Tuesday, May 24, 2022 2:33 PM To: Ian Young <iyoung@scatliff.ca> Subject: DR I Young Scatliff 20220517 Julius Lake West

Hi lan

Thank you for your information request. I completed a search of the Manitoba Conservation Data Centre's (CDC) rare species database for your area of interest. This includes the primary location as provided in the request; and a 2km radius buffer from the footprint boundary.

I am attaching a Microsoft Excel spreadsheet summarizing these occurrences. The spreadsheet includes scientific and common names, the provincial (SRank) rank for each species as well as the Manitoba Endangered Species and Ecosystem Act, and the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Species at Risk Act (SARA) designations. I'm also providing the ESRI Shapefiles use to complete the request.

Further information on this ranking system can be found on our website at: <u>http://www.natureserve.org/conservation-tools/conservation-status-assessment</u>. These designations can be found at: <u>http://web2.gov.mb.ca/laws/statutes/ccsm/e111e.php</u>, <u>https://www.cosewic.ca/index.php/en-ca/</u> and

http://www.sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1.

Manitoba's recommended setback distances can be found at: https://www.gov.mb.ca/sd/pubs/conservation-data-centre/mbcdc_bird_setbacks.pdf.

The information provided in this letter is based on existing data known to the Manitoba Conservation Data Centre of the Wildlife and Fisheries Branch at the time of the request. These data are dependent on the research and observations of CDC staff and others who have shared their data, and reflect our current state of knowledge. An absence of data does not confirm the absence of any rare or endangered species. Many areas of the province have never been thoroughly surveyed, therefore, the absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present. The information should not be regarded as a final statement on the occurrence of any species of concern, nor should it substitute for on-site surveys for species or environmental assessments. Also, because our Biotics database is continually updated and because information requests are evaluated by type of action, any given response is only appropriate for its respective request.

Please contact the Manitoba CDC for an update on this natural heritage information if more than six months passes before it is utilized.

Third party requests for products wholly or partially derived from our Biotics database must be approved by the Manitoba CDC before information is released. Once approved, the primary user will identify the Manitoba CDC as data

contributors on any map or publication using data from our database, as the Manitoba Conservation Data Centre; Wildlife and Fisheries Branch, Manitoba Sustainable Development.

This letter is for information purposes only - it does not constitute consent or approval of the proposed project or activity, nor does it negate the need for any permits or approvals required by the Province of Manitoba.

We would be interested in receiving a copy of the results of any field surveys that you may undertake, to update our database with the most current knowledge of the area.

If you have any questions or require further information contact me directly at (204) 945-7760.

Colin

Reference screen clip:



Colin Murray

Information Manager- Manitoba Conservation Data Centre Fish and Wildlife Branch, Natural Resources and Northern Development 200 Saulteaux Crescent, Winnipeg, MB R3J3W3 T: 204-945-7760 F: 204-945-3077

From: Ian Young <<u>iyoung@scatliff.ca</u>> Sent: May 17, 2022 8:29 AM To: Murray, Colin (ARD) <<u>Colin.Murray@gov.mb.ca</u>> Subject: Rare Elements Check - Julius Lake West

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION: ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hi Colin,

I have been attempting to submit a rare elements information request for an upcoming project but seem to be having some trouble with the website. Whenever I submit, it gives me a server error message. Not sure if the issue is on my end or yours, but I was hoping I could just submit directly to you via email.

I have attached the print off of the request form and a kmz for the site location.

Please let me know if this works for you, or if I will need to keep trying to submit via the website.

Thanks,

lan Young,

SCATLIFF + MILLER + MURRAY

visionary urban design + landscapes

204.927.3444 ext 256 | <u>iyoung@scatliff.ca@scatliff.ca</u> | <u>www.scatliff.ca</u> 1120-201 Portage Avenue Winnipeg, Manitoba R3B 3K6

