

Bright Meadows Solar Project Environmental Evaluation



Prepared For

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Down to Earth Biology

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
%	percent
<	less than
>	more than
ABMI	Alberta Biodiversity Monitoring Institute
ACIMS	Alberta Conservation Information Management System
AGRASID	Agricultural Regions of Alberta Soil Inventory Database
AUC	Alberta Utilities Commission
AWCS	Alberta Wetland Classification System
bgs	below ground surface
BMP	Best management practice
CanSIS	Canadian Soil Information Service
C&R Directive	Conservation and Reclamation Directive for Renewable Energy Operations
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
Directives	Wildlife Directive for Alberta Solar Energy Projects
EA	Environmental Assessment
EDI	EDI Environmental Dynamics Inc.
EE	Environmental Evaluation
e.g.,	for example (Latin <i>exempli gratia</i>)
EPA	Alberta Environment and Protected Areas
EPA-FWS	Alberta Environment and Protected Areas – Fish and Wildlife Stewardship
EPA-WM	Alberta Environment and Protected Areas – Wildlife Management
ESA	Environmentally Significant Area
ESC	Erosion and Sediment Control
et al.	and others (Latin <i>et alia</i>)
FWMIS	Fish and Wildlife Management Information System
FWIMT	Fish and Wildlife Internet Mapping Tool
GOWN	Groundwater Observation Well Network
ha	hectare
IBA	Important Bird Area
i.e.,	that is (Latin <i>id est</i>)
km	kilometre
km ²	square kilometres
km/hr	kilometres per hour
kV	kilovolt
LSA	Local Study Area
m	metre
MBCA	<i>Migratory Birds Convention Act</i>
mbgs	metres below ground surface



Acronym/Abbreviation	Definition
MDP	Municipal Development Plan
MV	medium voltage
MW	megawatts
MW-ac	megawatts, alternating current
MW-dc	megawatts, direct current
NAD	North American Datum
PCM	Post-construction monitoring
PDSA	Pre-Disturbance Site Assessment
POI	point of interconnection
PV	photovoltaic
RSA	Regional Study Area
SARA	<i>Species at Risk Act</i>
SOMC	Species of Management Concern
sp.	species
the Project	the Bright Meadows Solar Project
UTM	Universal Transverse Mercator
VEC	Valued Ecosystem Component
W4M	West of the Fourth Meridian



1 INTRODUCTION

Revolve Meadows Solar GP Inc. (the Proponent), on behalf of Revolve Meadows Solar Limited Partnership (each a subsidiary of Revolve Renewable Power Corporation) is proposing to construct and operate the 15.7 megawatt (MW-ac) Bright Meadows Solar Project (hereafter referred to as the Project), located within the County of Wetaskiwin No. 10 in central Alberta, approximately 6 km east of the village of Ma-Me-O Beach, Alberta (Figure 1-1). The Project is sited predominately on chronically grazed tame pasture and has been used by the landowner for cattle grazing for over a decade. .

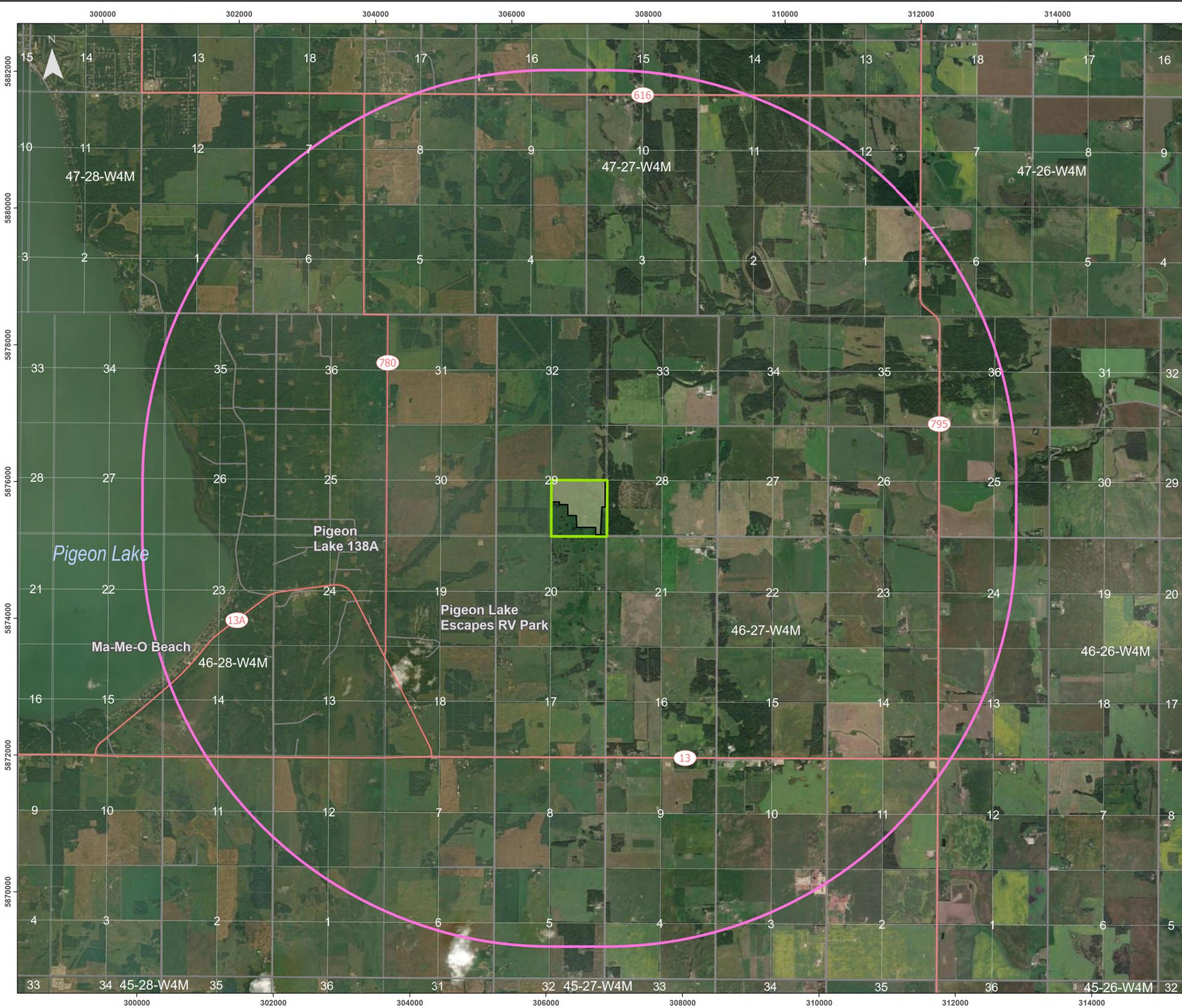
This Environmental Evaluation (EE) has been prepared in fulfilment of information requirement SP15 of the Alberta Utilities Commission (AUC) Rule 007: Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines (Alberta Utilities Commission 2024).

1.1 PROJECT BACKGROUND

A Renewable Energy Submission Report (Submission Report) was prepared and submitted to Alberta Environment and Protected Areas – Fish and Wildlife Stewardship (EPA-FWS) on December 22, 2022, and responses to supplemental information requests were shared with EPA-FWS on April 12, 2023. On April 20, 2023, EPA-FWS issued a Renewable Energy Referral Report (Referral Report) summarizing the potential risks to wildlife and wildlife habitat. Overall, the risk of the Project to wildlife and wildlife habitat was determined to be low (Alberta Environment and Protected Areas 2023).

The Project Footprint has been refined to avoid small areas of remnant treed deciduous habitat to the extent practicable to further reduce the risk to wildlife and wildlife habitat, and as a consequence of the smaller generating capacity available on the distribution system. The updated Project Footprint is presented here within this EE. The updated Project Footprint has been reduced from 58.8 hectares (ha) as presented in the Submission Report to 41.8 ha, and the area of deciduous treed habitat within the Project Footprint has been reduced from 4.0 ha to 1.6 ha.

The Proponent is a wholly-owned subsidiary of Revolve Renewable Power Corporation (Revolve), a publicly listed and Canadian-owned renewable energy company founded in 2012. Revolve has more than 3,000 MW of renewable projects in development or in operation across Canada, the United States, and Mexico. In 2023, Revolve entered the Alberta market with the acquisition of the Box Springs (6 MW) wind farm located near Medicine Hat, and owns and operates two run-of-river hydro power facilities in British Columbia, and acquired in the Project in late 2024.

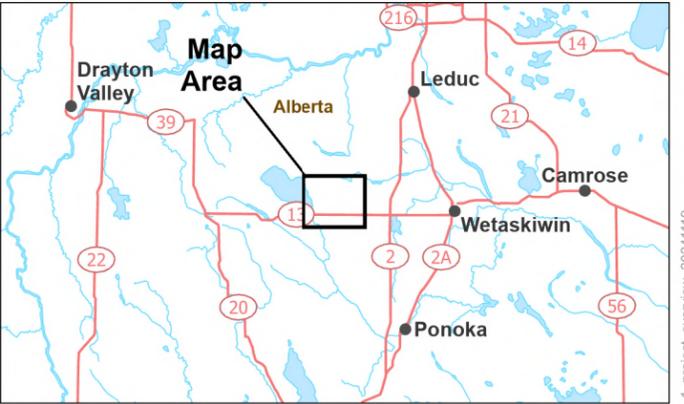


Bright Meadows Solar Project Overview

Revolve Meadows Solar GP Inc.

Legend

Project Footprint	Highway
Project Area	Primary Road
Regional Study Area	Township
	Section
	Quartersection



0 500 1,000 1,500 2,000
Metres
Map Scale = 1:55,000 (printed on 11 x 17)
Map Projection: NAD 1983 CSRS UTM Zone 12N
Rotated 2 Degrees

Data Sources

- Project Location and Layout. Revolve Meadows Solar LP. November 15, 2024.
- Main Basemap. CanVec 1:50,000: Government of Canada; World Imagery: Earthstar Geographics
- Main Basemap. World Imagery: Maxar

Disclaimer
EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data have been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

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1.2 PROJECT DESCRIPTION

The Project is situated within SE 29-46-27 W4M and is expected to generate up to 15.7 MW-ac (20.3 MW-dc) of generating capacity once operational. The Project is situated on the land and bounded at its southern end by a road allowance, and on the eastern side of the site, along the road allowance between the land and the parcel SW 28-46-27 W4M. The Project access will connect at the southeast corner of the site to the existing approach at the intersection of Range Road 274 and Township Road 464 (see Figure 1-2). The project lands are located in a very rural area with few residences close by, and where the land use has been cattle grazing for many years by the current landowner due to the history of low productivity of the land for cultivation.

The Project Area in this EE is defined as an area of 67.4 hectares (ha) in size, encompassing all of the SE 29-46-27 W4M and its southern road allowance, and the portion of road allowance of SW28-46-27 W4M intersected by the Project (Figure 1-2).

1.2.1 PROJECT COMPONENTS

The Project Footprint includes the perimeter fencing for the Project, six solar photovoltaic (PV) arrays, six inverters, internal access routes at grade, buried collector lines, a switchgear, and ancillary infrastructure (e.g., workspace). A short segment of medium voltage (MV) overhead cable will connect the Project to the existing Fortis distribution system at the point of interconnection (POI), located at the southeastern extent of the Project Area.

Descriptions of the Project's primary components are listed in Table 1-1 and their dimensions in Table 1-2.

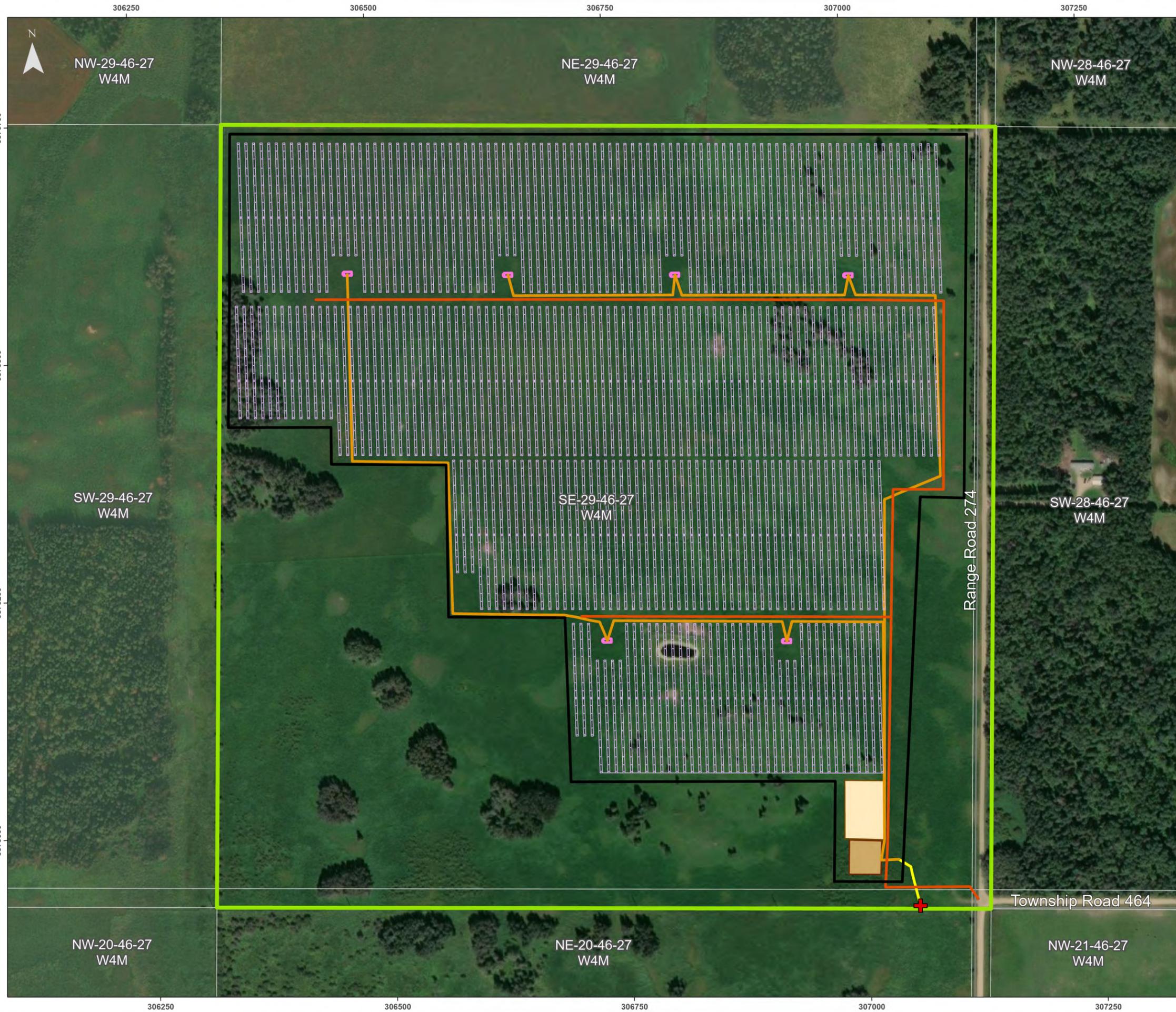


Table 1-1. Description of Project components.

Project Component¹	Description
Perimeter fence	The perimeter security fence will be 3,104 m long, and extending around the perimeter of the Project Footprint, excluding the Project access that ends on an existing approach to Range Road 274. The fence will either have large enough gaps for small wildlife (e.g., waterbirds, small mammals) to pass under (i.e., walking/foraging), or otherwise will be installed slightly off the ground to allow some level of passage, to the extent that any such fence design is acceptable and approved under the County bylaws or other regulation.
Photovoltaic arrays	The Project will include a total of six PV arrays configured on a single-axis tracker racking system. The racking system will be secured with steel beam foundations (e.g., I-beams) which will be installed to a depth of between 2 and 3 metres below ground surface (mbgs).
Electrical collector system	Approximately 2.4 km of buried collector lines will be installed with the use of trenches to a maximum width of 1 m and an approximate depth of 1.5 mbgs. The underground electrical collector system connects the PV panels to the inverters, and then the inverters to the switchgear.
Inverters	Six inverters, each with a capacity of 3.15 MW (total capacity 18.9 MW) will be secured with steel beam foundations (e.g., I-beams) which will be installed to a depth of between 2 and 3 metres below ground surface (mbgs).
Access	Access planning for the Project has used existing roads to the extent feasible. Access on the Project Footprint will be 4.5 m wide, constructed at grade and capped with gravel.
Workspace	A 0.26 ha temporary workspace is planned near the entrance to the Project Footprint. This area will be cleared, graded, and temporarily gravelled for laydown and staging during Project construction.
Switchgear	One 25 kV outdoor switchgear (0.12 ha) will be installed south of the workspace, on a concrete pad. The excavation depth for the concrete pad will not exceed 1.2 mbgs.
MV interconnection cable	57 m of Medium Voltage (MV) cable will be installed overhead, connecting the Project switchgear to the existing 25 kilovolt (kV) Fortis distribution system.

Table 1-2. Summary of Project Footprint.

Project Component	Project Footprint	
	Length (km)	Area (ha)
Perimeter fence	3.10	N/A
Photovoltaic arrays	N/A	37.66
Electrical collector system	2.41	0.24
Inverters	N/A	0.02
Access	1.78	0.80
Workspace	N/A	0.26
Switchgear	N/A	0.12
MV cable	0.06	N/A

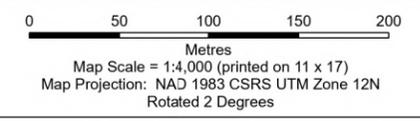
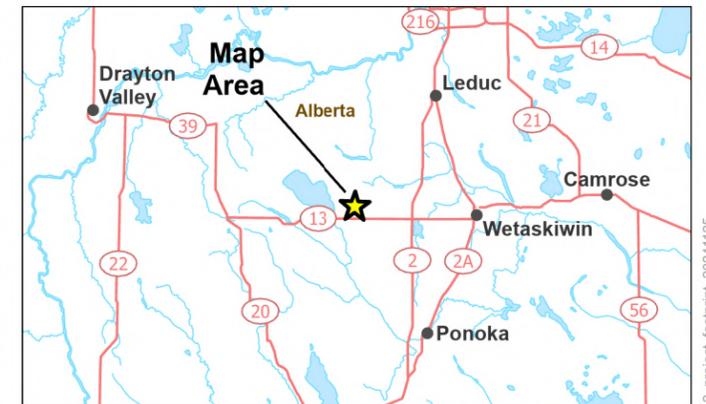


Bright Meadows Solar Project Site

Revolve Meadows Solar GP Inc.

Legend

- ▬ Project Area
- Project Footprint
- Fence
- Photovoltaic Arrays
- Access
- Collector Lines
- Inverters
- Workspace
- Switchgear
- + Point of Interconnection
- Medium Voltage (MV) Interconnection Cable
- Primary Road
- Quartersection



Data Sources

- Project Location and Layout. Revolve Meadows Solar LP, November 15, 2024.
- Main Basemap. CanVec 1:50,000; Government of Canada; World Imagery: Maxar

Disclaimer
 EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data have been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

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1.2.2 PROJECT ACTIVITIES

The Project has been divided into three phases: construction, operation, and decommissioning and reclamation. Specific activities associated with each of these Project phases are described further below.

1.2.2.1 Construction

Activities to be conducted during the construction phase of the Project are described in Table 1-3.

Table 1-3. Project construction activities.

Construction Activity	Details
Pre-construction activities	Includes work such as pre-construction wildlife clearance surveys, Pre-Disturbance Site Assessment, site surveying and staking, utility locates, and geotechnical investigations. This work will be conducted with the use of light duty vehicles and truck-mounted drill rigs. Isolated areas of tree and shrub clearing will also be undertaken at this time.
Site access	Access planning for the Project has used existing roads to the extent feasible. Site access will be constructed to create an even, safe travel surface suitable for construction equipment. These access routes will be constructed at grade. During access construction, the topsoil and existing vegetation will be salvaged and stockpiled separately from subsoil for later use during reclamation. Subsoil grading will be undertaken as warranted, followed by gravel installation on the travel surface.
Installation of fencing	The Project Footprint will be fully fenced with standard perimeter security fencing. It is expected that the security fence will be standard chain link fencing, and the total fencing will be minimized to the extent practical, and in accordance with County requirements. Fencing will use straight lines and square corners as much as possible.
Installation of photovoltaic arrays	Earthworks will be avoided to the extent feasible; however, minor earthworks may be necessary. During earthworks, topsoil will be salvaged, and subsoil will be graded; following installation, soils will then be replaced in reverse sequence of excavation. Construction vehicles and equipment will be limited to areas that are required for Project construction. Racking system foundations will be installed by pounding in steel beams (e.g., I-beams). PV panel racking systems will be secured to the pile foundations, followed by PV panels. Any subsoil brought to the surface during pile installation will be separated from the topsoil and returned to the subsoil to the extent possible.
Installation of switchgear and inverters	Topsoil and existing vegetation will be salvaged and stockpiled separately from subsoil for later use during reclamation. Subsoil will be excavated and graded as warranted. Concrete pads will be poured onsite and soil will be replaced around the foundations in reverse sequence of excavation.
Collector installation	Collector lines will be trenched underground within the Project Footprint. During trenching, topsoil and subsoil may be stripped and stored separately. Collector lines will be installed as soon as possible during construction following excavation to reduce the time that trenches are open (i.e., limit the risk of entrapping wildlife) and minimize potential soil erosion. Soil backfill will occur immediately following collector line installation and will be recontoured to the original topographic profile.
Temporary reclamation	Following Project construction, activities to be conducted during the operational phase include: removal of gravelled surfaces required temporarily for construction; landscape re-contouring; soil decompaction (as necessary); topsoil replacement; and, revegetation and Erosion and Sediment Control (ESC), as appropriate. A tame grass mix will be seeded underneath the panels and within disturbed areas of the Project Footprint not required to support operation. Vegetation maintenance (e.g., trimming/mowing) will be conducted, either by means of scheduled mowing or with the use of agricultural grazing.



