



Wetland Assessment and Impact Report

ELDCI Subdivision Planning

February 2024





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Table of Contents

1.0	Introduction.....	1
1.1	Background	2
1.1	Project Need and Rationale	2
1.2	Project Development Concept	2
1.3	Regulatory Context	2
1.4	Project Construction	2
1.5	Land Ownership	5
1.6	Personnel	5
1.7	Site Assessment Dates	5
2.0	Landscape Description.....	6
2.1	Land Use	7
2.2	Natural Subregion	7
2.3	Watershed	7
2.4	Relative Wetland Value Assessment Unit	7
2.5	Physiographic Region	9
2.6	Hydrogeology	9
2.7	Geology	9
2.8	Soils	9
2.9	Catchment and Drainage	10
2.10	General Description of Adjacent Upland Habitat	13
2.11	Species of Management Concern	13
3.0	Wetland Assessment.....	15
3.1	Site Assessment Dates	16
3.2	Wetland Permanence	16
3.3	Precipitation	16
3.4	Wetland Classification	17
3.5	Wetland Delineation	17
3.6	Wetland Vegetation Observations	17
3.7	Existing Wetland Disturbance	17
3.8	Wetland Valuation	18
4.0	Impacts.....	21
5.0	Mitigation Proposal.....	24
5.1	Avoidance	25
5.2	Minimization	25
6.0	Replacement Proposal.....	30
7.0	References.....	32



APPENDICES

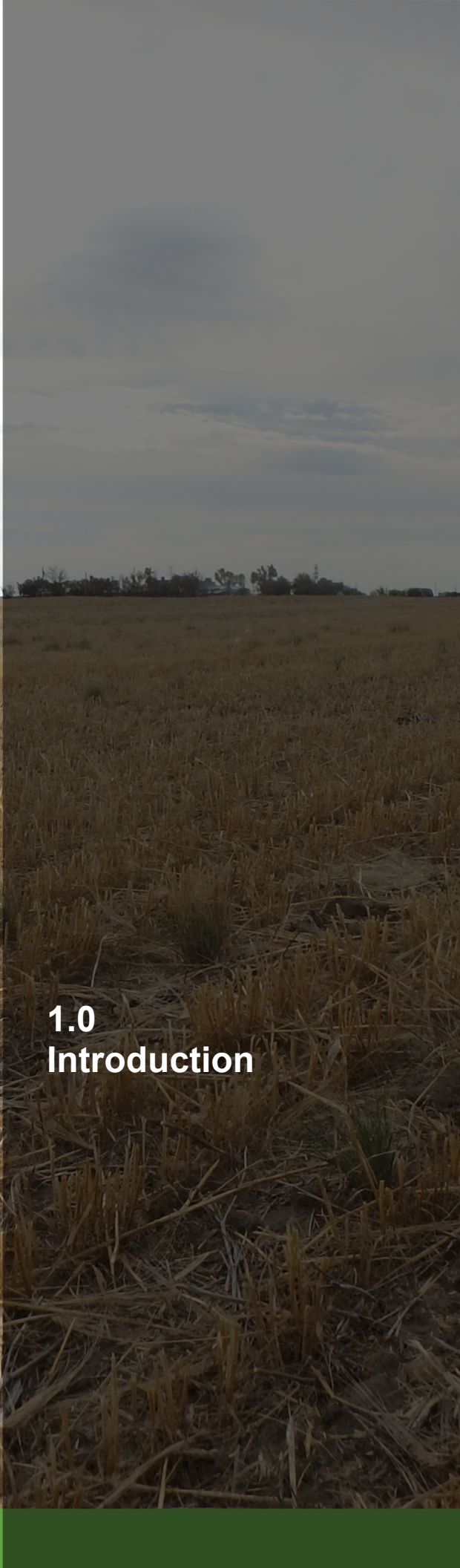
- Appendix A Qualifications
- Appendix B Photo Plates
- Appendix C FWMIT and ACIMS Results
- Appendix D Historical Photography
- Appendix E ABWRET-A Results

TABLES

Table 2.8.1: Soil Polygon	9
Table 2.9.1: Catchment Sizes	10
Table 2.11.1: 2 km FWMIT Database Search	13
Table 3.3.1: Historical Precipitation and Air Photo Information	16
Table 3.4.1: Information and Evidence Used to Classify Wetlands	17
Table 3.8.1: Wetland Valuation Results (ABWRET-A)	18
Table 3.6.1: Field Indicators for Wetland Identification	19
Table 4.1: Wetland Areas of Impact	22
Table 5.1: Mitigation Measures	26
Table 7.1: Wetland Replacement Matrix	31
Table 7.2: Wetland Replacement in-lieu Fees	31

FIGURES

Figure 1.1: Project Location Overview	3
Figure 1.2: Project Concept Plan	4
Figure 2.1: Surrounding Land Use	8
Figure 2.2: Approximate Catchments (Wetland 1 and 2)	11
Figure 2.3: Hillshade Topography	12
Figure 3.1: Wetland Soil Plots	20



1.0
Introduction

1.1 Background

ISL Engineering & Land Services has been contracted by the Evolution Land Development Corporation (ELDCI) to provide a Wetland Assessment and Impact Report (WAIR) for the proposed 54 ha residential and commercial development located at SE 1/4 Section 23-12-27-W4M in Claresholm, Alberta (Figure 1.1)

This WAIR has been conducted in accordance with the Alberta Wetland Assessment and Impact Report Directive (the Directive) (Government of Alberta, 2017). Two wetlands will be completely filled for site development. This WAIR will be utilized in submission for *Water Act* regulatory application as a wetland will be impacted.

1.1 Project Need and Rationale

This development project services the need for additional residential and commercial development in the Claresholm area. As the Project utilizes the entire developable area, wetland retention is not feasible.

1.2 Project Development Concept

The proposed development consists of eight full phases of development, with a single offsite phase including the construction of a stormwater management facility and sewer and water connections. The development site is a multi-phase development consisting of 12.85 ha. of commercial, 18.73 ha. of single family residential, 5.39 ha. of open space, 3.24 ha. of medium density multi-family, 1.10 ha. of townhouses and includes 0.92 ha. for a private facility.

Figure 1.2 shows the proposed site layout for development.

1.3 Regulatory Context

Two (2) wetlands are expected to be impacted by the construction of the Project and will experience permanent wetland area loss. Consequently, the Project requires a *Water Act* approval to proceed to construction.

Wetlands 1 and 2 on the Project do not meet permanence requirements to be submitted for an assessment of crown claimability under the *Public Lands Act* (AEPA 2016).

EPEA registration will be required for the Storm Water Management Facility as it's location overlaps that of Wetland 1.

1.4 Project Construction

1.4.1 Construction Schedule

Construction for the Project is scheduled to be tendered in late 2024 and construction is expected to begin in 2024. The construction work that impacts the identified wetland area will not commence until receipt of regulatory approvals is secured. ISL is fully available at any time during the Alberta Environment and Protected Areas (AEPA) review process to meet or provide clarification on any aspect of the Project.

1.4.2 Construction Methodology

Earthworks, grading and construction are expected to commence following receipt of regulatory approval. The work is anticipated to progress to earthworks, deep utilities, shallow utilities, roadworks, pathways and landscaping.



- Legend**
- Project Area
 - Wetlands

TITLE:
Location Overview

28434
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0 40 80 160 Meters
NAD 1983 UTM Zone 11N 1:5,000

	FIGURE	1.1
	DATE	2023-12-13
	PROJECT NO.	28434
	AUTHOR	RG





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- Town of Claisholm Boundary
- Proposed ASP Boundary
- Residential Estate Lots (Min 20m x 44m)
- Residential Large Lot (Min 20m x 40m)
- Residential Single Family (Min 15.2m x 35m)
- Multi-Family Residential / Seniors
- Highway Commercial
- Service Industrial
- Open Space
- Storm Water Management

Development Concept

Figure 1.2
Town of Claisholm
Evolution Area Structure Plan
February 2024



1.5 Land Ownership

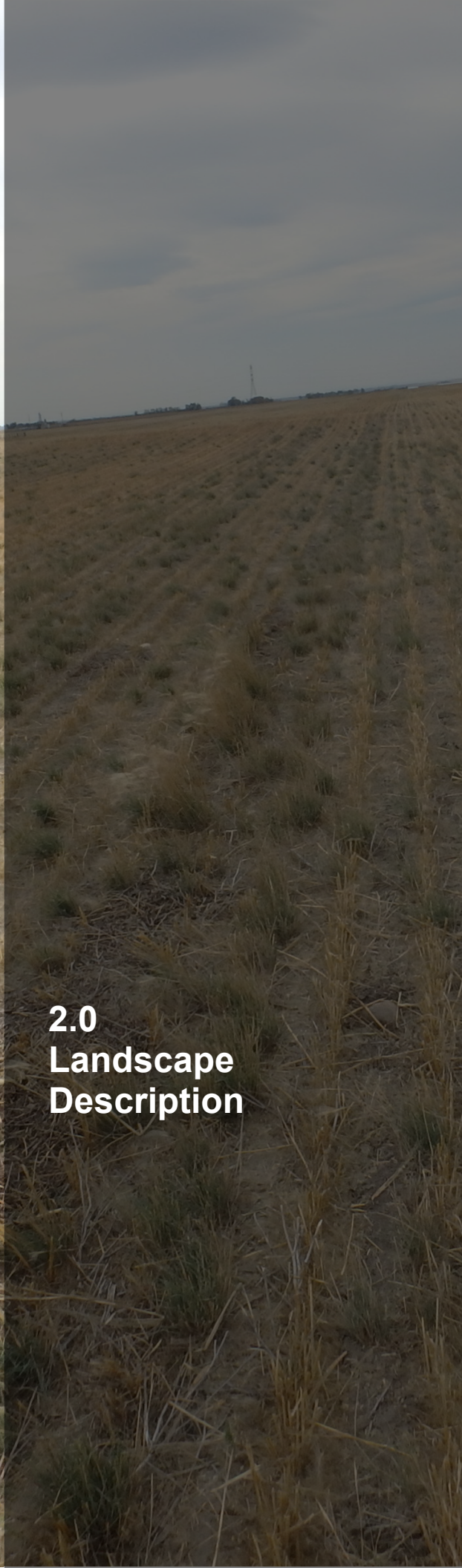
The land where the Project is located is owned by the applicant, ELDCI.

