

# Environmental Impact Assessment

Lloydminster Northeast Area Structure Plan

City of Lloydminster

November 2019

# Table of Contents


1.0 Introduction ..... 1
- 1.1 Environmental Impact Assessment Contents 2
- 1.2 Project Description 2

2.0 Biophysical Elements ..... 4
- 2.1 Desktop Methodology 5
- 2.2 Results of the Desktop Review 8

3.0 Effects on Biophysical Elements ..... 16
- 3.1 Study Limitations 17
- 3.2 Prediction of Effects on Biophysical Elements 17

4.0 Recommendations ..... 20
- 4.1 Regulatory Framework 21
- 4.2 Wetland Conservation and Protection 23
- 4.3 Future Recommended Studies 23

5.0 Decision Making Framework ..... 24

6.0 References ..... 26


## APPENDICES


Appendix A HABISask Soil Output

Appendix B Photo Plates

Appendix C HABISask Rare Species Public Output

Appendix D iMapInvasives Output

Appendix E HABISask Important Habitat Public Output

Appendix F HABISask Fisheries Output

Appendix G FWMIS Output

Appendix H Historical Photography

Appendix I July 2019 Field Visit Memorandum

## TABLES


Table 2.1: Wetland Classification ..... 7

Table 2.2: Rare Vascular Vegetation Species in the H1 Landscape Area ..... 8

Table 2.3: Non-Native Weeds in Saskatchewan ..... 10

Table 2.4: Invasive Wildlife Species in Saskatchewan ..... 11

Table 2.5: Desktop Wetland Assessment Results[1] ..... 12

Table 3.1: Potential Biophysical Effects ..... 17

Table 5.1: Decision Framework ..... 25

## FIGURES

Figure 1.1: Project Overview ..... 3
Figure 2.1: Wetlands, Watercourses and Waterbodies (Potential Current Extents) ..... 13
Figure 2.2: Wetlands, Watercourses and Waterbodies (Potential Current and Historical Extents) ..... 14
Figure 2.3: Permanent (Class IV or Swamp) Wetlands ..... 15



# 1.0 Introduction

## 1.1 Environmental Impact Assessment Contents

As described in the Municipal Development Plan (MDP) 2013-2032 (Parioplan 2013), an Environmental Impact Assessment (EIA) is required for any proposed development that may have an environmental impact. As this Area Structure Plan (ASP) includes turning native undisturbed lands into a developed area containing infrastructure, an EIA is required.

EIA's may include, but not be limited to:

- A project description including its purpose, alternatives and staging requirements.
- A description of the biophysical development affected e.g., site conditions and topography including natural and man-made constraints to development).
- A prediction of effects that the project may have on the biophysical environment
- Limitations of the study, criteria used in any predictions, and interests consulted
- Recommendations and mitigation measures
- A framework for decision makers to determine the final course of action.

Lloydminster's unique position as a cross border city has resulted in this EIA including Alberta information where applicable, despite the land it pertains to being located just on the Saskatchewan side of the border.

The EIA of the Project (Figure 1.1) uses desktop level analysis to identify potentially sensitive biological and physical features on or adjacent to the Study Area that have potential to be impacted by the project; the study area is defined as within 2.0 km of the Project footprint (Figure 1.2). Included in this report is baseline environmental conditions pertaining to current land use, existing site conditions, vegetation communities, potential wildlife habitat, as well as species and areas of management concern. The schedule of the EIA resulted in the production of this report in the winter of 2019, as such historical photography and google streetview taken in summer conditions are used.

## 1.2 Project Description

ISL Engineering and Land Services Ltd. (ISL) has been retained by The City of Lloydminster (The City) to conduct an EIA (Parioplan 2013), as part of the NE ASP (the Project), depicted on Figure 1.1. The Project is located in 11-50-28 W3M, 2-50-28 W3M, E 12-50-28 W3M and E 1-50-28 W3M. The ASP area is bounded by 40 Avenue, 67 Street, 50 Avenue and built up areas to the south.

The Northeast ASP lands are currently a mixture of industrial land, a water treatment plant, a former airport, a former public works yard and undeveloped cultivated fields. The purpose of this ASP is to develop a plan for public and private investment in the area with the intent for it to become a mixed-use community that includes residential, commercial, industrial and institutional uses.