1.2.2.2 Operation

Activities to be conducted during the operation phase of the Project include:

- monitoring and maintenance of Project infrastructure:
 - maintenance of Project components;
 - maintenance of erosion and sediment controls (ESC) as warranted;
 - vegetation maintenance (e.g., trimming/mowing);
 - weed identification and control if/when required; and,
 - third-party inspections.
- vehicle and equipment traffic.

1.2.2.3 Decommissioning and Reclamation

Activities to be conducted during the decommissioning and reclamation phase of the Project include:

- Project de-energization;
- removal of above-ground infrastructure;
- removal of below-ground structures to at least 1 mbgs;
- removal of gravelled surfaces required during operation;
- landscape re-contouring;
- soil decompaction (as necessary);
- topsoil replacement; and,
- revegetation and ESC, as appropriate.

1.3 PROJECT SETTING

1.3.1 NATURAL REGION AND NATURAL SUBREGION

The Project is located in the Boreal Forest Natural Region, specifically within the Dry Mixedwood Subregion of Alberta. The landscape in this subregion is generally composed of level to gently undulating plains with diverse vegetation, including aspen-dominated forests and grassy understories, interspersed with wetlands and agricultural land (Natural Regions Committee 2006). The dominant soil types in this region are Orthic Gray Luvisols and Dark Gray Chernozems (Natural Regions Committee 2006), supporting both forested and cultivated areas.

1.3.2 EXISTING INFRASTRUCTURE AND POPULATED PLACES

The Project is situated in within SE 29-46-27 W4M and its southern road allowance, and the western road allowance of SW 28-46-27 W4M, located approximately 70 km southwest of the city of Edmonton, and approximately 30 km west of the city of Wetaskiwin, Alberta. Several communities or developments are located within six km of the Project, including the village of Ma-Me-O Beach, a lake community on the



southeast shore of Pigeon Lake (approximately 6 km to the west); Pigeon Lake Reserve 138A (approximately 3 km to the northwest), and Pigeon Lake Escapes RV Park (approximately 3 km to the southwest).

The Project is sited on privately owned lands which are predominantly tame pasture. Based on a review of historical air photography and available imagery, the Project lands have been dominated by trees and tame pasture since 1949. Farmyards, treed areas, cultivation, and residences occupy the lands surrounding the Project. A network of oil and gas infrastructure (i.e., access, well pads and wells) is present between Ma-Me-O Beach and the Project.

1.3.3 REGIONAL LAND USE PLANS AND POLICIES

The Project is located within the County of Wetaskiwin No. 10 in the North Saskatchewan Land Use Region. To date, a North Saskatchewan Land Use Regional Plan has not been developed. The Project falls under the County of Wetaskiwin Municipal Development Plan (MDP; MDP Bylaw 2023/05). The Project aligns with the County's goals of supporting a robust economy and demonstrating responsible environmental stewardship.



2 CONCORDANCE WITH AUC RULE 007 SP15

This EE has been prepared in concordance with requirements outlined in SP15 of Section 4.4.2 of the AUC Rule 007 (Alberta Utilities Commission 2022; Table 2-1).

Table 2-1. Concordance with the AUC Rule 007 SP15 requirements.

Rule 007 SP15 Requirement	Applicable Report Section
Description of pre-project environmental and land use conditions in the local study area.	Section 1.3
Identification and description of Project activities and infrastructure that may adversely affect the environment.	Section 1.2
Identification of specific ecosystem components within the local study area that may be adversely affected by the project: Terrain and soils; Surface water bodies and hydrology; Groundwater; Wetlands; Vegetation species and communities; Wildlife species and habitat; Aquatic species and habitat; Air quality; and, Environmentally sensitive areas.	Section 4
Description of potential adverse effects of the project on the ecosystem components during the life of the project.	Section 4
Description of the methodology used to identify, evaluate and rate the adverse environmental effects and determine their significance, along with an explanation of the scientific rationale for choosing this methodology.	Section 3
Description of the mitigation measures proposed to be implemented during the life of the project to reduce the potential adverse effects.	Section 4
Description of the predicted residual adverse effects of the project and their significance after implementation of the proposed mitigation.	Section 4
Description of monitoring activities proposed to be implemented during the life of the project to verify the effectiveness of the proposed mitigation.	Section 5
List of the qualifications of the individual(s) who conducted or oversaw the environmental evaluation.	Appendix A



3 ENVIRONMENTAL EVALUATION METHODOLOGY

3.1 APPROACH

The purpose of the EE is to identify, evaluate and determine the significance of any potential adverse environmental effects of the Project that remain after the application of mitigation measures. The methods used are in keeping with current environmental assessment (EA) approaches and best practices and have been developed to provide a thorough and rigorous analysis, while presenting the results in a clear, concise, and well-organized manner. The approach includes the following key elements:

- Define the scope of the Project, which includes describing the components, showing their locations and describing the construction and operation methods.
- Define the scope of the evaluation, which includes identification of Valued Ecosystem Components (VECs) and the appropriate spatial and temporal boundaries relative to the Project components and scale of potential effects.
- Describe the existing environmental conditions potentially affected by the Project using appropriate data (i.e., desktop review, field survey results) relative to the delineated spatial boundaries.
- Identify likely Project-VEC interactions and potential adverse Project-related effects.
- Determine proven mitigation measures that are technically and economically feasible to avoid, reduce, or eliminate potential adverse Project-related effects.
- Determine residual adverse Project-related effects on the VECs (i.e., those effects remaining after the application of the proposed mitigation).
- Characterize the residual adverse Project-related effects (i.e., geographic extent, magnitude, duration, frequency, probability of occurrence, and reversibility) and determine their significance.
- Outline monitoring programs proposed for the Project, as applicable.

A full list of professionals that were involved in conducting the EE is provided in Appendix A.

3.2 SCOPING

The scope of the EE was determined by evaluating the likely interactions between the Project components and activities that potentially affect the selected VECs within the identified spatial and temporal boundaries. The existing environmental conditions and potential Project-VEC interactions were identified based on:

- review of publicly available data sources (e.g., government databases, technical reports, maps);
- interpretation of the results of field surveys;
- information provided by regulators and stakeholders; and,
- professional judgement of qualified, experienced environmental assessment practitioners.



3.2.1 VALUED ECOSYSTEM COMPONENTS

This EE is organized by and focused on the selected VECs. VECs are aspects of the biophysical environment which are of ecological importance, and which will likely be adversely affected by the Project. VECs reflect identified scientific and community concerns regarding a project and its potential effects and are typically identified early in the EE process considering regulatory requirements, as well as questions and issues raised through consultations with government departments and agencies, stakeholder groups and the interested public. The VEC approach is a useful, effective, and widely accepted way of focusing the EE on important environmental components and issues.

In compliance with AUC Rule 007 (SP15), the following eight VECs were identified and considered for Project-VEC interactions: aquatic species and habitat; terrain and soils; wetlands, surface waterbodies and hydrology; groundwater; vegetation species and communities, wildlife species and habitat; and environmentally sensitive areas. The potential for Project-VEC interactions was evaluated, and the results are presented in Table 3-1, including rationale for the three VECs not carried forward in the evaluation.

3.2.2 SPATIAL BOUNDARIES

The spatial boundaries have been established to direct and focus the EE. The spatial boundaries consider the VECs in terms of their overall characteristics and the way they are likely to interact with the Project. The spatial boundaries have been defined as follows:

- Project Area – the parcels of land within which the Project is situated (i.e., SE 29-46-27 W4M and the western road allowance of SW 28-46-27 W4M).
- Project Footprint – the area subject to direct disturbance from the Project. Defined as the surveyed boundaries for the safe construction, operation and decommissioning and reclamation of all Project components.
- Local Study Area (LSA) – is defined for each VEC, as appropriate. The LSAs have been designed to capture the extent of all direct effects and most indirect effects on each VEC.
- Regional Study Area (RSA) – A buffer of 5,000 m around the Project Area (952 km²). The RSA has been designed to capture the extent of all indirect effects on the VECs and provide regional context for the assessment for wildlife.

3.2.3 TEMPORAL BOUNDARIES

The temporal boundaries are based on the timeframe within which effects of the Project may occur, considering the Project phase:

- Construction – scheduled to commence in spring 2026 and be completed in fall 2026.
- Operation – the Project is expected to be in operation for 30 years or more, depending on feasibility of repowering and obtaining commercial off-take contracts.
- Decommissioning and Reclamation – removal of the Project infrastructure and reclamation is scheduled to last a few months but is season-dependent. The return of land to equivalent land capability is expected to occur within 2 years following reclamation.



Table 3-1. Rationale for Valued Ecosystem Components evaluation.

Valued Ecosystem Component	Environmental Evaluation Warranted	Rationale	Potential Effects Evaluated	Section(s) Where Addressed
Aquatic Species and Habitat	No	No aquatic species or associated habitat are located within 100 m of the Project Area; as such, adverse Project-related effects on aquatic species or habitat are expected to be negligible.	-	-
Air Quality	No	Project-related air emissions are expected to be limited and isolated to vehicle and equipment traffic during construction, operation, and decommissioning and reclamation. No continuous air emission sources are expected to occur during the normal Project lifespan; as such, adverse Project-related effects on air quality are expected to be negligible.	-	-
Terrain and Soils	Yes	Terrain and soils have the potential to be adversely affected during the construction and decommissioning and reclamation phases of the Project, including during activities such as soil salvage, grading, connector line installation, and soil replacement.	Alteration of terrain Reduction of soil quality Reduction of soil quantity	4.1
Wetlands, Surface Water, and Hydrology	Yes	Wetlands, surface water, and hydrology have the potential to be affected during all Project phases as a result of earthworks.	Change in extent of surface waterbodies Change in water quality Change in water quantity	4.2
Groundwater	Yes	Although the Project will not involve groundwater withdrawal, groundwater has the potential to be encountered during Project construction during pile installation (up to 3 mbgs) and excavations for collector installation (up to 1.5 mbgs). The glacial surface lithologies in the area that may bear groundwater have been documented in historical well log records to occur as shallow as 1.5 mbgs and extend as deep as 30 mbgs.	Change in groundwater quality Change in groundwater quantity	4.3
Vegetation Species and Communities	Yes	Vegetation species and communities have the potential to be affected by the Project during construction. Vehicles and equipment have the potential to introduce weed propagules, and exposed soils are prone to support weed species as first colonizers.	Alteration or loss of predominately non-native or disturbed vegetation Introduction or spread of weeds Introduction or spread of soil-borne disease	4.4
Wildlife Species and Wildlife Habitat	Yes	Regulatory requirements under the provincial Wildlife Act and the Wildlife Directive for Alberta Solar Energy Projects (Government of Alberta 2017), as well as the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the <i>Migratory Birds Convention Act</i> (MBCA), and the <i>Species at Risk Act</i> (SARA). Wildlife species and wildlife habitat have the potential to be adversely affected during all phases of the Project through physical disturbance to wildlife habitat as well as increased sensory disturbance (i.e., noise and presence) during the construction and reclamation activities.	Alteration or loss of wildlife habitat Change in sensory disturbance Change in wildlife mortality	4.5



Valued Ecosystem Component	Environmental Evaluation Warranted	Rationale	Potential Effects Evaluated	Section(s) Where Addressed
Environmentally Sensitive Areas	No	<p>AUC Rule 007 defines sensitive areas as “<i>areas that are important to the long-term maintenance of biological diversity, soil, water or other natural processes at multiple spatial scales. These areas contain rare or unique elements, or include elements that may require special management consideration due to their conservation needs</i>” (Alberta Utilities Commission 2024). The following datasets and publicly available literature sources were reviewed to gather information pertaining to vegetation species and communities within the LSA:</p> <ul style="list-style-type: none"> • Environmentally Significant Areas (ESAs) (Fiera Biological Consulting 2014); • Parks and Protected Areas (Alberta Environment and Parks 2022a); • Important Bird Areas (IBAs) (Birds Canada and Nature Canada 2023); • Migratory Bird Sanctuaries (Environment and Climate Change Canada 2022); and, • National Wildlife Areas (Environment and Climate Change Canada 2019). <p>None of these Environmentally Sensitive Areas are present within the Project Area or LSAs. As such, adverse Project-related effects on Environmentally Sensitive Areas are expected to be negligible.</p>	-	-



3.2.4 EXISTING ENVIRONMENTAL CONDITIONS

As described in Table 3-1, the EE focused on the following five VECs:

- terrain and soils;
- wetlands, surface waterbodies and hydrology;
- groundwater;
- vegetation species and communities; and,
- wildlife species and habitat;

For each of the VECs, a desktop review was undertaken of relevant publicly available databases. This information informed and supplemented results of field surveys required as per the Wildlife Directive for Alberta Solar Projects (the Wildlife Directive) (Government of Alberta 2017) and AUC Rule 007 (Alberta Utilities Commission 2024) to support the EE. Field surveys for the Project were completed in 2022 and 2024 as follows:

- land cover –visual survey of terrain features and vegetation communities within the Project Area which was also used to inform wetland identification, classification and delineation.
- wildlife species and habitat surveys included:
 - spring and fall bird migration surveys (2022);
 - raptor nest surveys (2022 and 2024);
 - breeding bird surveys (2022); and,
 - Sharp-tailed Grouse Surveys (2022 and 2024).

Together, the available historic data and field surveys provided an adequate and appropriate level of information to inform the EE and allow a complete evaluation of the likely effects of the Project on the existing environment and VECs.

Vegetation and wildlife species of management concern (SOMC) considered in this EE are those that have provincial and/or federal listings, as their populations and distributions within a provincial or federal context have been determined to require attention. For this EE, SOMC are defined as being:

- identified as endangered, threatened or special concern on all Schedules of the *Species at Risk Act* (SARA) (Government of Canada 2024);
- identified as endangered, threatened or special concern or under review by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2024);
- identified as endangered, threatened or special concern within the province of Alberta including species protected under the *Alberta Wildlife Act* (Government of Alberta 2000, Alberta Environment and Protected Areas 2024a); and,
- identified as at risk, may be at risk or sensitive under the Alberta Wild Species General Status Listing (Alberta Environment and Parks 2024).



3.3 RESIDUAL EFFECTS ANALYSIS

Residual effects are those remaining after the implementation of mitigation measures. Residual effects are predicted, characterized, and given a significance rating as outlined in the following subsections.

3.3.1 PREDICTION OF RESIDUAL EFFECTS

For each of the VECs carried forward within the EE, the following process was followed to predict residual effects that may occur as a result of the Project.

3.3.1.1 Identify Potential Effects

The expected interactions between the Project activities and the VECs within the spatial and temporal boundaries are evaluated and the potential adverse Project-related effects are identified. A potential adverse effect is likely to occur when the condition or extent of a VEC is predicted to be measurably reduced due to Project activities.

3.3.1.2 Identify Mitigation

Proven, accepted mitigation measures that are technically and economically feasible are proposed to avoid, reduce, or eliminate the effects of the Project on the VECs. Mitigation includes project design, scheduling, the implementation of best management practices (BMPs), recommendations from regulators, industry standards, and compliance with legislation, regulations, and guidelines (e.g., the Wildlife Directive, the Alberta Wetland Policy).

The layout of the Project was designed to limit potential effects of the Project on VECs to the extent feasible, including siting primarily within disturbed tame pasture, in proximity to active disturbance corridors (e.g., Range Road 274, Township Road 464). Additionally, mitigation measures were developed in consideration of the following directives and BMPs including:

- Beneficial Management Practices for Renewable Energy Projects (Neville 2017);
- Conservation and Reclamation Directive for Renewable Energy Operations (C&R Directive; Government of Alberta 2018c);
- 2010 Reclamation Criteria for Wellsites and Associated Facilities for Cultivated Lands (Alberta Environment and Sustainable Resource Development 2013a);
- Soil Series Information for Reclamation Planning in Alberta Volume 1 (Pedocan Land Evaluation Ltd. 1993a);
- Alberta Clubroot Management Plan (Government of Alberta 2014); and,
- Wildlife Directive for Alberta Solar Energy Projects (Government of Alberta 2017).



3.3.1.3 Predict Residual Effects

The mitigation measures proposed to avoid, reduce, or eliminate the potential effects are applied to the identified Project-related effects to predict the occurrence of residual effects (i.e., the effects remaining after the application of mitigation measures). The predicted residual effects are then characterized as discussed in Section 3.3.2.

3.3.2 CHARACTERIZATION OF RESIDUAL EFFECTS

Residual effects are classified in terms of several criteria, which are then considered during significance determination. Definitions for the residual effects criteria used in this assessment are summarized in Table 3-2.

Table 3-2. Criteria for evaluation of residual effects of the Project.

Criteria	Definition
Magnitude	<p>Low – a measurable change to existing conditions but within the range of natural variability and accepted protective standards.</p> <p>Moderate – a measurable change to existing conditions outside the range of natural variability, but still within accepted protective standards or not posing a risk to the viability of the Valued Ecosystem Component (VEC) at a subpopulation, population, community, or ecosystem level.</p> <p>High - a measurable change to existing conditions outside the range of natural variability and accepted protective standards or posing a risk to the viability of the VEC at a subpopulation, population, community, or ecosystem level.</p>
Geographic Extent	<p>Project Footprint –spatial extent of the area direct and indirect effects from Project activities is limited to the physical disturbance footprint of the Project.</p> <p>Local – spatial extent of direct and indirect effects from Project activities is limited to the Local Study Area (LSA).</p> <p>Regional – spatial extent of direct and indirect effects from Project activities occurs beyond the LSA.</p>
Duration	<p>Immediate – the effect only occurs during construction or decommissioning.</p> <p>Short-term – the effect occurs up to three years post-construction or post-decommissioning and reclamation.</p> <p>Medium-term – the effect will last for the lifetime of the Project, to the end of decommissioning and reclamation.</p> <p>Long-term – the effect will remain over three years beyond the end of decommissioning and reclamation.</p>
Frequency	<p>Infrequent – effect occurs several times at sporadic intervals.</p> <p>Frequent – effect occurs many times on a regular basis.</p> <p>Continuous – effect occurs continuously.</p>
Reversibility	<p>Reversible – effect can be fully mitigated and/or returned to baseline conditions following decommissioning.</p> <p>Not Reversible – effect cannot be fully mitigated and/or remains above baseline after Project decommissioning.</p>
Probability of Occurrence	<p>Unlikely – effect is not likely to occur.</p> <p>Possible – effect may occur.</p> <p>Probable – effect is likely to occur.</p> <p>Certain – effect will occur.</p>



3.3.3 DETERMINING SIGNIFICANCE OF RESIDUAL EFFECTS

Evaluating the significance of the predicted likely residual effects of a proposed project is an important step in the EE. This typically involves: 1) defining what a *significant* environmental effect is, and 2) on the basis of that definition, evaluating whether a project's likely residual effects are *significant* or *Not Significant*. The definition of significance generally incorporates the principles of sustainability and other relevant concepts and considerations, as appropriate. For this EE, significance has been predicted for all the likely individual residual effects of the Project, as well as the combined residual effects on each of the VECs.

In this EE, significant residual effects are defined as those adverse effects that are predicted to cause a change in the VEC that is likely to alter its status or integrity beyond a level where it is not sustainable or is unavailable to contribute to ecological function. An environmental effect that does not meet these criteria is considered Not Significant.



4 ENVIRONMENTAL EVALUATION

4.1 TERRAIN AND SOILS

The Terrain and Soils LSA has been defined as SE 29-46-27 W4M and its southern road allowance, and the western road allowance of SW 28-46-27 W4M (Figure 4-1). A desktop terrain and soil assessment within the Terrain and Soils LSA was completed by reviewing the following datasets and publicly available literature sources:

- Natural Regions and Subregions of Alberta (Natural Regions Committee 2006);
- Alberta Soil Information Viewer (Government of Alberta and Alberta Agriculture and Irrigation 2024);
- Alberta Land Suitability Descriptors (Alberta Agriculture and Forestry 2017);
- Canadian Soil Information Service (CanSIS)(Agriculture and Agri-Food Canada 2024); and,
- Soil Series Information for Reclamation Planning in Alberta Volume 2 (Pedocan Land Evaluation Ltd. 1993b).

4.1.1 EXISTING ENVIRONMENTAL CONDITIONS

Landform models summarize the characteristics of repeating patterns in the landscape. These patterns are described in surface form by seven attribute values and five slope classes (MacMillan and Pettapiece 2000). Soil series consist of soils developed on similar parent material and under similar environmental conditions and define attributes and limitations of land capability. Landform and soil series polygons and associated descriptors, and land suitability rating class within the Terrain and Soils LSA are shown on Figure 4-1.

