

ENVIRONMENTAL OVERVIEW

WaterSMART Municipal District of Greenview No. 16

Greenview Industrial Gateway
Phase 1 Upland Development
10-, 14-, 15-, 16-, 21-, 22-, 23-, & 27-67-5-W6M



JULY 2024

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1 INTRODUCTION

The Municipal District of Greenview No. 16 (Greenview) is developing the Greenview Industrial Gateway, a large-scale eco-industrial zone (the project), to promote industrial growth in the methane supply chain for the area. Greenview retained WaterSMART Solutions Ltd. (WaterSMART) to assess water availability and prepare an application for a water diversion licence under the *Water Act* (RSA 2000, c. W-3) to support the project. WaterSMART retained Associated Engineering Alberta Ltd. to support the upland Phase 1 of the project, specifically the design and development of the water intake, and to provide general planning considerations for the project. Phase 1 includes approximately 2,000 acres of the total project area (the study area) and is located 34 km south of Grande Prairie, on the east side of Highway 40 (Figure 1-1). Associated Environmental Consultants Inc. (Associated), the environmental division of the Associated Engineering group of companies, supported the project by conducting an environmental overview.

In 2022, Associated completed a high-level environmental overview for the entire study area (Associated 2022). The purpose of the 2022 environmental overview was to identify potential environmental sensitivities or constraints and provide recommendations for regulatory and compliance requirements. The purpose of this environmental overview is to provide additional detail on environmental sensitivities, constraints, and recommendations for regulatory compliance, specifically to the study area of Phase 1 (Figure 1-1). This overview is based on additional desktop and field-level findings. The Phase 1 study area includes the following legal land descriptions:

- 10-, 14-, 15-, 16-, 21-, 22-, 23-, and 27-67-5-W6M

Most of the upland Phase 1 study area has been cleared of vegetation since 2022, except for wetland areas, watercourses, and some stands of mature forest (Figure 1-1).

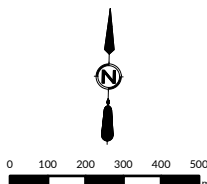
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waterSMART!
Water Management Solutions

LEGEND

- Study Area
- Base Data
- Highway
- Watercourse
- Water Body



AE PROJECT NO. 2022-3376-00
SCALE 1:20,000
COORD. SYSTEM NAD 1983 UTM ZONE 11N
DATE 2024-07-19
REV 00
DRAWN BY HS
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DESCRIPTION ISSUED FOR REPORT

**FIGURE 1-1
STUDY AREA**

WATERSMART SOLUTIONS, LTD.
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GATEWAY PROJECT

ENVIRONMENTAL OVERVIEW

2 METHODS

2.1 Desktop Information Review

The information reviewed for this report included government databases and spatial datasets, available reports, and aerial imagery. The government databases included:

- Significant Landforms of Alberta (Alberta Parks 2014);
- Soil Survey and Interpretations of the Wapiti Map Area, Alberta (Alberta Research Council 1980);
- Fisheries and Wildlife Management Information System (FWMIS) database (Government of Alberta 2024a);
- Alberta Conservation Information Management System database (Alberta Parks 2022);
- Listing of Historic Resources (GoA 2023);
- Wildlife Sensitivity Maps (EPA 2021); and
- Greenview Industrial Gateway Intake Environmental Overview (Associated 2022).

2.2 Field Assessment

Associated's Tristan Phaurest, B.Sc., and Portia Lloyd, P.Biol., conducted a field assessment from May 6 to 10, 2024, to identify and assess the environmental sensitivities that could be impacted by development. The terrestrial assessment focused primarily on identifying wildlife habitat in the remaining stands of mature forest. The wetland assessment was completed to classify and delineate any wetlands in the study area.

2.2.1 Terrestrial Assessment

The terrestrial assessment focused on the remaining ten stands of mature forest. One upland plot was completed in each remaining tree stand in the study area. Upland plots were completed far enough into the centre of each tree stand to avoid potential edge effects from surrounding development. Vegetation and wildlife information was recorded at each upland plot. Vegetation was categorized by stratum and evaluated in a corresponding plot size (10 m, 5 m, and 1 m radius plots for trees, shrubs, and herbs, respectively). Additionally, a meandering 30 m transect was walked through each upland stand to search for sensitive species and habitat features. All incidental wildlife features were recorded in each tree stand. The notes from the terrestrial assessment are provided in Appendix A.

2.2.2 Wetland Assessment

The wetland assessment draws on information gathered by reviewing government databases and other available information. A field assessment was conducted to verify the baseline environmental conditions.

Wetlands were identified, delineated, and classified based on the following Alberta Wetland Policy directives and guides:

- Alberta Wetland Classification System (ESRD 2015); and
- Alberta Wetland Identification and Delineation Directive (GoA 2015a).

According to the Alberta Wetland Identification and Delineation Directive (GoA 2015a), five pathways are available to accomplish wetland delineation. The selected pathway depends on the characteristics of the wetlands, identified based on historical aerial photos and the quality of the resources available. Pathway 3 was the most appropriate for this project and included a simple desktop delineation with field verification. This pathway was selected due to the availability of good imagery and the presence of distinct wetland boundaries.

2.2.2.1 Desktop Delineation

To identify and map coarse wetland boundaries, available historical imagery was reviewed. Imagery used for this assessment was from years 1949, 1979, 1985, 2005, 2010, and 2023 (EPA 2024, Google Earth Pro 2022). The images are provided in Appendix B. Additionally, light detection and ranging data were obtained to further define wetland boundaries.

2.2.2.2 Field Delineation

Wetlands were identified and delineated where indicators of hydrophytic vegetation (i.e., plants adapted to saturated soil conditions) and hydric soils (i.e., permanently or seasonally saturated soils) were observed.

Hydrophytic vegetation was determined to be present when the dominant cover of vegetation had an indicator status of facultative (FAC), facultative wetland (FACW), or obligate wetland (OBL) (Table 2-1), based on the Regional Wetland Plant List for the Western Mountain Valley’s and Coast (Lichvar et al. 2016). Plant species were identified following Moss (1994), but updated nomenclature was used where known. Hydric soils were determined based on organic matter content, appropriate chroma, and the presence of mottles or other hydric characteristics, as stated in the Alberta Wetland Identification and Delineation Directive (GoA 2015a, USDA 2018).

Table 2-1 Definition of Plant Indicator Status

Indicator Category	Indicator Symbol	Definition
Obligate wetland	OBL	Plants that are almost always a hydrophyte; they are rarely found in uplands.
Facultative wetland	FACW	Plants that usually occur as a hydrophyte; they are occasionally found in uplands.
Facultative	FAC	Plants that commonly occur as either a hydrophyte or a non-hydrophyte.
Facultative upland	FACU	Plants that occasionally occur as a hydrophyte; they usually occur in uplands.
Upland	UPL	Plants that are almost always found in non-wetlands.

Source: National Wetland Plant List Indicator Rating Definitions (Lichvar et al. 2012)

Vegetation, soil, and hydrology data were collected at each wetland and recorded on field forms (Appendix A). Representative photos of the wetlands were taken, including photos of hydric soil indicators and hydrophytic vegetation, where applicable (Appendix C). For each data plot, herbaceous vegetation species and their cover were recorded within a 1 m x 1 m quadrat, shrub species were recorded within a 5 m radius plot, and tree species were recorded within a 10 m radius plot, where applicable. The soil texture and properties were determined based on a soil core obtained using a Dutch auger and shovel. The location of each data plot was recorded using a Trimble TDC100 and R1 receiver, using settings capable of sub-metre accuracy.

Where indicators of hydrophytic vegetation and hydric soils were present, a wetland determination was made. If one or more of the criteria were absent, depending on the site conditions, the area was designated as non-wetland. Wetland hydrology indicators were documented to assist in identifying wetlands. Desktop-delineated wetland boundaries were consulted at each wetland location, and where field verification determined that the boundaries were not accurate, the wetland boundaries were adjusted accordingly.

2.2.2.3 Classification and Permanence

Wetlands were classified based on the Alberta Wetland Classification System (ESRD 2015). Each wetland was assigned a class (i.e., marsh, shallow open water, swamp, bog, or fen), form (i.e., vegetation structure), and type (i.e., salinity, water permanence, and acidity-alkalinity), where applicable.

3 BASELINE ENVIRONMENTAL FEATURES

The baseline environmental features, including the environmental sensitivities, are shown in in Figure 3-1 and discussed in Sections 3.1 to 3.8.

3.1 Land Use

The project is located in the Central Mixedwood subregion of the Boreal Natural region in Alberta (Natural Regions Committee 2006). The dominant land uses in the study area include cultivation, pulp and paper production, oil and gas activities, hunting, and fishing (Natural Regions Committee 2006).

Alberta is divided into two broad land management areas: the Green Area, which generally consists of forested public land (Crown land), and the White Area, which generally consists of privately owned settled and developed land. The study area is located entirely within the Green Area.

3.2 Geomorphology, Landforms, and Soils

The landscape in the Central Mixedwood subregion is characterized by gently undulating plains, with some hummocky upland inclusions throughout (Natural Regions Committee 2006). Surface materials are predominantly medium-textured tills, fine-textured lacustrine deposits, coarse-textured fluvial and eolian deposits, and organic deposits (Natural Regions Committee 2006).

The bedrock geology of the study area consists of sandstone, siltstone, and mudstone, and is split between two formations (Prior et al. 2013). The northern part of the study area (including the water intake) is located in the Upper Cretaceous Wapiti Formation, while the southern part is located in the Upper Cretaceous and Paleogene Scollard Formation (Prior et al. 2013).

The project is not located in an area that has been designated as a significant landform element by the Government of Alberta (Alberta Parks 2014).

Upland soils in the study area are dominated by Gleyed Solonchic Gray Luvisols (Donnelly soil series) and wetland areas were dominated by Orthic Luvis Gleysols (Snipe soil series) and Terric Mesic Fibrisols (Kenzie soil series) (Alberta Research Council 1980). Soils in the study area where the forest is intact are likely undisturbed; however, in areas of previous development or in the recently cleared areas, admixing and compaction may have occurred.