SEARCH CRITERIA	SITE	SCINAME	COMNAME	S_RANK	ESEA	SARA	COSEWIC	FIRSTOBS	LASTOBS	EO_RANK	REPACC	NOTES
Within	Julius Lake West	No listed or tracked species occurrences found at this time										
Within 2km radius of site boundary of	Julius Lake West	No listed or tracked species occurrences found at this time										
Records in general area of	Julius Lake West	Asarum canadense	Wild Ginger	S3S4				1977-05-26	1977-05-26	H - Historical	Low	
Records in general area of	Julius Lake West	Rhynchospora alba	White Beakrush	S3				1983-07-14	1983-07-14	H - Historical		
Records in general area of	Julius Lake West	Calopogon tuberosus var. tuberosus	Tuberous Grass-pink	S2				Jul-49	Jul-49	H - Historical	Low	
Records in general area of	Julius Lake West	Pogonia ophioglossoides	Rose Pogonia	S1				1983-07-14	1983-07-14	H - Historical	Low	
Records in general area of	Julius Lake West	Melanerpes erythrocephalus	Red-headed Woodpecker	S3B	Threatened	Endangered	Endangered	2008-04-12	2018-07-10	E - Verified extant (viability not assessed)	High	
Records in general area of	Julius Lake West	Cypripedium arietinum	Ram's-head Lady's-slipper	S2S3				1975-06-01	2006-06-19	E - Verified extant (viability not assessed)	Very Low	
Records in general area of	Julius Lake West	Lithobates pipiens	Northern Leopard Frog	S4		Special Concern	Special Concern	2011-10-04	2011-10-04	E - Verified extant (viability not assessed)	Very High	
Records in general area of	Julius Lake West	Leucophysalis grandiflora	Large White-flowered Ground- cherry	S3S4				1975-06-12	1975-06-12	H - Historical	Low	
Records in general area of	Julius Lake West	Eurybia macrophylla	Large-leaved Aster	S1				1987	1987	H - Historical	Very Low	
Records in general area of	Julius Lake West	Cyperus houghtonii	Houghton's Flatsedge	S2S3				1979-08-07	1979-08-07	H - Historical	Low	
Records in general area of	Julius Lake West	Vermivora chrysoptera	Golden-winged Warbler	S2S3B	Threatened	Threatened	Threatened	2014-07-09	2014-07-09	E - Verified extant (viability not assessed)	Medium	
Records in general area of	Julius Lake West	Contopus virens	Eastern Wood-pewee	S3B		Special	Special	2013-06-07	2013-06-07		High	
Records in general area of	Julius Lake West	Arethusa bulbosa	Dragon's-mouth Orchid	S2				1951-06-16	1951-06-16	H - Historical	Very Low	
Records in general area of	Julius Lake West	Strophitus undulatus	Creeper	S5				2003-08-01	2003-08-01	H? - Possibly historical	High	
Records in general area of	Julius Lake West	Ranunculus hispidus var. caricetorum	Bristly Buttercup	S2				1977-05-26	1977-05-26	H - Historical		
Records in general area of	Julius Lake West	Dolichonyx oryzivorus	Bobolink	S3S4B		Threatened	Threatened	2012-06-15	2012-06-15	E - Verified extant (viability not assessed)	Medium	
Records in general area of	Julius Lake West	Strix varia	Barred Owl	S3S4							Medium	
Records in general area of	Julius Lake West	Hirundo rustica	Barn Swallow	S4B		Threatened	Threatened	2012-06-15	2012-06-15	E - Verified extant (viability not assessed)	Medium	

From:+WPG574 - HRB Archaeology (SCH) <HRB.archaeology@gov.mb.ca>
July 14, 2022 11:00 AMSent:July 14, 2022 11:00 AMTo:Image: Comparison of the sector of the s

*** This is an external eMail. Please be careful with attachments and links. ***

Good morning,

Further to your e-mail regarding the above noted application, the Manitoba Historic Resources Branch (HRB) has examined the location in conjunction with Branch records for areas of potential concern. The potential to impact heritage resources is believed to be low based on analysis of current data, therefore, the Historic Resources Branch has no concerns with the proposed project at this time.

If at any time, however, heritage resources are encountered in association with these lands during testing and development, there is an obligation to report any heritage resources and a prohibition on destruction, damage or alteration of said resources as per sections 46 and 51 of the Heritage Resources Act. The Historic Resources Branch may require that an acceptable heritage resource management strategy be implemented by the proponent/developer to mitigate the effects of their activity on the heritage resources.

Heritage Resources includes fossils and/ or animal bones that may be preserved in the peat.