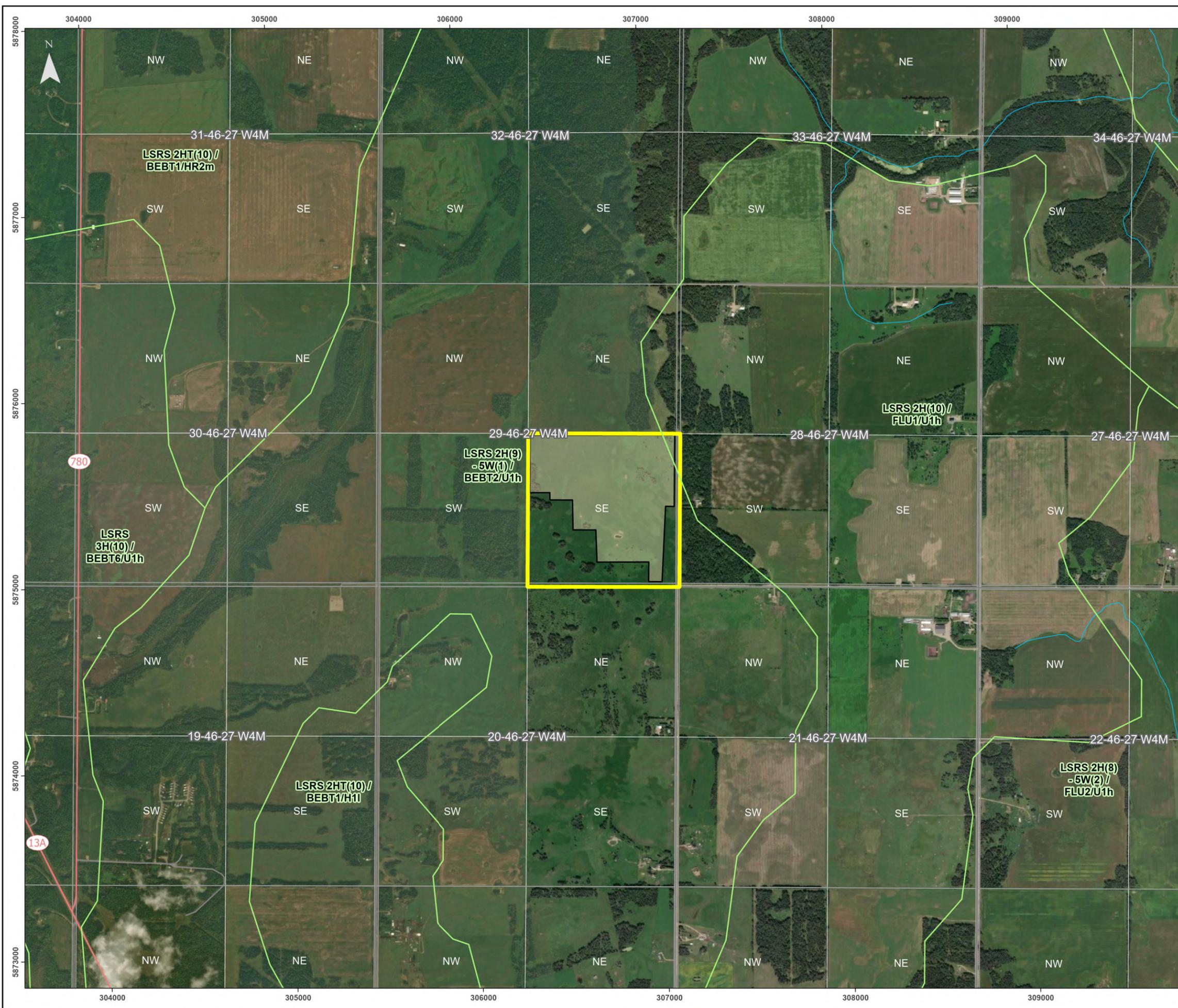
The Terrain and Soils LSA is 67.39 in size, located within the Dry Mixedwood Natural Subregion of the Boreal Natural Region which is typically characterized by level to gently undulating terrain with some hummocky uplands (Natural Regions Committee 2006).

Soil Series within the Terrain and Soils LSA include Benalto (Dark Gray Luvisol), Falon (Orthic Dark Gray Chernozem), and Brenton (Orthic Gray Luvisol) (Table 4-1 and Table 4-2). The land suitability rating within the Terrain and Soils LSA is approximately 60.77 ha of Class 2 soils (90%) and 6.62 ha of Class 5 soils (9%; Table 4-1). Class 2 soils within the Terrain and Soils LSA are slightly limited by inadequate heat units for optimal vegetative growth whereas the Class 5 soils within the Terrain and Soils LSA are very severely restricted by excess water limiting vegetative production (Alberta Agriculture and Forestry 2017).

The County of Wetaskiwin also has its own evaluation process for rating farmland potential within the county, and considers the host lands for the Project to be of low agricultural value. The County's online Property Assessment and Farmland Valuation Report identifies that the Project is proposed on pasture land with a Canada Land Inventory (CLI) rating of 6 and 7. According to the CLI system, lands with ratings of 6 and 7 are categorized as having limited agricultural productivity and are not considered high-value farmland. These ratings indicate that the land is better suited for grazing or other lower-intensity agricultural uses, rather than



for cultivation or other forms of high-yield farming. As such, the land is not regarded as prime agricultural land in terms of its potential for farming operations.

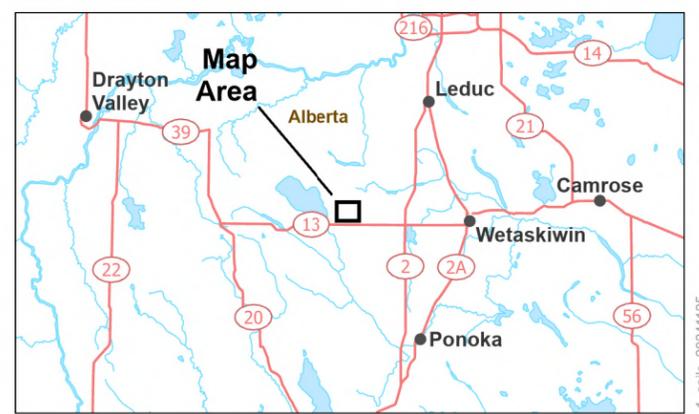


Predominant terrain and soil characteristics identified for the Project

Revolve Meadows Solar GP Inc.

Legend

Project Footprint	Highway
Terrain and Soil LSA	Primary Road
AGRISID Soil Characteristics	Section
	Quartersection



0 200 400 600 800
 Metres
 Map Scale = 1:20,000 (printed on 11 x 17)
 Map Projection: NAD 1983 CSRS UTM Zone 12N
 Rotated 2 Degrees

Data Sources

- Project Location and Layout. Revolve Meadows Solar LP. November 15, 2024.
- Soil Characteristics, AGRASID soil polygons: Government of Canada
- Main Basemap. CanVec 1:50,000; Government of Canada; World Imagery: Maxar

Disclaimer

EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data have been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

Drawn: PH	Checked: SS	Figure 4-1	Date: 11/26/2024
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Table 4-1. Predominant terrain and soils characteristics within the Terrain and Soils Local Study Area.

Polygon ID ¹	Map Unit ¹	Landform ¹	Soil Series ¹		Land Suitability Rating System (Spring Grains) ¹	Area of LSA (ha)
			Primary	Secondary		
18677	BEBT2/U1h	Undulating – high relief	Benalto	Breton	2H(9) – 5W(1)	66.22
18690	FLU1/U1h	Undulating – high relief	Falun	Benalto	2H(10)	1.70

Notes:

¹ (Government of Alberta and Alberta Agriculture and Irrigation 2024)

Table 4-2. Soil series classification and description within the Project Footprint.

Soil Series Code ¹	Soil Series Name ¹	Soil Classification ¹	Description ¹
BEN	Benalto	Dark Gray Luvisol	Soils are well drained and weakly calcareous (<6 CaCO ₃ equivalent %), textures are moderately fine (e.g., sandy clay loam, clay loam, and silty clay loam). There are typically a few stones near the surface of soil but present in the subsoil, and surface colour is variable.
BTN	Breton	Orthic Gray Luvisol	Soils are well drained and weakly calcareous (<6 CaCO ₃ equivalent %), textures are moderately fine (e.g., sandy clay loam, clay loam, and silty clay loam). Topsoil is thin in forested areas, with typically no Ah horizon. In cultivated fields, the Ap horizon is a mix of the LH and Ae horizons, approximately 15 cm in depth. Exposure of Paskapoo sandstone is commonly associated with Breton soils.
FLU	Falun	Orthic Dark Gray Chernozem	Soils are well drained and weakly calcareous (<6 CaCO ₃ equivalent %), textures are moderately fine (e.g., sandy clay loam, clay loam, and silty clay loam). Soils are commonly uniform in texture, structure and colour.

Notes:

¹(Pedocan Land Evaluation Ltd. 1993b, Agriculture and Agri-Food Canada 2019)

4.1.2 POTENTIAL EFFECTS

Potential adverse Project-related effects on the Terrain and Soils VEC include alteration of terrain, reduction in soil quality, and reduction in soil quantity.

4.1.2.1 Alteration of Terrain

Alteration of terrain can result in Project-related effects on landscape morphology and terrain stability. At the Project, alteration of terrain will primarily be associated with localized grading and trenching (i.e., clearing of vegetation, soil salvage). If such activities occur at a large scale, they have the potential to alter local topography (e.g., slope, aspect, and exposure) and, thereby, change the predominant surface drainage patterns and increase surface erosion potential.

The terrain affected by the Project Footprint is level to gently undulating and is not expected to pose challenges or restrictions on construction. No natural, undisturbed slopes coincide with the Project Footprint and all lands anticipated to be disturbed have been chronically altered by past agricultural use.



4.1.2.2 Reduction in Soil Quality

Soil handling during the construction and decommissioning and reclamation phases of the Project has the potential to reduce soil quality through potential changes in soil structure and consistency due to:

- Compaction – Soil compaction may result from equipment travel during construction. Reduced soil infiltration has the potential to decrease soil water holding capacity, root infiltration and vegetation re-establishment.
- Admixing – Admixing may result from soil handling where subsoils are inadvertently mixed with topsoil. Admixing can adversely affect vegetation re-establishment.
- Contamination – Soil contamination may result from an incidental release (e.g., fuel, lubricants) from on-site equipment during all Project phases, which can adversely affect vegetation re-establishment.

The above potential changes in soil structure, consistency, and chemistry have the potential to affect revegetation success and end-land use capability following reclamation.

4.1.2.3 Reduction in Soil Quantity

Soil disturbance and excessive handling can result in a loss of soil material caused by erosion (i.e., movement of soil particles via wind and/or water). Reduction in soil quantity can adversely affect the capability of the land to support vegetation growth by decreasing the volume of growing substrate (i.e., topsoil).

4.1.3 MITIGATION

Mitigation measures proposed to reduce the potential for adverse Project-related effects on the Terrain and Soil VEC include:

- If hydrovac excavation is required, the following mitigation measures will be implemented:
 - Strip topsoil from all hydrovac locations prior to excavation.
 - Verify all hydrovac trucks and tanks have arrived on site clean and free of contaminants.
 - Hydrovac waste will be disposed of at an approved waste management facility.
 - All hydrovac excavations will be backfilled and compacted with mineral soil.
- Soil stripping activities will be informed by the soil stripping map and recommendations provided in the Pre-Disturbance Site Assessment report and will be done using methods appropriate to the construction task.
- Two-lift soil salvage (i.e., the first lift removing topsoil and the second lift removing subsoil) will be implemented to avoid soil degradation through admixing.
- Topsoil and subsoil stripping will only be completed under dry site conditions unless it can be demonstrated that soil stripping under frozen conditions will avoid soil admixing.
- Soil stripping and salvage will be avoided during extreme winds, or wet conditions that may result in the rutting or compaction of the soil surface. When wet soils are identified, one or more of the following mitigation measures will be implemented:
 - Restrict construction equipment to low-ground pressure tires or wide pad tracks.



- Restrict rubber-tired traffic from travelling within areas of active construction.
- Install geotextiles or matting in areas exhibiting wet or thawed soil conditions.
- Halt construction and vehicle travel until dry.
- The decision to shut down construction activities due to wet soil conditions will be made by the Prime Contractor's Project Manager in consultation with the Environmental Monitor and the Proponent.
- Topsoil stripping/salvaging will be avoided during frozen conditions unless it can be demonstrated that soil stripping under frozen conditions will avoid admixing.
- Topsoil and subsoil will be stockpiled separately with a minimum separation of 1-metre to avoid admixing (i.e., the mixing of topsoil and subsoil).
- Topsoil and subsoil stockpiles should be labelled, georeferenced and photo documented.
- Topsoil (1st lift) will be stored/stockpiled on topsoil.
- Subsoil (2nd lift) will be stored/stockpiled on subsoil; where this is not possible, it may be stored on top of geotextile or similar material to separate it from underlying topsoil.
- Soil stockpiles will be located on stable ground and will be sloped to prevent erosion or sloughing.
- Temporary erosion control measures will be implemented or installed (e.g., soil roughening, geotextile cover, silt fencing, etc.) to reduce the risk of soil loss through water or wind erosion.
- Erosion control measures will be regularly inspected (e.g., weekly) throughout the construction phase and repaired or replaced as needed.
- Trenching activities have the potential to bring lower subsoil and parent materials to surface — including large rocks and cobbles — adversely affecting topsoil properties and growing capability due to admixing (e.g., integration of coarse fragments and/or sodic parent materials). Where trenching methods will be employed, the following mitigation measures will be implemented:
 - Soil stripping will be restricted to the trench-line, with topsoil salvaged from the work side of the trench.
 - The trench will be excavated to depth, storing the subsoil as close as possible to the trench using the measures described above to avoid contact with topsoil.
 - The trench will be backfilled with the excavated material, replacing material in reverse order of excavation: subsoil will be replaced and compacted first, followed by replacement of topsoil.
 - The area will be reseeded with the appropriate seed mix; erosion and sediment control measures will be implemented as required.
- Heavy equipment use during pile installation increases the potential for soil compaction, rutting and soil degradation. To the extent practical, heavy equipment operation will be limited to areas that are required to construct the Project. Heavy equipment operation will be limited to dry or frozen site conditions and paused during wet site conditions – if possible.
- Pile installation activities have the potential to bring subsoil materials to the surface and adversely affect topsoil properties and growing capability due to admixing (e.g., integration of coarse fragments and/or parent materials). To the extent practical, excess subsoil will be removed from the soil surface to prevent degradation to adjacent topsoil during pile installation.



- Construction activities should be scheduled and planned according to forecasted weather conditions to avoid the potential for water or wind erosion.
- Erosion and sediment control measures (e.g., silt fence or wattles) should be made available on site if soil erosion or sedimentation issues are identified during the construction phase.
- Areas of exposed topsoil will be revegetated as soon as practicable to prevent erosion.
- If wind erosion is identified to be problematic or unavoidable, the following mitigation measures will be considered:
 - Schedule soil stripping/salvage operations during low winds, where feasible;
 - Soil stockpiles will be roughened, wetted or covered;
 - Areas of heavy vehicle traffic should be wetted to reduce dusty conditions; and,
 - Wind fencing will be installed.
- Leave snow on the Project Footprint (if safe and practical) prior to topsoil salvage to avoid thawing soil conditions.
- Use snow to level workspaces on temporary access roads to reduce soil disturbance where soil will not be salvaged.
- Snow will be cleared and stockpiled on site in a manner to avoid unintentional sedimentation onto surrounding areas and any sensitive environmental features (e.g., wetlands).
- Weed control measures (e.g., mechanical, or chemical) will be completed prior to the stripping and salvaging of topsoil – if possible.
- Areas of the Project Footprint that contain weeds will be stripped and stockpiled separately from weed-free areas to minimize the spread and introduction of weed species throughout the Project Footprint.
- All vehicles or equipment entering the proposed Project Footprint during the construction phase will be clean and free of residual soil and debris to prevent the introduction or spread of weeds listed under the Alberta Weed Control Act (Government of Alberta 2008) and Weed Control Regulation (Government of Alberta 2010).
- Vehicle and equipment operation will be restricted to existing and constructed access roads, parking areas and designated workspaces to prevent the spread of weeds and invasive plant species.
- Once initially cleaned, travel on public roadways will not require additional cleaning/sanitization prior to re-entry onto the Project Footprint.
- The risk of Clubroot infestation will be mitigated as per the Alberta Clubroot Management Plan (Government of Alberta 2023).
- Certified weed-free seed mixes will be used.
- Erosion and sediment control measures installed during the construction phase of the Project will be regularly inspected and repaired or replaced if required.
- During operations, long-term ESC structures will be periodically monitored for their effectiveness and repaired as/when required.
- Erosion and sediment control materials (e.g., silt fence or erosion control blankets) will be available on site for installation in the event that soil erosion or sedimentation issues are identified during operation activities.



4.1.4 PREDICTED RESIDUAL EFFECTS

Considering the proactive planning and proposed mitigation, the predicted residual effects on the Terrain and Soils VEC as a result of the Project are shown in Table 4-3.

Table 4-3. Potential effects, mitigation, and predicted residual effects for terrain and soils.

Potential Effect	Project Phase	Mitigation	Predicted Residual Effect
Alteration of Terrain	Construction, decommissioning, and reclamation	See Section 4.1.3	Alteration of Terrain
Reduction in Soil Quality	Construction, decommissioning, and reclamation	See Section 4.1.3	Reduction in Soil Quality
Reduction in Soil Quantity	Construction, decommissioning, and reclamation	See Section 4.1.3	Reduction in Soil Quality

4.1.5 CHARACTERIZATION OF RESIDUAL EFFECTS

The residual effects on the Terrain and Soils VEC were characterized as shown in Table 4-4. The Project is expected to result in residual alteration of terrain in limited and isolated areas of the Project Footprint during construction to achieve a safe and stable operational Project Footprint. The Project is also expected to result in residual reductions in soil quantity and soil quality where soil is disturbed and/or handled within the Project Footprint during construction and decommissioning and reclamation.

These residual effects were judged to be of low magnitude because the disturbance within the Project Footprint represents only 0.44% of the RSA, limited to the areas of physical disturbance within the Project Footprint, of medium-term duration (lasting until the end of decommissioning and reclamation), infrequent because they are only expected to occur during construction and again during decommissioning and reclamation, and reversible. The probability of occurrence of these residual effects is predicted to be possible.

4.1.6 DETERMINATION OF SIGNIFICANCE FOR TERRAIN AND SOILS

The Project is not expected to result in adverse effects on soil quality and quantity that will result in a change to the Terrain and Soils VEC that will alter its status or integrity beyond an acceptable level (i.e., where it is not sustainable or is unavailable to contribute to ecological functions); as such, the residual effects on Terrain and Soils are predicted to be Not Significant.



Table 4-4. Predicted residual effects characterization and significance determination for terrain and soils.