1.6 Personnel

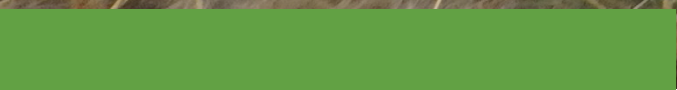
Robyn Gamber is an Environmental Scientist with ISL and a Professional Biologist (P. Biol.) in good standing with the Alberta Society of Professional Biologists (ASPB). She has been conducting wetland assessments and writing wetland reports since 2016, received formal Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A) training from SALMTEC in 2016 and is an AEPA authenticator for WAIRs (qualifications provided in Appendix A). Ms. Gamber conducted the wetland assessments (ABWRET-A) on the Project.

1.7 Site Assessment Dates

The ABWRET-A assessment (Government of Alberta, 2015) was conducted on September 18, 2023. This wetland assessment will expire on September 17, 2026.



**2.0
Landscape
Description**



2.1 Land Use

The proposed development area is located within the Town of Claresholm, AB (the Town) and west of Hwy 2. It is bounded by 39 Avenue West to the north, Township Road 123 to the east, a golf course to the west, and agricultural fields to the south. Surrounding land use is depicted in Figure 2.1.

The existing land use in the area is dominated by agriculture and it was cultivated at the time of the field assessment.

2.2 Natural Subregion

Grassland Natural Region

Mixedgrass Natural Subregion

The Project is located in the Mixedgrass Natural Subregion of the Grassland Natural Region (Natural Regions Committee [NRC] 2006). The Mixedgrass Natural Subregion is a broad, north-south band of fertile, intensively cultivated prairie in south-central Alberta. It receives slightly higher precipitation than the Dry Mixedgrass to the east and less than the Foothills Fescue to the west. Undulating and hummocky till plains, level lacustrine areas and undulating to hummocky eolian deposits are typical landforms. The Mixedgrass Natural Subregion occurs on well drained, loamy Dark Brown Chernozemic soils. The three reference sites within this subregion, are differentiated according to location and elevation within the subregion.

On scattered native prairie remnants located within the plains reference site, northern wheat grass (*Elymus lanceolatus*), western wheat grass (*Agropyron smithii*), needle-and-thread (*Stipa comata*) and June grass (*Koeleria macrantha*) are dominant. On dry, sandy sites, sand grass (*Calamovilfa longifolia*) form part of the communities. Moist sites are characterized by the addition of blue grama grass (*Bouteloua gracilis*) to the community.

Shrub communities, including buckbrush (*Symphoricarpos occidentalis*), silver sagebrush (*Artemisia cana*), silverberry (*Elaeagnus commutata*) and prickly rose (*Rosa acicularis*), occur in depressions, ravines, coulees and northerly aspects. Adjacent to rivers, tall shrub and forest communities of willows (*Salix* spp.), thorny buffaloberry (*Shepherdia argentea*) and narrow-leaf cottonwood (*Populus angustifolia*) or balsam poplar (*Populus balsamifera*) develop. Moisture deficiencies during the summer months may be limiting to crop production and irrigation is sometimes necessary (Natural Regions Committee 2006).



2.3 Watershed

The Project is located within the Oldman River Watershed, and part of the South Saskatchewan River basin (GOA 2023b). The Oldman Watershed extends eastward from the slopes of the Rocky Mountains through various landscapes, including rangelands, dryland, irrigated agricultural plains, and prairie grasslands. The Rocky Mountains contribute to the headwaters of the Oldman mainstream and its tributaries, such as the Crowsnest and Castle rivers, Willow and Pincher creeks. Additionally, the headwaters of the Belly, Waterton, and St. Mary rivers originate in Montana. The watershed exhibits diverse conditions in terms of land and water resources, influenced by human activities. In headwater sub-basins, water quantity is sufficient, water quality is generally fair to good, and riparian ecosystems are healthy. However, as the Oldman River progresses eastward, water quality declines, available water supplies decrease, and several concerns arise, indicating varying impacts on the environment (Oldman Watershed Council, 2022).

2.4 Relative Wetland Value Assessment Unit

With respect to wetland replacement pursuant to the Wetland Policy (Government of Alberta 2013), the Project Area is located within the Relative Wetland Value Assessment Unit (RWVAU) 21, where *in lieu* rates are \$17,700/ ha (Government of Alberta 2018).



- Legend**
-  Project
 - Land Use within 2km Buffer**
 -  Cultivated
 -  Hay
 -  Highway
 -  Recreational - Golf Course
 -  Rural Residential
 -  Urban

TITLE:
Land Use

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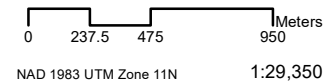


FIGURE 2.1
DATE 2023-12-13
PROJECT NO. 28434
AUTHOR RG



2.5 Physiographic Region

Physiographic regions are large and distinct areas that share similar relief and landforms shaped by common geomorphic processes and geological history. The Project lies within the Interior Plains physiographic region (The Canadian Encyclopedia 2023) in the Western Alberta Plains Region of the Southwest Plains, in the Little bow Plains District (Agriculture Canada 2023). The Interior Plains physiographic region consists of poorly consolidated shales, siltstones and sandstones. Flat lying limestones and marine originating shales underly the entire region. In the southern portion of the Interior Plains, grassland vegetation dominates.

2.6 Hydrogeology

Water table and shallow surficial deposit groundwater in the Project area are expected to be a muted representation of surface topography. Water wells registered in the Alberta Groundwater Information Centre Water Well database in the vicinity of the Project indicate groundwater levels in the underlying bedrock to range from 2 to 3 m below ground surface (GOA 2023a).

2.7 Geology

The underlying bedrock geology of the Project area is the Willow Creek formation. The formation is mixture of mudstone and sandstone, formed during the Upper Cretaceous and Paleogene age (AER 2013).

2.8 Soils

The Project is located primarily in Orthic Dark Brown Chernozemic soil group including polygons 6147 and 6099 (Alberta Agriculture and Forestry 2023a). Further information is detailed in Table 2.8.1 below.

Table 2.8.1: Soil Polygon

Polygon Code	Soil Polygon Code	Landform	Component	Landscape Model Description
6147	ZDL1/DL	DL- disturbed land	1	Miscellaneous undifferentiated mineral soils (ZUN).
6099	LEWN4/U11	U11 – undulating-low relief	1	Orthic Dark Brown Chernozem on medium textured (L, SiL) sediments deposited by wind and water (LET).
			2	Orthic Dark Brown Chernozem on medium textured (L, SiCL, CL) materials over medium (L, CL) or fine (C) textured till (WNY).

Source: Alberta Agriculture and Forestry: Alberta Soil Information Viewer (2023a)

2.9 Catchment and Drainage

Contour mapping of the Project area is not available in fine enough scale to capture the precise catchment size; however, Google Earth Pro Elevations (Google 2023) provides approximate catchment size estimates, listed in Table 2.9.1 below and shown in Figure 2.2. Topography is depicted in Figure 2.3.

Table 2.9.1: Catchment Sizes




Wetland	Wetland size (ha)	Estimated Catchment size (ha)
1	0.72	17
2	0.27	6

Other Hydrological Features Nearby or within the Project

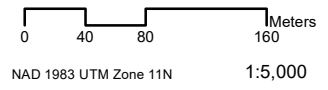
Artificial Water Features


The nearest waterbodies are artificial water features within the golf course, immediately west of this Project.