I have attached a template for a heritage resource management plan in order to help create a procedure preparing for the event if a heritage object is found. It is helpful for site managers, employees, contractors to have a check-list or steps of what to do and whom to call should heritage resources be accidentally encountered.

If you have any questions, please contact the Branch at HRB.archaeology@gov.mb.ca for proper assignment and queueing.

Brittany Romano Impact Assessment Archaeologist Historic Resources Branch | Manitoba Sport, Culture and Heritage 213 Notre Dame Avenue, Main Floor | Winnipeg, MB | R3B 1N3 e. Brittany.Romano@gov.mb.ca

-----Original Message-----From: KGS Resource <resource@system.kgsgroup.com> On Behalf Of Sent: June 28, 2022 10:28 AM To: Tsukamoto, Suyoko (SCH) <Suyoko.Tsukamoto@gov.mb.ca>



+WPG574 - HRB Archaeology (SCH) <HRB.archaeology@gov.mb.ca>;

Subject: Julius Lake West Peat Harvesting Development - Heritage Screening Request Form - KGS Group Transmittal No. 22-0293-002-0004

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ATTENTION: ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Dear Suyoko Anne Tsukamoto,

Please find the attached documents with the associated information listed on the transmittal.

Should you have any questions, please contact me at our office.



NOTE: Please confirm receipt via email.

APPENDIX G

Manitoba Breeding Bird Atlas





Predefined point count coordinates Coordonnées des points d'écoute prédéterminés

POINT	EASTING UTM Est	NORTHING UTM Nord	Legend	Légende
1	694376	5534278	Expressway or highway —	Autoroute ou route nationale (asphaltée)
2 3	694341 694166	5535203 5539799	Regional or local road —	Route régionale ou locale (asphaltée ou non)
4	691409	5534145	Rail line	 Chemin de fer
5	694322	5535706	Utility corridor	- Ligne de transport d'énergie
6	693458	5530934	Watercourse	 Rivière ou ruisseau
7	693859	5534216	Mature broadleaf forest	Forêt de feuillus (mature)
8	692832	5534207	Young broadleaf forest	Forêt de feuillus (ieune)
9	694264	5537067	Mature coniferous forest	Forêt de conifères (mature)
10	692929	5533054	Young coniferous forest	Forêt de conifères (ieune)
11	693359	5534212	Mature mixed forest	Forêt mixte (mature)
12	690869	5534118	Young mixed forest	Forêt mixte (ieune)
13	692771	5533532	Shruhland / other	Milieu arbustif / autre
14	694285	5536549		Milieu humide (marais)
15	692958	5530920	Agriculture / open country	Milieu agricole
16	692319	5534188	Lirban / undessified	Mileu urbanisé / non classifié
17	692884	5530424	Water	Fau
18	692435	5530900	Water	Lau
19	690367	5534093		
20	691929	5530886		
21	691429	5530870	Topographic data:	Données topographiques :
22	690921	5530848	© Government of Manitoba © Natural Resources Canada	© Gouvernement du Manitoba © Ressources naturelles Canada
23	690399	5530816		
24			Cartographic production	on by Bird Studies Canada
25			Production cartographique	par Études d'oiseaux Canada
26				
27			Note: This map is only for use h	wattee participants in the context of
28			the project. The project partner	s are in no way responsible for any
29			inaccuracies, mistakes or omise	sions in the information that appears
30			011	no map.

6° Universal Transverse Mercator (UTM) Projection; Zone 14, Central Meridian -99°; North American Datum 1983 (NAD 83) Projection universelle transverse de Mercator (UTM) 6° Zone 14, méridien central -99°; Système de référence géodésique nord-américain 1983 (NAD 83)



Southeast

14PA93

Avis : cette carte ne doit être utilisée que par les participants au projet de

l'Atlas des oiseaux nicheurs du Manitoba, et uniquement dans le cadre du projet.

Les responsables du projet d'atlas ne peuvent être tenus responsables de

toute inexactitude, erreur ou omission concernant les informations apparaissant

sur cette carte.