Predicted Residual Effect	Alteration of terrain	Reduction in soil quantity	Reduction in soil quality
Project Phase(s)	Construction	Construction, Decommissioning and Reclamation	Construction, Decommissioning and Reclamation
Magnitude	Low	Low	Low
Geographical Extent	Project Footprint	Project Footprint	Project Footprint
Duration	Medium term	Medium term	Medium term
Frequency	Infrequent	Infrequent	Infrequent
Reversibility	Reversible	Reversible	Reversible
Probability of Occurrence	Possible	Possible	Possible
Significance	Not Significant	Not Significant	Not Significant



4.2 WETLANDS, SURFACE WATER, AND HYDROLOGY

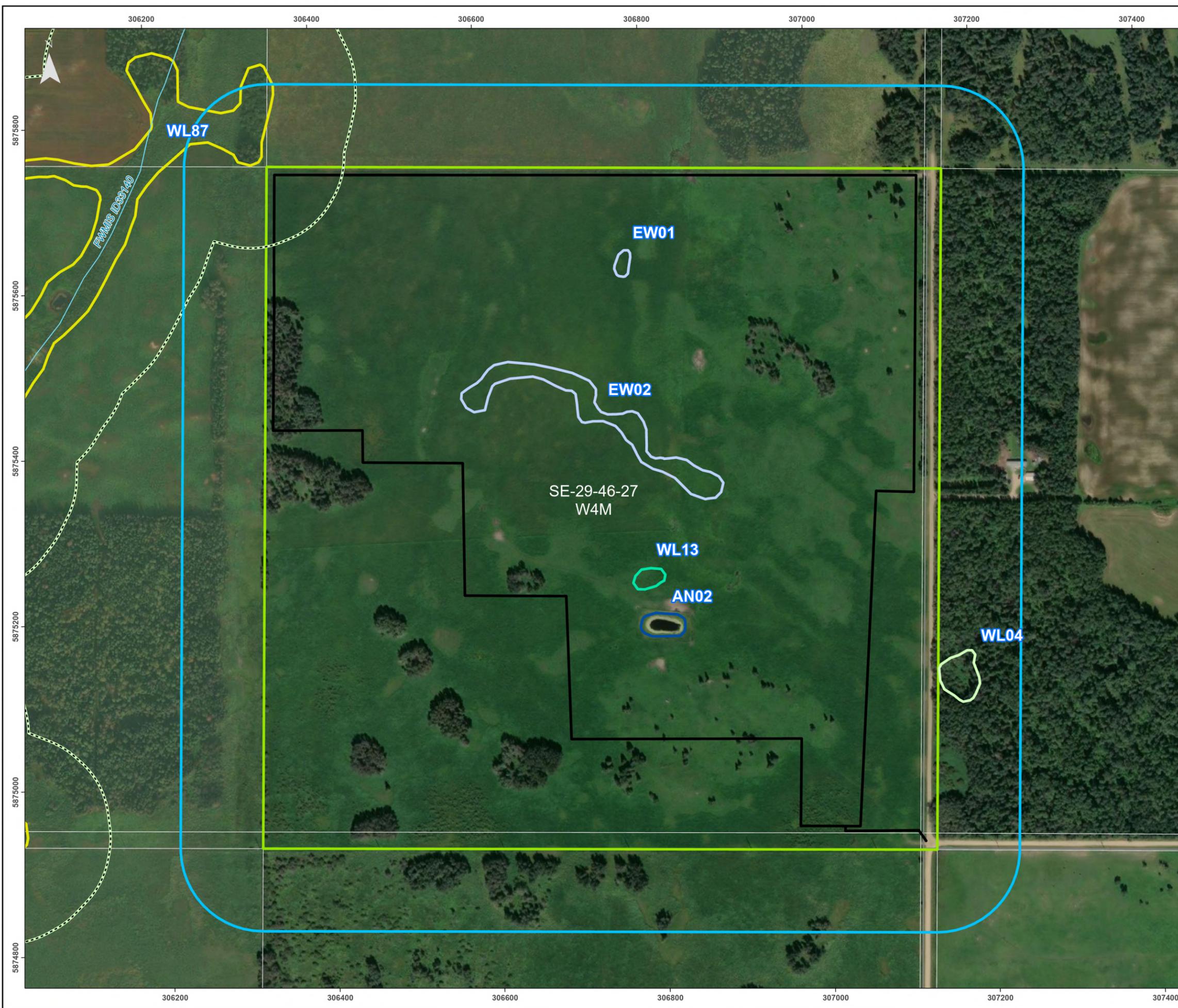
The Wetlands, Surface Water, and Hydrology LSA is defined as a 100 m buffer around SE 29- 46-27 W4M (Figure 4-2). A desktop wetland assessment was completed by a qualified wetland practitioner to identify, classify, and delineate wetlands and surface water features potentially affected by the Project in accordance with the Alberta Wetland Policy (Government of Alberta 2013) and its associated directives. The following datasets and publicly available literature sources were reviewed to gather information pertaining to wetlands, surface waterbodies, and hydrology within the Wetlands, Surface Water, and Hydrology LSA:

- Satellite Imagery (ESRI 2022);
- Historical aerial photographs (1949, 1963, 1976, 1982, 1993, 1998, 2003, and 2021) (Government of Alberta 2024a);
- Alberta Merged Wetland Inventory (Alberta Environment and Parks 2020a);
- Alberta Biodiversity Monitoring Institute (ABMI) Wetland Inventory Data (Alberta Biodiversity Monitoring Institute 2021);
- Topography (LiDAR 7.5 m Digital Elevation Model; AltaLIS Ltd. 2023); and,
- Historical climate data (Alberta Agriculture and Irrigation 2024).

For the purpose of the desktop review, wetlands were identified and delineated within the LSA following Pathway 2 – Comprehensive Desktop Delineation Only (Government of Alberta 2015). Wetland permanence was assessed according to the Guide for Assessing Permanence of Wetland Basins (Alberta Environment and Parks 2016), including analysis of historical climate data and air photos to establish the duration of flooding and wetland inundation across changes in seasons and precipitation. All wetlands identified and mapped within the Wetlands, Surface Water, and Hydrology LSA were classified according to the Alberta Wetland Classification System (Alberta Environment and Sustainable Resource Development 2015).

Representative aerial photographs were selected based on precipitation data over years, months and days from 1949-2021 (Alberta Agriculture and Irrigation 2024, Government of Alberta 2024a). Imagery was selected based on availability, quality, and correlation with historical precipitation data from normal, dry and wet time periods.

Visual surveys of terrain and vegetation communities undertaken in September of 2022 were also used to inform wetland identification, classification and delineation within the Wetlands, Surface Water, and Hydrology LSA.



Surface water bodies identified for the Project

Revolve Meadows Solar GP Inc.

Legend

- Project Area
- Project Footprint
- Wetlands, surface water, and hydrology Local Study Area

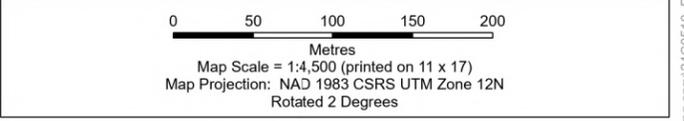
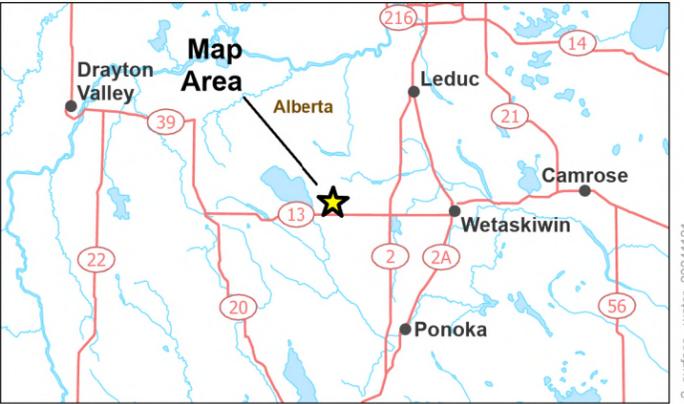
Wetlands

- Dugout
- Ephemeral Waterbody
- Seasonal Graminoid Marsh
- Temporary Graminoid Marsh
- Temporary Shrubby Swamp

Wetland Setback

- Non-temporary Wetland Setback (100m)

Quartersection



Data Sources

- Project Location and Layout. Revolve Meadows Solar LP. November 15, 2024.
- Wetlands. EDI
- Main Basemap. CanVec 1:50,000; Government of Canada; World Imagery; Maxar

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4.2.1 EXISTING ENVIRONMENTAL CONDITIONS

Two graminoid marshes, one shrubby swamp, two ephemeral waterbodies, and one anthropogenic dugout were identified within the Wetlands, Surface Water, and Hydrology LSA (Figure 4-2; Table 4-5). Of these, the two ephemeral waterbodies, one temporary graminoid marsh, and anthropogenic dugout are located within the Project Footprint (Figure 4-2; Table 4-5).

Only one non-temporary wetland was identified within the Wetlands, Surface Water, and Hydrology LSA. Wetland WL87 is a seasonal graminoid marsh located at the northwestern corner of the Wetlands, Surface Water, and Hydrology LSA, associated with a mapped drainage that extends from the northeast to the southwest (FWIMT ID 33140; Alberta Environment and Protected Areas 2024b). The required 100 m setback from WL87 extends into the northwestern extent of the Project Footprint, with a nearest distance of 24.6 m between WL87 and Project infrastructure (i.e., the perimeter fence).

4.2.2 POTENTIAL EFFECTS

As described in Section 1.2.2.1, limited and isolated earthworks are anticipated to occur on the Project Footprint during construction. As such, Project construction has the potential to result in a change in the extent of surface waterbodies within the Project Footprint (e.g., two ephemeral waterbodies, one temporary graminoid marsh, and one anthropogenic dugout). In addition, Project activities have the potential to result in changes to the quantity and quality of surface water moving across the Project Footprint and into wetlands and waterbodies within the Wetlands, Surface Water, and Hydrology LSA.

4.2.2.1 Change in Extent of Surface Waterbodies

Potential effects are associated with localized grading, trenching (i.e., clearing of vegetation, soil salvage), and installation of Project components within wetlands and waterbodies. Project components constructed directly within wetlands and waterbodies have the potential to alter wetland and waterbody extent.

4.2.2.2 Change in Water Quality

Project activities during all Project phases present the potential for the transportation of sediment and contaminants (e.g., hydrocarbons) into waterbodies as a result of equipment and vehicle operation in proximity to them. Soil exposure and handling during construction and decommissioning and reclamation can result in the mobilization of soil material through erosion (i.e., movement of soil particles via wind and/or water) downgradient into wetlands and waterbodies. This sediment can reduce wetland function through changes to vegetation health and soil permeability. There is also potential for an incidental release of substances during construction (e.g., fuel, lubricants, concrete washout), which can adversely affect water quality, and in turn, wetland function.



Table 4-5. Anticipated disturbance to wetlands and waterbodies, and applicable setbacks required for the Project.

Waterbody Class ^{1,2}	Waterbody ID	Disturbance ³ Area (ha)	Proximity of Project Footprint the nearest edge of the wetland (m)	Rationale/Justification for siting
Ephemeral Waterbody	EW01	0.05	0.0	Waterbody EW01 has historically been disturbed by agricultural activity.
Ephemeral Waterbody	EW02	0.83	0.0	Waterbody EW02 has historically been disturbed by agricultural activity.
M-G-II	WL13	0.07	0.0	Wetland W13 has historically been disturbed by agricultural activity.
M-G-III	WL87	0.0	24.6	Wetland WL87 has historically been disturbed by agricultural activity and is associated with a potential ephemeral drainage (FWIMT ID 33140) that flows southwest to northeast outside of the Project Footprint. Direct wetland disturbance will be avoided.
S-S-II	WL04	0.0	86.6	Wetland WL04 is a temporary shrubby swamp, located east of Range Road 274, outside the Project Footprint. Direct wetland disturbance will be avoided.
Total⁴		0.95		

Notes:

- ¹ Alberta Wetland Classification System (Alberta Environment and Sustainable Resource Development 2015).
- ² Roman numerals are equivalent to wetland classes described in Stewart and Kantrud (Stewart and Kantrud 1971).
- ³ Area of wetland directly disturbed by the Project during the lifetime of the Project.
- ⁴ Numbers are rounded for presentation purposes; totals may not equal the sum of the individual values.

4.2.2.3 Change in Water Quantity

Potential effects are associated with localized soil grading that can result in changes in topography (slope, aspect, and exposure) and surface water connectivity. This, in turn, can alter surface drainage patterns. Additionally, there is the potential for soil compaction from Project activities, which can subsequently reduce soil infiltration. Reduced infiltration has the potential to increase surface inundation in low areas and/or flood surrounding upland areas, especially during high flow events such as spring melts or heavy rains. As such, changes to water quantity have the potential to occur through alteration of quantity, velocity and direction of overland flows.

4.2.3 MITIGATION

Mitigation measures proposed for the Project to reduce the potential for adverse effects on Wetlands, Surface Waterbodies, and Hydrology VEC include:

- Prior to construction activities occurring within 100 m of non-temporary wetlands or other habitats with the potential to support sensitive amphibian populations, a non-intrusive field survey will be conducted by an experienced wildlife biologist to determine the presence of breeding sensitive amphibians. If sensitive amphibians are observed, mitigation measures (e.g., species-



specific setback buffer, exclusion fencing, on-site monitor) will be designed and implemented, and forwarded to EPA for their review.

- Work within setbacks or in areas directly disturbing wetlands/ waterbodies with the potential to support sensitive amphibian populations will be scheduled outside of the amphibian breeding period (i.e., an experienced wildlife biologist will be on site if construction occurs during the amphibian breeding period).
- Any disturbance to wetlands and/or waterbodies that cannot be avoided during construction of the Project will be addressed by following all terms and conditions within approvals and/or permits (e.g., Water Act Approval) and adhering to relevant requirements (Alberta Wetland Policy, Code of Practice for Watercourse Crossings) for protection of wetlands and ephemeral waterbodies. Wetland replacement fees, as appropriate, will be paid to EPA in accordance with Alberta Wetland Policy requirements.
- Prior to the start of construction activities within 100 m of non-temporary wetlands, a field survey will be completed by a qualified biologist to determine the presence of breeding sensitive amphibians.
- Boundaries of all wetlands and ephemeral waterbodies within the Project Footprint will be flagged/staked to avoid incidental disturbance.
- Construction will be completed during dry or frozen conditions – if possible.
- Site drainage will be implemented and maintained as appropriate (e.g., appropriately-sized culverts, ditches, berms, site grading).
- Structures to manage surface water (e.g., drainage ditches) during the Construction and Operational phases of the Project will be constructed if/where applicable and as per design specifications.
- Work within wetlands will be completed during dry or frozen ground conditions, when possible, to lessen soil compaction and erosion.
- If work in wet soil conditions is required, equipment and techniques that distribute ground pressure will be used to avoid soil compaction and admixing.
- Topsoil stripping activities will be scheduled to occur during favourable environmental (e.g., weather) and site/soil conditions (e.g., dry, frozen). Additional soil stripping/salvage guidance is provided in Section 4.1.3.
- All equipment will arrive on site clean, free of leaks and in good working condition. Equipment will be inspected prior to arriving on site to verify that it is free of all foreign material including dirt, vegetative debris, and hazardous materials (e.g., hydraulic fluid).
- Areas used for washing, refuelling, equipment maintenance, hazardous chemical storage and portable lavatories will be located >100 m from a wetland or waterbody.
- When equipment is operated within 100 m of wetlands and waterbodies, the following precautions will be taken:
 - all equipment will be equipped with a spill kit and drip trays;
 - non-mobile equipment will be kept within adequate containment (i.e., spill trays or an impermeable berm with minimum capacity of 110% of the volume of hazardous material present);
 - routine inspections and maintenance will be performed on all equipment; and,



- all fluid transfers (including refuelling) will take place in containment (e.g., an impervious tarp or tray) and be manned to monitor for leaks and spills.
- Concrete work areas will be isolated from waterbodies or wetlands to prevent uncured or partly cured concrete from interacting with waterbodies or wetlands.
- Erosion and sediment control measures (e.g., silt fence) will be installed when working within 100 m of a non-temporary (i.e., Class III and above) wetland or waterbody to prevent sedimentation and other materials from entering the wetland or waterbody.
- Erosion and sediment control measures will be inspected regularly and repaired or replaced as necessary.
- Regular environmental inspections by an environmental monitor will be completed during construction activities within 100 m of a wetland or waterbody to confirm adherence to all applicable legislation, guidelines and best management practices for works in and about wetlands and waterbodies.

4.2.4 PREDICTED RESIDUAL EFFECTS

Considering the proactive planning and proposed mitigation, the predicted residual effects on the Wetlands, Surface Waterbodies, and Hydrology VEC are shown in Table 4-6.

Table 4-6. Potential effects, mitigation, and predicted residual effects for wetlands, surface waterbodies and hydrology.

Potential Effect	Project Phase	Mitigation	Predicted Residual Effect
Change in extent of surface waterbodies	Construction	See Section 4.2.3	Change in extent of surface waterbodies
Change in water quality	Construction, operation, decommissioning and reclamation	See Section 4.2.3	Change in water quality
Change in water quantity	Construction, operation, decommissioning and reclamation	See Section 4.2.3	Change in water quantity

4.2.5 CHARACTERIZATION OF RESIDUAL EFFECTS

The residual effects on the Wetlands, Surface Waterbodies, and Hydrology VEC are characterized as shown in Table 4-7. With regard to change in the extent of surface waterbodies, the Project is expected to result in the permanent disturbance to one anthropogenic dugout, and potential alteration of two ephemeral waterbodies and a temporary graminoid marsh wetland. The residual effects were determined to be low, as limited and isolated earthworks are expected to occur within the ephemeral waterbodies and wetland. The geographic extent is predicted to be limited to the Project Footprint, long term in duration as disturbance to wetlands and waterbodies is expected to persist past decommissioning and reclamation, infrequent as it is expected to occur only during construction, not reversible as the wetland and waterbodies are not anticipated to be reclaimed to pre-construction conditions at the end of the Project lifespan, and certain.

With the implementation of the mitigation outlined above, limited local changes to water quantity and quality may still occur during construction and decommissioning and reclamation. The magnitude of these changes



is expected to be low and limited to the Project Footprint. Isolated to the construction and decommissioning and reclamation phases during vehicle and equipment use and times of soil exposure, the duration of these residual effects is expected to be short term, and to occur infrequently. Should changes to water quantity and quality occur (i.e., they are possible but not certain), the changes are expected to be possible and reversible.

The low magnitude characterizations for residual effects on the Wetlands, Surface Waterbodies, and Hydrology VEC are consistent with the low risk ranking provided by EPA – FWS related to wetlands (Alberta Environment and Protected Areas 2023).

Table 4-7. Predicted residual effects characterization and significance determination for wetlands, surface waterbodies and hydrology.

Predicted Residual Effect	Change in extent of surface waterbodies	Change in water quality	Change in water quantity
Project Phase	Construction	Construction, operation, decommissioning and reclamation	Construction, operation, decommissioning and reclamation
Magnitude	Low	Low	Low
Geographical Extent	Project Footprint	Project Footprint	Project Footprint
Duration	Long term	Short term	Short term
Frequency	Infrequent	Infrequent	Infrequent
Reversibility	Irreversible	Reversible	Reversible
Probability of Occurrence	Certain	Possible	Possible
Significance	Not Significant	Not Significant	Not Significant

4.2.6 DETERMINATION OF SIGNIFICANCE

The Project is not expected to result in adverse effects on the extent of surface waterbodies, water quantity or water quality that will result in a change to the Wetlands, Surface Waterbodies and Hydrology VEC that will alter its status or integrity beyond a level where it is not sustainable or is unavailable to contribute to ecological functions; as such, the residual effects on Wetlands, Surface Waterbodies and Hydrology are predicted to be Not Significant.



4.3 GROUNDWATER

The Groundwater LSA is defined as a 1.6 km buffer of SE 29-46-27 W4M (13.8 km²; Figure 4-3). The following datasets and publicly available literature sources were reviewed to gather information pertaining to hydrogeological conditions within the LSA:

- Bedrock Geology of Alberta interactive map (Alberta Geological Survey 2021a);
- Surficial Geology of Alberta Map (Fenton et al. 2013);
- Hydrogeological Regions of Alberta (Alberta Geological Survey 2021);
- Hydrogeological Regions of Alberta Interactive Map (Alberta Geological Survey 2021b);
- Research publications;
- Alberta Water Wells Information Database (Government of Alberta 2023a);
- Groundwater Observation Well Network (Government of Alberta 2023b); and,
- Alberta Water Licence Viewer (Government of Alberta 2024b).

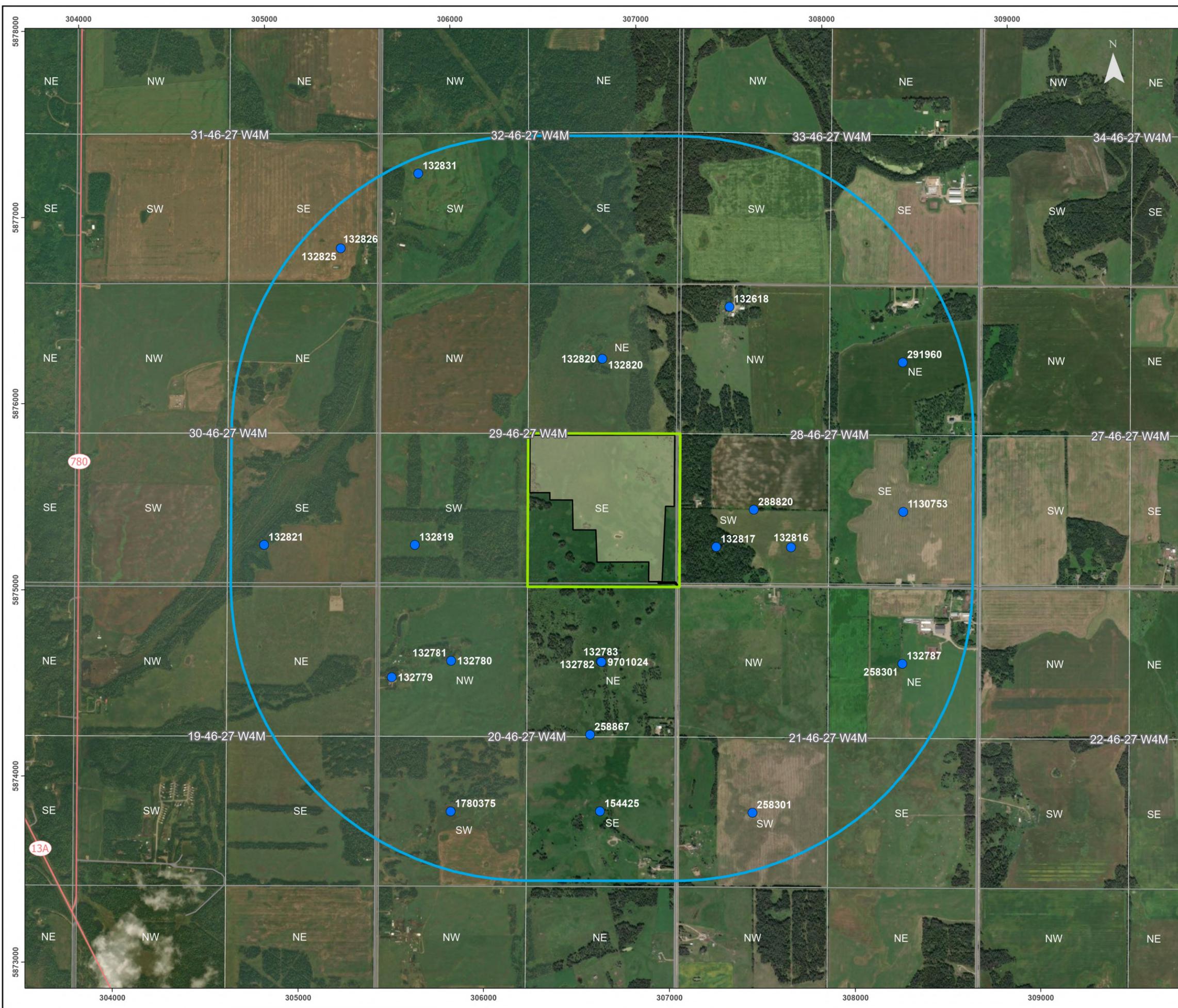
4.3.1 EXISTING ENVIRONMENTAL CONDITIONS

4.3.1.1 Geology

The late Paleocene aged Paskapoo Formation is an important bedrock formation within the Groundwater LSA, which consists of sandstone, mudstone, siltstone and occasional coal, with large, usually laterally extensive sandstone bodies. Formations that underlie the Paskapoo Formation include the Scollard Formation, the Horseshoe Canyon Formation, the Bearpaw Formation, the Belly River Group, and the Lea Park Formation (Alberta Geological Survey 2021b).