3.3 Vegetation

Vegetation in the Central Mixedwood subregion is characterized by forests dominated by aspen (*Populus tremuloides*), aspen and white spruce (*Picea glauca*) forests, and white spruce and jack pine (*Pinus banksiana*) stands on upland terrain, with fens and bogs covering almost half of the area (Natural Regions Committee 2006).

Most of the study area has been cleared since Associated's 2022 environmental overview. The 2024 assessment focused on the remaining 10 upland undisturbed vegetated areas. Vegetation plots that were sampled are assumed to be representative of the study area based on the vegetation signatures visible from aerial imagery.

Upland plots were found to be predominantly mixedwood, the canopy consisting of a mixture of white spruce, trembling aspen (*Populus tremuloides*), and paper birch (*Betula papyrifera*). Tree canopy height varied slightly, but most tree stands were found to have an upper canopy of aspen 18–22 m tall, with a diameter breast height (DBH) of 20–30 cm, and a sub-canopy of primarily white spruce 12 m tall with a DBH of 10–25 cm. One exception was at upland plot T10, which was in a regenerating aspen stand at the south end of the property. This area was 3 to 5 years old and was made up entirely of aspen 3 m tall with a DBH <10 cm.

The understory in the upland plots was found to be dense with prickly rose (*Rosa acicularis*), naked bishop's-cap (*Mitella nuda*), bunchberry (*Cornus canadensis*), gooseberry (*Ribes oxycanthoides*), bush honeysuckle (*Diervilla lonicera*), and various feathermoss species. Vegetation information is provided with the field data in Appendix A.

3.4 Wetland Delineation

Based on the field verification, three wetlands were found to intersect the study area (Table 3-1). Figure 3-1 shows the boundaries of the wetlands relative to the study area. Available digital elevation model data and aerial imagery were used to map the boundaries for all wetlands.

The wetlands were assessed in the field for hydric soil, hydrophytic vegetation, and wetland hydrology indicators. The primary soil indicator observed for identifying hydric soils was soil that contains an organic layer with a thickness of 40 cm or more (A1). Soils in W2 were frozen past 20 cm; therefore, the wetland delineation was primarily based on vegetation and hydrology indicators.

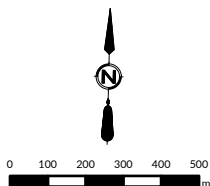
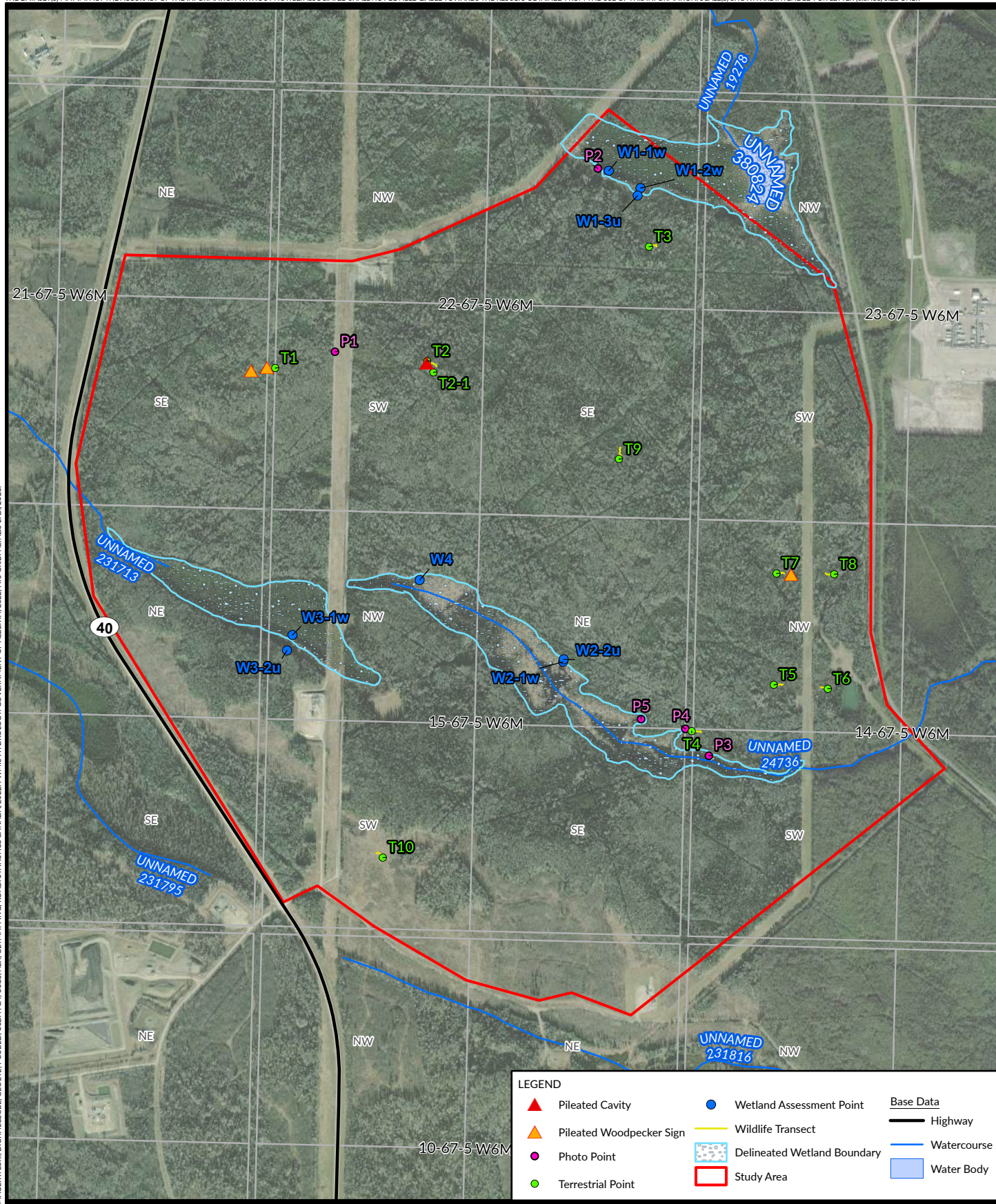
The dominant vegetation in the peatland wetlands included black spruce (*Picea mariana*), Labrador tea (*Rhododendron groenlandicum*), and various sphagnum mosses (*Sphagnum* spp.). The dominant vegetation in the swamp transitions and mineral wetland included black spruce, paper birch, white spruce, green alder (*Alnus viridis*), red-osier dogwood (*Cornus sericea*), and bluejoint (*Calamagrostis canadensis*). Observations of vegetation, soils, and hydrology in the upland and wetland data plots are provided in the field forms in Appendix A.

Table 3-1 Wetland Classification for Wetlands that Intersect the Study Area

Wetland ID	Total Area (ha)	Permanence	Classification Code ¹	Hydrology Indicator	Soil Indicator ²	Vegetation Indicator ³
W1	25	Permanent	FWc	A3, B7, C9, D1, D2	A1	V2
W2	15	Permanent	WBV	A1, A3, B10, C9, D2	NA	V2
W3	24	Permanent	FWc	A2, A3, D1, D2	A1	V2

¹ The classification code is based on the Alberta Wetland Classification System (ESRD 2015). ² Soil indicators: A1 – Soils that contain an organic layer with a thickness of 40 cm or more. ³ Vegetation indicators: V2 – Dominance test is >50%. FWc – wooded coniferous fen. NA – not applicable; WBV – shallow bare open water

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IMAGERY: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, USDA FSA, USGS, AEA, GETMAPPING, ROAD, STATISTICS CANADA, 2022, FWIS HYDROLOGY, GOVERNMENT OF ALBERTA, 2022, AITS GRID, AITALIS LTD., 2020.



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FIGURE 3-1 SITE OVERVIEW

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ENVIRONMENTAL OVERVIEW

3.5 Surface Water

The study area intersects with one watercourse (Figure 3-1). Watercourse ID 24736 is an unnamed Class C waterbody with a restricted activity period of August 1–July 15. This waterbody is unmapped according to the Code of Practice for Watercourse Crossings – Grande Prairie Management Area Map (Government of Alberta 2012a). However, under the Code of Practice for Watercourse Crossings, “where an unmapped waterbody enters a mapped Class C waterbody, the unmapped waterbody is Class C for all portions of the unmapped waterbody.” Therefore, as the unmapped waterbody is hydraulically connected to mapped Class C waterbodies (Smoky River), the unmapped waterbody adopts the same class and restricted activity period. A FWMIS search conducted on July 15, 2024, indicated that no fish have been sampled to date in this watercourse (GoA 2024a).

3.6 Wildlife

3.6.1 Wildlife Zones

The study area occurs in the B5 migratory bird nesting zone, where the general bird nesting period is from late April to late August (Government of Canada 2018). The potential for migratory bird nesting is highest in the forested areas away from disturbance. However, migratory birds may nest in vegetation in other site types or on anthropogenic structures such as bridges or buildings.

Some non-migratory birds, such as owls, may begin nesting as early as mid-February. Although there is no wildlife zone or nesting period specific to owls, the ranges of several species, including barred owl (*Strix varia*), great-horned owl (*Bubo virginianus*), and northern saw-whet owl (*Aegolius acadicus*), overlap the study area (Cornell University 2019). Individuals of these species may nest in trees and forested habitats of the study area.

Nesting cavities of pileated woodpecker (*Dryocopus pileatus*) provide essential habitat for pileated woodpeckers but also for other migratory birds after the woodpecker cavities have been abandoned. Pileated woodpecker nesting cavities were placed under protection under the *Migratory Birds Convention Act, 1994* in 2022. These cavities are protected year-round regardless of whether they are occupied. Pileated woodpeckers nest in mature mixedwood or coniferous forests and typically use large trees (>40 cm DBH) with heart-rot for nesting. The study area does contain potential pileated woodpecker habitat (Figure 3-1).

The study area is located in the range of grizzly bears (*Ursus arctos horribilis*); *Public Lands Act P.40 RSA 2000* approvals obtained for this project may require that setback distance guidelines from den sites between October 1 and April 30 are followed. The setback distance (i.e., 200, 500, or 750 m) will be determined relative to the resource management risk ranking assigned by the regulatory reviewer. The resource management risk ranking is based on the impact of construction on the site and the duration of operations of the activity.