April 2010 / Avril 2010

http://www.birdatlas.mb.ca/



Manitoba Breeding Bird Atlas - Region 4 - Square 14PA93 (page 1)

Square Summary (14PA93)								Region summary (#4: Southeast)					
	#spe	cies		#bouro	#pc	done	#square	s #sq with	data	#species	#pc done	target #pc	
poss	prob	conf	total	#nours	road	offrd	142	132		206	2122	532	
42	28	10	80	10.5	15	0							

Target number of point counts in this square: 8 road side, 7 off road (Mature coniferous forest: 1, Open Wetland: 6). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat. Approximate time allocation for general atlassing:: Young broadleaf forest: 13%, Mature broadleaf forest: 22%, Young coniferous forest: 4%, Mature coniferous forest: 8%, Young mixed forest: 1%, Mature mixed forest: 1%, Open Wetland: 44%, Agriculture / open country: 1%, Urban / unclassified: 2%. Refer to the atlas PDF maps and

online resources to locate habitats.

SPECIES	Code	%	SPECIES	Code	%	SPECIES	Code	%
<u>Canada Goose</u>		80	Eared Grebe ‡§		2	American Avocet		0
Trumpeter Swan †		14	Western Grebe ‡§		0	Spotted Sandpiper		36
Wood Duck		34	American White Pelican §		0	Solitary Sandpiper ‡		9
Gadwall		2	Double-cr. Cormorant §		2	Willet		<1
American Wigeon		2	American Bittern	S	41	Upland Sandpiper		8
American Black Duck ‡¤		1	Least Bittern †		<1	Marbled Godwit		30
Mallard	FY	83	Great Blue Heron §	Н	56	<u>Wilson's Snipe</u>		86
Blue-winged Teal		27	Great Egret ‡¤		0	American Woodcock	М	56
Northern Shoveler		8	Black-crown. NHeron §		0	Wilson's Phalarope		8
Northern Pintail		2	<u>Turkey Vulture</u>		77	Bonaparte's Gull ‡		2
Green-winged Teal		21	Osprey		6	Franklin's Gull ‡§		0
Canvasback ‡		2	Bald Eagle		42	Ring-billed Gull §		3
Redhead ‡		2	Northern Harrier		55	Herring Gull §		4
Ring-necked Duck		34	Sharp-shinned Hawk		19	Caspian Tern §		0
Lesser Scaup		9	Cooper's Hawk		10	Black Tern §		13
Bufflehead		8	Northern Goshawk		3	Common Tern §		3
Common Goldeneye		17	Broad-winged Hawk	Н	70	Forster's Tern §		<1
Hooded Merganser		43	Swainson's Hawk ‡		<1	Rock Pigeon		43
Common Merganser		13	Red-tailed Hawk		70	Mourning Dove	Т	68
Ruddy Duck ‡		1	American Kestrel	н	67	Black-billed Cuckoo	S	67
Gray Partridge		<1	Merlin		43	Eastern Screech-Owl ‡		<1
Ruffed Grouse	FY	80	Peregrine Falcon ‡¤		0	Great Horned Owl		27
Spruce Grouse		19	Yellow Rail ¤		13	Northern Hawk Owl ¤		10
Sharp-tailed Grouse		30	Virginia Rail		7	Barred Owl ¤	н	29
Wild Turkey ‡		12	Sora		41	Great Gray Owl ¤		18
Common Loon		21	American Coot		9	Long-eared Owl ¤		28
Pied-billed Grebe		14	Sandhill Crane	н	87	Short-eared Owl ¤		6
Horned Grebe ¤		2	Piping Plover †		0	Boreal Owl ¤		21
Red-necked Grebe §		5	Killdeer	А	70	Northern Saw-whet Owl	S	48

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Manitoba Breeding Bird Atlas - Summary Sheet for Square 14PA93 (page 2 of 3)