Surficial geology in the region generally consists of glacial materials (morainal, lacustrine, and fluvial deposits). In the LSA, surficial geology consists primarily of 6 to 20 m thick draped and stagnation morainal deposits with the following features (Barker et al. 2011, Alberta Geological Survey 2021b):

- **Moraine:** Glacial ice deposits, referred to as diamicton or till, that distinctively lack topographic characterization. Morainal deposits consist of dominantly clay, silt, and sand, with minor components of boulders (sometimes bedrock), cobbles, and pebbles. Depending on glacial history, this sediment may be stratified or contain lenses of glaciofluvial and/or glaciolacustrine sediment.
- **Stagnation Moraine:** Refers to deposits produced by the melting of buried, stagnant ice at the glacial margin, and subsequent slumping and collapse of supraglacial and englacial materials. Typically these deposits have low to high-relief hummocky topography, and are composed primarily of till, possibly stratified, and containing glaciofluvial and/or glaciolacustrine deposits (Barker et al. 2011, Fenton et al. 2013).

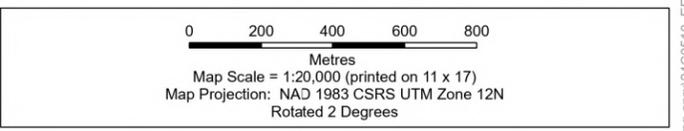
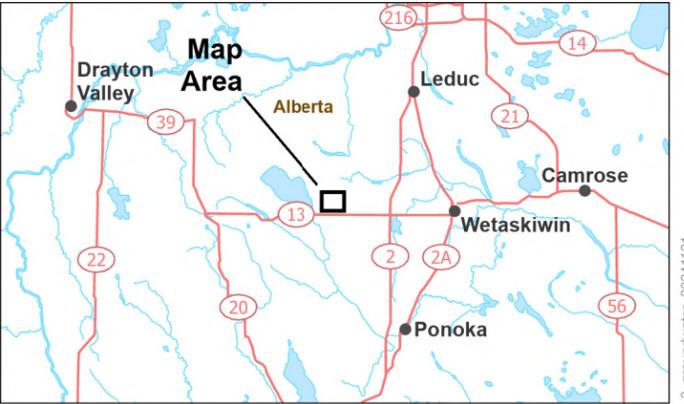


Groundwater wells identified for the Project

Revolve Meadows Solar GP Inc.

Legend

- Project Area
- Project Footprint
- Groundwater Local Study Area
- Groundwater Well (GIC ID)
- Highway
- Primary Road
- Section
- Quartersection



Data Sources

- Project Location and Layout. Revolve Meadows Solar LP. November 15, 2024.
- Groundwater wells. Alberta Water Well Information Database: Government of Alberta
- Main Basemap. CanVec 1:50,000: Government of Canada; World Imagery: Maxar

Disclaimer
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4.3.1.2 Hydrogeology

The Project is within the Western Plains and Benchlands Hydrogeological Region of Alberta (Alberta Geological Survey 2021b), Region 2. The characteristics of the region are described as follows:

- The landscape is divided into two geomorphological subregions – undulating plains in the east and rolling to rugged hills in the west.
- Bedrock is the most common source of groundwater in the region as the glacial sediments overlaying the bedrock are generally thin. The Paskapoo Formation is a bedrock formation in the region that contains an extensive aquifer system.
- The bedrock consists mainly of mudstone with sandstone bodies, which act as productive aquifers. Bedrock elevation is lower in the north portion of the region than the south.
- Groundwater recharge takes place across most of the region as a result of topographic features (rolling to rugged hills), thin sediment cover over bedrock aquifers, and relatively moist climate, particularly in the western portion of the region.
- In portions of the region that have a drier climate, groundwater recharge is reduced to small landscape depressions.

The Paskapoo Formation hosts the most extensive and productive aquifer system in the region, although the formations' potential for hosting productive aquifers is dependant on the sand content of the formation in a given area. The channel-shaped bodies of sandstone within the Paskapoo Formation make highly productive aquifers across both local and regional scales, dependant on the size and how laterally extensive the bodies are. Other finer grained bedrock formations in the area have been sourced for groundwater withdrawal needs; however, they provide lower volume yields for domestic and agricultural purposes.

Groundwater recharge in the eastern portion of the region, where the Groundwater LSA exists, is typically depression focused, where meteoric water collects in the hummocky depressions of the prairie landscape and recharges both local and regional groundwater systems. Recharge in the Groundwater LSA ranges from 151 to 175 mm annually, and the Groundwater LSA has been identified as a recharge area, with the potentiometric surface of groundwater ranging from 11 to 50 mbgs (Barker et al. 2011).

The Land Suitability Rating System (Spring Grains) within the Project Area reported slight to severe water holding capacity where crops are slightly affected by inadequate temperatures and very severely affected by excess water (2H(9) – 5W(1)) and poorly drained soils (Government of Alberta 2018c); the soil permeability corresponds to positive recharge of groundwater.

4.3.1.3 Water Wells

Groundwater Observation Well Network (GOWN) wells were not identified within the Groundwater LSA (i.e., the Project Area plus a 1.6 km buffer around it). The closest GOWN well, Bear Hills Lake_3018, is located approximately 18 km southeast of the Project Area.

Thirty-five (35) groundwater well records were returned from a search of the Alberta Water Well Information Database Wells within the Groundwater LSA (Government of Alberta 2024c). None of the water wells were



reported to exist within the Project Area. The well locations for the associated borehole logs and water well records identified within the Groundwater LSA are shown on Figure 4-3. The water well records and borehole logs are compiled in Appendix E.

Well use was reported as domestic (11/35 wells), domestic/stock (3/35 wells), stock (5/35 wells), industrial (6/35 wells), and unknown (1/35 wells) purposes. Nine (9) of the 35 wells were reported to have baseline water well tests.

According to the borehole logs provided by the well search, both the surficial and bedrock geology across the LSA consists of a surficial clay layer, sometimes including sand (extending to a max depth of 9 mbgs), a sand layer – occasionally including clay (max depth of 30 mbgs), a shale unit (varying in depth), a water-bearing sandstone unit (ranging from 30 to 55 mbgs), and shale/coal units with thin sandstone lenses (extending to 131 mbgs). The only two well reports that included well construction details reported screened intervals (where groundwater is drawn) installed within the sandstone unit, ranging from 42.98 – 48.77 mbgs (GIC Well ID 9701024) and 41.15-53.34 mbgs (GIC Well ID 288820). In one well (GIC Well ID 9701024) located south of the Project Area, three water-bearing units were observed in sand/gravel and sandstone units, ranging from 18.29 -22.86 mbgs and 44.20 – 48.77 mbgs. The majority of the wells in the Groundwater LSA extract water from the water-bearing sandstone unit ranging from 30-55 mbgs.

From the data available on the borehole logs, static groundwater levels within the Groundwater LSA ranged from 0.03 mbgs to 29 mbgs. The surficial glacial material in the Groundwater LSA, consisting of clay, sand, and sandy clay, does not appear to host widespread groundwater bearing units.

4.3.2 POTENTIAL EFFECTS

During Project construction, shallow excavations/temporary trenches that extend approximately 1 m in width and 1 to 1.5 mbgs depth are expected for collector lines, and piles are expected to be installed at 2 to 3 mbgs. Although unexpected, if groundwater is encountered, dewatering of the excavations may be required for safety. Excavations are not expected to occur during operation, and shallow excavations (to approximately 1.5 m) are expected to occur during decommissioning. As such, the potential effects on groundwater are identified as a change in groundwater quantity and quality.

4.3.2.1 Change to Groundwater Quality

With the operation of equipment (e.g., trackhoes, trucks) required to safely excavate the earthworks, there is potential for inadvertent leaks and/or spills of lubricants and fuel, and the possibility of subsequent migration to interact with shallow groundwater resulting in potential contamination.

4.3.2.2 Change to Groundwater Quantity

The Project itself will not involve groundwater withdrawals. The shallowest potentially water-bearing unit identified within the Groundwater LSA may exist within surficial glacial materials within the Project Area. This unit, consisting primarily of sand, was reported to begin at 1.5 to 9 mbgs and extended as deep as 10.6



mbgs, although clay and sand units (combined) have been logged to extend greater than 30 mbgs in the area. The sand unit has not been confirmed to bear water in the area, however due to the permeability of a sand unit in glacial material and the uncertainty related to the connectivity of this unit across the site, it is possible that this unit may host groundwater.

Although not expected, there is potential to encounter groundwater during excavations for the installation of piles at 2 to 3 mbgs. If this interaction occurs, dewatering is expected to be required to maintain safe and proper installation. Therefore, the potential exists for a change to groundwater quantity as a result of the Project, however, it is not expected to have an adverse effect on groundwater quantity in the Groundwater LSA, as the Project Footprint is small relative to the regional groundwater system.

4.3.3 MITIGATION

Mitigation measures proposed for the Project to reduce the potential for adverse effects on the Groundwater VEC include:

- All equipment will arrive on site clean, free of leaks and in good working condition. An inspection prior to arriving on site will be conducted to verify that all foreign material has been removed including dirt, mud, debris, grease, oil, hydraulic fluid, or other substances. Any identified leaks will be repaired and then appropriately cleaned.
- Spill response kits will be available on site and the crews trained in their use. Spills will be reported to the appropriate authorities as necessary and cleaned up in a timely manner in compliance with Alberta regulations.
- Areas used for washing, refuelling, equipment maintenance, hazardous chemical storage and portable lavatories will be located >100 m from surface waterbodies and areas of deep excavation (i.e., pile excavations).
- When equipment is operated within 100 m of surface waterbodies and deep excavations, the following precautions will be taken:
 - non-mobile equipment will be kept within adequate containment (i.e., spill trays or an impermeable berm with minimum capacity of 110% of the volume of hazardous material present);
 - routine inspections and maintenance will be performed on all equipment; and,
 - all fluid transfers (including refuelling) will take place in containment (e.g., an impervious tarp or tray) and be manned to monitor for leaks and spills.
- Concrete work areas will be isolated from water in excavations to prevent uncured or partly cured concrete from interacting with groundwater or surface water (e.g., during dewatering).
- Excavations will be dewatered as necessary, with water pumped to stable and vegetated areas to slow the velocity of water and prevent sediment from entering wetlands or waterbodies. Additional erosion protection (e.g., tarp or bales, energy dissipators) may be required to facilitate infiltration back into the ground in a manner that does not cause erosion of soils or transport of sediments into wetlands or waterbodies.



4.3.4 PREDICTED RESIDUAL EFFECTS

Considering the depth of planned excavations, nature of the surficial lithology, and limited horizon for potential interaction between the piles and groundwater, and the proactive planning and proposed mitigation described in Section 4.3.3, the predicted residual effects on the Groundwater VEC are shown in Table 4-8.

Table 4-8. Potential effects, mitigation, and predicted residual effects for groundwater.

Potential Effect	Project Phase	Mitigation	Predicted Residual Effect
Change in groundwater quantity	Construction, decommissioning and reclamation	Section 4.3.3	Change in groundwater quantity
Change in groundwater quality	Construction, decommissioning and reclamation	Section 4.3.3	Change in groundwater quality

4.3.5 CHARACTERIZATION OF RESIDUAL EFFECTS

The residual effects on the Groundwater VEC were characterized as shown in Table 4-9. Considering the depth of the installed piles, limited horizon for potential interaction between the piles and groundwater, and the proactive planning and proposed mitigation described above, the residual adverse Project-related effects (during construction and decommissioning) on groundwater are predicted to be low in magnitude, isolated to the Project Footprint, and short term in duration (i.e., occurring up to three years post-construction and post-decommissioning and reclamation). The frequency is predicted to be infrequent, only occurring sporadically during construction and decommissioning and reclamation, and the residual effects are anticipated to be reversible over time. The probability of occurrence has been predicted to be possible.

Table 4-9. Predicted residual effects characterization and significance determination for groundwater.

Predicted Residual Effect	Change in groundwater quantity	Change in groundwater quality
Project Phase	Construction, decommissioning and reclamation	Construction, decommissioning and reclamation
Magnitude	Low	Low
Geographical Extent	Project Footprint	Project Footprint
Duration	Short term	Short term
Frequency	Infrequent	Infrequent
Reversibility	Reversible	Reversible
Probability of Occurrence	Possible	Possible
Significance	Not Significant	Not Significant

4.3.6 DETERMINATION OF SIGNIFICANCE FOR GROUNDWATER

The Project is not expected to result in adverse effects on groundwater quantity and quality that will result in a change to the Groundwater VEC that will alter its status or integrity beyond a level where it is not sustainable or is unavailable to contribute to ecological functions; as such, the residual effects on groundwater are predicted to be Not Significant.



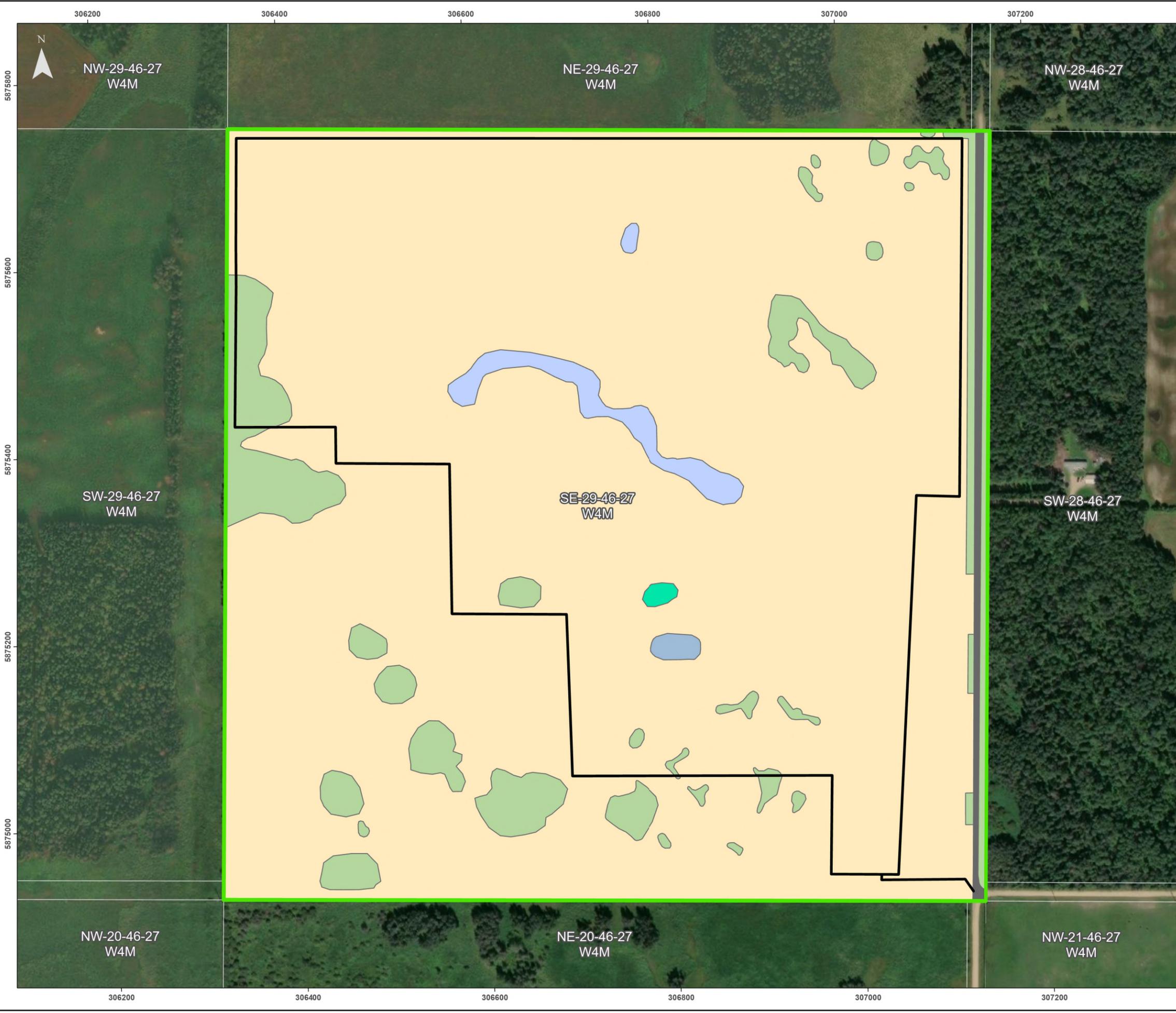
4.4 VEGETATION SPECIES AND COMMUNITIES

The Vegetation Species and Communities LSA is defined as the Project Area (64.13 ha; Figure 4-4). The following datasets and publicly available literature sources were reviewed to gather information pertaining to vegetation species and communities within the Vegetation Species and Communities LSA:

- Natural Regions and Subregions of Alberta (Natural Regions Committee 2006);
- Federally designated Critical Habitats (Environment and Climate Change Canada 2024);
- Predictive Landcover (Alberta Biodiversity Monitoring Institute 2019);
- Endangered and Threatened Plant range (Alberta Environment and Protected Areas 2024c);
- Alberta Conservation Information Management System (ACIMS) element occurrence data (Alberta Environment and Protected Areas 2022a);
- Satellite Imagery – ESRI (ESRI 2022); and,
- Cumulative Clubroot Infestations (Government of Alberta 2024d).

4.4.1 EXISTING ENVIRONMENTAL CONDITIONS

Land use in the Dry Mixedwood Natural Subregion of the Boreal Natural Region, within which the Vegetation Species and Communities LSA is located, is characterized by aspen-dominated forests, fens, and cultivated areas where soils are suitable (Natural Regions Committee 2006). The Vegetation Species and Communities LSA is dominated by habitually grazed tame pasture, with small remnant treed deciduous areas, wetlands, ephemeral waterbodies, and an anthropogenic dugout (Appendix B, Photos 1 to 3).

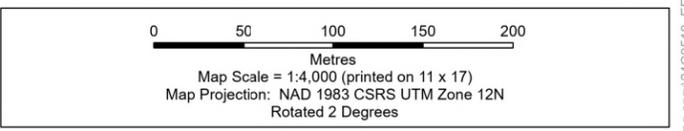
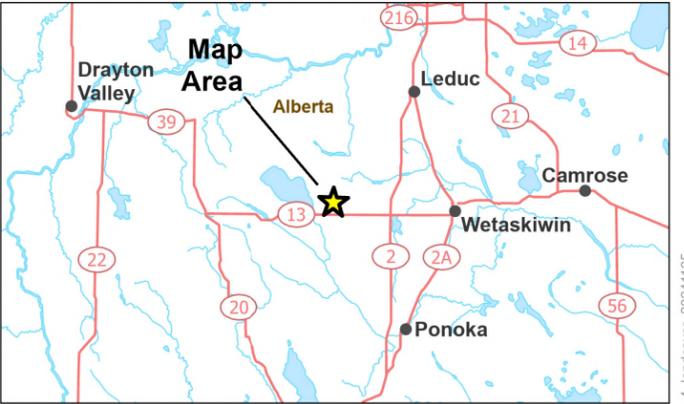


Land cover in the Vegetation Species and Communities Local Study Area

Revolve Meadows Solar GP Inc.

Legend

- Vegetation Species and Communities Local Study Area
- Project Footprint
- Tame Pasture/Hay
- Treed Deciduous
- Existing Road
- Wetland**
- Dugout
- Ephemeral Waterbody
- Temporary Graminoid Marsh
- Quartersection



Data Sources

- Project Location and Layout. Revolve Meadows Solar LP, November 15, 2024.
- Wetlands. EDI
- Main Basemap. CanVec 1:50,000; Government of Canada; World Imagery; Maxar

Disclaimer

EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data have been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

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4.4.1.1 Land Cover

Land cover within the Vegetation Species and Communities LSA was identified through desktop review followed by visual field confirmation. The land cover is comprised of 89.4% (60.24 ha) tame pasture and 8.2% (5.49 ha) treed deciduous cover, with 1.4% (0.95 ha) of wetlands, 0.9% (0.13 ha) anthropogenic dugout, and <0.1% (0.58 ha) existing road (Table 4-10).

Table 4-10. Summary of land cover within the Vegetation Species and Communities Local Study Area and Project Footprint.

Land Cover	Project Footprint (ha) ³	Vegetation Species and Communities LSA (ha) ³	Percent of Vegetation Species and Communities LSA ³
Tame Pasture	39.17	60.24	89.4
Treed Deciduous ¹	1.59	5.49	8.2
Wetland and Waterbodies ²	0.95	0.95	1.4
Dugout	0.13	0.13	0.9
Existing Roads	-	0.58	<0.1
Total	41.84	67.39	100

Notes:

¹ Treed deciduous habitats within the Project Footprint consist of small remnant treed areas dominated by aspen.