3.6.2 Wildlife Observations

Data from FWMIS revealed that nine wildlife species have been documented within 1 km of the study area (Government of Alberta 2024a) (Table 3-2). Wildlife observations captured during the field survey are provided in datasheets in Appendix A.

Table 3-2 Wildlife Species and Status Previously Recorded Within or Near the Study area

Common Name	Scientific Name	Field Recording?	General Status of Alberta Wild Species ¹	Wildlife Act ²	Species at Risk Public Registry ³	COSEWIC ⁴
American kestrel	<i>Falco sparverius</i>	Yes	Secure	NA	NA	NA
North American beaver	<i>Castor canadensis</i>	Yes	Secure	NA	NA	NA
Broad-winged hawk	<i>Buteo platypterus</i>	No	Sensitive	NA	NA	NA
Canada goose	<i>Branta canadensis</i>	Yes	Secure	NA	NA	NA
Canada warbler	<i>Wilsonia canadensis</i>	Yes	May be at risk	Under consideration for Threatened	Threatened	Special concern
Common yellowthroat	<i>Geothlypis trichas</i>	Yes	Sensitive	NA	NA	NA
Great grey owl	<i>Strix nebulosa</i>	No	Sensitive	NA	Not at risk	NA
Grizzly bear	<i>Ursus arctos horribilis</i>	No	At risk	Special concern	Special concern	Special concern
Least flycatcher	<i>Empidonax minimus</i>	Yes	Secure	NA	NA	NA
Mallard	<i>Anas platyrhynchos</i>	Yes	Secure	NA	NA	NA
Moose	<i>Alces alces</i>	Yes	Secure	NA	NA	NA
Mule deer	<i>Odocoileus hemionus</i>	Yes	Secure	NA	NA	NA
Pileated woodpecker	<i>Dryocopus pileatus</i>	Yes	Sensitive	NA	NA	NA
Red-breasted nuthatch	<i>Sitta canadensis</i>	Yes	Secure	NA	NA	NA
Red-winged blackbird	<i>Agelaius phoeniceus</i>	Yes	Secure	NA	NA	NA

Common Name	Scientific Name	Field Recording?	General Status of Alberta Wild Species ¹	Wildlife Act ²	Species at Risk Public Registry ³	COSEWIC ⁴
Ruby-crowned kinglet	<i>Regulus calendula</i>	Yes	Secure	NA	NA	NA
Northern harrier	<i>Circus cyaneus</i>	Yes	Secure	NA	NA	Not at risk
Wilson's snipe	<i>Gallinago delicata</i>	Yes	Secure	NA	NA	NA
White-throated sparrow	<i>Zonotrichia albicollis</i>	Yes	Secure	NA	NA	NA
Trumpeter swan	<i>Cygnus buccinator</i>	No	Sensitive	Special concern	NA	Not at risk
Western wood-pewee	<i>Contopus sordidulus</i>	No	May be at risk	NA	NA	NA
Yellow-rumped warbler	<i>Setophaga coronata</i>	Yes	Secure	NA	NA	NA

¹ Government of Alberta (2024b). ² Revised Statutes of Alberta 2000, chapter W-10. ³ Government of Canada 2021a. ⁴ Government of Canada 2021b. COSEWIC – Committee on the Status of Endangered Wildlife in Canada

Table 3-3 Habitat Requirements for Wildlife Species of Conservation Concern Previously Recorded in or Near the Study Area

Common Name	Scientific Name	Habitat Requirements	Habitat Presence in Study Area
Canada warbler	<i>Wilsonia canadensis</i>	Found in mixed conifer and deciduous forests with a shrubby understorey (Cornell University 2019)	High potential to occur in forested areas in the study area
Grizzly bear	<i>Ursus arctos horribilis</i>	Found in forests, woodlands, meadows, and prairies at all elevations, with a preference for riparian areas (National Wildlife Federation 2022)	Some potential to occur on sloped areas near watercourses in the study area
Trumpeter swan	<i>Cygnus buccinator</i>	Use shallow, small ponds, lakes, marshes, bogs, and quiet stretches of river for breeding. Require 100 yards of open water for take-off (Cornell University 2019)	Moderate potential to occur in wetland W2

3.7 Historical Resources

Greenview submitted a review for a historical resources application for the upland development area in October 2021. Alberta Culture determined that there was no concern.

3.8 Indigenous Consultation

The study area is located in Treaty 8 territory, which was established in 1899. Treaties outline the rights, obligations, and benefits of the signing parties to each other. Treaty 8 provides Treaty 8 First Nations with the right to carry out their usual vocations of hunting, fishing, and trapping within the Treaty 8 area. Additionally, the Gift Lake Métis Settlement is located northeast of the study area, and development may interfere with the Métis use of the Smoky River. First Nations and Métis people may use the study area for hunting, fishing, trapping, and gathering activities. Greenview is currently engaging with the following First Nations and Métis groups:

- Sucker Creek First Nation;
- Horse Lake First Nation;
- Aseniwuche Winewak Nation;
- Sturgeon Lake First Nation; and
- Gift Lake Métis Settlement.

4 REGULATORY CONSIDERATIONS

The anticipated federal, provincial, and municipal regulatory permitting requirements are outlined in Table 4-1. These requirements are based on the legislation current to July 15, 2024. The regulatory requirements should be verified during the preliminary and detailed design stages to ensure compliance with current regulations.

The regulatory requirements below (Table 4-1) are for the upland development only and assume that development below the high-water mark of any watercourses will be avoided. If the development impacts watercourses, further federal permitting through under the *Fisheries Act* and *Canadian Navigable Waters Act* may be required.

Table 4-1 Anticipated Regulatory Permitting Requirements for Phase 1 Upland Construction

Legislation	Activity/Trigger	Approval Type	Timing and Consideration
<i>Migratory Birds Convention Act, 1994</i> (SC 1994, c. 22)	Project work during the breeding bird season (zone B5: late April to late August)	No permit required; pre-construction sweep required	A pre-construction sweep for migratory bird nests is required before tree clearing may begin. Nest sweeps also include a search for pileated woodpecker cavities, which are protected year-round.
<i>Water Act</i> (RSA 2000, c. W-3)	Tree clearing or disturbance in wetlands	Approval	Any temporary or permanent disturbance to a wetland requires an approval under the <i>Water Act</i> . If wetlands will be permanently disturbed, they need to be delineated and be compensated for, and a wetland assessment and impact report must be submitted for approval under the <i>Water Act</i> . If there is potential to disturb a permanent open-water wetland (W2), a Crown claim letter will need to be submitted to the Water Boundaries Unit for review.
<i>Public Lands Act</i> (RSA 2000, c. P-40)	Project work during the restricted activity period for grizzly bears (October 1–April 30)	No permit required; pre-construction sweeps required for disposition applications	Work on public lands should begin outside the restricted activity period for grizzly bears. If work occurs between October 1 and April 30, pre-construction sweeps for dens will be required with a buffer of 200–750 m, depending on the level of risk.

5 PLANNING RECOMMENDATIONS FOR DEVELOPMENT

Based on the desktop review and the field assessment, the environmental constraints of the project include the potential for impacts to wetlands, watercourses, and sensitive wildlife. Impacts to these resources can be mitigated by using avoidance strategies during design and best management practices during construction.

It is too early in the project process for providing construction recommendations, and the exact development plans are unknown at this time. Environmental compliance is the responsibility of the developer, and the following planning recommendations are provided as guidance only:

- Avoid all wetlands in the study area to the extent possible. Where avoidance is not practical, minimize impacts by reducing the extent of the project footprint in wetlands and limit the intensity of activity near wetlands. Ensure proper permitting and compensation requirements are fulfilled before construction begins. If permanent impacts to the wetlands cannot be avoided, additional permitting will be required.

- Confirm avoidance of the bed and shore of all potentially Crown-claimable wetlands (W2). Provincial and local regulations apply to development proposed in and near wetlands. Alberta Environment and Protected Areas is the agency with jurisdiction over development activities that affect wetlands. They administer the *Water Act*, *Public Lands Act*, and the Alberta Wetland Policy. Approval under the *Water Act* is required before any alteration to the bed and shores of waterbodies, including wetlands. The *Public Lands Act* stipulates that the Crown owns the bed and shores of all permanent, naturally occurring waterbodies. Proposed impacts to any permanent Crown-claimable wetlands require application for a title disposition under this Act.
- The watercourse that runs through the study area should be avoided.
 - Consider the presence of mitigations and setbacks during development planning (Government of Alberta 2012b).
 - Be aware of timing windows for activities that have the potential to impact the watercourse.
 - Consider watercourses in stormwater management planning.
- Potential habitat for pileated woodpecker was observed during the field surveys. The following options should be considered:
 - Confirm the presence of pileated woodpecker cavities in the remaining forested areas. Abandoned nest cavities are considered protected for 36 months after the cavity is registered with the abandoned nest registry (Government of Canada 2022). If possible, avoid construction near identified cavities.
 - If avoidance is not possible, either complete construction after the cavity has been abandoned for 36 months or apply for a relocation permit.
- The area surrounding the study area contains potential habitat for grizzly bears. Construction should be planned to occur outside the grizzly bear denning season (October 1–April 30). If denning season cannot be avoided, pre-construction den sweeps should be completed with a buffer of 200–750 m surrounding the study area, depending on the type of disturbance required.

6 CLOSURE

This report was prepared for WaterSMART Solutions Ltd. to describe the existing environmental sensitivities and regulatory constraints associated with the planning and construction of the industrial area planned in the Municipal District of Greenview No. 16.

The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

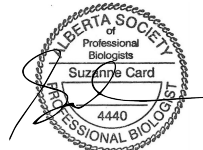
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APPENDIX A – FIELD NOTES

12°C 10:00 AM.

McElhanney

Job No. GIG Date May 7, 2024 Page 1 of 10

Surveyor PL/ATP

Tree Swallow.

Moose tracks.

Falcon x2 = American Kestrel

Snake Wilson's.

Chickadee

P1) SE edge of tree stand.

T1) Yellow rumped warbler.