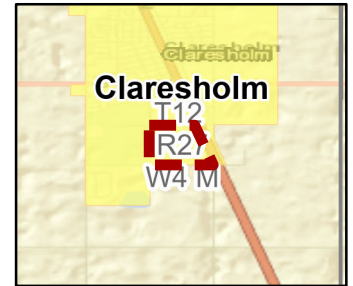
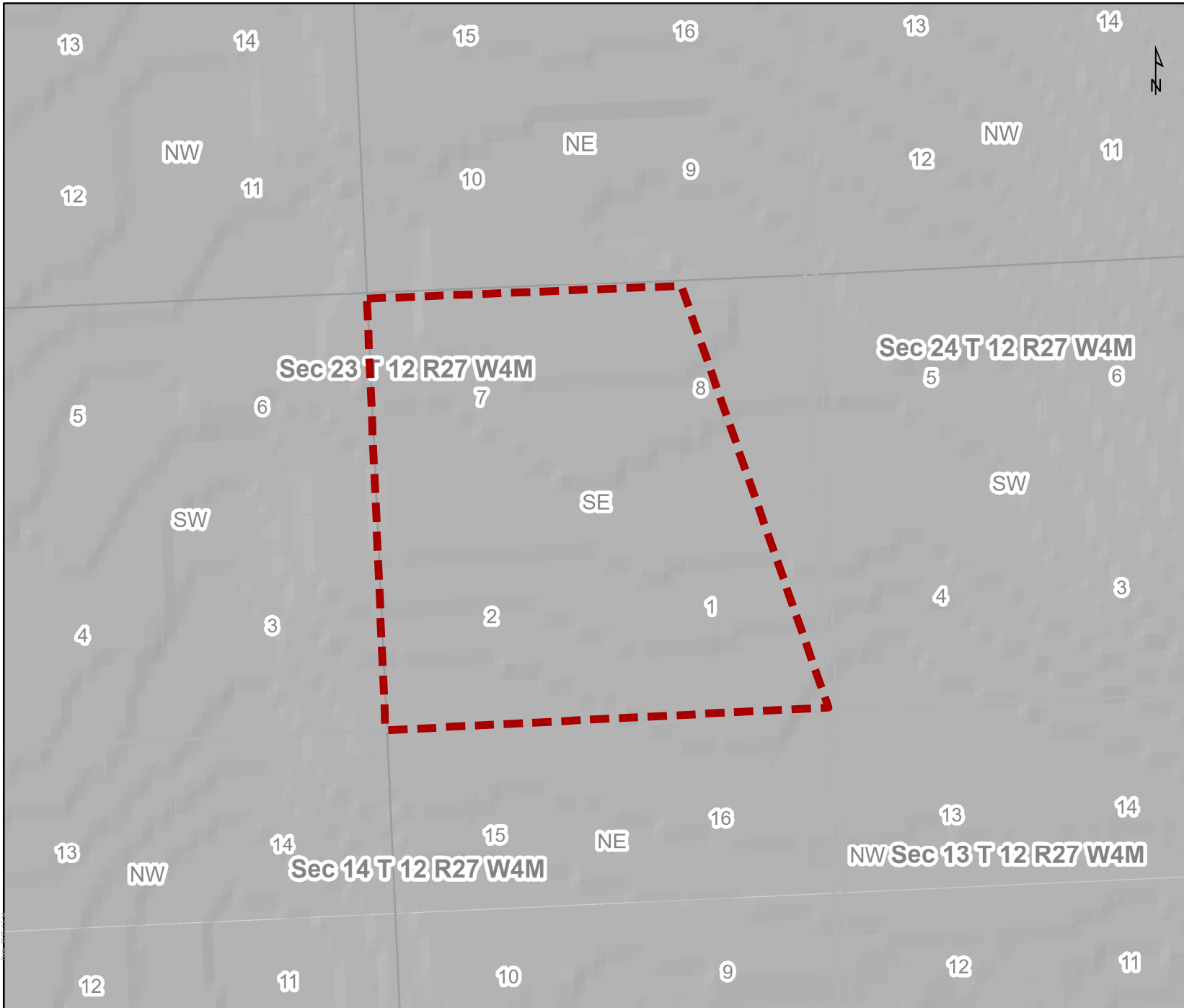
- Legend**
-  Project Area
 -  Wetlands
 -  Wetland Catchment (estimated using Google Earth)

TITLE:
 Approximate Wetland Catchments
 28434
 ELDCI Subdivision Planning



	FIGURE	2.2
	DATE	2023-12-13
	PROJECT NO.	28434
	AUTHOR	RG





Legend

 Project Area

TITLE:
Hillshade Topography

28434
ELDCI Subdivision Planning

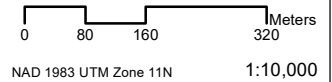


FIGURE 2.3
DATE 2023-12-13
PROJECT NO. 28434
AUTHOR RG



2.10 General Description of Adjacent Upland Habitat

The Project is best described as cultivated agricultural land. Site photographs showing wetland and upland vegetation are provided as photo plates in Appendix B.

The existing vegetation community of the Project is dominated by an agricultural crop (barley/wheat or similar). Other species more sparsely observed are mainly all weedy non-natives including creeping (Canada thistle) (*Cirsium arvense*), and summer cypress (*Kochia scoparia*).

2.11 Species of Management Concern

No rare plants or rare ecological communities were recorded in ACIMS within 2 km of the Project (ACIMS 2022). Output from the Alberta Conservation Information Service (ACIMS) is provided in Appendix C.

2.11.1 Wildlife

The Alberta Fish and Wildlife Internet Mapping Tool (FWMIT [AEPA 2021]) was queried on December 13, 2023. This search was completed using the Internet Mapping Tool utilizing a 2km buffered polygon centered on the proposed Project Area. Results of the search provided a list of 2 vertebrate species at risk with potential to occur in the Project Area (Table 2.11.1). Additionally, the Project intersects the Prairie falcon (*Falco mexicanus*) sensitive range. FWMIT results can be viewed in Appendix C.

2.11.2 Fish

A FWMIT search of the 2 km buffer surrounding the Project area returned two records non-sportfish occurrences (AEPA 2021), FWMIT results can be viewed in Appendix C and Table 2.11.1.

Table 2.11.1: 2 km FWMIT Database Search

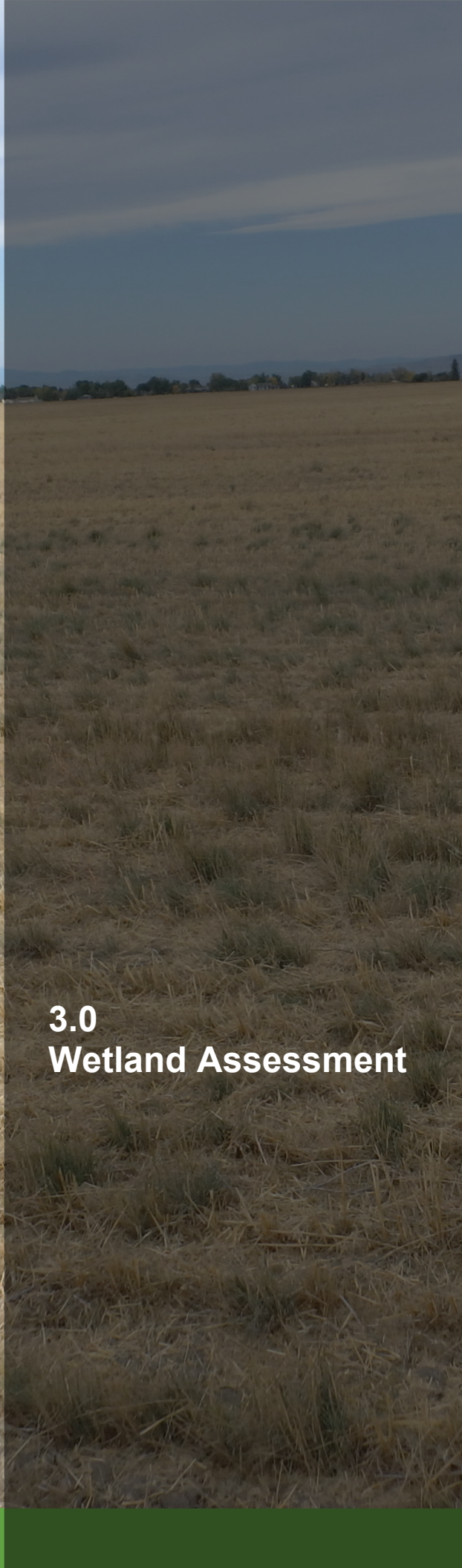
Common Name	Scientific Name	GSAWS ¹	Alberta Wildlife Act ²	SARA ³
Wildlife Inventory				
Ferruginous hawk	<i>Buteo regalis</i>	At Risk	Endangered	Special Concern
Plains spadefoot	<i>Spea bombifrons</i>	May Be At Risk	Not listed	Not at Risk
Fish Inventory				
Burbot	<i>Lot lota</i>	Secure	Not listed	Not listed
Prussian carp	<i>Carassius gibelio</i>	Exotic	Not listed	Not listed

Notes:

1. General Status of Alberta Wild Species (Government of Alberta 2020).
2. Alberta Wildlife Act (Government of Alberta. 2000a).
3. SARA status retrieved from Species at Risk Registry (Government of Canada 2022).



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3.0
Wetland Assessment

3.1 Site Assessment Dates

The ABWRET-A assessment and field delineation of wetlands 1-2 (Government of Alberta 2015a, b) was conducted on September 18, 2023.

3.2 Wetland Permanence

Wetlands 1 and 2 do not meet permanence requirements to be eligible for Crown ownership (AEPA 2016).

3.3 Precipitation

Precipitation data is provided in Table 3.3.1. The mean precipitation is 417.73 mm (SEM 10.2 mm). The highest yearly precipitation recorded was in 1951 at 697.78 mm and the lowest in 2001 at 175.58 mm (Alberta Agriculture and Forestry 2023b).

Table 3.3.1: Historical Precipitation and Air Photo Information

Air Photo Date ^{1,2} (Season)	Air Photo ID Roll; Photo	Scale (1:)	Annual Precipitation ³	Monthly Precipitation ³	Daily Precipitation ³
1949	AS0178; 150	40000	Within average	N/A	N/A
1967	AS0987;14	31680	Within Average	N/A	N/A
1972-May-31 (Spring)	AS1170; 61	6000	Above Average	2.03mm Below Monthly Average (approx. 35.53 mm prior 2 weeks)	0 mm
1979-Nov-20 (Winter)	AS2132;256	10000	Below Average	8.64 mm below Monthly Average (approx. 0 mm prior 2 weeks)	0 mm
1985-May (Spring)	AS3202;238	30000	Very Slightly Above Average	20.62mm Below Monthly Average	N/A
1993-Sept-18 (Fall)	AS4374;189	20000	Above Average	9.41 mm Above Monthly Average (approx. 33.7 mm prior 2 weeks)	0 mm
2000-May-25 (Spring)	AS5104;213	20000	Below Average	41.18mm Below Monthly Average (approx. 1.81 mm prior 2 weeks)	0 mm
2012	DS2012021-15	30000	Below Average	N/A	N/A

Notes:

1. Where collection date is available
2. All aerial imagery sourced from AEPA's Aerial Photo Record System (APRS) (Alberta Environment and Protected Areas, 2023)
3. All historical precipitation data from (Alberta Agriculture and Forestry, 2023)

3.4 Wetland Classification

The details used to classify the wetlands are in Table 3.4.1. Field identifiers for identification and delineation are provided in Table 3.6.1. Wetland boundaries were determined by a combination of soils indicators, topography, historical photography and vegetation species (where present). Figure 3.2 provides a map showing soils plots and where soils were indicative of wetlands, wetland boundaries, or no wetland presence.