² Wetland and Waterbodies land cover includes non-temporary wetlands, temporary wetlands, and ephemeral waterbodies.

³ Numbers are rounded for presentation purposes; totals may not equal the sum of the individual values.

4.4.1.2 Listed Vegetation Species and Communities

The Vegetation Species and Communities LSA does not coincide with any federally designated Critical Habitats (Environment and Climate Change Canada 2024), or the Endangered and Threatened Plant Range (Alberta Environment and Protected Areas 2024c). Review of the ACIMS database completed on November 13, 2024, showed no documented listed vegetation species, listed ecological communities, parks, protected areas, or Crown reservations or notations occur within the Vegetation Species and Communities LSA (Alberta Environment and Protected Areas 2022a).

A review of historical air photography between 1950 and 2024 demonstrated consistent, chronic anthropogenic disturbance within the Vegetation Species and Communities LSA, including intermittent clearing of remnant treed and shrubby areas, and agricultural use of the pasture. This consistent and chronic disturbance, including the historical conversion of treed areas into tame pasture for cattle grazing over multiple decades is expected to have reduced the potential for listed vegetation species and communities to occur within the Vegetation Species and Communities LSA.

4.4.1.3 Clubroot

Clubroot—a serious soil-borne disease of canola, mustard and other crops in the cabbage family—is closely monitored and managed in Alberta (Government of Alberta 2014). The presence of clubroot is associated with a decline in crop producing capacity. Confirmed occurrences of clubroot have been previously



documented in agricultural fields within the County of Wetaskiwin No. 10, with a high occurrence of clubroot cases in Leduc County, located adjacent to the County of Wetaskiwin No. 10 to the north (Government of Alberta 2024d).

4.4.2 POTENTIAL EFFECTS

During construction, vegetation is expected to be disturbed on the Project Footprint. Vehicles and equipment have the potential to introduce weed seeds and/or propagules, and exposed soils are prone to support weed species as first colonizers. As such, the potential Project-related effects on vegetation species and communities include the loss or alteration of vegetation and the introduction or spread of weeds.

4.4.2.1 Alteration or Loss of Vegetation

Construction activities, including localized grading and trenching (i.e., clearing of vegetation, soil salvage), have the potential to directly disturb vegetation communities. Construction activities have potential to alter soils through alteration of substrate composition, moisture regimes, drainage patterns, and temperatures indirectly affecting vegetation communities.

The Project Footprint is predominantly situated on chronically disturbed agricultural lands (i.e., tame pasture grazed by cattle). While limited and isolated earthworks will be undertaken within the Project Footprint during construction, direct disturbance to predominantly non-native vegetation is anticipated to occur.

4.4.2.2 Introduction or Spread of Weeds

Weed seeds and/or propagules within soil that are attached to the work boots or wheels or undercarriage of equipment or vehicles transported to the Project have the potential to introduce and/or cause the proliferation of invasive plants and weeds regulated by the *Weed Control Act* on disturbed areas and/or adjacent to workspaces, which may result in alterations to vegetation diversity.

4.4.2.3 Introduction or Spread of Soil-borne Disease

Soil particles attached to the wheels or undercarriage of equipment or vehicles transported to the Project have the potential to introduce clubroot to disturbed areas and/or adjacent to workspaces.

4.4.3 MITIGATION

Mitigation measures proposed for the Project to avoid or minimize the potential effects on the Vegetation Species and Communities VEC include the following:

- Construction activities should be scheduled and planned according to forecasted weather conditions to avoid the potential for water erosion.



- Erosion and sediment control measures (e.g., silt fence or erosion control blankets) will be available on site in the event that soil erosion or sedimentation issues are identified during the construction phase.
- Areas of exposed topsoil will be revegetated as soon as practicable to prevent water erosion and sediment transport.
- Construction activities should be scheduled and planned according to forecasted weather conditions to avoid the potential for wind erosion (e.g., dust).
- If wind erosion is identified to be problematic or unavoidable, the following mitigation measures will be considered:
 - Schedule soil stripping/salvage operations during low winds, where feasible;
 - Soil stockpiled will be roughened, wetted or covered;
 - Areas of heavy vehicle traffic should be wetted to reduce avoid dusty conditions; and,
 - Wind fencing installation.
- All vehicles or equipment entering the proposed Project Footprint during the construction phase will be clean and free of residual soil and debris to prevent the introduction or spread of weeds listed under the Alberta Weed Control Act (Government of Alberta 2008) and Weed Control Regulation (Government of Alberta 2010).
- Vehicle and equipment operation will be restricted to existing and constructed access roads, parking areas and designated workspaces to prevent the spread of weeds and invasive plant species.
- Once initially cleaned, travel on public roadways will not require additional cleaning/sanitization prior to re-entry onto the Project Footprint.
- Where feasible, weed control will be completed (e.g., mechanical or chemical) prior to earth works, as appropriate.
- The risk of Clubroot will be mitigated as per the Alberta Clubroot Management Plan (Government of Alberta 2023).
- Only certified weed-free seed mixes will be used when completing interim revegetation – if needed.
- During construction areas of soil disturbance or exposed soils will be regularly inspected during the growing season for the introduction and proliferation of invasive plants and weeds listed under the Alberta Weed Control Act (Government of Alberta 2008) and Weed Control Regulation.
- During operations, invasive plant and weed surveys will be conducted during a biologically appropriate time of year (e.g., when invasive plants can be identified) within areas where soil was exposed during construction activities (e.g., temporary access routes, laydowns, collector line trenches) during the first growing season following construction.
- The incidence of observed invasive plant and/or weed species will be documented during operations; information collected for each occurrence should include:
 - Date and surveyor information;
 - Plant species;
 - Geographic location (e.g., GPS point);
 - Estimated size of the population (e.g., by pacing the length and width or delineating with a GPS track);



- Density and distribution of the population; and,
- Photo documentation.
- Invasive plants and weeds will be controlled using the following treatment options (alone or in combination):
 - mechanical control (involves the physical removal of the plants); and,
 - chemical control (involves application of synthetic and/or natural herbicides).
- Treatment options for an invasive plant/weed occurrence will be based on the identity of the weed/invasive plant, its designation in the County of Wetaskiwin No. 10, the size and extent of the occurrence, time of year, the proximity of the occurrence to sensitive areas (e.g., waterbodies), and the available control options.
- Invasive plants will be controlled in consultation with a qualified professional to minimize potential effects on surrounding land uses and environmental values.
- Where chemical control is necessary, herbicide selection and use on site will comply with all applicable laws and regulations.
- Previously identified occurrences of invasive plants and/or weeds will be periodically monitored within the Project Footprint in subsequent years to verify efficacy of control measures and allow for early detection of recolonization and/or spread.

4.4.4 PREDICTED RESIDUAL EFFECTS

Considering the proactive planning and proposed mitigation, the predicted residual effects on the Vegetation Species and Communities VEC as a result of the Project are shown in Table 4-11.

Table 4-11. Potential effects, mitigation, and predicted residual effects for vegetation species and communities.

Potential Effect	Project Phase	Mitigation	Predicted Residual Effect
Alteration or loss of vegetation	Construction	Section 4.4.3	Loss or alteration of vegetation
Introduction or spread of weeds	Construction, operation, decommissioning and reclamation	Section 4.4.3	Introduction or spread of weeds
Introduction or spread of soil-borne disease	Construction, operation, decommissioning and reclamation	Section 4.4.3	Introduction or spread of soil-borne disease

4.4.5 CHARACTERIZATION OF RESIDUAL EFFECTS

The residual adverse Project-related effects on Vegetation Species and Communities VEC were characterized as shown in Table 4-12. Given the implementation of the mitigation measures described above and the limited anticipated disturbance to native vegetation, the magnitude of alteration or loss of vegetation is predicted to be low and limited to the Vegetation Species and Communities LSA. The duration is expected to be medium term, lasting until the end of decommissioning and reclamation, and occur infrequently. The residual effect of alteration or loss of vegetation is expected to be reversible at the end of the Project life cycle, and certain.

The introduction or spread of weeds and soil-borne disease has the potential to occur during all Project phases; the magnitude of the effect is expected to be low, relative to the risks of these effects in the current, intensive,



and chronic agricultural land use within and surrounding the Vegetation Species and Communities LSA. The geographic extent of the predicted residual effect for introduction or spread of weeds and soil-borne disease is expected to be local (i.e., limited to the LSA).

While the residual effect of the introduction and spread of weeds is predicted to be medium term, lasting to the end of decommissioning and reclamation, the duration for soil-borne disease is expected to be long term, persisting over three years beyond the end of decommissioning and reclamation. The frequency of the residual effects of introduction or spread of weeds is expected to be frequent and reversible, whereas the predicted residual effect of introduction or spread of soil-borne disease is expected to occur infrequently and is not expected to be reversible.

Table 4-12. Predicted residual effects characterization and significance determination for vegetation species and communities.

Predicted Residual Effect	Alteration or loss of vegetation	Introduction or spread of weeds	Introduction or spread of soil-borne disease
Project Phase	Construction	Construction, operation, decommissioning and reclamation	Construction, operation, decommissioning and reclamation
Magnitude	Low	Low	Low
Geographical Extent	Local	Local	Local
Duration	Medium term	Medium term	Long term
Frequency	Infrequent	Frequent	Infrequent
Reversibility	Reversible	Reversible	Not reversible
Probability of Occurrence	Certain	Probable	Unlikely
Significance	Not Significant	Not Significant	Not Significant

4.4.6 DETERMINATION OF SIGNIFICANCE FOR VEGETATION SPECIES AND COMMUNITIES

The predicted residual effect of loss or alteration of predominantly non-native or disturbed vegetation and the introduction or spread of weeds and soil-borne disease resulting from the Project is not expected to result in a change to the Vegetation Species and Communities VEC that will alter its status or integrity beyond an level where vegetation species and communities are not sustainable or are unavailable to contribute to ecological function; therefore, the residual effects are predicted to be Not Significant.



4.5 WILDLIFE SPECIES AND HABITAT

The Wildlife Species and Habitat LSA was defined as the quarter section that the Project Footprint lies within (i.e., SE 29- 46-27 W4M), plus a 1 km buffer (69.8 km²; Figure 4-5). The following datasets and publicly available literature sources were reviewed to gather information pertaining to wildlife species and habitat within the LSA:

- Federally designated Critical Habitats (Environment and Climate Change Canada 2024);
- Wildlife Sensitivity Ranges (Alberta Environment and Protected Areas 2024c); and,
- Fish and Wildlife Internet Mapping Tool (FWIMT; Alberta Environment and Protected Areas 2024b).

Additionally, in accordance with the Wildlife Directive (Government of Alberta 2017), site-specific wildlife surveys were completed in the Wildlife Species and Habitat LSA by qualified wildlife biologists in 2022 and 2024 under General Permit #22-130, and #24-120, respectively, and include the following:

- spring and fall bird migration surveys (2022);
- raptor nest surveys (2022 and 2024);
- breeding bird surveys (2022); and,
- Sharp-tailed Grouse lek surveys (2022 and 2024).

All wildlife surveys completed to date appropriately and adequately describe existing wildlife species and habitat, and data collected have informed Project siting, and characterize wildlife species and habitat values within the LSA (across landcover types) and within the RSA to provide regional context.

4.5.1 EXISTING ENVIRONMENTAL CONDITIONS

The Wildlife Species and Habitat LSA does not overlap with federally designated Critical Habitats (Environment and Climate Change Canada 2024). The southwest portion of the RSA is sited within the Sharp-tailed Grouse range and the Sensitive Raptor (Bald Eagle [*Haliaeetus leucocephalus*]) range (Alberta Environment and Protected Areas 2024c); however, the Project Area is not located within either range. A search of the Fisheries and Wildlife Management Information System (FWMIS), via the Fish and Wildlife Internet Mapping Tool (FWIMT) revealed no historic occurrences of SOMC previously observed within the Wildlife Species and Habitat LSA or RSA (Alberta Environment and Parks 2022b).

4.5.1.1 Spring and Fall Migration Bird Surveys

Spring and fall bird migration surveys were conducted on April 10, April 24, and May 4, 2022, September 22-23, October 19-20, and November 4, 2022, as per as per Standard 100.2.1 of the Wildlife Directive (Government of Alberta 2017). Survey protocols adhered to the *Bird Migration Survey Protocol* (Alberta Environment and Parks 2020b). Four point count plots, one stopover plot, and one stopover transect were surveyed to provide adequate coverage of representative landcover types within and around the Wildlife



Species and Habitat LSA (Appendix C, Appendix Figure C-1). The Referral Report characterized the overall bird numbers observed during the migration surveys as moderate (Alberta Environment and Protected Areas 2023). Results of the spring and fall migration surveys are summarized in Appendix D, Appendix Table D-1 and Appendix Table D-2. The Referral Report (Alberta Environment and Protected Areas 2023) recognizes that no SOMC were observed during the spring or fall bird migration surveys.

4.5.1.2 Breeding Bird Surveys

Breeding bird surveys were conducted on June 2 and July 7, 2022, as per as per as per Standard 100.2.1 of the Wildlife Directive (Government of Alberta 2017) and the protocol outlined in the *Sensitive Species Inventory Guidelines* (Alberta Environment and Sustainable Resource Development 2013b). Fourteen breeding bird plot locations were selected to survey all landcover types within and around the Wildlife Species and Habitat LSA (Appendix C, Appendix Figure C-1). Results of the breeding bird surveys are summarized in Appendix D, Appendix Table D-3.

The Referral Report (Alberta Environment and Protected Areas 2023) recognizes that no SOMC were observed during the breeding bird surveys, and that moderate bird activity was observed, therefore the risk to breeding birds was assessed to be low.

As several small stands of treed deciduous habitat are present within the Project Area, the Referral Report assessed the overall risk to birds as high (Alberta Environment and Protected Areas 2023). Through proactive Project siting, the Proponent has subsequently refined the Project Footprint to avoid the majority of treed deciduous habitat (Figure 4-4; Table 4-10), thereby reducing the risk to birds since the Referral Report was issued.

4.5.1.3 Raptor Nest Surveys

Raptor nest surveys were conducted within the Wildlife Species and Habitat LSA on April 10, April 23, and on July 7, 2022, and were repeated on April 9–10, and May 8, 2024, as per Standard 100.2.1 of the Wildlife Directive (Government of Alberta 2017) and the protocols outlined in the *Sensitive Species Inventory Guidelines* (Alberta Environment and Sustainable Resource Development 2013b).

In 2022, one active Red-tailed Hawk (*Buteo jamaicensis*) nest was identified within the Wildlife Species and Habitat LSA (RN12). The Referral Report recognizes the Proponent's siting efforts to avoid the Red-tailed Hawk nest and the Project's location outside of the sensitive raptor ranges, and therefore has considered the risk to raptor nests as low (Alberta Environment and Protected Areas 2023).

The 2024 raptor nest surveys determined the Red-tailed Hawk nest identified in 2022 (RN12) was no longer present; however, one new active Red-tailed Hawk nest was identified within the Wildlife Species and Habitat LSA (RN14) and two new active Red-tailed Hawk nests were identified within the RSA (RN9 and RN16).



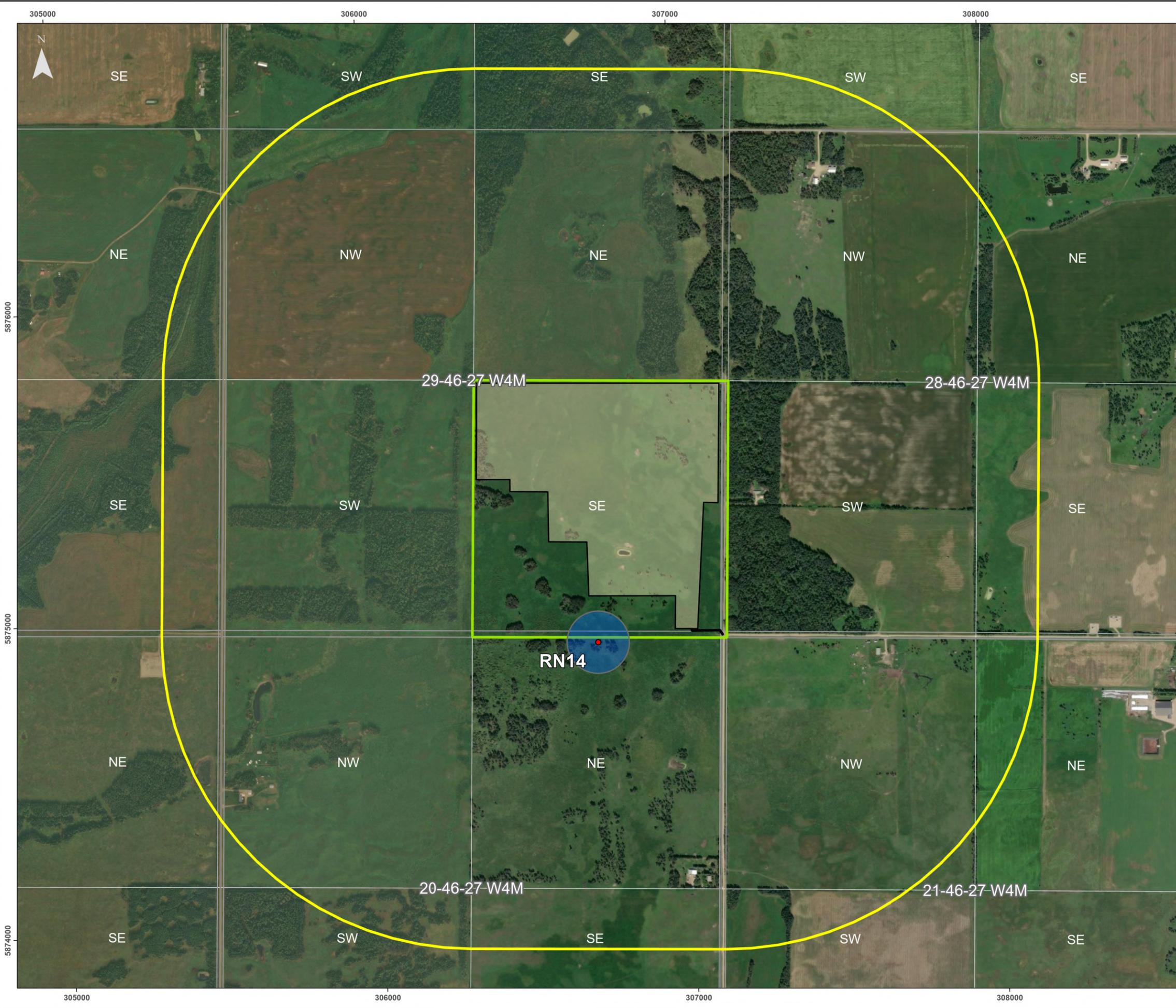
In addition, one raptor nest (RN17) was observed approximately 65 m west of the Project Footprint and was confirmed to be inactive in 2024. The nest was determined to be too small for a Bald Eagle but of suitable size for a buteo sized raptor (e.g. Red-tailed Hawk).

The Project Footprint does not infringe on any active raptor nest setback (Figure 4-5). The locations and status of all active raptor nests identified in 2022, and all raptor nests observed in 2024 within the RSA are summarized in Table 4-13. All raptor nests identified within the RSA during all survey years and regardless of activity status are shown in Appendix C, Appendix Figure C-2.



Table 4-13. 2022 and 2024 raptor nest locations and proximity to Project infrastructure.

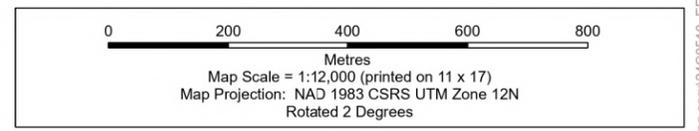
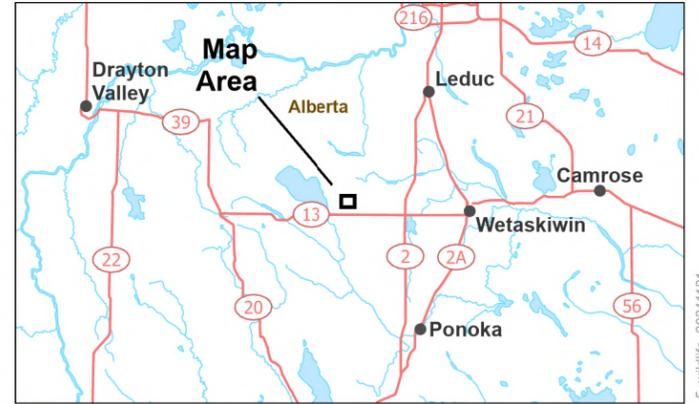
Nest ID	Occupant Common Name	Status	Location of Nest (UTM Zone 13U NAD 83)		Is the Required Setback Met (Y/N)	Distance from Nest to Nearest Project Infrastructure (m)	Comments
			Easting (m)	Northing (m)			
RN6	N/A	Confirmed Inactive in 2024	308806	5875962	N/A	1,692	Outside the LSA
RN9	Red-tailed Hawk	Confirmed Active in 2024	308644	5874023	Y	1,763	Outside the LSA
RN11	N/A	Confirmed Inactive in 2024	305199	5874978	N/A	1,228	Outside the LSA
RN12	Red-tailed Hawk	Active in 2022; nest Not Present in 2024	306252	5875065	N/A	352	Nest presumed destroyed
RN13	N/A	Confirmed Inactive in 2024	307503	5875047	N/A	412	-
RN14	Red-tailed Hawk	Confirmed Active in 2024	306716	5874891	Y	149	-
RN15	N/A	Confirmed Inactive in 2024	305485	5873793	N/A	1,736	Outside the LSA
RN16	Red-tailed Hawk	Confirmed Active in 2024	305764	5876560	Y	1,015	Outside the LSA
RN17	N/A	Confirmed Inactive	306639	5875000	N/A	66	-



Wildlife features in the Wildlife Local Study Area

Revolve Meadows Solar GP Inc.