Red Breasted Nuthatch

White Throated Sparrow, Northern Flicker

@T1) Vegetation

Mitella nuda, Kidney leaved viburnum.

Rosa acicularis, Cornus canadensis,

Ribes oxycanthoides, Clubmoss,

Ribes glandulosum, Linnaea borealis

creamy pearlie. Bush honeysuckle

pladiolum. allocolium blustea, brachytheca

@T1) CANOPY

AVI: B18 Aw10

DRH: Aw 32cm

B12 Swq Aw1

Sw 15cm

May 7, 2024 GIG. 2 of 10

@ T2 - potential pileated woodpecker cavity, took photos, monitored for 5 mins. Recently made.

@ T2-1 (Vegetation)

Mitella nuda, Pyrola asarifolia,
Linnaea borealis, Bush honeysuckle,
Fragaria virginiana, Rosa acicularis,
Ribes glandulosum, Creamy pea
vine, P. trem, P. glauca, B. pap., Fir.

Canopy

Wildlife YERW

AV1: B20 Aw10 DBH: Aw: 27cm
B12 Sws Aw2 Sws 19cm

P2) Sphagnum sp. collected
for TD
- edge of fen along Siesmic
land.

Job No. _____

Date

May 7, 2024

Page

3 of 10

Surveyor

PL/TP

WI-lw

• Trees (10m radius) %
Picea mariana 50% ✓ FacW
 50

• Shrubs (5 m radius) %
Rhododendron groenlandicum 60% ✓ obl
Picea mariana 5% FacW
 32.5% 65%

• Herbaceous (1m x 1m) %
 Small bog cran 2 ✓ obl
 Bog cranberry 1 Fac
 3%

Mosses % 3
 - *Sphag fusc* 40 3
 - *Pleurozium amb.* 50
 - *Sphag angust.* 10 100%
 - *Cladonia* trace

Vegetation indicator = V_1, V_2

(Wc F) → Ruby crowned Kinglet
 → Yellow lumped warbler
 Photos ✓

Soils 0-40cm Organic

All indicator met.

- Some frozen peat

Hydrology

Geomorphic position

Inundation on aerial images

Peat moss > 30 cm

W1-2w

Trees (10m radius)

%

Picea mariana

10. FacU

Betula papyrifera

40. Fac.

Picea glauca

10. Fac

Alnus viridus

20. FacU

Shrubs (5m radius)

80

Alnus viridus

10. FacU

Cornus stolonifera

15. FacU

Bush honeysuckle

2

Betula pap

5 Fac

Wild Red raspberry

5 FacU

15.35

87%

Herbs

Calla can.

3/3

90% FacU

Aster sp.

100%

1%

Job No. GICG Date _____ Page 5 of 10Surveyor PL/TP

Mosses | *Clenasium dendroides* 1%
Mnium playdii 1% Big red stem 1%
Drapemictatus aduncis, 1%

Soils | frozen, cannot assess

Hydrology
 - Standing water in hollows.

FS 7010

W1-3

	10m radius	%	
<u>Trees</u>	<i>Picea glauca</i>	60	✓ Fac
	<i>B. pap.</i>	5	Fac
	<i>P. trem.</i>	5	FacU.
		70	
	35%		

	5m radius	
<u>Shrubs</u>	<i>R. aciculans</i>	10. ✓ FacU.
	Bush hanesuckle	20. ✓ ?
	<i>Cornus stol.</i>	5. ✓ FacW.
	<i>B. pap.</i>	1. ✓ Fac.
		36%
	16	

Herbaceous.

1m x 1m

6 of 10 2
4
500

Cornucan	2 ✓	FaeU
Mitella nuda	2 ✓	FaeW/Obl
Frag virg	1	FaeU

2.5% 5%

Moss

Climaci dendroides	2%
Plagionium	1%
Big red-stem	2%
	5%

- lots leaf litter.
- old equisetum

Soils.

Soils frozen @ time of assessment.

0-8cm	2.5% 5/2 100	SICL
8-24cm	2.5% 5/2 40 2.5% 4/2 40 2.5% 5/6	10%
L FH 8-0cm		

Hydrology

No hydrology indicator.
Hollows do not have standing water.

Job No. GIG. Date May 7, 2024 Page 7 of 10Surveyor PL/TPT3 | 3:36 PM

No bird activity

Vegetation | *P. glauca*, *P. trem.*,
B. pap., Bush honeysuckle,
Cornus can. lin. bor., *Frag. virg.*,
Mitella nuda, *R. acicularis*,
P. asarifolia,

• yellow rumped warblers X 2 (V, A)

red stem feather moss,

Cornus stolonifera, *Cala can.*,
 frog pelt lichen, red stem feather
 moss, pillium,

CANOPY | B22 Aw10 : DBH Aw: 40cm
B12 Sw10 Sw: 23cm

May 8, 2024

FIS | *P. trem.*, *P. glauca*, *B. pap.*,
C. can., *M. nuda*, Bush Honey, *R. acic.*

- old cutblock, signs of regen.

- yellow rumped warbler

- not suitable pileated nesting habitat

- Wild lily of the valley

TS @ CANOPY

DBH

AVI%:

Sw: 27cm

B12Sw₁₀

Bw 10cm

C10Bw₁Aw₁

Aw 6cm

T6 Same veg community as
TS. Not suitable Pileated habitat
Some old poplar sp. snags still standing

CANOPYB12Aw₁Bw₂Sw₁

DBH Same

as T5

→ Older snags are ~ 18m^{20m} tall 30cm DBH

T7

- Rosa acicularis, Frag vltg,
Cornus, Ribes triste, M. nuda
Linnaea borealis, Bush honeys,
Cala can, P. trem, P. glauca,
Viola canadensis,

- Potential pileated habitat

CANOPYB15Aw₃Sw₂

Aw DBH: 24cm

B10Sw₁₀

Sw DBH: 10cm

Job No. GIG Date _____ Page 9 of 10Surveyor PL/TP

- T8 B. pap. P. trem, P. glauca,
 - old cut block, but older than
 T5 + T6 areas.
 - Ungulate carcass, recently
 killed.
 - M. nuda, Bush honeysuckle,
 Suitable Pileated habitat.

CANOPYDBH

Aw	20 cm
Sw	20 cm
Bw	14 cm

B18Aw9SwB11Sw7Bw2Aw

FS 7010

- T9 P. trem. P. glauca, B. pap;
 Rosa acicularis, Bush honey, M.
 nuda, Frag. virg, Linnæa borealis,
 Cornus canadensis, Ribes sp.
 Yellow rumped warbler
 Suitable pileated woodpecker habitat

CANOPYDBH

Aw	25 cm
Sw	14 cm
Bw	7 cm

B15Aw9SwB10Sw8Bw2

@ W4

Vegetation | Calacan,
 Bush honeysuckle, B. pop,
 Salix scoul, P. man,
 Snipe
 some standing H₂O.

May 9, 2024

T10 Poputrem
 Regen area ~ 3-5 years old.
 Calacan, lots of deadfall
 Not suitable for pileated.

Avi: B3A_{w10} DBA < 150m

- No grizzly habitat ~~pres~~ obs win site area
- possibly win 500m
- Beavers present in and around watercourse
- veg characterized
- white throated sparrow

WETLAND DELINEATION FIELD FORM - ALBERTA

Project Name: GIG Sampling Date: May 7, 2024 Sampling Plot #: W1W
 Applicant/Owner: Greenview County/Watershed Municipality/County: Greenview County
 Investigator(s): PL/TP Company Name: AE
 Legal Land Description: Sec Twp Rge Mer GPS Northing: Easting: Zone:
 Indicator Status Source List: WMV/GP Wetland Classification: F-Wc
 Soil Map Unit Name: N/A Slope (%): 0-2%

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Photographs taken? Yes ✓ No
 Are Vegetation , Soil , or Hydrology naturally problematic? no

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Indicator Present? # <u>V1, V2</u> No <u></u>	Is the Sampled Area within a Wetland? Yes <u>✓</u> No <u></u>
Hydric Soil Indicator Present? # <u>A1</u> No <u></u>	Desktop delineation Kept <u></u> Updated <u>✓</u> Removed <u></u>
Hydrology Indicator Present? # <u>A3, B7</u> No <u></u>	

Remarks:
Clear cut surrounding. Early in growing season. Frozen below surface.
Ruby crowned kinglet, yellow rumped warbler.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10m rad.</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Picea mariana</u>	<u>50</u>	<u>✓</u>	<u>FacW</u>
2. <u></u>			
3. <u></u>			
4. <u></u>			
<u>50</u> = Total Cover		<u>25</u>	
Sapling/Shrub Stratum (Plot size: <u>5m rad.</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rhodod. green</u>	<u>100</u>	<u>✓</u>	<u>obl</u>
2. <u>Picea mariana</u>	<u>5</u>		<u>FacW</u>
3. <u></u>			
4. <u></u>			
5. <u></u>			
6. <u></u>			
7. <u></u>			
<u>65</u> = Total Cover		<u>32.5</u>	
Herb Stratum (Plot size: <u>1m x 1m</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Vaccinium oxycoccos</u>	<u>2</u>	<u>✓</u>	<u>obl</u>
2. <u>Vaccinium vitis-idaea</u>	<u>1</u>	<u>✓</u>	<u>Fac</u>
3. <u></u>			
4. <u></u>			
5. <u></u>			
6. <u></u>			
7. <u></u>			
8. <u></u>			
9. <u></u>			
10. <u></u>			
11. <u></u>			
<u>3</u> = Total Cover		<u>1.5</u>	
% Bare Ground in Herb Stratum <u>97% mosses</u>		<u>0.6</u>	
Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)			
Hydrophytic Vegetation Indicators: ☒ V1 - Rapid Test for Hydrophytic Vegetation ☒ V2 - Dominance Test is >50% ☐ V3 - Surface encrustations of algae are present ☐ V4 - Presence of a dominant groundcover of peat mosses (<i>Sphagnum</i> spp.) ☐ V5 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Problematic Hydrophytic Vegetation ¹ (Explain in Remarks) ☐ None			
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Remarks: <u>Peat mosses dominate ground cover. No bare ground. Hummock & hollow topography.</u>			
Remarks: <u>mosses include, sphagnum fuscum, Pleur amb., Sphag angust, Cladonia lichen sp.</u>			

SOIL

Sampling Plot #: W1-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Colour (moist)	%	Mottles Colour (moist)	%	Contrast	Texture	Remarks
0-40 ⁺	Organic						Peat masses

Hydric Soil Indicators (Refer to Wetland Identification and Delineation Directive for full description and user notes):

- | | | |
|---|--|--|
| ☒ A1: Organic Soil | ☐ A12: Thick Dark Surface | ☐ S9: Thin Dark Surface |
| ☐ A2: Organic Surface Layer | ☐ S1: Humic Sandy Layer | ☐ F2: Loamy Gleyed Matrix |
| ☐ A4: Sulfidic Material | ☐ S5: Sandy Redox | ☐ F3: Depleted Matrix |
| ☐ A9: Humic Layer | ☐ S6: Stripped Matrix | ☐ F6: Redox Dark Surface |
| ☐ A11: Depleted Below Dark Surface | | |

Restrictive Layer (if present):

Type: N/A
 Depth (cm): N/A

Hydric Soil Present? # A1 No ☐

Remarks:

All organic. Could not reach mineral. Frozen @ ~35 cm.