Table 3.4.1: Information and Evidence Used to Classify Wetlands

Wetland ID	Classification Codes	Soil Characteristics	Hydrologic Characteristics	Vegetation Characteristics ¹	Most Abundant Indicator	Photoplates (Appendix B)
1	M-G-II	Gleying starting at 19cm from soil surface (Matrix: 10YR 4/2 Gley: 10YR 6/2)	No surface water present at time of field assessment (September)	foxtail barley (<i>Hordeum jubatum</i>)	Topography of land is a basinal depression foxtail barley, soils indicators	1-2
2	M-G-II	Evident rusting of iron mottles starting at 16cm from soil surface, gley layer begins at 19cm (Matrix: 10YR 3/1 Gley: 10YR 7/10)	No surface water present at time of field assessment (September)	foxtail barley (<i>Hordeum jubatum</i>)	Topography of land is a basinal depression, foxtail barley, soils indicators	3-4

Notes:

- As defined in Alberta Wetland Plant Indicator Species List (Alberta Native Plant Council 2021).

3.5 Wetland Delineation

Field indicators for wetland identification and delineation is provided in Table 3.4.2. Field based wetland delineations were completed with a hand-held Garmin GPS unit with +/-3 meter accuracy. Historical imagery, used to complete the desktop pre-field work, is provided in Appendix D.

Pathway 5 (comprehensive desktop delineation with field verification) was used to delineate all the wetlands due to periodically saturated indicators at the wetland edges not being visible at all times, and good available imagery. Due to the heavy disturbance of cultivation and likely herbicide spraying of the crop, soils indicators were relied on.

3.6 Wetland Vegetation Observations

Wetland vegetation is described in Table 3.4.1 and 3.6.1. No rare plants were identified during the field assessment.

3.7 Existing Wetland Disturbance

Wetland 1 and 2 were observed to be cultivated at the time of assessment.

3.8 Wetland Valuation

The wetland value was determined by AEPA using their ABWRET-A valuation tool. AEPA valuation results are included in Table 3.8.1 and provided in Appendix E. The wetland area requiring in-lieu fee replacement is provided in Table 4.1.

Table 3.8.1: Wetland Valuation Results (ABWRET-A)

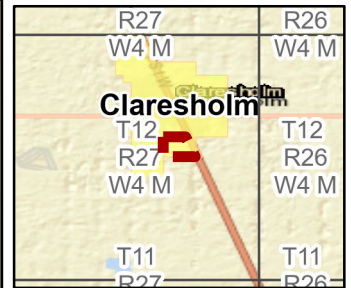
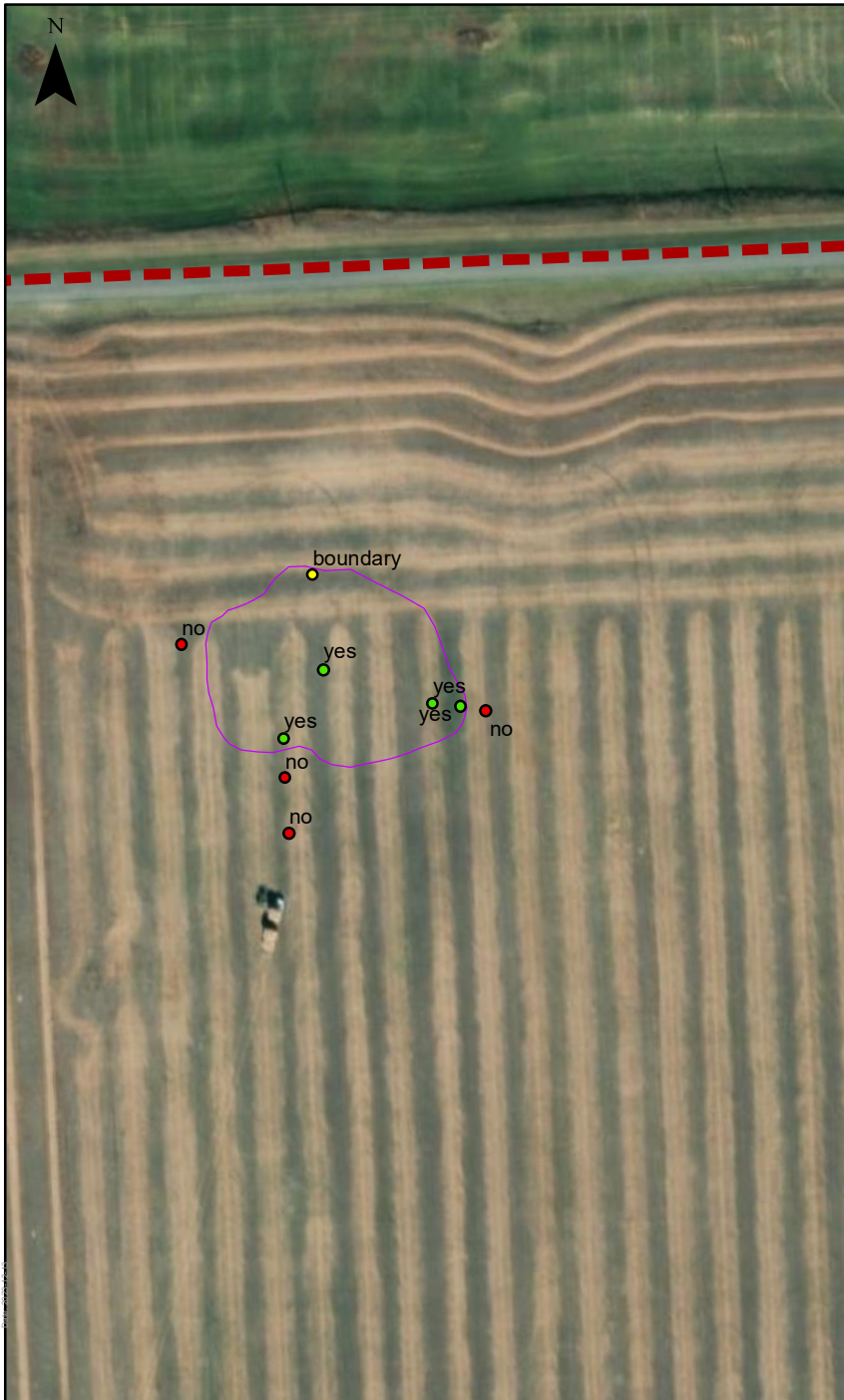
Wetland ID	Value
1	B
2	B

Table 3.6.1: Field Indicators for Wetland Identification

Wetland Number	Wetland Class Code (Vegetation Community Name)	Plot Technique	Plot Location (UTM) (Zone 12U) ¹	Stratum (Ground, Shrub, Tree)	Common Name	Latin Name	Wetland Species ²	Percent Relative Cover of Abundant Species (Rounded to the nearest 5) ³
WL1	M-G-II	1x1	315375 E/ 5542471 N	Ground	Foxtail barley	<i>Hordeum jubatum</i>	FACW	15
					Crop species (wheat/barley)	-	-	60
					Bare ground	-	-	20
WL2	M-G-II	1x1	314965 E/ 5543015 N	Ground	Crop species (wheat/barley)	-	-	55
					Bare ground	-	-	20
					Foxtail barley	<i>Hordeum jubatum</i>	FACW	20
					common plantain	<i>Plantago major</i>	FAC	5
					Canada thistle	<i>Cirsium arvense</i>	FACU	T

Notes:




- Assessment of representative vegetation via purposeful meander on foot and 1x1 plots.
- As defined in the Alberta Wetland Plant List (Alberta Native Plant Council, 2021). Great Plains Regions results listed.
 OBL: Obligate (almost always a hydrophyte, rarely in uplands)
 FACW: Facultative Wetland (usually a hydrophyte, occasionally found in uplands)
 FAC: Facultative (commonly occurs as either a hydrophyte or nonhydrophyte)
 FACU: Facultative Upland (Occasionally is a hydrophyte, usually occurs in uplands)
- May not add to 100 due to surface water, bare ground or thatch
- It is presumed by the field assessor that herbicide use on this crop occurred this spring, resulting in lack of wetland species in wetlands within cropland cultivated wetlands.



Legend

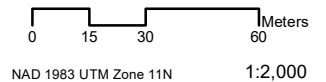
-  Project Area
-  Wetlands


Soil Plots

-  boundary (soils indicate wetland boundary)
-  no (Soils do not indicate this is wetland)
-  yes (Soils indicate wetland)

TITLE:
Wetland Soil Plots

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	FIGURE	3.1
	DATE	2023-12-13
	PROJECT NO.	28434
	AUTHOR	RG





**4.0
Impacts**

The proposed Project (~54.8ha) encounters two wetlands with an area totaling 0.99 ha (Table 4.1 and Figure 4.1). Loss of 0.99 ha of wetland area is unavoidable, due to the nature of the proposed project as described in Sections 1.0 and 5.0 and illustrated in Figure 4.1.

Table 4.1: Wetland Areas of Impact

Wetland	Area (ha) of Entire Wetland	Area of Wetland Impact (ha)	Percentage of Wetland Impacted
1	0.72	0.72	100%
2	0.27	0.27	100%

The Project includes complete infilling of wetlands for residential and commercial development. As discussed in Section 1.2, the entire site will be utilized for development purposes.

Total wetland loss in the Project Area is expected as a result of the Project. With the implementation of a storm water management plan, the Project will mitigate for this change within the Town and surrounding area.

With the implementation of an engineered storm management plan, the hydrological impact of infilling of these wetlands on the larger watershed and adjacent neighbours will be mitigated. Additionally, payment of in-lieu compensation fees is proposed to mitigate for the loss of these wetlands.