- Legend**
- Project Area
 - Project Footprint
 - Wildlife Local Study Area
 - Primary Road
 - Section
 - Quartersection
- Raptor Nests**
- Active Red-tailed Hawk nest
 - 100-m Activity Setback



- Data Sources**
- Project Location and Layout. Revolve Meadows Solar LP. November 15, 2024.
 - Wildlife Data. EDI.
 - Main Basemap. CanVec 1:50,000; Government of Canada; World Imagery; Maxar

Disclaimer
 EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data have been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

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4.5.1.4 Sharp-tailed Grouse Lek Surveys

Sharp-tailed Grouse lek surveys were conducted on April 11 and April 24, 2022, and were repeated on April 9-10, and May 9, 2024 as per Standard 100.2.1 of the Wildlife Directive (Government of Alberta 2017) and the protocol outline in the *Sensitive Species Inventory Guidelines* (Alberta Environment and Sustainable Resource Development 2013b). A total of 12 plots were completed to provide adequate coverage of suitable habitat (i.e., native and tame pasture) within the RSA along with a general ground search to identify suitable lekking habitat. No Sharp-tailed Grouse individuals or leks were observed within the Wildlife Species and Habitat LSA or RSA during the surveys.

4.5.2 POTENTIAL EFFECTS

The potential adverse effects of the Project on wildlife species and habitat include: alteration or loss of habitat, change in sensory disturbance and change in wildlife mortality as discussed in the following subsections.

4.5.2.1 Alteration or Loss of Wildlife Habitat

Construction activities, including localized grading and trenching (i.e., clearing of vegetation, soil salvage), have the potential to adversely affect wildlife habitat and may reduce habitat availability and functionality, through direct disturbance and/or fragmentation. Direct habitat loss/alteration of wildlife habitat is expected to be the size of the Project Footprint: 41.84 ha (6.0% of the Wildlife Species and Habitat LSA). With proactive siting, the majority of the Project Footprint is situated on chronically disturbed tame pasture (39.17 ha, 94% of the Project Footprint; see Table 4-10) which is currently subject to routine, seasonal disturbances (e.g., swathing, baling, grazing). Additionally, with implementation of appropriate setbacks for wildlife species and habitat features the potential for interactions between the Project and wildlife species and habitat is expected to be reduced. Disturbance to wildlife habitat by the Project Footprint includes:

- 39.2 ha (94%) of the Project Footprint is located within chronically disturbed tame pasture habitat, with limited wildlife habitat value; and,
- 2.7 ha (6%) of the Project Footprint is located within areas of higher wildlife habitat quality (i.e., treed deciduous, wetlands and waterbodies, dugout).

4.5.2.2 Change in Sensory Disturbance

The Project has been preferentially sited in areas that experience existing chronic disturbance due to livestock grazing on pasture land and nearby road traffic.

Increased human and equipment presence during construction and decommissioning and reclamation activities, has the potential to deter wildlife from using the limited quality habitat available within the LSA. Increased sensory disturbance during Project operation would be expected to be limited to the noise generated by isolated traffic and the presence of humans associated with routine maintenance activities. The noise generated by the Project is expected to be similar in nature to that generated during the current land uses and activities (e.g., agriculture) within the Wildlife Species and Habitat LSA.



4.5.2.3 Change in Wildlife Mortality

It is expected that wildlife mortality already occurs within the Wildlife Species and Habitat LSA, likely through collisions of birds with existing buildings and other infrastructure (e.g., industrial land use associated with oil and gas activity), interactions between wildlife and vehicles on roads, and the operation of agricultural equipment within the fields, primarily during the late spring to fall period.

A change in wildlife mortality has the potential to occur throughout the life of the Project. In the absence of mitigation measures, site preparation (e.g., clearing of vegetation) could result in the direct loss of occupied nests or dens, and the associated young. Collisions with Project construction vehicles or equipment could result in wildlife mortality or injury. During operation, wildlife collisions with solar panels could result in direct wildlife mortality.

Activities that occur near active nests could also result in indirect mortality (e.g., reduced nest success) to bird species that are sensitive to disturbance. These bird species may abandon their nests with eggs or fledglings, which would be expected to result in nest failure. This disturbance is expected to be highest during any vegetation clearing activities during construction that occur within the bird nesting period. Once the Project is in operation, birds that choose to build nests near infrastructure would likely do so by choice, indicating a tolerance of routine activities that occur during Project operation.

4.5.3 MITIGATION

Mitigation measures proposed for the Project to reduce the potential for adverse effects on the Wildlife Species and Habitat VEC include:

- Prior to construction activities occurring within 100 m of non-temporary wetlands or other habitats with the potential to support sensitive amphibian populations, a non-intrusive field survey will be conducted by an experienced wildlife biologist to determine the presence of breeding sensitive amphibians. If sensitive amphibians are observed, mitigation measures (e.g., species-specific setback buffer, exclusion fencing, on-site monitor) will be designed and implemented, and forwarded to EPA for their review.
- Work within setbacks or in areas directly disturbing wetlands/ waterbodies with the potential to support sensitive amphibian populations will be scheduled outside of the amphibian breeding period (i.e., an experienced wildlife biologist will be on site if construction occurs during the amphibian breeding period).
- Clear demarcation of the boundaries of the Project Footprint to avoid inadvertent encroachment onto surrounding non-permitted areas. All Project activity will be restricted to the approved footprint.
- Clearly flag/stake the boundaries of all sensitive wildlife features (e.g., wetlands).
- Where vegetation clearing is required, it will be undertaken outside of the general nesting period of migratory birds (i.e., Zone B4; April 17 to August 24) (Environment and Climate Change Canada 2024) to the extent feasible. Where clearing is required within the general nesting period of migratory birds, a non-intrusive nest survey will be conducted by a qualified wildlife biologist



to determine the presence of breeding birds. If active nests (i.e., nest under construction or constructed, with or without eggs present) are found or suspected to be present based on bird behaviour, then each confirmed or suspected nest location will be appropriately buffered with a no-disturbance area and avoided until the nest is determined to be no longer active.

- In accordance with the Wildlife Directive (Government of Alberta 2017) site-specific wildlife surveys will be kept current until the Project is commissioned, to identify nesting/breeding areas, and appropriate mitigation will be applied.
- A pre-construction wildlife clearance survey will be completed for all Project components, as appropriate, to verify the status of all known wildlife habitat features and identify new wildlife habitat features (if present) to inform appropriate mitigation (e.g., activity restriction buffers).
- Key results of the surveys and any associated mitigation will be shared with the Project Environmental Monitor and the Prime Contractor.
- A speed limit of 30 km/hr will be established within the Project Area during construction and operation to minimize dust and collision risk for wildlife on Project access.
- To mitigate the indirect effect of noise on wildlife during the construction phase, vehicles and equipment will be properly maintained and muffled to reduce engine noise.
- A member of the on-site construction staff will be trained in protocols to respond to and report environmental and wildlife issues identified on site.
- Project personnel will be required to report wildlife issues, incidents with wildlife, nuisance wildlife, injured or dead wildlife as soon as it is safe to do so to the on-site Project Manager, who will determine in collaboration with the Owner's environmental representative corrective and/or emergency action to be taken in the field and what regulatory reporting is required. In the event that an injured or dead species listed provincially (Alberta Environment and Parks 2020a) and/or federally (Government of Canada 2024) is observed on site, the local EPA Wildlife Biologist will be promptly notified.
- Project personnel will be prohibited from carrying firearms and being accompanied by domestic animals. An exception applies to the potential use of trained dogs during mortality searches.
- Any excavations deeper than 2 m, if required, will be fenced off and covered when they are to be left unfilled for more than 24 hours. All excavations will be backfilled as soon as practicable.
- Where avoidance of environmentally sensitive features or their associated setbacks was not possible during Project design, a qualified environmental professional may be present on site, as required, to inspect or monitor construction activities, guide implementation of mitigation, and monitor and report on the effectiveness of the mitigation measures, as appropriate.
- The Proponent will follow the Post-Construction Survey Protocols for Wind and Solar Energy Projects (Alberta Environment and Parks 2020b) and requirements set forth in the Referral Report for the Project. Post-construction monitoring wildlife surveys (PCM surveys) will be conducted annually, by a qualified biologist, for a minimum of three years after the Project is operational. PCM surveys will accomplish the following:
 - Document wildlife mortalities;
 - Determine carcass removal rate;
 - Determine searcher efficiency in detecting available wildlife carcasses; and,
 - Monitor Project effects on wildlife.



4.5.4 PREDICTED RESIDUAL EFFECTS

The predicted residual effects on wildlife species and habitat resulting from the Project are alteration or loss of habitat, change in sensory disturbance, and change in wildlife mortality (Table 4-14).

Table 4-14. Potential effects, mitigation, and predicted residual effects for wildlife species and habitat.

Potential Effect	Project Phase	Mitigation	Predicted Residual Effect
Alteration or loss of wildlife habitat	Construction, decommissioning and reclamation	See Section 4.5.3	Alteration or loss of wildlife habitat
Change in sensory disturbance	Construction, operation, decommissioning and reclamation	See Section 4.5.3	Change in sensory disturbance
Change in wildlife mortality	Construction, operation, decommissioning and reclamation	See Section 4.5.3	Change in wildlife mortality

4.5.5 CHARACTERIZATION OF RESIDUAL EFFECTS

Although the value of the majority of available wildlife habitat within the Project Footprint is considered to be low, small areas of isolated, fragmented deciduous treed habitat do provide limited suitable habitat for foraging and resting for some avian species on a seasonal (e.g., during migration) or year-round basis. Available habitats within the Project Footprint are expected to have a low potential for occurrence of SOMC.

Up to 41.8 ha of wildlife habitat is expected to be altered or lost during the life of the Project. The magnitude of the effect is predicted to be low based on the predominantly low quality of the wildlife habitat available within the Project Footprint (i.e., chronically disturbed tame pasture), the typically low wildlife biodiversity within agricultural land uses throughout the RSA, and the maintenance of similar vegetation underneath the solar panels (i.e., tame pasture) during operation. The geographic extent was deemed to be the Project Footprint, as this is the extent of the physical disturbance with the potential to directly disturb wildlife habitat. The duration was determined to be medium term because land use capability is expected to be restored following decommissioning and reclamation. The effect is expected to occur during construction and again during decommissioning and reclamation (i.e., infrequent) and was determined to be reversible, and is characterized as certain to occur (Table 4-15).

With the increased human and equipment presence during construction and decommissioning and reclamation activities, there is the potential that wildlife may be deterred from using habitat in the vicinity of the Project. The magnitude was deemed to be low, considering the current levels of chronic disturbance of the lands affected by agricultural equipment, grazing cattle, and vehicle traffic throughout the RSA. The effect was characterized as local in geographic extent (confined to the LSA), medium-term duration (i.e., higher during construction, but also occurring during decommissioning and reclamation), occurring frequently, and reversible (Table 4-15).

Wildlife mortality resulting from Project operation is expected to be limited and unlikely. Direct mortality during construction, decommissioning and reclamation are possible (e.g., through direct nest destruction), and indirect effects could also occur (e.g., nest abandonment). The magnitude of the predicted residual effect is



anticipated to be moderate, primarily as a precautionary approach in response to the moderate overall levels of avian observations in the Wildlife Species and Habitat LSA during the migration periods. The geographic extent is expected to be regional due to the activity of the wildlife species present either seasonally or on a year-round basis. The duration was characterized as medium term, lasting until the solar arrays have been removed and reclamation completed. The frequency was deemed to be continuous throughout the lifetime of the Project and characterized as possible overall for the probability of occurrence, although unlikely during the operation phase (Table 4-15).

Table 4-15. Potential residual effects for wildlife species and habitat.

Predicted Residual Effect	Alteration or loss of wildlife habitat	Change in sensory disturbance	Change in wildlife mortality
Project Phase	Construction	Construction, decommissioning and reclamation	Construction, operation, decommissioning and reclamation
Magnitude	Low	Low	Moderate
Geographical Extent	Project Footprint	LSA	RSA
Duration	Medium term	Medium term	Medium term
Frequency	Infrequent	Frequent	Continuous
Reversibility	Reversible	Reversible	Not reversible
Probability of Occurrence	Certain	Certain	Possible
Significance	Not Significant	Not Significant	Not Significant

4.5.6 DETERMINATION OF SIGNIFICANCE FOR WILDLIFE SPECIES AND HABITAT

The residual effects of alteration or loss of wildlife habitat, change in sensory disturbance and change in wildlife mortality are not expected to result in a change in the Wildlife Species and Habitat VEC that will alter its status or integrity beyond where it is not sustainable or is unavailable to contribute to ecological function; therefore, the residual effect of the Project on the Wildlife Species and Habitat VEC is predicted to be Not Significant.



5 MONITORING

5.1 RECLAMATION MONITORING

In accordance with the *Conservation and Reclamation Directive for Renewable Energy Operations* (the C&R Directive; Government of Alberta 2018c), a Pre-Disturbance Site Assessment will be undertaken prior to Project construction, and Interim Monitoring Site Assessments and Reclamation Certificate Site Assessments will be conducted as warranted throughout the life of the Project.

5.2 POST-CONSTRUCTION MONITORING

Where required, a Post-Construction Wildlife Fatality Monitoring Program following up-to-date EPA protocols will be undertaken in accordance with the Project AUC approval conditions and AUC Rule 033.

6 CONCLUSION

Based on the results of the EE, the predicted adverse residual effects resulting from the Project are expected to be of low to moderate magnitude and limited primarily to the Project Footprint, with some effects extending into the LSA. All predicted residual effects are expected to be Not Significant. With the Project components predominately affecting previously disturbed lands (i.e., tame pasture), the Project is not expected to affect the sustainability of any of the VECs evaluated, nor their contributions to a viable ecosystem.

The Project has met the intent of the Wildlife Directive and requirements of Rule 007 with respect to solar power plant applications and will employ standard appropriate mitigation measures, BMPs and industry standards to limit adverse effects that may result during all Project phases. Considering the predicted limited effects on the environment, it is EDI's opinion that the Project can be constructed and operated in an environmentally responsible manner and is in the best interest of Albertans.



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APPENDICES



APPENDIX A EVALUATOR QUALIFICATIONS



Appendix Table A-1. Evaluator Qualifications.

Name	Title	Role	Experience
Stephen Glendinning, BSc, P. Biol.	Senior Wildlife Biologist	Contributing Author	Stephen, a Professional Biologist, has over 25 years of consulting experience servicing multiple industries including renewable energy firms, throughout western Canada. He has provided services for renewable energy clients ranging from due-diligence, environmental constraints analysis, baseline biophysical studies (specializing in bird surveys), environmental assessment, provincial permit applications, regulatory/stakeholder consultation, regulatory hearing support/expert testimony, and post-construction monitoring program design and execution.
Susan Skinner, MSc	Biologist, Project Manager	Contributing Author	Susan has over 25 years of avian ecology experience, leading environmental baseline, monitoring, and habitat compensation programs throughout western Canada. She has managed environmental scopes multiple renewable projects across Alberta and Saskatchewan.
Cody Cameron, BSc, PGeo	Hydrogeologist	Technical Review	Cody is a Professional Geologist in both British Columbia and Alberta with over 20 years of professional experience in the field of geoscience. He has extensive experience working on various geology field programs and associated reporting, including environmental assessments.
Jennifer Muir, MSc, PBiol	Terrestrial Ecologist	Technical Review	Jennifer is a Professional Biologist and renewable energy specialist with over 15 years of experience in vegetation ecology. She has specialized in the inventory and implementation of best practices associated with wetlands and vegetation throughout western Canada.
Jeff Meggs, MSc, RPBio	Senior Biologist	Senior Review	Jeff is a Senior Biologist with more than 28 years of experience in the study of terrestrial and aquatic ecosystems. He has considerable experience in the design and conduct of field, modelling and monitoring studies related to fish, wildlife, fish and wildlife habitat, coarse woody debris, and aquatic and terrestrial invertebrate communities, as well as expertise in the design and implementation of biodiversity and ecosystem processes research. His inventory, research and analytical skills are complimented by a background in operational and strategic conservation planning for wildlife and biodiversity within the resource management sector.



APPENDIX B PHOTOS



Appendix Photo B-1. Example of tame pasture habitat on the western boundary of Project along Range Road 274.



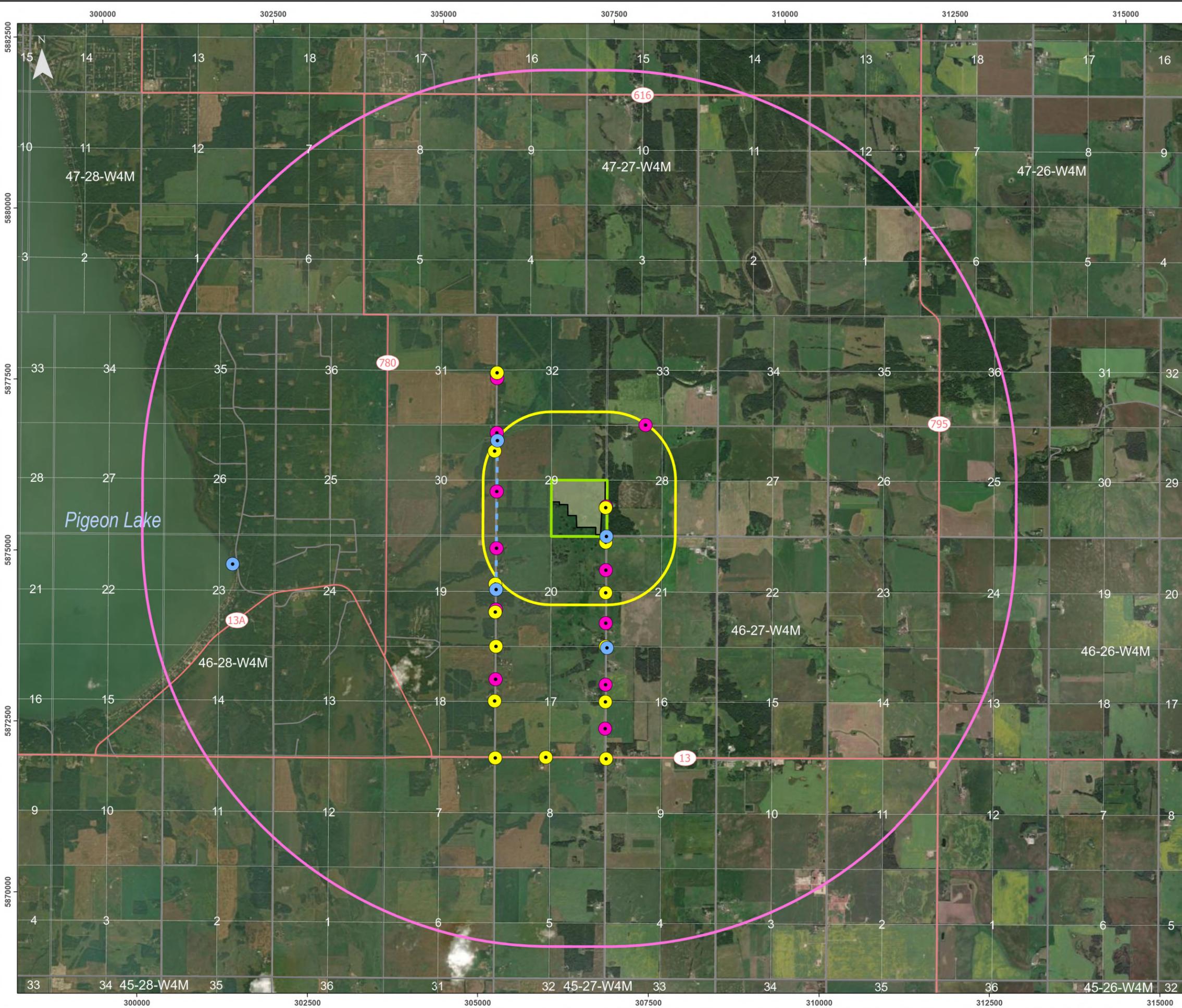
Appendix Photo B-2. Example of treed deciduous aspen stand found on the Project (April 10, 2022).



Appendix Photo B-3. Example of an ephemeral wetland found on the Project (September 23, 2022).