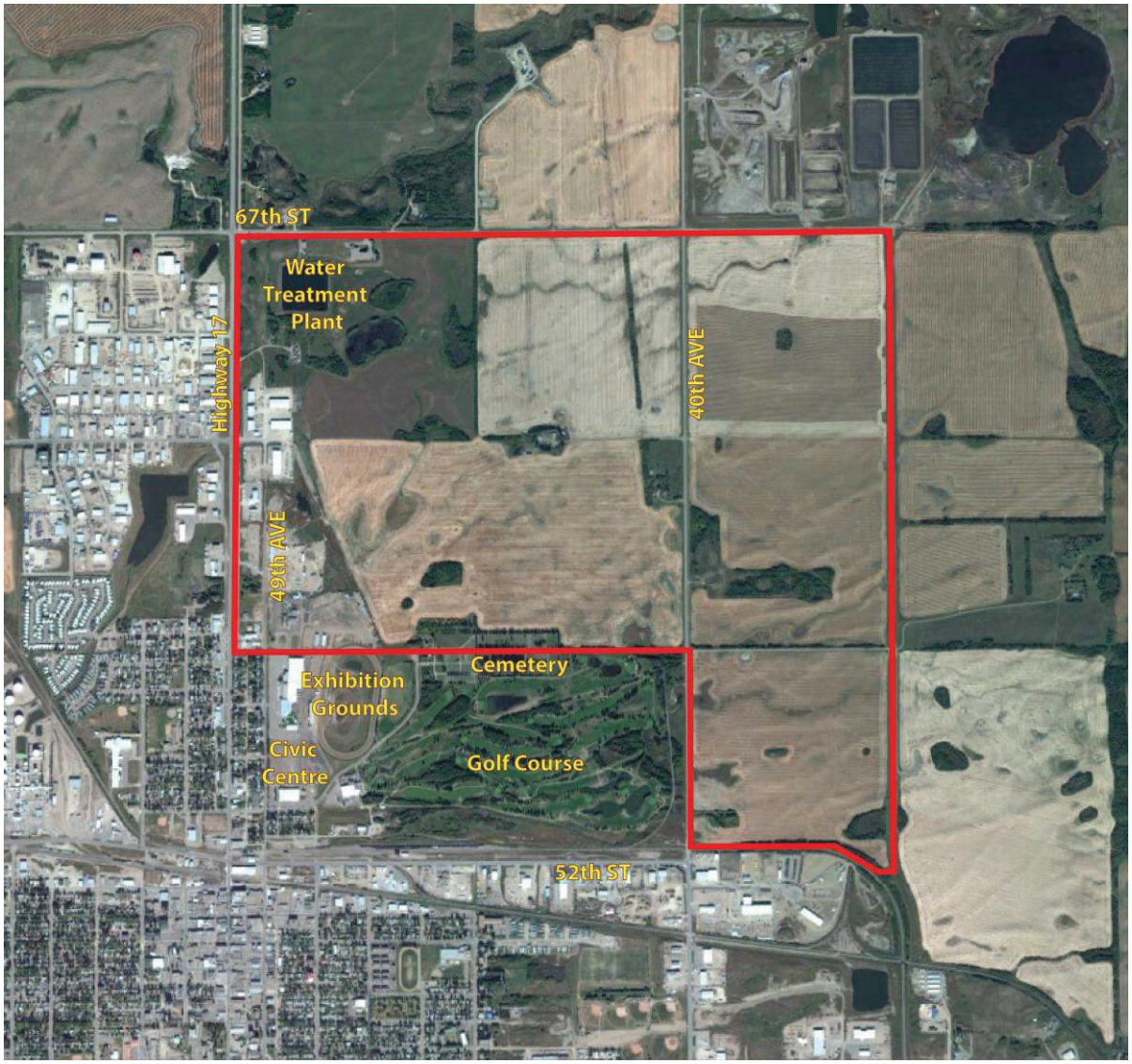



Figure 1.1: Project Overview



# 2.0
# Biophysical Elements

## 2.1 Desktop Methodology

Wildlife species and vegetation elements of management concern are any that meet the following criteria:

- Species for which provincial and/or federal restricted activity periods or setback distances exist (Environment and Climate Change Canada 2017a);
- Species listed to be of Special Concern, Threatened or Endangered under the *Species at Risk Act* (*SARA*) *(*Government of Canada, 2002), Committee on the Status of Endangered Wildlife (COSEWIC) (Government of Canada 2015) or in the Wildlife Act (Government of Saskatchewan 1998)
- Previously identified fish and wildlife species provided by HABISask and listed in the Wildlife Act (SK CDC 2019, Government of Saskatchewan 1983); and
- Rare vegetation species listed on HABISask (SK CDC 2019).

Additional biophysical elements have been included if thought to be of potential concern given the biophysical elements present or potentially present in the ASP area.

### 2.1.1 Vegetation

Alberta Conservation Information Management System (ACIMS) and HABISask (Hunting Angling and Biodiversity Information) element occurrence data was reviewed to identify known rare plant and rare ecological community occurrences in the vicinity of the proposed Project. For invasive species, iMapInvasives was used to identify any potential concerns with invasive species in the Project area.

### 2.1.2 Wildlife

ISL conducted a review of AEP's (Alberta Environment and Parks) FWMIS (Fish and Wildlife Information Management System) database and the HABISask database for Saskatchewan to determine known species and wildlife protection area occurrences within a 2 km radius from the center of the ASP area.

### 2.1.3 Fish

To determine the presence of fish, and potential for fish habitat in the Project area, a review of FWMIS and the HABISask database for Saskatchewan was conducted.

### 2.1.4 Soil

Saskatchewan Soil Capability classification is interpretive, often based on existing information and not field studies. The Soil Index describes the limitations of soils affecting agricultural use. Classes 1-3 are considered suitable for crops, 4 are considered marginal and 5-7 are suitable as pasture (Shields et al. 1968). The HabiSask Database was queried to determine the soil Index value (Appendix A).

### 2.1.5 Wetlands

The HABISask database was assessed for potential water features by examining contour lines to gain an understanding of the number, size, and location of potential wetlands. To further identify wetlands, an assessment of historical photographs and satellite imagery was completed.

#### Wetland Classification

Wetlands are areas where the soil is inundated with water at an ephemeral to permanent time scale, such that the soils become reduced (i.e., hydric) and hydrophytic vegetation is dominant. Based on hydrologic, ecological, and soil (e.g., biogeochemical) properties, wetlands can be further grouped and classified. The methodology used to classify wetlands for the Project was based on the Stewart and Kantrud (1971) Wetland Classification System with the Alberta Wetland Classification System (AWCS) (Alberta Environment and Sustainable Resource

Development [ESRD] 2015) provided for informational purposes, given the proximity to Alberta and the uniqueness of the cross-border position of Lloydminster.

Within the AWCS there are five wetland classes divided into forms based on vegetation. Wetland forms are further subdivided into types based on biological, hydrologic, or biogeochemical attributes. Stewart and Kantrud (1971) Classes are comparable to the Water Permanency Type. It should be noted that to determine the full wetland Class, Form, and Type according to the AWCS, field assessment at the appropriate time of year (i.e., the growing season) is required. Consequently, this report only reports on wetland Class.

The following provides definitions of each wetland Class (from ESRD 2015). For more information on wetland Classification see the AWCS (ESRD 2015).

**Marshes** are mineral wetlands with water levels near, at or above the ground surface for variable periods during the year, and which supports graminoid vegetation in the deepest portion of the wetland in the majority of years.

**Shallow open water** wetlands are mineral wetlands with water levels near, at or above the ground surface of variable periods of the year, which is less than two metres deep at mid-summer and that contains an open water zone in the deepest wetland zone covering greater than 25% of the total area in the majority of years. The open water zone is an expanse of open, mostly unshaded water in marshes and shallow open waters that typically supports submersed, or floating vegetation and is less than two metres deep at mid-summer.

**Swamps** are mineral wetlands with water levels near, at or above the ground surface for variable periods during the year; and contains either more than 25% tree and/or shrub cover of a variety of species.

**Bogs** are peatlands fed by ombrogenous waters originating from precipitation with low concentrations of dissolved minerals. Bogs are not expected within the Project area.