SPECIES	Code	%	SPECIES	Code	%	SPECIES	Code	%
Common Nighthawk ¤		1 1	Black-billed Magpie	н	56	<u>European Starling</u>		58
Whip-poor-will ¤		34	American Crow	FY	93	Cedar Waxwing	Μ	96
Chimney Swift ¤		1	Common Raven	Н	94	Golden-winged Warbler ‡¤	S	37
Ruby-throated Hummingbird	Н	61	Horned Lark		3	Tennessee Warbler		46
Belted Kingfisher	Н	48	Purple Martin §		10	Nashville Warbler	Μ	93
Red-headed Woodpecker ¤	S	25	Tree Swallow	FY	84	Northern Parula ‡¤		19
Yellow-bellied Sapsucker	FY	90	North. Rgh-wing Swallow		8	Yellow Warbler	Μ	90
Downy Woodpecker	S	71	Bank Swallow §		20	Chestnut-sided Warbler	М	89
Hairy Woodpecker	S	86	Cliff Swallow §		39	Magnolia Warbler	S	48
Am. Three-toed Woodp.		12	Barn Swallow	AE	78	Cape May Warbler	S	22
Black-backed Woodpecker		25	Black-capped Chickadee	Μ	95	Yellow-rumped Warbler	Μ	66
Northern Flicker	А	96	Boreal Chickadee		21	Black-thr. Green Warbler		34
Pileated Woodpecker		70	Red-breasted Nuthatch	S	67	Blackburnian Warbler	S	58
Olive-sided Flycatcher ¤		33	White-breasted Nuthatch	S	45	Pine Warbler †		11
Eastern Wood-Pewee	S	72	Brown Creeper		31	Palm Warbler ‡		6
Yellow-bellied Flycatcher	S	27	House Wren	S	70	Bay-breasted Warbler	S	6
Alder Flycatcher	S	93	Winter Wren		50	Black-and-white Warbler	Μ	95
Least Flycatcher	М	91	<u>Sedge Wren</u>		68	American Redstart	Μ	89
Eastern Phoebe	S	74	Marsh Wren	S	40	Ovenbird	Μ	93
Great Crested Flycatcher	S	69	Golden-crowned Kinglet		30	Northern Waterthrush		40
Western Kingbird		14	Ruby-crowned Kinglet	S	46	Connecticut Warbler	S	45
Eastern Kingbird	н	80	Eastern Bluebird	FY	65	Mourning Warbler	S	75
Yellow-throated Vireo		27	Mountain Bluebird ‡		0	Common Yellowthroat	т	96
Blue-headed Vireo	S	56	Veery	М	86	Wilson's Warbler ‡		3
Warbling Vireo	S	45	Swainson's Thrush		50	Canada Warbler ‡¤		12
Philadelphia Vireo		12	Hermit Thrush	А	83	Eastern Towhee	S	15
Red-eyed Vireo	М	97	American Robin	CF	96	Chipping Sparrow	Μ	94
Gray Jay	Н	57	Gray Catbird	CF	77	Clay-colored Sparrow	Μ	76
Blue Jay	S	95	Brown Thrasher		39	Vesper Sparrow		45

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Manitoba Breeding Bird Atlas - Summary Sheet for Square 14PA93 (page 3 of 3)

SPECIES	Code	%
Lark Sparrow		9
Savannah Sparrow	М	56
Le Conte's Sparrow	М	51
Nelson's Sparrow		15
Song Sparrow	М	90
Lincoln's Sparrow		31
Swamp Sparrow	М	92
White-throated Sparrow	А	96
Dark-eyed Junco		34
Scarlet Tanager ¤	Ρ	36
Rose-breasted Grosbeak	S	87
Indigo Bunting		30
Bobolink	А	50
Red-winged Blackbird	FY	94
Western Meadowlark	S	46
Yellow-headed Blackbird		10
Brewer's Blackbird		52
Common Grackle		68
Brown-headed Cowbird	S	73
Baltimore Oriole	S	66
Purple Finch		34
House Finch		6
Red Crossbill †		10
White-winged Crossbill ¤		12
Pine Siskin		40
American Goldfinch	Р	93
Evening Grosbeak		25
House Sparrow		37

This list includes all species found during the Manitoba Breeding Bird Atlas (2010-2014) in the region #4 (Southeast). Underlined species are those that you should try to add to this square (14PA93). They have not yet been reported during the atlas, but were reported in more than 50% of the squares in this region during the project so far. "Code" is the code for the highest breeding evidence for that species in square 14PA93 during the project so far. The % columns give the percentage of squares in that region where that species was reported during the project (this gives an idea of the expected chance of finding that species in region #4). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), † (rare in Manitoba) or ¤ (rare in Manitoba, documentation only required for confirmed records). Current as of 17/05/2024. An up-to-date version of this sheet is available from http://www.birdatlas.mb.ca/mbdata/summaryform.jsp?squareID=14PA93?lang=en

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