HYDROLOGY- Wetland Hydrology Indicators:

Primary		Secondary
☐ Surface Water Present (A1)	☐ Water-stained leaves (B9)	☐ Drainage patterns (B10)
☐ High Water Table (A2)	☐ Salt crust (B11)	☐ Moss trim lines (B16)
☒ Saturation (A3)	☐ Aquatic Fauna (B13)	☐ Dry-season water table (C2)
☐ Water Marks (B1)	☐ Marl Deposits (B15)	☐ Crayfish burrows (C8)
☐ Sediment Deposits (B2)	☐ Hydrogen sulfide odour (C1)	☒ Saturation visible on aerial imagery (C9)
☐ Drift Deposits (B3)	☐ Oxidized rhizospheres along living roots (C3)	☒ Stunted or stressed plants (D1)
☐ Algal mat or crust (B4)	☐ Presence of reduced iron (C4)	☒ Geomorphic position (D2)
☐ Iron deposits (B5)	☐ Recent iron reduction in tilled soils (C6)	☐ Shallow Aquitard (D3)
☐ Surface soil cracks (B6)	☐ Thin Humic surface (C7)	☐ Microtopographic relief (D4)
☒ Inundation on aerial imagery (B7)	☒ Other (Explain in Remarks)	☐ FAC neutral test (D5)
☐ Sparsely vegetated concave surface (B8)		☐ Frost-heave hummocks (D7)

Wetland Hydrology Field Observations (if applicable):

Depth of surface water (cm): N/A
 Depth to water table in soil pit (cm): N/A

Hydrology Indicators Present? Yes ☒ No ☐

Remarks:

Peatland. Inundation and open water further east on aerial imagery.

WETLAND DELINEATION FIELD FORM - ALBERTA

Project Name: GIG Sampling Date: May 7, 2024 Sampling Plot #: W1-2W
 Applicant/Owner: Greenview Cnty/Water Municipality/County: Greenview
 Investigator(s): PL/TP Company Name: AE
 Legal Land Description: Sec 1 Twp 2 Rge 3 Mer 4 GPS Northing: 5000000 Easting: 5000000 Zone: 18N
 Indicator Status Source List: WMV/GP Wetland Classification: SS
 Soil Map Unit Name: N/A Slope (%): 0-2%

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation, Soil, or Hydrology significantly disturbed? Yes ☒ No ☐ Photographs taken? Yes ☒ No ☐
 Are Vegetation, Soil, or Hydrology naturally problematic? Yes ☐ No ☒

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Indicator Present? # <u>V2</u> No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Indicator Present? # <u>A1, A3</u> No ☐	Desktop delineation Kept ☐ Updated ☒ Removed ☐
Hydrology Indicator Present? # <u>A1, A3</u> No ☐	

Remarks: Clearcut immediately adjacent. Early season assessment. Some veg not present as it would be later in the season.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10m rad</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Picea mariana</u>	<u>10</u>	☒	<u>FacW</u>	Number of Dominant Species That Are OBL, FACW or FAC: <u>5</u> (A)
2. <u>Betula papyrifera</u>	<u>40</u>	☒	<u>Fac</u>	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. <u>Picea glauca</u>	<u>10</u>	☒	<u>Fac</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. <u>Alnus viridus</u> >3m height	<u>20</u>	☒	<u>FacW</u>	
	<u>80</u> = Total Cover		<u>40</u>	
Sapling/Shrub Stratum (Plot size: <u>5m rad</u>)				Hydrophytic Vegetation Indicators:
1. <u>Alnus viridus</u>	<u>10</u>	☒	<u>FacW</u>	— V1 - Rapid Test for Hydrophytic Vegetation
2. <u>Cornus stolonifera</u>	<u>15</u>	☒	<u>FacW</u>	☒ V2 - Dominance Test is >50%
3. <u>Lonicera dioica</u>	<u>2</u>	☐	<u>FacU</u>	— V3 - Surface encrustations of algae are present
4. <u>Bet. pap.</u>	<u>5</u>	☐	<u>Fac</u>	— V4 - Presence of a dominant groundcover of peat mosses (<i>Sphagnum</i> spp.)
5. <u>Rubus idaeus</u>	<u>5</u>	☐	<u>FacU</u>	— V5 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
6.				Problematic Hydrophytic Vegetation ¹ (Explain in Remarks)
7.				None
Herb Stratum (Plot size: <u>1m x 1m</u>)				
1. <u>Calamagrostis canadensis</u>	<u>99</u>	☒	<u>FacW</u>	
2. <u>Aster sp. unknown last year</u>	<u>1</u>	☐	<u>?</u>	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	<u>100</u> = Total Cover		<u>50</u>	
% Bare Ground in Herb Stratum	<u>0</u>		<u>20</u>	

Remarks: No bare ground, unknown aster sp. Last years flowering stems. Early spring. Fewer sp. Drapenictatus adunus. Mosses include: Cladonia dendroica, Mnium platydia Big red stem.

SOIL

Sampling Plot #: W1-2w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Colour (moist)	%	Mottles Colour (moist)	%	Contrast	Texture	Remarks

Hydric Soil Indicators (Refer to Wetland Identification and Delineation Directive for full description and user notes):

- | | | |
|---|--|--|
| ☐ A1: Organic Soil | ☐ A12: Thick Dark Surface | ☐ S9: Thin Dark Surface |
| ☐ A2: Organic Surface Layer | ☐ S1: Humic Sandy Layer | ☐ F2: Loamy Gleyed Matrix |
| ☐ A4: Sulfidic Material | ☐ S5: Sandy Redox | ☐ F3: Depleted Matrix |
| ☐ A9: Humic Layer | ☐ S6: Stripped Matrix | ☐ F6: Redox Dark Surface |
| ☐ A11: Depleted Below Dark Surface | | |

Restrictive Layer (if present):

Type: FrozenDepth (cm): 0cmHydric Soil Present? # ? No Remarks: Frozen soil conditions. Could not assess.

HYDROLOGY- Wetland Hydrology Indicators:

Primary		Secondary
☒ Surface Water Present (A1) <u>in hollows</u>	☐ Water-stained leaves (B9)	☐ Drainage patterns (B10)
☐ High Water Table (A2)	☐ Salt crust (B11)	☐ Moss trim lines (B16)
☒ Saturation (A3)	☐ Aquatic Fauna (B13)	☐ Dry-season water table (C2)
☐ Water Marks (B1)	☐ Marl Deposits (B15)	☐ Crayfish burrows (C8)
☐ Sediment Deposits (B2)	☐ Hydrogen sulfide odour (C1)	☐ Saturation visible on aerial imagery (C9)
☐ Drift Deposits (B3)	☐ Oxidized rhizospheres along living roots (C3)	☐ Stunted or stressed plants (D1)
☐ Algal mat or crust (B4)	☐ Presence of reduced iron (C4)	☒ Geomorphic position (D2)
☐ Iron deposits (B5)	☐ Recent iron reduction in tilled soils (C6)	☐ Shallow Aquitard (D3)
☐ Surface soil cracks (B6)	☐ Thin Humic surface (C7)	☐ Microtopographic relief (D4)
☐ Inundation on aerial imagery (B7)	☐ Other (Explain in Remarks)	☐ FAC neutral test (D5)
☐ Sparsely vegetated concave surface (B8)		☐ Frost-heave hummocks (D7)

Wetland Hydrology Field Observations (if applicable):

Depth of surface water (cm): 20cm in hollowsDepth to water table in soil pit (cm): N/AHydrology Indicators Present? Yes ☒ No

Remarks:

Standing H₂O in hollows.

WETLAND DELINEATION FIELD FORM - ALBERTA

Project Name: GIG Sampling Date: May 7, 2024 Sampling Plot #: W1-3W
 Applicant/Owner: Greenview County/Waterways Municipality/County: Greenview county
 Investigator(s): PL/TP Company Name: AE
 Legal Land Description: Sec 1 Twp 1 Rge 1 Mer 1 GPS Northing: Easting: Zone:
 Indicator Status Source List: WMV/GP Wetland Classification: Upland
 Soil Map Unit Name: NIA Slope (%): 0-2%

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation X, Soil , or Hydrology significantly disturbed? Photographs taken? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? clear cut

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Indicator Present? # <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u> </u>
Hydric Soil Indicator Present? # <u> </u> No <u> </u>	Desktop delineation Kept <u> </u> Updated <u> </u> Removed <u> </u>
Hydrology Indicator Present? # <u> </u> No <u> </u>	
Remarks: <u>Early spring assessment. Clear cut, highly disturbed veg.</u>	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10mrad</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>P. glauca</u>	<u>60</u>	<u>✓</u>	<u>Fac</u>
2. <u>B. pap.</u>	<u>5</u>	<u> </u>	<u>Fac</u>
3. <u>P. trem.</u>	<u>5</u>	<u> </u>	<u>FacU</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>70</u> = Total Cover		<u>35%</u>	
Sapling/Shrub Stratum (Plot size: <u>5mrad</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rosa acicularis</u>	<u>10</u>	<u>✓</u>	<u>FacU</u>
2. <u>Lonicera dioica</u>	<u>20</u>	<u>✓</u>	<u>FacU</u>
3. <u>Cornus stolonifera</u>	<u>5</u>	<u> </u>	<u>FacW</u>
4. <u>B. pap.</u>	<u>1</u>	<u> </u>	<u>Fac</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>36</u> = Total Cover		<u>18%</u>	
Herb Stratum (Plot size: <u>1m x 1m</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cornus canadensis</u>	<u>2</u>	<u>✓</u>	<u>FacU</u>
2. <u>Mitella nuda</u>	<u>2</u>	<u>✓</u>	<u>FacU</u>
3. <u>Fragaria virginiana</u>	<u>1</u>	<u> </u>	<u>FacU</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>
11. <u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>5</u> = Total Cover		<u>2.5%</u>	
% Bare Ground in Herb Stratum <u>90%</u>			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Hydrophytic Vegetation Indicators:

— V1 - Rapid Test for Hydrophytic Vegetation

— V2 - Dominance Test is >50%

— V3 - Surface encrustations of algae are present

— V4 - Presence of a dominant groundcover of peat mosses (*Sphagnum* spp.)