Project construction is not expected to have adverse effects on the health and safety of the local human or wildlife populace. The wildlife habitat on the Project Area is overall considered poor quality as it is adjacent to the Town and has on-site disturbance (e.g., cultivation and adjacent roads). Furthermore, mitigation measures outlined in Table 5.1 will be implemented to minimize impacts to biophysical resources.

The Project represents an incremental change to existing conditions within the surrounding area. Due to the Project, cumulative effects on the landscape, watershed, and wetlands in the broader environment are thus expected to be incremental.

Details on footprint selection is provided in Section 4.2. Mitigation to minimize Project impacts is provided in Section 4.3, while details on the in-lieu fees for wetland replacement are provided in Section 5.0.



Legend

- Project Area
- Wetland Impact Area

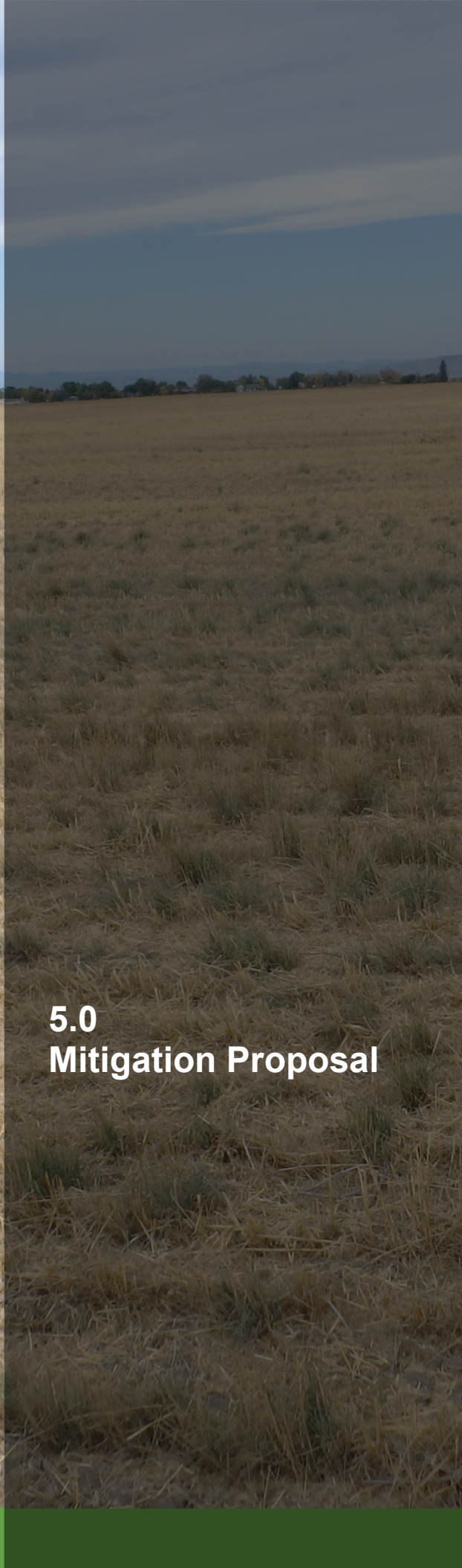
TITLE:
Wetland Impacts

28434
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0 40 80 160 Meters
NAD 1983 UTM Zone 11N 1:5,000

	FIGURE	4.1
	DATE	2023-12-14
	PROJECT NO.	28434
	AUTHOR	RG





**5.0
Mitigation Proposal**



5.1 Avoidance

Due to the nature of the Project as described in Section 1.0, impacts to the wetlands cannot be avoided. Mitigation measures will be employed (Table 5.1) and wetland replacement (Section 5.0) is required. The following section outlines the reasonings used to determine the final Project footprint.

5.1.1 Project Footprint Selection

The development utilizes the entire land area for construction of residential and commercial areas. Wetland infilling is not avoidable and is required to complete site grading in a feasible manner. Utilization of the site for these purposes is in keeping with the Towns plan for this area in this growing community.

5.2 Minimization

Due to the nature of the proposed Project as described in Section 1.0, impacts of the Project can be minimized during construction with mitigation techniques. Mitigation for the Project includes standard mitigation, as presented in Table 5.1.

Table 5.1: Mitigation Measures

Project Consideration	Recommendations/Mitigation
Geology, Topography, Soils	
<ul style="list-style-type: none"> Alteration of drainage patterns 	<p style="text-align: center;">Construction</p> <ul style="list-style-type: none"> Implement erosion control plan. Monitor measures regularly and repair on an as needed basis. During soil disturbance activities, identify locations where there are gaps in snow, topsoil, and spoil, and if needed, are to be created. Gaps are typically associated with terrain features (e.g., slope changes). If the spoil piles have frozen to an extent that would impair natural water drainage on site, postpone grading until appropriate conditions prevail. Reduce the grading to areas where work will be conducted in a relatively short timeframe as practical to limit the potential for dust and erosion. Place erosion control matting, wood chips, wood mulch, tackifier, staked logs or rollback on slopes or exposed sites that will be difficult to stabilize. Ensure that adequate anchoring of the erosion control matting is in place. Ensure there is sufficient frost or low enough soil moisture to allow construction without causing excessive rutting or soil compaction. Monitor soil piles for erosion. Initiate erosion control (e.g., watering down, tackifier application), if warranted. Replace soil horizons in the order removed, where applicable. De-compact compacted subsoils, temporary access roads and soils damaged during wet weather to the depth of compaction prior to topsoil replacement. If soils are wet, postpone decompaction until soils dry to ensure that compaction alleviation measures are effective. Regrade areas with vehicle ruts, erosion gullies, or where soil subsidence has occurred. Conduct dust control as necessary. Do not use methods that will cause chemical inputs into nearby offsite waterbodies, including ditches. <p style="text-align: center;">Post Construction</p> <ul style="list-style-type: none"> Restore topography at temporary workspace locations to return drainage patterns as close to the original as possible. Install temporary fences, if warranted, to restrict disturbance of soils until vegetation is established. Monitor areas of potential soil instability following construction. Conduct remedial erosion control work, as needed.
Hydrology- Groundwater and Surface Water	
<ul style="list-style-type: none"> Contamination of groundwater from external pollutants Alteration of water quality and flow patterns 	<p style="text-align: center;">Pre-Construction</p> <ul style="list-style-type: none"> Plan for erosion and sediment control measure implementation. Acquire regulatory approvals and prepare to implement mitigation measures. Ensure baseline data has been collected to ensure water quality. Install a silt fence, or other appropriate erosion control measures to prevent erosion to downstream waterbodies and ditches, appropriate for conditions at the time. Preferentially schedule construction in dry or frozen conditions if possible. <p style="text-align: center;">Construction</p> <ul style="list-style-type: none"> Maintain equipment in good working condition and ensure that equipment and vehicles are free of leaks. Do not wash equipment or machinery near any waterbody, watercourse or ditch. Control wastewater from construction activities by diverting wastewater to confirmed upland locations. Ensure no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides, or other chemicals are released on the ground or into any drainage features. Maintain drainage across any temporary workspace during construction. Ensure construction does not cause ponding of water or unintentional channelization of surface water flow.

Project Consideration	Recommendations/Mitigation
	<p style="text-align: center;">Post Construction</p> <ul style="list-style-type: none"> • Re-establish surface drainage patterns, where feasible and as planned in the storm water management plan. • Remove all mats, ramps, and approaches after construction so they do not impede the restoration of natural drainage patterns.
Vegetation	
<ul style="list-style-type: none"> • Introduction of new weed or invasive species • Further establishment of existing weed or invasive species 	<p style="text-align: center;">Pre-Construction</p> <ul style="list-style-type: none"> • Prior to construction, the contractor shall manage weeds located on the construction footprint (ideally) during the previous growing season. This is to additionally include locations of temporary workspace, staging, and stockpile areas. <p style="text-align: center;">Construction</p> <ul style="list-style-type: none"> • The Project area has low densities of weed species within the cultivated area and high densities immediately outside of cultivation. Weed control prior, during, and following construction, as well as equipment cleaning and soil handling procedures to minimize weed spread, is recommended, including: • Ensure that all construction equipment is thoroughly cleaned before it arrives on-site and after it leaves the site to prevent the introduction of new weed species to the site or the spread of existing weed species to other locations. • Conduct weed control (if prior to seed set) before construction commences. • Monitor weed growth during construction occurring in the growing season and conduct weed control on soil storage piles and elsewhere, if necessary. Do not utilize the soil in weed infested areas on other projects to avoid transferring weeds to other locations. • The awarded construction contractor shall conduct monitoring of weed growth and conduct weed control until project closure. • Utilize a certified and licensed pesticide applicator company to conduct any chemical control of weeds. • If Noxious or Prohibited Noxious weeds (as listed by the Government of Alberta) are mechanically controlled (cutting, mowing, pulling), remains should be collected, double bagged, and disposed of in deep burial at a landfill. • Monitor for weed growth of Noxious and Prohibited Noxious weeds post construction. Implement control and eradication measures where warranted. • Construction equipment must be clean and free of soil or vegetative debris before its arrival on the Project site to reduce the risk of weed introduction. Any equipment that arrives dirty, will not be permitted on the construction footprint. • Install signage on the fences of avoidance areas to alert workers of sites to be avoided or where special measures are necessary. • Clear vegetation only as needed to reduce the potential for terrain instability and erosion potential into downstream water. • Monitor weed growth monthly in the growing season during the course of construction and conduct corrective measures. • If warranted, lay geotextile material such as matting over sensitive erosional areas to reduce soil and surface vegetation effects. • Develop appropriate work methods that will avoid or reduce disturbance and deposition of debris off the construction footprint. <p style="text-align: center;">Post Construction</p> <ul style="list-style-type: none"> • Place an erosion control blanket or other appropriate measure if directed to do so by the ESC Plan to support seed establishment for erosion control. After seeding, reduce the foot traffic or fence until establishment has occurred. • Vehicle traffic should be prohibited on newly vegetated areas until establishment to reduce erosion potential. • If weed species on the <i>Weed Act</i> are observed, they are to be immediately controlled or eradicated.
Wildlife and Wildlife Habitat	
<ul style="list-style-type: none"> • Alteration / loss of wildlife wetland habitat. 	<p style="text-align: center;">Pre-Construction</p> <ul style="list-style-type: none"> • Conduct pre-construction nest sweeps if warranted based on construction timing and follow all wildlife mitigation recommendations in the Biophysical Assessment.