**Fens** are minerogenous peatlands with surface or subsurface water flow that range from moderately-acidic or basic. Fens are not expected within the Project area.

Table 2.1 provides details on S&K and AWCS. The Study Area is expected to contain marshes, swamps and shallow open water wetlands of S&K classes I to IV.

Table 2.1: Wetland Classification

| System | Class | Form | Type | | |
|---|---|---|---|---|---|
| | | | Salinity | Water Permanence[1] | Plant Community Zone |
| S&K | Class I - Ephemeral ponds | - | - | Surface water present after snowmelt in most years for only a brief period of time | Low Prairie Zone |
| S&K | Class II - Temporary ponds | - | - | Surface water present after snowmelt or heavy rainfall | Wet Meadow |
| S&K | Class III - Seasonal Ponds | - | - | Surface water present in growing season, gone by end of the summer | Shallow Wetland |
| S&K | Class IV - Semi-permanent ponds | - | - | Surface water present year round in the majority of years unless in drought conditions | Deep Wetland |
| S&K | Class V - Permanent Ponds | - | - | Surface water present in all years including drought conditions | Open water |
| S&K | Class VI - Alkali ponds | - | High concentration of salts and dominated by salt tolerant plants | Intermittent | Alkaline |
| AWCS | Marsh [M] | Graminoid [G] | Freshwater [f] to slightly brackish [sb] | Temporary [II] | Wet Meadow |
| | | | Freshwater [f] to moderately brackish [mb] | Seasonal [III] | Shallow Wetland |
| | | | Freshwater [f] to brackish [b] | Semi-permanent [IV] | Deep Wetland |
| AWCS | Shallow Open Water [SOW] | Submersed and/or floating aquatic vegetation [A], bare [B] | Freshwater [f] to moderately brackish [mb] | Seasonal [III] | Shallow Wetland |
| | | | Freshwater [f] to sub-saline [ss] | Semi-permanent [IV] | Deep Wetland |
| | | | Slightly brackish [sb] to sub-saline [ss] | Permanent [V] | Open Water |
| | | | Saline [s] | Intermittent [VI] | Alkaline |
| AWCS | Swamp [S] | Wooded coniferous [Wc] [2], Wooded mixedwood [Wm] [2], Wooded deciduous [Wd] [2], Shrubby [S] | Freshwater [f] to slightly brackish [sb] | Temporary [II] | Wet Meadow |
| | | | Freshwater [f] to slightly brackish [sb] | Seasonal [III] | Shallow Wetland |
| | | | Moderately brackish [mb] to sub-saline [ss] | Seasonal [III] | Shallow Wetland |

1. Roman numerals in AWCS are equivalent to wetland Classes by Stewart and Kantrud (1971).
2. Swamp types are not applicable to wooded swamps due to lack of available information.

## 2.2 Results of the Desktop Review

### 2.2.1 Land use and Habitat

#### Ecoregion and Landscape Area

The Aspen Parkland Ecoregion is a mosaic of aspen stands and fescue prairies. Aspen concentration becomes more pronounced as one moves northward in the ecoregion. Typically, the aspen stands will occur in moister areas such as valley bottoms and north facing slopes and hillsides. Fescue dominated grasslands will occur in drier and southward facing slopes (SK CDC 2014). The Project occurs in the Lloydminster Plain Landscape Area (H1). The plain is nearly level, although morainal uplands such as Eagle Hills and valleys such as the Big Gully Coulee occur within the Landscape Area. Most of the Lloydminster Plain is cropland for cereals (Padbury et al. 1998).

#### Local Habitat

Vegetation within the ASP area is mainly cultivated. Interspersed within is numerous wetlands, and treed areas including treed wetlands and windrows. The treed areas are dominated by Aspen. A modified watercourse is located in the NW corner of the ASP area. Photoplates of habitats taken by Google Streetview in summer are provided in Appendix B.

### 2.2.2 Vegetation

#### Rare Species

No rare vascular or non-vascular species occurrences are present in the ASP area (SK CDC 2019). The output from the publicly available database is provided in Appendix C. The nearest historical occurrence (with the 2km Study area) is located within city limits of Lloydminster in a developed area and is highly unlikely to be currently present given the development.