— V5 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain in Remarks)

None Borderline = wetland bandary.

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Remarks:

Moss species:

Climacium dendroides 2%

Plagium 1%

Big red stem 2%

5%

Remarks: Mitella nuda found in all upland areas. Moist forest. Clear cut area, regenerating.

SOIL

Sampling Plot #: W1-3u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix		Mottles		Contrast	Texture	Remarks
	Colour (moist)	%	Colour (moist)	%			
8-0	L FH						
0-8	2.5Y 5/2	100	nomottles			SiCL	
8-24	2.5Y 5/2	40	2.5Y 5/6	20	P	SiC	
	2.5Y 4/2	40					

Hydric Soil Indicators (Refer to Wetland Identification and Delineation Directive for full description and user notes):

☐ A1: Organic Soil	☐ A12: Thick Dark Surface	☐ S9: Thin Dark Surface
☐ A2: Organic Surface Layer	☐ S1: Humic Sandy Layer	☐ F2: Loamy Gleyed Matrix
☐ A4: Sulfidic Material	☐ S5: Sandy Redox	☐ F3: Depleted Matrix
☐ A9: Humic Layer	☐ S6: Stripped Matrix	☐ F6: Redox Dark Surface
☐ A11: Depleted Below Dark Surface		

Restrictive Layer (if present):

Type: Frozen
Depth (cm): below 24 cmHydric Soil Present? # No ☒Remarks: Does not meet hydric soil indicators.

HYDROLOGY- Wetland Hydrology Indicators:

Primary		Secondary
☐ Surface Water Present (A1)	☐ Water-stained leaves (B9)	☐ Drainage patterns (B10)
☐ High Water Table (A2)	☐ Salt crust (B11)	☐ Moss trim lines (B16)
☐ Saturation (A3)	☐ Aquatic Fauna (B13)	☐ Dry-season water table (C2)
☐ Water Marks (B1)	☐ Marl Deposits (B15)	☐ Crayfish burrows (C8)
☐ Sediment Deposits (B2)	☐ Hydrogen sulfide odour (C1)	☐ Saturation visible on aerial imagery (C9)
☐ Drift Deposits (B3)	☐ Oxidized rhizospheres along living roots (C3)	☐ Stunted or stressed plants (D1)
☐ Algal mat or crust (B4)	☐ Presence of reduced iron (C4)	☐ Geomorphic position (D2)
☐ Iron deposits (B5)	☐ Recent iron reduction in tilled soils (C6)	☐ Shallow Aquitard (D3)
☐ Surface soil cracks (B6)	☐ Thin Humic surface (C7)	☐ Microtopographic relief (D4)
☐ Inundation on aerial imagery (B7)	☐ Other (Explain in Remarks)	☐ FAC neutral test (D5)
☐ Sparsely vegetated concave surface (B8)		☐ Frost-heave hummocks (D7)

Wetland Hydrology Field Observations (if applicable):

Depth of surface water (cm): X
Depth to water table in soil pit (cm): XHydrology Indicators Present? Yes No ☒

Remarks:

No hydrology indicators present @ time of assessment

WETLAND DELINEATION FIELD FORM - ALBERTA

Project Name: GIG Sampling Date: May 8, 2024 Sampling Plot #: W2-1w
 Applicant/Owner: Greenview County Municipality/County: Greenview County
 Investigator(s): PL/TP Company Name: AE
 Legal Land Description: Sec Twp Rge Mer GPS Northing: N/A Easting: _____ Zone: _____
 Indicator Status Source List: WMV/GP Wetland Classification: WBU
 Soil Map Unit Name: N/A Slope (%): 0-2%

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Photographs taken? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No No, however beaver.

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Indicator Present? # <u>V2</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Indicator Present? # _____ No <u>3</u>	Desktop delineation Kept _____ Updated _____ Removed _____
Hydrology Indicator Present? # <u>A1, A3</u> No _____	

Remarks: Beaver impacted, clear cutting surrounding + healthy buffer. Very early in growing season. Few veg. sp.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10m radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Betula papyrifera</u>	<u>8</u>	<u>✓</u>	<u>FAC</u>
2. <u>Larix laricina</u>	<u>1</u>		<u>FACW</u>
3. _____			
4. _____			
<u>8</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Larix laricina</u>	<u>1</u>		<u>FACW</u>
2. <u>Picea glauca</u>	<u>2</u>		<u>FACU</u>
3. <u>Salix scouleriana</u>	<u>5</u>	<u>✓</u>	<u>FAC</u>
4. <u>Salix exigua</u>	<u>3.5</u>	<u>✓</u>	<u>FACW</u>
5. _____			
6. _____			
7. _____			
<u>11.5</u> = Total Cover			
Herb Stratum (Plot size: <u>1m x 1m</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Cala can</u>	<u>90</u>	<u>✓</u>	<u>FACW</u>
2. <u>C. albertensis</u>	<u>5</u>		<u>OBL</u>
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
<u>95</u> = Total Cover			
% Bare Ground in Herb Stratum: <u>5 litter + herbaceous debris</u>			
Remarks:			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Hydrophytic Vegetation Indicators:

— V1 - Rapid Test for Hydrophytic Vegetation

X V2 - Dominance Test is >50%

— V3 - Surface encrustations of algae are present

— V4 - Presence of a dominant groundcover of peat mosses (*Sphagnum* spp.)

— V5 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

— Problematic Hydrophytic Vegetation¹ (Explain in Remarks)

— None

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Remarks:

42.5

5.75 - 1.15 + 1.15 = 2.30

4.5

SOIL

Sampling Plot # W2-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix		Mottles		Contrast	Texture	Remarks
	Colour (moist)	%	Colour (moist)	%			

Hydric Soil Indicators (Refer to Wetland Identification and Delineation Directive for full description and user notes):

- | | | |
|---|--|--|
| ☐ A1: Organic Soil | ☐ A12: Thick Dark Surface | ☐ S9: Thin Dark Surface |
| ☐ A2: Organic Surface Layer | ☐ S1: Humic Sandy Layer | ☐ F2: Loamy Gleyed Matrix |
| ☐ A4: Sulfidic Material | ☐ S5: Sandy Redox | ☐ F3: Depleted Matrix |
| ☐ A9: Humic Layer | ☐ S6: Stripped Matrix | ☐ F6: Redox Dark Surface |
| ☐ A11: Depleted Below Dark Surface | | |

Restrictive Layer (if present):

 Type: _____
 Depth (cm): _____
Hydric Soil Present? # _____ No ?

Remarks:

Frozen, cannot dig.

HYDROLOGY- Wetland Hydrology Indicators:

Primary		Secondary
☒ Surface Water Present (A1)	☐ Water-stained leaves (B9)	☒ Drainage patterns (B10)
☐ High Water Table (A2)	☐ Salt crust (B11)	☐ Moss trim lines (B16)
☒ Saturation (A3)	☐ Aquatic Fauna (B13)	☐ Dry-season water table (C2)
☐ Water Marks (B1)	☐ Marl Deposits (B15)	☐ Crayfish burrows (C8)
☐ Sediment Deposits (B2)	☐ Hydrogen sulfide odour (C1)	☒ Saturation visible on aerial imagery (C9)
☐ Drift Deposits (B3)	☐ Oxidized rhizospheres along living roots (C3)	☐ Stunted or stressed plants (D1)
☐ Algal mat or crust (B4)	☐ Presence of reduced iron (C4)	☒ Geomorphic position (D2)
☐ Iron deposits (B5)	☐ Recent iron reduction in tilled soils (C6)	☐ Shallow Aquitard (D3)
☐ Surface soil cracks (B6)	☐ Thin Humic surface (C7)	☐ Microtopographic relief (D4)
☐ Inundation on aerial imagery (B7)	☐ Other (Explain in Remarks)	☐ FAC neutral test (D5)
☐ Sparsely vegetated concave surface (B8)		☐ Frost-heave hummocks (D7)

Wetland Hydrology Field Observations (if applicable):

 Depth of surface water (cm): N/A
 Depth to water table in soil pit (cm): N/A
Hydrology Indicators Present? Yes ☒ No ☐

Remarks:

Beaver impacted, open water present.Mallard.Canada geeseRedwinged BB.Nuthatch.Northern Harrier.