Project Consideration	Recommendations/Mitigation
<ul style="list-style-type: none"> Wildlife sensory disturbance of construction activities. Direct wildlife mortality during construction from vehicle traffic. 	<p style="text-align: center;">Construction</p> <ul style="list-style-type: none"> Fence or stake boundaries of disturbance. Do not allow clearing or grading beyond the fencing/stakes unless mitigation plans and approvals have been made/obtained. Re-fence/stake the boundaries where warranted following disturbance. Ensure that noise abatement equipment (e.g. mufflers) on machinery is in good working order. Turn off equipment when not in use. Enclose noisy equipment, as needed, to limit the transmission of noise beyond the construction site. Report any wildlife incidents (e.g., aggressive behaviour and nuisance behaviour) or collisions with wildlife to the contractors wildlife biologist. Review restricted activity dates and sensitive breeding seasons applicable to construction-related activities prior to scheduling clean-up activities. If possible, schedule clearing and construction activities outside the migratory bird nesting window of February 15 to end of August 31. If not possible, the contractor shall hire a wildlife biologist to conduct pre-disturbance nest sweeps and will follow all measures recommended by the biologist. If clearing or construction activities occurs within the restricted activity dates, a nest survey a maximum of 7 days prior to construction activities will be required. Nest surveys by a qualified biologist should occur every 3-7 days during construction within the restricted activity dates until all habitat is removed, construction is complete, or as directed by a qualified biologist. In the event that active nests, dens, burrows, etc. are found during clearing and construction activities, the wildlife biologist is to be contacted and they may consult the appropriate regulator at their discretion. Active nests may be subject to an appropriate buffer until the nest is no longer active or a permit may be granted for removal. Do not harass or feed wildlife. Use signage, fencing, and reducing speed limits to avoid wildlife mortality related to collision as feasible. <p style="text-align: center;">Post Construction</p> <ul style="list-style-type: none"> Revegetate disturbed bare soils as soon as possible following construction to reduce the potential impact of erosion to downstream water/ wildlife habitat.
Wetlands and Waterbodies	
<ul style="list-style-type: none"> Alteration of wetland hydrology, area (shape) and water quality and quantity 	<p style="text-align: center;">Pre-Construction</p> <ul style="list-style-type: none"> Acquire regulatory approvals (i.e. <i>Water Act</i> Approval) and prepare to implement mitigation measures as described in the WAIR and in the <i>Water Act</i> approval letter. Copies of the approval are to be kept on site during construction. Install silt fencing or other appropriate protective measures to protect downstream and offsite waterbodies, prior to ground disturbance. Preferentially schedule construction in dry or frozen conditions if possible. <p style="text-align: center;">Construction</p> <ul style="list-style-type: none"> Use wide-track equipment, low-ground-pressure equipment, or conventional equipment operating from the vehicle crossing locations, or rig mats when working on saturated soils. If Wetlands must be dewatered, pump sediment laden dewatering discharge into a vegetated area or settling basin to prevent sediment and other deleterious substances from directly re-entering the wetland or any offsite wetland or waterbody. <p style="text-align: center;">Post Construction</p> <ul style="list-style-type: none"> Temporary measures (e.g., rig mats) and other temporary barriers (e.g., silt fencing, snow fencing) should not be left in place beyond their design period.



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**6.0
Replacement
Proposal**

The value for in-lieu wetland replacement fees assumes a D value of replacement wetland (Table 7.1). The Project is located in Relative Wetland Value Assessment Unit number 21, where the in-lieu rate is \$17,700.00/ ha (Government of Alberta 2018). Wetland replacement fee calculations are provided in Table 7.2.

Table 7.1: Wetland Replacement Matrix

Value of Wetland Lost	Value of Replacement Wetland			
	D	C	B	A
A	8:1	4:1	2:1	1:1
B	4:1	2:1	1:1	0.5:1
C	2:1	1:1	0.5:1	0.25:1
D	1:1	0.5:1	0.25:1	0.125:1

Notes: As described in Government of Alberta (2018).

Table 7.2: Wetland Replacement in-lieu Fees

Wetland ID	Value	Area (ha)	Replacement Multiplier	Replacement Area	Replacement Fee
1	B	0.72	4	0.72*4 =2.88 ha	\$50,976.00
2	B	0.27	4	0.27*4=1.08 ha	\$19,116.00
Subtotal					\$70,092.00
GST					\$3,504.60
TOTAL					\$73,596.60



7.0
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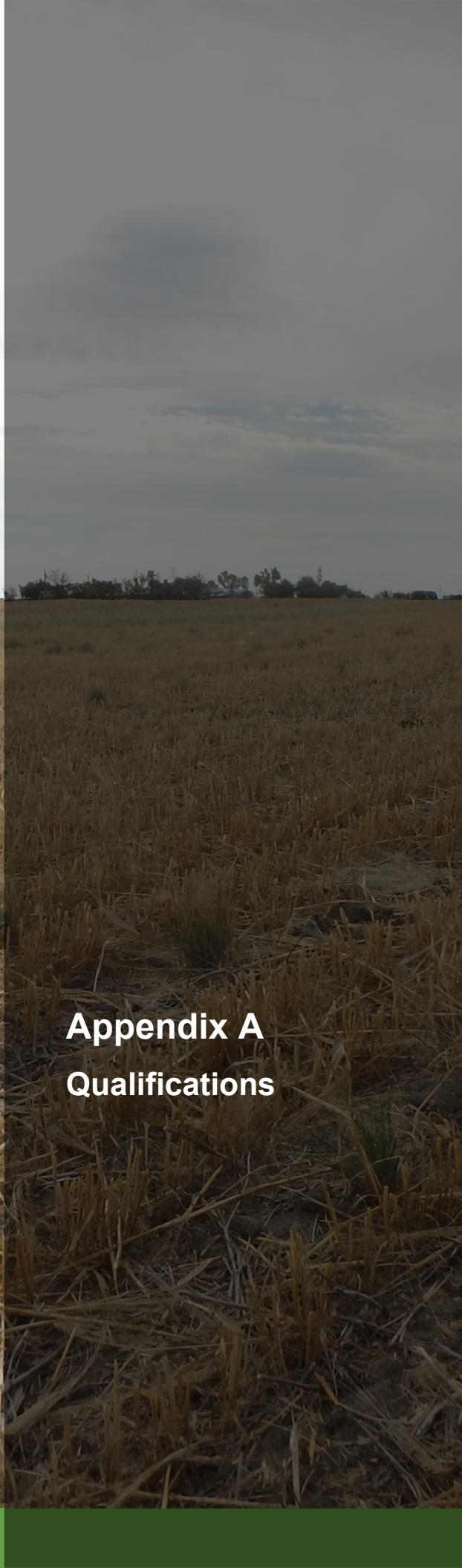
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**Appendix A
Qualifications**

SCIENCE AND LAND MANAGEMENT
TRAINING AND EDUCATION CENTRE INC.

CONGRATULATES

Robyn Gamber

on completing SALMTEC's 3-day **Alberta Wetland Rapid
Evaluation Tool – Actual** (White Area) Training Course, held in
Wheatland County from **July 6 to 8, 2016**, and is therefore awarded this

CERTIFICATE OF COMPLETION

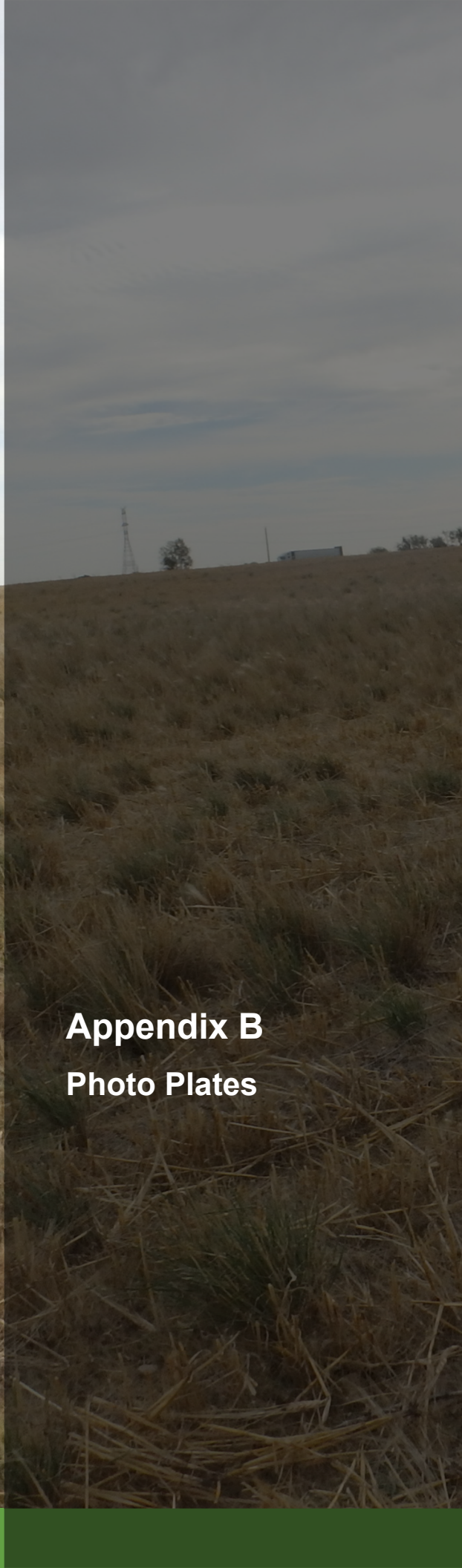
Paul Adamus

Dr. Paul Adamus
Course Instructor



Laurie Hamilton

Laurie Hamilton
SALMTEC Director



Appendix B
Photo Plates



Plate 1 View of Wetland 1 showing basinal nature of land, bare soils and foxtail barley (SE 23-12-27 W4M; approximately 12U 315412 E/ 5542443 N) (September 18, 2023).