None of the plant species known to occur within 2 km of the proposed Project are listed by *SARA,* COSEWIC or the Alberta *Wildlife Act* (COSEWIC 2015, Government of Canada 2015).

Table 2.2: Rare Vascular Vegetation Species in the H1 Landscape Area

| Common Name | Scientific Name | Provincial Rank[1] | Global Rank[2] |
|---|---|---|---|
| **Vascular Plants** | | | |
| Short-stemmed Thistle | *Cirsium drummondii* | S3 | G5 |
| Western Hawk's-beard | *Crepis occidentalis* | S3 | G5 |
| Tall Blue Lettuce | *Lactuca biennis* | S3 | G5 |
| Prairie False-dandelion | *Nothocalais cuspidata* | S3 | G5 |
| Menzies' Catchfly | *Silene menziesii* | S3 | G5 |
| Hairy Bugseed | *Corispermum villosum* | S2 | G4? |
| Bristle-leaved Sedge | *Carex eburnea* | S3 | G5 |
| Slender Spike-rush | *Eleocharis elliptica* | S3 | G5 |
| Moss Gentian | *Gentiana fremontii* | S3 | G3G4 |
| Marsh Felwort | *Lomatogonium rotatum* | S3 | G5 |
| Carolina Wild Geranium | *Geranium carolinianum* | S3 | G5 |
| Sticky Purple Geranium | *Geranium viscosissimum* | S2 | G5 |
| Soft Wild Bergamot | *Monarda fistulosa var. mollis* | S3 | G5T5? |

| Common Name | Scientific Name | Provincial Rank[1] | Global Rank[2] |
|---|---|---|---|
| Lesser Duckweed | *Lemna minor* | S1 | G5 |
| Lesser Bladderwort | *Utricularia minor* | S2 | G5 |
| Immaculate Lily | *Lilium philadelphicum var. andinum f immaculata* | S1 | G5TUQ |
| Pale Moonwort | *Botrychium pallidum* | S1 | G3 |
| Leathery Grape-fern | *Sceptridium multifidum* | S3 | G5 |
| Striped Coral-root | *Corallorhiza striata var. striata* | S3 | G5T5 |
| Small Yellow Lady's-slipper | *Cypripedium parviflorum* | S3 | G5 |
| Small Yellow Lady's Slipper | *Cypripedium parviflorum var. makasin* | S3 | G5T4T5 |
| Columbia Needlegrass | *Achnatherum nelsonii ssp. dorei* | S3 | G5T5? |
| California Wild Oat Grass | *Danthonia californica var. americana* | S3 | G5TNRQ |
| Plains Rough Fescue | *Festuca hallii* | S3 | G5 |
| Mutton Grass | *Poa fendleriana ssp. fendleriana* | S3 | G5T5 |
| Tumble Grass | *Schedonnardus paniculatus* | S3 | G5 |
| Northern Buttercup | *Ranunculus pedatifidus var. affinis* | S3 | G5T5 |
| Sandhills Cinquefoil | *Potentilla lasiodonta* | S2 | G3 |
| Crowfoot Violet | *Viola pedatifida* | S3 | G5 |

Source: Saskatchewan Conservation Data Centre (2019)

1. S1 (Critically Imperiled): Five or fewer occurrences, or especially vulnerable to extirpation due to other factor(s).
   S2 (Imperiled): Twenty or fewer occurrences, or vulnerable to extirpation due to other factor(s).
   S3 (Vulnerable): One hundred or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes, or other factor(s).
   S4 (Apparently Secure): Uncommon but not rare; potentially some cause for long term concern due to declines or other factors.
   S5 (Secure): Common, widespread, abundant.
   B: Breeding.
   S_S_: Denotes the range of uncertainty about the status rank of the element.
   SNA: Not Applicable because the species or ecosystems is not a suitable target for conservation activities (e.g., introduced species).
   T (Tracked): Current information suggest species is rare or of conservation concern.
2. Global (G) ranks are based on species status world-wide and follow a system parallel to Provincial Ranks (Note 1).