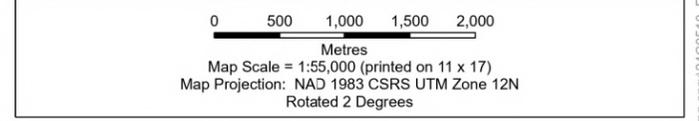
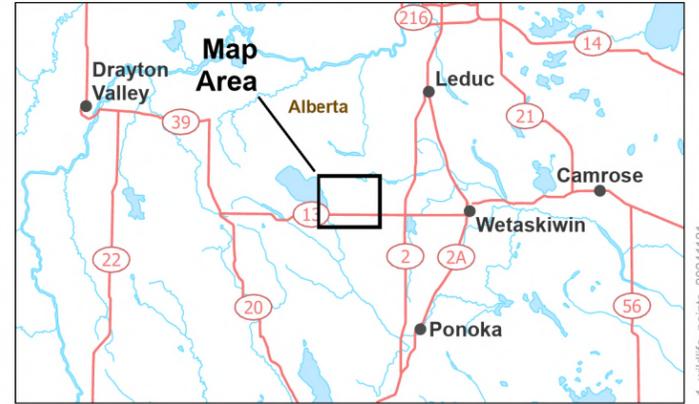
APPENDIX C WILDLIFE MAPS



Wildlife Survey point locations for the Project

Revolve Meadows Solar GP Inc.

- Legend**
- Project Footprint
 - Project Area
 - Wildlife Local Study Area
 - Regional Study Area
 - Migratory Bird Survey Locations
 - Breeding Bird Survey
 - Sharp-tailed Grouse Lek Survey Locations
 - Stopover Transect for Bird Migration (SO-TR-01)
 - Highway
 - Primary Road
 - Township
 - Section
 - Quartersection



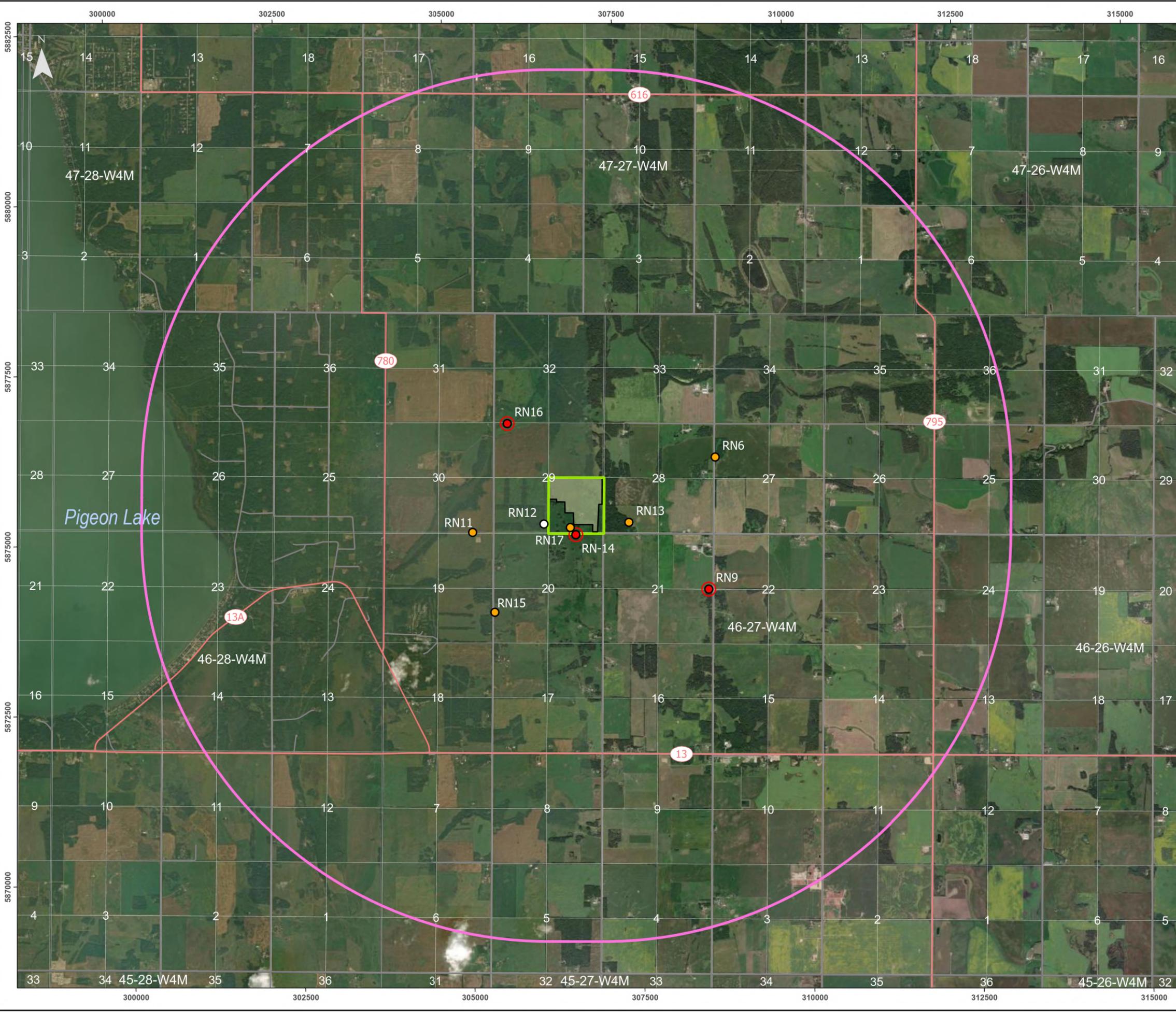
Data Sources

- Project Location and Layout. Revolve Meadows Solar LP, November 15, 2024.
- Main Basemap. CanVec 1:50,000: Government of Canada; World Imagery: Earthstar Geographics
- Main Basemap. World Imagery: Maxar

Disclaimer
 EDI Environmental Dynamics Inc. has made every effort to verify this map is free of errors. Data have been derived from a variety of digital sources and, as such, EDI does not warrant the accuracy, completeness, or reliability of this map or its data.

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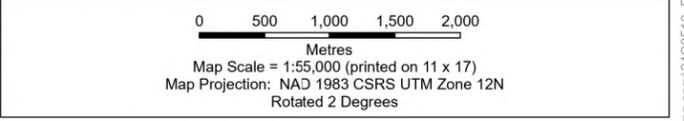
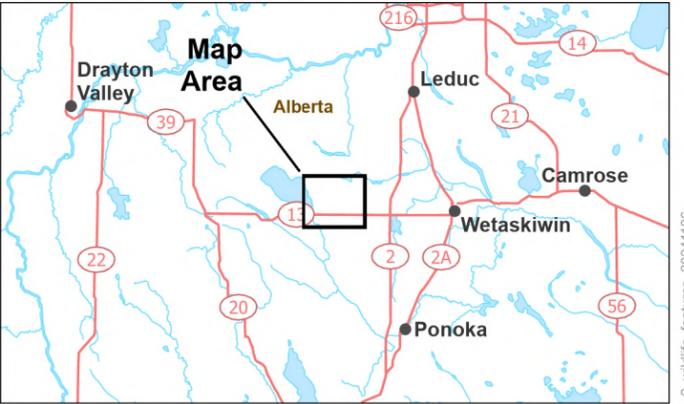


Wildlife features in the Regional Study Area

Revolve Meadows Solar GP Inc.

Legend

 Regional Study Area	 Highway
 Project Area	 Primary Road
 Project Footprint	 Township
 100-m Activity Setback	 Section
2024 Nest Status	
● Active Nests	 Quartersection
● Inactive Nests	
○ Not Present	



Data Sources

- Project Location and Layout. Revolve Meadows Solar LP. November 15, 2024.
- Main Basemap. CanVec 1:50,000: Government of Canada; World Imagery: Earthstar Geographics
- Main Basemap. World Imagery: Maxar

Disclaimer
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APPENDIX D WILDLIFE DATA TABLES

Appendix Table D-1. 2022 spring and fall bird migration survey observations and survey effort.

Survey Type	Number of Plots	Total Surveys Completed	Total Survey Time (Minutes)	Total Number of Bird Observations	Summary (Observations/Minute)
Spring					
Point Counts	4	24	480	3,408	7.1
Stopover Counts	5	30	300	3,737	12.5
Fall					
Point Counts	4	24	480	2,130	4.4
Stopover Counts	5	30	300	3,975	13.3

Appendix Table D-2. Spring migration bird survey: observations by species table.

Species	Provincial General Status	Number of Individuals	Number of Flocks ¹ (greater than 2 birds of the same species)	Number of individuals observed within 0-400 m	Number of individuals observed within 400-800 m	Number of individuals observed greater than 800 m
American Coot	Secure	12	1	-	-	12
American Crow	Secure	24	2	4	13	7
American Robin	Secure	33	1	31	2	-
American Tree Sparrow	Secure	6	1	6	-	-
American Wigeon	Secure	2	-	-	2	-
Black-billed Magpie	Secure	10	-	4	5	1
Black-capped Chickadee	Secure	22	3	18	4	-
Blue Jay	Secure	2	-	2	-	-
Bufflehead	Secure	2	-	2	-	-
Canada Goose	Secure	56	9	13	20	23
Chipping Sparrow	Secure	2	-	2	-	-
Common Goldeneye	Secure	17	2	17	-	-
Common Grackle	Secure	1	-	1	-	-
Common Raven	Secure	7	-	2	5	-
European Starling	Exotic/Alien	53	6	48	5	-
Franklin's Gull	Secure	10	1	10	-	-
Hairy Woodpecker	Secure	1	-	1	-	-
House Finch	Secure	6	1	6	-	-
Killdeer	Secure	3	-	2	1	-
Magnolia Warbler	Secure	1	-	1	-	-
Mallard	Secure	26	4	16	10	-
Passerine sp.	NA	13	1	3	4	6
Pileated Woodpecker	Sensitive	1	-	1	-	-

Species	Provincial General Status	Number of Individuals	Number of Flocks ¹ (greater than 2 birds of the same species)	Number of individuals observed within 0-400 m	Number of individuals observed within 400-800 m	Number of individuals observed greater than 800 m
Redhead	Secure	1	-	-	1	-
Red-necked Grebe	Secure	10	2	3	7	-
Red-tailed Hawk	Secure	6		3	1	2
Red-winged Blackbird	Secure	17	4	13	4	-
Ring-billed Gull	Secure	18	2	7	11	-
Shorebird sp.	NA	14	2	3	-	11
Song Sparrow	Secure	5	-	5	-	-
Sora	Sensitive	3	-	3	-	-
Townsend's Solitaire	Secure	1	-	1	-	-
Tundra Swan	Secure	11	1	-	-	11
Waterfowl sp.	NA	5	1	-	-	5
Wilson's Snipe	Secure	4	-	3	1	-
Total		405	44	231	96	78

¹ Flocks are defined as a group of greater than 2 birds of the same species gathered or moving together.

Appendix Table D-3. Fall migration bird survey: observations by species.

Species	Provincial General Status	Number of Individuals	Number of Flocks ¹	Number of individuals observed within 0-400 m	Number of individuals observed within 400-800 m	Number of individuals observed greater than 800 m
American Coot	Secure	30	2	30		
American Crow	Secure	37	7	17	20	
American Goldfinch	Secure	5	1	5		
American Robin	Secure	3	1	1	2	
American Wigeon	Secure	7	1		7	
Barn Swallow	May Be at Risk	1		1		
Black-billed Magpie	Secure	21	4	17	4	
Blackbird sp.	NA	11	4	11		
Black-capped Chickadee	Secure	23	5	22	1	
Bonaparte's Gull	Secure	25	2	25		
Brown-headed Cowbird	Secure	11	2	11		
Bufflehead	Secure	7	2	2	5	
Cackling Goose	Accidental/Vagrant	15	1	15		
Canada Goose	Secure	738	20	276	170	292

Species	Provincial General Status	Number of Individuals	Number of Flocks ¹	Number of individuals observed within 0-400 m	Number of individuals observed within 400-800 m	Number of individuals observed greater than 800 m
Canada Jay	Secure	2		2		
Common Goldeneye	Secure	41	1	41		
Duck sp.	NA	22	1	1	21	
European Starling	Exotic/Alien	112	3	110	2	
Hairy Woodpecker	Secure	1		1		
Horned Grebe	Sensitive	1		1		
Lesser Scaup	Secure	20	2	4	16	
Mallard	Secure	55	7	46	5	4
Northern Harrier	Secure	1		1		
Northern Shoveler	Secure	2	1	2		
Pileated Woodpecker	Sensitive	1		1		
Red-winged Blackbird	Secure	2		2		
Ring-billed Gull	Secure	16	2	16		
Ruby-crowned Kinglet	Secure	1		1		
Savannah Sparrow	Secure	2	1	2		
Sparrow sp.	NA	16	3	15	1	
Swainson's Hawk	Secure	1			1	
Tree Swallow	Secure	5	1	1		4
White-breasted Nuthatch	Secure	3		3		
Yellow-bellied Sapsucker	Secure	1			1	
Yellow-rumped Warbler	Secure	2		2		
Unknown Passerine	NA	1		1		
Total		1,242	74	686	256	300

¹ Flocks are defined as a group of greater than 2 birds of the same species gathered or moving together.

Appendix Table D-4. Breeding bird surveys: observations by species table.

Species	Provincial General Status	Number of Individuals
American Crow	Secure	5
American Goldfinch	Secure	4
American Redstart	Secure	1
American Robin	Secure	22
Baltimore Oriole	Secure	1
Black-and-white Warbler	Secure	3
Black-billed Magpie	Secure	12
Black-capped Chickadee	Secure	9
Blackpoll Warbler	Secure	1
Brewer's Blackbird	Secure	15
Brown-headed Cowbird	Secure	3
California Gull	Secure	6
Canada Goose	Secure	2
Cedar Waxwing	Secure	1
Chipping Sparrow	Secure	7
Clay-coloured Sparrow	Secure	45
Common Yellowthroat	Sensitive	4
Dark-eyed Junco	Secure	5
Eastern Kingbird	Sensitive	1
Franklin's Gull	Secure	2
Gray Catbird	Secure	5
Horned Lark	Secure	1
House Sparrow	Exotic/Alien	1
House Wren	Secure	15
Least Flycatcher	Secure	8
LeConte's Sparrow	Secure	1
Lincoln's Sparrow	Secure	3
Mallard	Secure	5
Merlin	Secure	1
Mourning Dove	Secure	1
Nelson's Sparrow	Secure	1
Ovenbird	Secure	1
Pileated Woodpecker	Sensitive	1
Pine Siskin	Secure	2
Red-eyed Vireo	Secure	6
Red-tailed Hawk	Secure	4
Red-winged Blackbird	Secure	20
Rock Pigeon	Exotic/Alien	13
Rose-breasted Grosbeak	Secure	3
Savannah Sparrow	Secure	5

Species	Provincial General Status	Number of Individuals
Solitary Sandpiper	Secure	2
Song Sparrow	Secure	8
Tree Swallow	Secure	8
Vesper Sparrow	Secure	2
Warbling Vireo	Secure	1
Western Kingbird	Secure	1
Western Wood-pewee	May Be at Risk	2
White-breasted Nuthatch	Secure	1
White-crowned Sparrow	Secure	1
White-throated Sparrow	Secure	9
Wilson's Snipe	Secure	3
Yellow Warbler	Secure	10
Yellow-bellied Flycatcher	Undetermined	1
Yellow-bellied Sapsucker	Secure	3
Yellow-headed Blackbird	Secure	1
Yellow-rumped Warbler	Secure	3
Total		302

¹ Alberta Wild Species General Status (Alberta Environment and Parks 2024) (Alberta Environment and Protected Areas 2022b)



APPENDIX E GROUNDWATER WELL REPORTS



Reconnaissance Report

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Please click the water Well ID to generate the Water Well Drilling Report.

Groundwater Wells

GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (ft)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (ft)	TEST RATE (igpm)	SC_DIA (in)
132779	NW	20	46	27	4	WARNKE DRILLING LTD.	1972-11-10	140.00	New Well	Domestic		4		HARDEN, D.J.	77.00	5.00	4.50
132780	NW	20	46	27	4	FRASER, RON	1981-03-03	135.00	New Well	Unknown		5		HARDEN, D.	75.00	8.00	4.50
132781	NW	20	46	27	4	UNKNOWN DRILLER		30.00	Chemistry	Domestic	1			HARDEN, DUANE			0.00
132782	NE	20	46	27	4	UNKNOWN DRILLER		200.00	Chemistry	Domestic	1			ZIELKE, BRIAN			0.00
132783	NE	20	46	27	4	UNKNOWN DRILLER		90.00	Chemistry	Domestic				ZIELKE, BRIAN			0.00
132785	SW	21	46	27	4	BURGESS, GEORGE WELL DRILLING LTD.	1980-04-08	180.00	New Well	Stock		9		TUGWELL, L.	97.00	6.00	4.50
132786	16	21	46	27	4	UNKNOWN DRILLER		183.00	Chemistry	Domestic & Stock	1		14	BAILER, HARVEY #2 MILK HOUSE	69.29	8.50	6.00
132787	NE	21	46	27	4	SNETLER WATER WELL DRILLING LTD.	1988-06-24	192.00	New Well	Stock		16		BAILER, TRACY	66.00	8.00	5.56
132816	3	28	46	27	4	UNKNOWN DRILLER	1953-05-19	650.00	Structure Test Hole	Industrial				CALIF STANDARD CO #STH 4C			0.00
132817	4	28	46	27	4	UNKNOWN DRILLER	1953-05-20	650.00	Structure Test Hole	Industrial				CALIF STANDARD CO #STH 4C			0.00
132818	11	28	46	27	4	FELDBERG ROBERT	1986-05-12	430.00	New Well	Domestic		12		HILLER, RUBIN	75.00	5.00	4.50
132819	4	29	46	27	4	UNKNOWN DRILLER	1953-07-23	650.00	Structure Test Hole	Industrial				CALIF STANDARD CO #STH 46-335E			0.00
132820	NE	29	46	27	4	FRASER, RON	1975-09-22	104.00	New Well	Stock		4		WOLLIN, D.W.	33.00	12.00	4.50
132821	2	30	46	27	4	UNKNOWN DRILLER	1953-07-26	658.00	Structure Test Hole	Industrial				CALIF STANDARD CO #STH 4B-350E			0.00
132825	1	31	46	27	4	UNKNOWN DRILLER		40.00	Flowing Shot Hole	Industrial				#SP 51-76			0.00
132826	1	31	46	27	4	UNKNOWN DRILLER	1952-10-08	60.00	Flowing Shot Hole	Industrial		3		#SP 43-93-211			0.00
132831	5	32	46	27	4	STARKEY DRILLING	1983-11-17	46.00	New Well	Stock		4		HAVANKA, RENO	0.10		2.00
154425	SE	20	46	27	4	FRASER, RON	1990-09-25	150.00	New Well	Domestic & Stock		10		PEZDERIC, KIRK/LORNE	89.00	7.00	4.50
167461	NE	29	46	27	4	FRASER, RON	1992-07-15	105.00	New Well	Stock		4		WOLLIN, D.	8.00	10.00	5.56
258301	NE	21	46	27	4	ACTION WATER WELLS LTD.	1995-05-25	160.00	New Well	Domestic		13	15	359796 ALTA LTD/C/O BAILER, T.	66.00	10.00	6.00



Reconnaissance Report

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GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (ft)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (ft)	TEST RATE (igpm)	SC_DIA (in)
258867	10	20	46	27	4	VINO'S WATER WELL DRILLING	1995-08-30	170.00	New Well	Domestic & Stock		7		KRAUSE, ROGER	85.00	10.00	5.00
288820	SW	28	46	27	4	FRASER, RON	1997-10-21	175.00	New Well	Domestic		11	15	BAILER, H.	84.00	10.00	5.56
291960	NE	28	46	27	4	ACTION WATER WELLS LTD.	1999-05-26	175.00	New Well	Domestic		19	10	EAGLE ROCK FARMS CORP	77.00	10.00	6.00
1130753	SE	28	46	27	4	BIG IRON DRILLING LTD.	2009-10-30	165.00	New Well	Domestic		7	26	GRECKO, MATTHEW	86.33	10.00	6.00
1780375	SW	20	46	27	4	WARNKE DRILLING LTD.	2012-11-05	200.00	New Well	Domestic		7	19	MACPHERSON, DONNY & BOBBI	87.56	5.00	6.00
9701024	NE	20	46	27	4	WARNKE DRILLING 2014 LTD	2014-04-24	160.00	New Well	Domestic		7	19	ROBERTS, JOE	89.04	11.00	6.00

Please click the water Test ID to generate the Baseline Water Well Test Report.

Baseline Water Well Tests

Test ID	GIC Well ID	LSD	QTR	SEC	TWP	RGE	M	Resource Company	Testing Date	Water Quality	Pump Test	Gas	Isotopes
1204927	291960	16	NE	28	46	27	4	Evolve Exploration	2008-08-27	Yes	Yes	-	-
1204935	132818	13	NW	28	46	27	4	Evolve Exploration	2008-08-27	Yes	Yes	-	-
1205607		1	SE	31	46	27	4	Evolve Exploration	2009-01-14	Yes	Yes	-	-
1205619		4	SW	32	46	27	4	Evolve Exploration	2009-01-14	Yes	Yes	-	-
1207027		4	SW	32	46	27	4	Evolve Exploration	2009-01-14	Yes	Yes	-	-
1210633		9	NE	28	46	27	4	Evolve Exploration	2009-01-20	Yes	Yes	-	-
1210781	291960	16	NE	28	46	27	4	Evolve Exploration	2009-01-20	Yes	Yes	Yes	-
1210877	132779	12	NW	20	46	27	4	Evolve Exploration	2009-02-04	Yes	Yes	-	-
1210885		4	SW	20	46	27	4	Evolve Exploration	2009-02-04	Yes	Yes	-	-