Plate 2 View of soil from wetland 1 illustrating rusting and low chroma mottles (SE 23-12-27 W4M; approximately 12U 315375 E/ 5542471 N) (September 18, 2023).



Plate 3 View of Wetland 2 showing basinal nature of land, foxtail barley (SE 23-12-27 W4M; approximately 12U 314976 E/ 5543058 N) (September 18, 2023)



Plate 4 View of soil pit in Wetland 2 showing rusting in soils (SE 23-12-27 W4M; approximately 12U 314965 E/ 5543015 N) (September 18, 2023).



Appendix C
FWMIT and ACIMS
Results

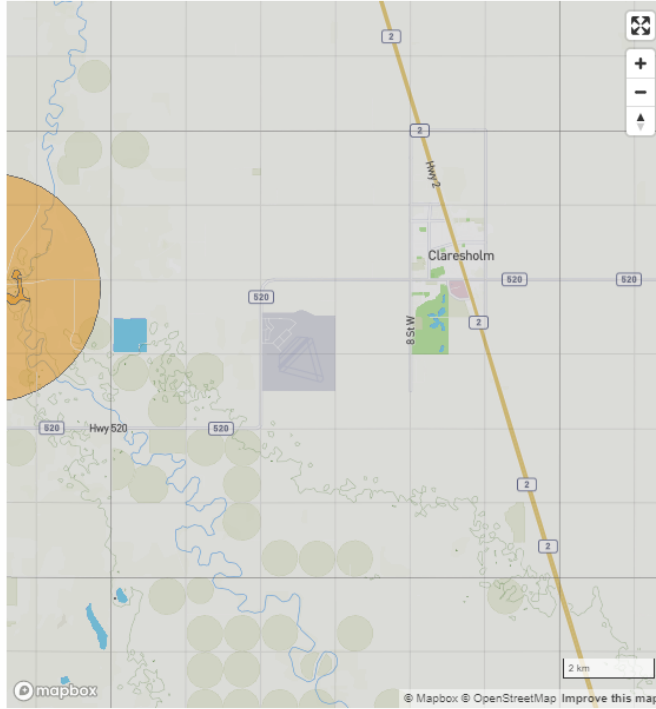
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2 Select Reason for Request: *

3

SEC	TWP	RGE	MER
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(option) [Convert Lat/Long to Township](#)



- Legend**
- Element Occurrences (part one, non-sensitive)
 - Element Occurrence (part two, sensitive)

For information on where to obtain GIS data for boundaries of parks and protected areas in Alberta, please refer to [Alberta's Open Data catalog](#).

Park and Protected area boundaries can be previewed using the [GeoDiscover Alberta geospatial viewer](#).

Date: 14/12/2023
 Requestor: Consultant
 Reason for Request: Element Occurrence Search
 SEC: 23 TWP: 012 RGE: 27 MER: 4



Non-sensitive EOs (updated: June 2022)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
-------------	-------	-------	--------	-------	----------	------------

No Non-sensitive EOs Found: Next Steps - [See FAQ](#)

Sensitive EOs (updated: June 2022)




M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
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No Sensitive EOs Found: Next Steps - [See FAQ](#)

Updated: Aug 31, 2022

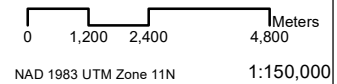



Legend

-  Project Area
-  2km Project Buffer
-  ACIMS Record Occurrences

TITLE:
ACIMS Records (2022)

28434
ELDCI Subdivision Planning



	FIGURE	C
	DATE	2023-12-13
	PROJECT NO.	28434
	AUTHOR	RG



Fish and Wildlife Internet Mapping Tool (FWIMT)

(source database: Fish and Wildlife Management Information System (FWMIS))

Species Summary Report

Report Date: 13-Dec-2023 15:33

Species present within the current extent

Fish Inventory

BURBOT
PRUSSIAN CARP

Wildlife Inventory

FERRUGINOUS HAWK
PLAINS SPADEFOOT

Stocked Inventory

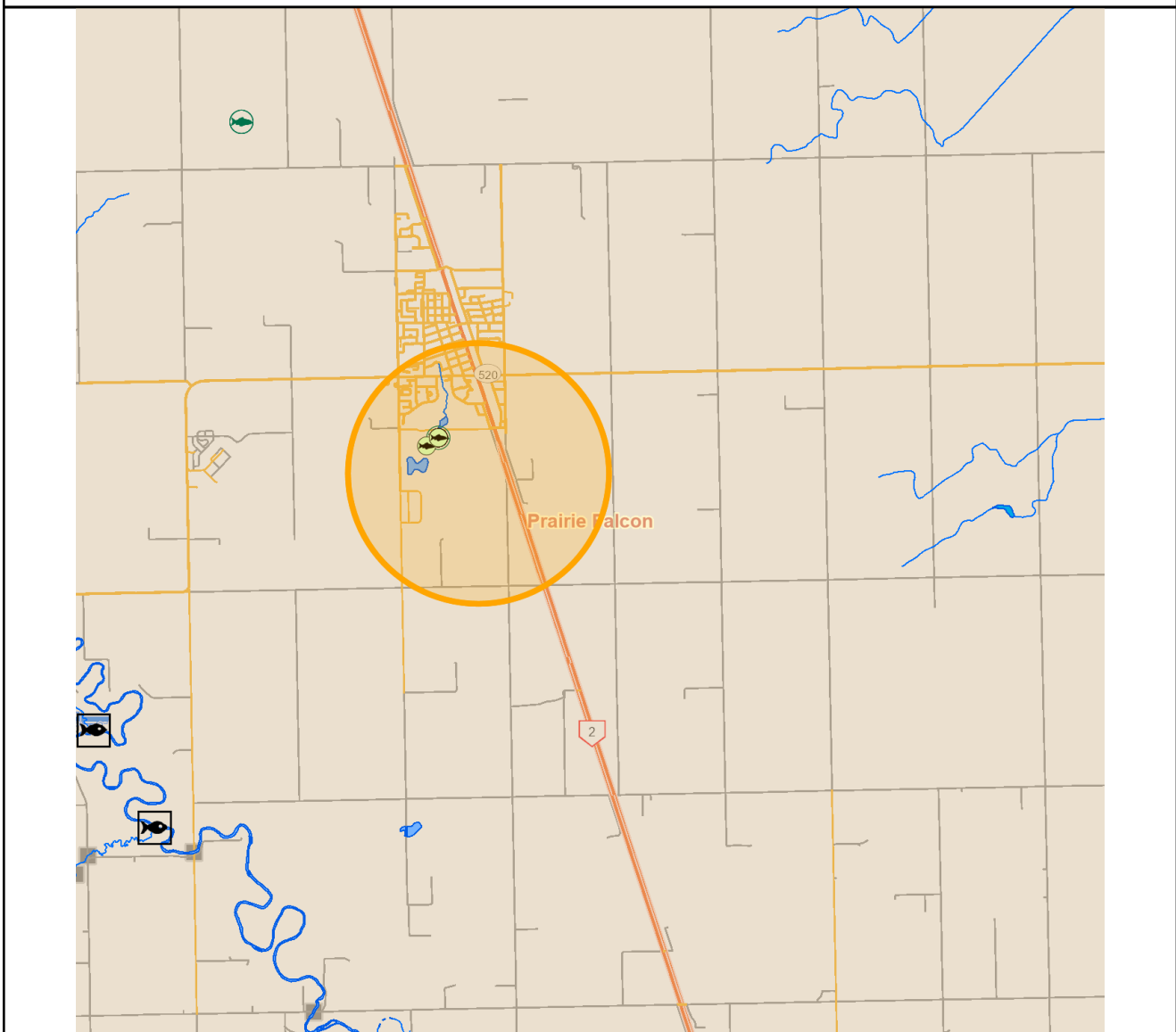
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Buffer Extent