WETLAND DELINEATION FIELD FORM - ALBERTA

Project Name: GIG Sampling Date: May 8, 2024 Sampling Plot #: W2-2M
 Applicant/Owner: Greenview County Municipality/County: Greenview County
 Investigator(s): PL/TP Company Name: AE
 Legal Land Description: Sec Twp Rge Mer GPS Northing: Easting: Zone:
 Indicator Status Source List: UMV/GP Wetland Classification: Upland
 Soil Map Unit Name: N/A Slope (%): 3%

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Photographs taken? Yes ✓ No
 Are Vegetation , Soil , or Hydrology naturally problematic? LDNO

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Indicator Present? # <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Indicator Present? # <u> </u> No <u>X</u>	Desktop delineation Kept <u> </u> Updated <u>X</u> Removed <u> </u>
Hydrology Indicator Present? # <u> </u> No <u>X</u>	
Remarks: <u>Clear cut adjacent. Upland area within veg buffer of wetland. Early in spring. Few veg sp.</u>	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10m rad</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Picea glauca</u>	<u>70</u>	<u>✓</u>	<u>FacU</u>
2. <u>Bet. pap.</u>	<u>10</u>	<u> </u>	<u>Fac</u>
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>60</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m rad</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rosa acicularis</u>	<u>5</u>	<u>✓</u>	<u>FacU</u>
2. <u>Picea glauca</u>	<u>2</u>	<u>✓</u>	<u>FacU</u>
3. <u>Bush honeysuckle</u>	<u>5</u>	<u>✓</u>	<u>Fac</u>
4. <u>Ribes hirt.</u>	<u>15</u>	<u>✓</u>	<u>Fac</u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>17</u> = Total Cover			
Herb Stratum (Plot size: <u>1m x 1m</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corn can.</u>	<u>2</u>	<u>✓</u>	<u>FacU</u>
2. <u>Equisetum arvense</u>	<u>1</u>	<u>✓</u>	<u>Fac</u>
3. <u>Frag. virg.</u>	<u>1</u>	<u>✓</u>	<u>FacU</u>
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>
11. <u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>4</u> = Total Cover <u>0.8</u>			
% Bare Ground in Herb Stratum <u>96%</u> - not including moss cover			
Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>14%</u> (A/B) Hydrophytic Vegetation Indicators: — V1 - Rapid Test for Hydrophytic Vegetation — V2 - Dominance Test is >50% — V3 - Surface encrustations of algae are present — V4 - Presence of a dominant groundcover of peat mosses (<i>Sphagnum</i> spp.) — V5 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain in Remarks) <u>None</u> ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Remarks: <u>30.</u> <u>8.5. = 3.14. 7 = 2.14</u> <u>2.</u>			
Remarks: <u>Bryum sp. 1%</u> <u>Brachy sp. 1%</u> <u>Picea glauca DBH: 23cm.</u> <u>B. pap DBH: 11cm. BISSW10</u> <u>B12BW10</u>			

SOIL

Sampling Plot #: W2-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Colour (moist)	%	Mottles Colour (moist)	%	Contrast	Texture	Remarks
4-0	L.F.H.						
0-20	2.5Y 3/2	100				SiL	Very moist.
20+	2.5Y 5/1	45	10YR 4/6	5	P	CL	
	2.5Y 5/4	50					

Hydric Soil Indicators (Refer to Wetland Identification and Delineation Directive for full description and user notes):

☐ A1: Organic Soil	☐ A12: Thick Dark Surface	☐ S9: Thin Dark Surface
☐ A2: Organic Surface Layer	☐ S1: Humic Sandy Layer	☐ F2: Loamy Gleyed Matrix
☐ A4: Sulfidic Material	☐ S5: Sandy Redox	☐ F3: Depleted Matrix
☐ A9: Humic Layer	☐ S6: Stripped Matrix	☐ F6: Redox Dark Surface
☐ A11: Depleted Below Dark Surface		

Restrictive Layer (if present):

Type: _____

Depth (cm): _____

Hydric Soil Present? # _____ No ☒Remarks: Does not meet soil indicator criteria.

HYDROLOGY- Wetland Hydrology Indicators:

Primary		Secondary
☐ Surface Water Present (A1)	☐ Water-stained leaves (B9)	☐ Drainage patterns (B10)
☐ High Water Table (A2)	☐ Salt crust (B11)	☐ Moss trim lines (B16)
☐ Saturation (A3)	☐ Aquatic Fauna (B13)	☐ Dry-season water table (C2)
☐ Water Marks (B1)	☐ Marl Deposits (B15)	☐ Crayfish burrows (C8)
☐ Sediment Deposits (B2)	☐ Hydrogen sulfide odour (C1)	☐ Saturation visible on aerial imagery (C9)
☐ Drift Deposits (B3)	☐ Oxidized rhizospheres along living roots (C3)	☐ Stunted or stressed plants (D1)
☐ Algal mat or crust (B4)	☐ Presence of reduced iron (C4)	☐ Geomorphic position (D2)
☐ Iron deposits (B5)	☐ Recent iron reduction in tilled soils (C6)	☐ Shallow Aquitard (D3)
☐ Surface soil cracks (B6)	☐ Thin Humic surface (C7)	☐ Microtopographic relief (D4)
☐ Inundation on aerial imagery (B7)	☐ Other (Explain in Remarks)	☐ FAC neutral test (D5)
☐ Sparsely vegetated concave surface (B8)		☐ Frost-heave hummocks (D7)

Wetland Hydrology Field Observations (if applicable):

Depth of surface water (cm): _____

Depth to water table in soil pit (cm): _____

Hydrology Indicators Present? Yes _____ No ☒

Remarks:

Canada geeseThere are no hydrology indicators present.

WETLAND DELINEATION FIELD FORM - ALBERTA

Project Name: GIG Sampling Date: May 9/24 Sampling Plot #: W3-1W
 Applicant/Owner: Greenwood County Municipality/County: Greenwood County
 Investigator(s): PLTP Company Name: Associated Environmental
 Legal Land Description: Sec Twp Rge Mer GPS Northing: Easting: Zone:
 Indicator Status Source List: DMU/GP Wetland Classification: F-W₂
 Soil Map Unit Name: NIA Slope (%): 0.2%

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Photographs taken? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? NO

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Indicator Present? # <u>V2, V4</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Indicator Present? # <u>A1</u> No <u> </u>	Desktop delineation Kept <u> </u> Updated <u>X</u> Removed <u> </u>
Hydrology Indicator Present? # <u>A2, A3</u> No <u> </u>	
Remarks: <u>Clearcut adjacent to wetland, no upland buffer</u>	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10m rad</u>)	Absolute Dominant Indicator % Cover	Species?	Status	Dominance Test worksheet:
1. <u>DICMAR</u>	<u>50%</u>	<u>X</u>	<u>FACW</u>	Number of Dominant Species That Are OBL, FACW or FAC: <u>3</u> (A)
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Sapling/Shrub Stratum (Plot size: <u>5m rad</u>)				
1. <u>RHODGR</u>	<u>60%</u>	<u>X</u>	<u>OBL</u>	
2. <u>DICMAR</u>	<u>10%</u>	<u> </u>	<u>FACW</u>	
3. <u>V</u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
Herb Stratum (Plot size: <u>1m x 1m</u>)				
1. <u>VACCUT</u>	<u>2%</u>	<u>X</u>	<u>FAC</u>	
2. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
11. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
% Bare Ground in Herb Stratum <u>MOSS 100%</u>				
Remarks:				
SPHA ANG: <u>70%</u>				
HYLOSAL: <u>5%</u>				
AMBL RE: <u>15%</u>				

SOIL

Sampling Plot # W3-1w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Colour (moist)	%	Mottles Colour (moist)	%	Contrast	Texture	Remarks
0-25	Organic	100%					

Hydric Soil Indicators (Refer to Wetland Identification and Delineation Directive for full description and user notes):

- | | | |
|---|--|--|
| ☒ A1: Organic Soil | ☐ A12: Thick Dark Surface | ☐ S9: Thin Dark Surface |
| ☐ A2: Organic Surface Layer | ☐ S1: Humic Sandy Layer | ☐ F2: Loamy Gleyed Matrix |
| ☐ A4: Sulfidic Material | ☐ S5: Sandy Redox | ☐ F3: Depleted Matrix |
| ☐ A9: Humic Layer | ☐ S6: Stripped Matrix | ☐ F6: Redox Dark Surface |
| ☐ A11: Depleted Below Dark Surface | | |

Restrictive Layer (if present):

Type: Fract @ 25cmDepth (cm): 25cmHydric Soil Present? # A1 No ☐
 Remarks: Organic soil fract @ 25cm
Similar to W1-1w.

HYDROLOGY- Wetland Hydrology Indicators:

Primary		Secondary
☐ Surface Water Present (A1)	☐ Water-stained leaves (B9)	☒ Drainage patterns (B10)
☒ High Water Table (A2)	☐ Salt crust (B11)	☐ Moss trim lines (B16)
☒ Saturation (A3)	☐ Aquatic Fauna (B13)	☐ Dry-season water table (C2)
☐ Water Marks (B1)	☐ Marl Deposits (B15)	☐ Crayfish burrows (C8)
☐ Sediment Deposits (B2)	☐ Hydrogen sulfide odour (C1)	☐ Saturation visible on aerial imagery (C9)
☐ Drift Deposits (B3)	☐ Oxidized rhizospheres along living roots (C3)	☒ Stunted or stressed plants (D1)
☐ Algal mat or crust (B4)	☐ Presence of reduced iron (C4)	☒ Geomorphic position (D2)
☐ Iron deposits (B5)	☐ Recent iron reduction in tilled soils (C6)	☐ Shallow Aquitard (D3)
☐ Surface soil cracks (B6)	☐ Thin Humic surface (C7)	☐ Microtopographic relief (D4)
☐ Inundation on aerial imagery (B7)	☐ Other (Explain in Remarks)	☐ FAC neutral test (D5)
☐ Sparsely vegetated concave surface (B8)		☒ Frost-heave hummocks (D7)

Wetland Hydrology Field Observations (if applicable):

Depth of surface water (cm): NADepth to water table in soil pit (cm): NAHydrology Indicators Present? Yes ☒ No ☐

Remarks:

~ Rhy Craned Kinglet
- Red-breasted nuthatch
- Moose sign

WETLAND DELINEATION FIELD FORM - ALBERTA

Project Name: G16x Sampling Date: May 9, 2014 Sampling Plot #: W3-2U
 Applicant/Owner: Greenwood County Municipality/County: Greenwood
 Investigator(s): TP/PL Company Name: Alberta Environmental
 Legal Land Description: Sec Twp Rge Mer GPS Northing Easting Zone
 Indicator Status Source List: WNV/AD Wetland Classification: Upland
 Soil Map Unit Name: NA Slope (%): 2-5%

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)

Are Vegetation X, Soil , or Hydrology significantly disturbed? Photographs taken? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic?