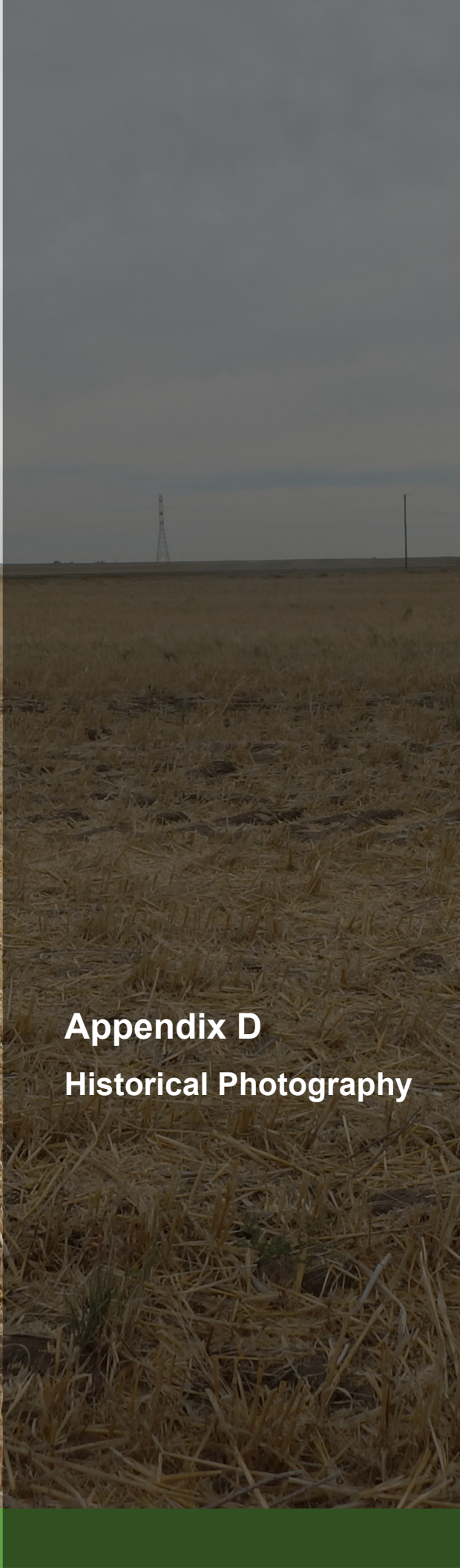
Centroid (X,Y)	Projection	Centroid (Qtr Sec Twp Rng Mer)	Radius or Dimensions
601808, 5538017	10-TM AEP Forest	SE 23 12 27 4	2 kilometers

Contact Information

For contact information, please visit:
<https://www.alberta.ca/fisheries-and-wildlife-management-contacts.aspx>



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Appendix D
Historical Photography



Legend



Project Area

Wetland Delineation by Photo Year



1949

TITLE:
Historical Photography

28434
ELDCI Subdivision Planning

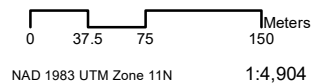


FIGURE	D
DATE	2023-12-13
PROJECT NO.	28434
AUTHOR	RG





Legend



Project Area

Wetland Delineation by Photo Year



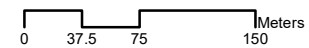
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TITLE:

Historical Photography

28434

ELDCI Subdivision Planning

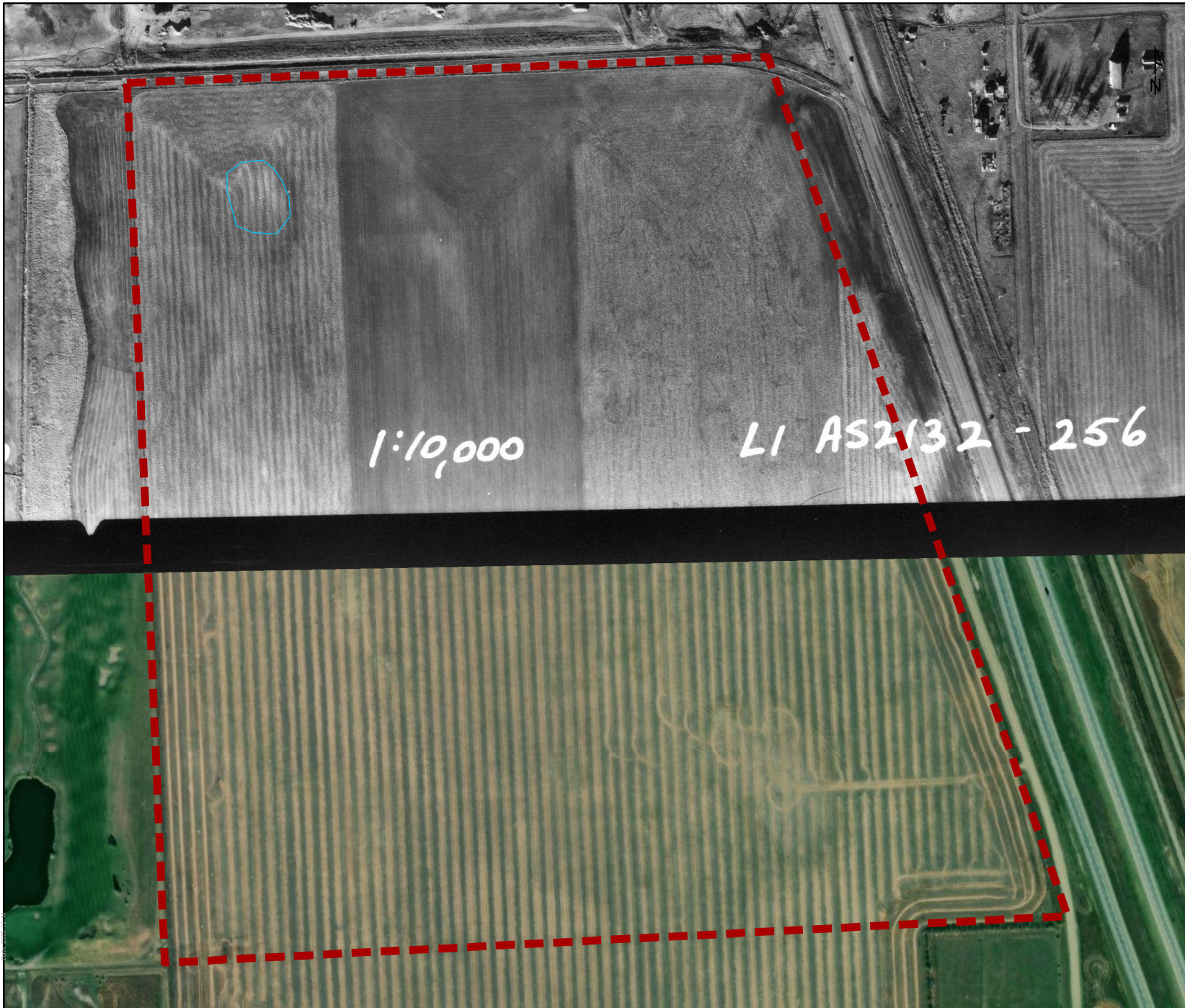


NAD 1983 UTM Zone 11N 1:4,904



FIGURE	D
DATE	2023-12-13
PROJECT NO.	28434
AUTHOR	RG





Legend

 Project Area

**Wetland
Delineation by
Photo Year**

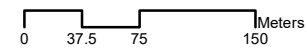
 1979

TITLE:

Historical Photography

28434

ELDCI Subdivision Planning



NAD 1983 UTM Zone 11N 1:4,905



FIGURE	D
DATE	2023-12-13
PROJECT NO.	28434
AUTHOR	RG





Legend

 Project Area

**Wetland
Delineation by
Photo Year**

 1985

TITLE:
Historical Photography

28434
ELDCI Subdivision Planning

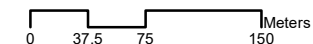
 Meters
NAD 1983 UTM Zone 11N 1:4,905



FIGURE D
DATE 2023-12-13
PROJECT NO. 28434
AUTHOR RG





Legend



Project Area

Wetland Delineation by Photo Year



1993

TITLE:
Historical Photography

28434
ELDCI Subdivision Planning

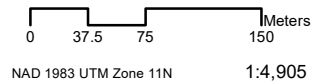


FIGURE	D1
DATE	2023-12-13
PROJECT NO.	28434
AUTHOR	RG





Legend



Project Area

TITLE:
Historical Photography
2000

28434
ELDCI Subdivision Planning

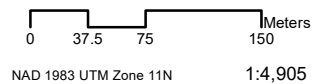


FIGURE D1
DATE 2023-12-13
PROJECT NO. 28434
AUTHOR RG





Legend

 Project Area

Wetland Delineations by Photo Year

 2012

TITLE:
Historical Photography

28434
ELDCI Subdivision Planning

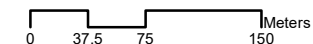
 Meters
NAD 1983 UTM Zone 11N 1:4,905



FIGURE D1
DATE 2023-12-13
PROJECT NO. 28434
AUTHOR RG





Appendix E
ABWRET-A Results

Function (ABWRET-A Raw Score)	1	2
Surface Water Storage (WS)	5.70	5.70
Stream Flow Support (SFS)	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00
Phosphorus Retention (PR)	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	10.00
Organic Nutrient Export (OE)	0.00	0.00
Fish Habitat (FH)	0.00	0.00
Aquatic Invertebrate Habitat (INV)	5.18	4.95
Amphibian Habitat (AM)	4.39	4.26
Waterbird Habitat (WB)	4.59	4.49
Songbird, Raptor, & Mammal Habitat (SBM)	3.25	3.07
Pollinator & Native Plant Habitat (PH)	2.88	2.76
Human Use & Recognition (HU)	1.65	1.57
Function (ABWRET-A Normalized Score)	1	2
Surface Water Storage (WS)	0.77	0.77
Stream Flow Support (SFS)	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00
Phosphorus Retention (PR)	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.00
Fish Habitat (FH)	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.52	0.49
Amphibian Habitat (AM)	0.62	0.60
Waterbird Habitat (WB)	0.33	0.32
Songbird, Raptor, & Mammal Habitat (SBM)	0.31	0.28
Pollinator & Native Plant Habitat (PH)	0.20	0.18
Human Use & Recognition (HU)	0.12	0.10
Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	1	2
Normalized Hydrological Health (HH)	0.77	0.77
Normalized Water Quality (WQ)	1.00	1.00
Normalized Ecological Health (EH)	0.62	0.60
Normalized Human Use (HU)	0.12	0.10
RWVAU #	21	21
Normalized Value Score (ABWRET_a)	0.73	0.72
Value Category (a, b, c, d)	c	c
Abundance Factor	1	1
Final Score(A, B, C, D)	B	B
HUC 4	1	2
HUC4Name	OLDMAN	OLDMAN RIVER
HUC4Code	0401	0401