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Indicator Present? # <u>V2</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Indicator Present? # <u> </u> No <u>X</u>	Desktop delineation Kept <u> </u> Updated <u>X</u> Removed <u> </u>
Hydrology Indicator Present? # <u> </u> No <u>X</u>	
Remarks: <u>cleared cutblocks, clearing was done right up to the wetland boundary edge.</u>	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10m rad</u>)	Absolute Dominant Indicator % Cover	Species?	Status	Dominance Test worksheet:
1. <u>BETULAP</u>	<u>1</u>	<u>X</u>	<u>FAC/FACW</u>	Number of Dominant Species That Are OBL, FACW or FAC: <u>5</u> (A)
2. <u>POPULUS</u>	<u>21</u>	<u>X</u>	<u>FACW</u>	Total Number of Dominant Species Across All Strata: <u>8</u> (B)
3. <u>PICEGLA</u>	<u>21</u>	<u>X</u>	<u>FAC</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>5/8</u> (A/B)
4. <u> </u>	<u>51</u>	<u> </u>	<u> </u>	
<u>51</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m rad</u>)				
1. <u>POPULUS</u>	<u>65</u>	<u>X</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u> </u> V1 - Rapid Test for Hydrophytic Vegetation <u>X</u> V2 - Dominance Test is >50% <u> </u> V3 - Surface encrustations of algae are present <u> </u> V4 - Presence of a dominant groundcover of peat mosses (<i>Sphagnum</i> spp.) <u> </u> V5 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain in Remarks) <u> </u> None
2. <u>ROSARCI</u>	<u>8</u>	<u> </u>	<u>FACW</u>	
3. <u>CORNUS</u>	<u>5</u>	<u> </u>	<u>FACW</u>	
4. <u>RIBESLAC</u>	<u>1</u>	<u> </u>	<u>FAC</u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
<u>79</u> = Total Cover				
Herb Stratum (Plot size: <u>1m x 1m</u>)				
1. <u>MITE NUD</u>	<u>1</u>	<u>X</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Remarks: <u>Dominant:</u> <u>TREE: 5/2 = 2.5%; NA = 0.25% (1)</u> <u>SAPLING: 79/2 = 39.5%</u> <u>HERB: 5/2 = 2.5%; NA = 0.25% (1)</u>
2. <u>FRAGVIR</u>	<u>1</u>	<u>X</u>	<u>FACW</u>	
3. <u>PELAGIUS spp</u>	<u>1</u>	<u>X</u>	<u>FACW</u>	
4. <u>EQUIARV</u>	<u>2</u>	<u>X</u>	<u>FAC</u>	
5. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
11. <u> </u>	<u> </u>	<u> </u>	<u> </u>	
<u>5</u> = Total Cover				
% Bare Ground in Herb Stratum <u>95</u>				
Remarks: <u>Highly disturbed site, mixture of upland and wetland species, right on boundary</u> <u>Upland species presence are indicative of upland habitat</u> <u>Reason for dominance, is 20% rule made a low parameter,</u>				

SOIL

Sampling Plot # W3-211

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Colour (moist)	%	Mottles Colour (moist)	%	Contrast	Texture	Remarks
7-0cm							LFA
0-16cm							organic
16-28cm	10YR 3/2	60%	NA	NA	NA	SiC	
	10YR 4/2	40%					
22-40cm	7.5YR 2.5/1	75%	5YR 4/4	2%	NA	SiC	
	7.5YR 4/3	25%					

Hydric Soil Indicators (Refer to Wetland Identification and Delineation Directive for full description and user notes):

- | | | |
|---|--|--|
| ☐ A1: Organic Soil | ☐ A12: Thick Dark Surface | ☐ S9: Thin Dark Surface |
| ☐ A2: Organic Surface Layer | ☐ S1: Humic Sandy Layer | ☐ F2: Loamy Gleyed Matrix |
| ☐ A4: Sulfidic Material | ☐ S5: Sandy Redox | ☐ F3: Depleted Matrix |
| ☐ A9: Humic Layer | ☐ S6: Stripped Matrix | ☐ F6: Redox Dark Surface |
| ☐ A11: Depleted Below Dark Surface | | |

Restrictive Layer (if present):

 Type: NA
 Depth (cm): NA
Hydric Soil Present? # No ☒

Remarks:

HYDROLOGY- Wetland Hydrology Indicators:

Primary		Secondary
☐ Surface Water Present (A1)	☐ Water-stained leaves (B9)	☐ Drainage patterns (B10)
☐ High Water Table (A2)	☐ Salt crust (B11)	☐ Moss trim lines (B16)
☐ Saturation (A3)	☐ Aquatic Fauna (B13)	☐ Dry-season water table (C2)
☐ Water Marks (B1)	☐ Marl Deposits (B15)	☐ Crayfish burrows (C8)
☐ Sediment Deposits (B2)	☐ Hydrogen sulfide odour (C1)	☐ Saturation visible on aerial imagery (C9)
☐ Drift Deposits (B3)	☐ Oxidized rhizospheres along living roots (C3)	☐ Stunted or stressed plants (D1)
☐ Algal mat or crust (B4)	☐ Presence of reduced iron (C4)	☐ Geomorphic position (D2)
☐ Iron deposits (B5)	☐ Recent iron reduction in tilled soils (C6)	☐ Shallow Aquitard (D3)
☐ Surface soil cracks (B6)	☐ Thin Humic surface (C7)	☐ Microtopographic relief (D4)
☐ Inundation on aerial imagery (B7)	☐ Other (Explain in Remarks)	☐ FAC neutral test (D5)
☐ Sparsely vegetated concave surface (B8)		☐ Frost-heave hummocks (D7)

Wetland Hydrology Field Observations (if applicable):

Depth of surface water (cm): _____

Depth to water table in soil pit (cm): _____

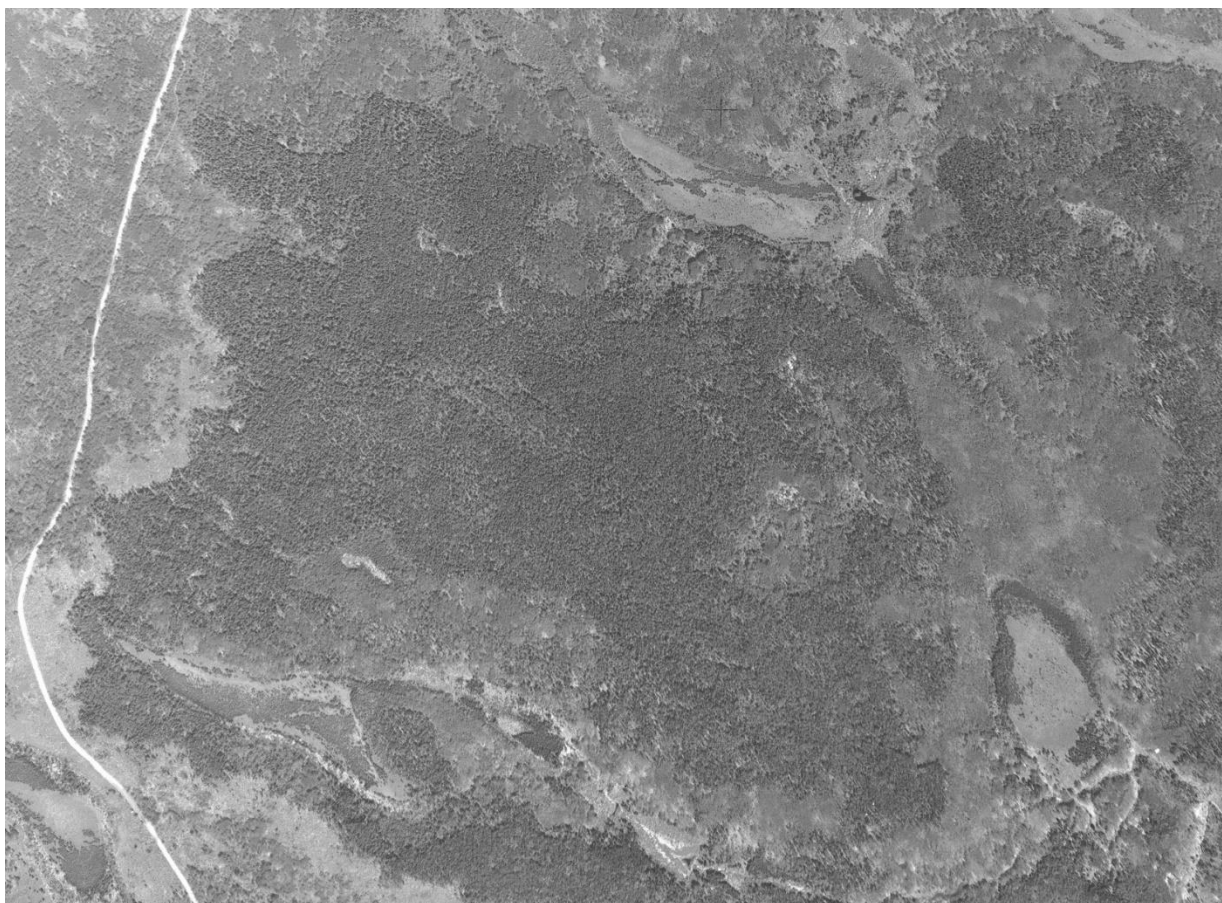
Hydrology Indicators Present? Yes _____ No ☒

Remarks:

- yellow-rumped warbler
 - Ruby crowned kinglet
 - White throated sparrow.

APPENDIX B – HISTORICAL PHOTOS

Historical Photo 1 18 August 1949



Historical Photo 2 31 May 1979



Historical Photo 3 03 June 1985



Historical Photo 4 17 September 2005



Historical Photo 5 23 August 2010



Historical Photo 6 May 2023



APPENDIX C – SITE PHOTOGRAPHS

Photo 1 Pileated woodpecker cavity



Photo 2 Upland forest at T1



Photo 3 Fen vegetation at W1



Photo 4 Watercourse in study area



Photo 5 Existing tree clearings



Photo 6 Organic soils at W3