### Weeds

Plants designated as Prohibited, Noxious or Nuisance in Saskatchewan are listed in Schedule I, II and III of the Ministerial Order for designation of Prohibited, Noxious and Nuisance weed in Accordance with the Weed Control Act (Government of Saskatchewan 2010). A search of the iMAPInvasives Database produced no results (Appendix D) Species known to be present are provided listed by the Saskatchewan Conservation Data Centre (2014) and are provided in the table below.

Table 2.3: Non-Native Weeds in Saskatchewan

| Common Name | Scientific Name |
|---|---|
| Common burdock | *Arctium minus* |
| Absinthe | *Artemisia absinthium* |
| Japanese Brome | *Bromus japonicus* |
| Downy Brome | *Bromus tectorum* |
| Flowering Rush | *Butomus umbellatus* |
| Heart-pod Hoarycress | *Cardaria draba* |
| Nodding Thistle | *Carduus nutans* |
| Spotted knapweed | *Centaurea stoebe ssp. micranthos* |
| Canada Thistle | *Cirsium arvense* |
| Field Bindweed | *Convolvulus arvensis* |
| Common Hound's-tongue | *Cynoglossum officinale* |
| Leafy Spurge | *Euphorbia esula* |
| Baby's-breath | *Gypsophila paniculata* |
| Dame's Rocket | *Hesperis matronalis* |
| Common Frogbit | *Hydrocharis morsus-ranae* |
| Himalayan Balsam | *Impatiens glandulifera* |
| Field Scabious | *Knautia arvensis* |
| Kochia | *Kochia scoparia* |
| Long-stalk Hoarycress | *Lepidium appelianum* |
| Oxeye Daisy | *Leucanthemum vulgare* |
| Yellow Toadflax | *Linaria vulgaris* |
| Purple Loosestrife | *Lythrum salicaria* |
| Scentless Chamomile | *Matricaria perforata* |
| Wild Parsnip | *Pastinaca sativa* |
| European Buckthorn | *Rhamnus cathartica* |
| Russian Thistle | *Salsola kali* |
| White Cockle | *Silene latifolia* |
| Bladder Campion | *Silene vulgaris* |
| Perrenial Sowthistle | *Sonchus arvensis* |
| Salt Cedar, Tamarisk | *Tamarix spp.* |
| Common Tansy | *Tanacetum vulgare* |
| Common Dandelion | *Taraxacum officinale* |

Source: Saskatchewan Conservation Data Centre (2014)

### 2.2.3 Wildlife

### 2.2.4 Important Wildlife Habitats

The ASP is not located within or adjacent to any Ramsar wetlands (Bureau of the Convention on Wetlands 2014), World Biosphere Reserves (UNESCO 2015), Western Hemisphere Shorebird Reserves (WHSRN 2012), IBAs (Bird Studies Canada and Nature Canada 2015), Ducks Unlimited Canada Projects (DUC 2019), Migratory Bird Sanctuaries or National Wildlife Areas (Environment and Climate Change Canada 2017b).

The ASP area is not located within or adjacent to any provincially-identified parks, ecological reserves, Saskatchewan Wildlife Habitat Protection Act (WHPA) lands, Fish and Wildlife Development Fund lands or Agriculture and Agri-Food Canada (AAFC) Community Pasture Program (CPP) lands (AAFC-CPP lands) (SK CDC 2019; Appendix E).

The ASP area is within a North American Waterfowl Management Plan (NAWMP) Target Landscape (Government of Saskatchewan 2015). The Saskatchewan Water Security agency encourages land owners to participate in a voluntary stewardship agreement where conservation is recognized through a certificate of appreciation.

### 2.2.5 Rare Wildlife Species

No occurrences of rare vertebrate animals, invertebrate animals or animal assemblages are located within the ASP area. One animal assemblage occurs outside of the area, approximately 1 km from the ASP (SK CDC 2019) (Appendix C).

### 2.2.6 Invasive Wildlife Species

Invasive wildlife species as listed by the Saskatchewan CDC are provided in Table 2.4 below.

Table 2.4: Invasive Wildlife Species in Saskatchewan

| Common Name | Scientific Name |
|---|---|
| Rock Pigeon | *Columba livia* |
| Common Carp | *Cyprinus carpio* |
| House Sparrow | *Passer domesticus* |
| Gray Partridge | *Perdix perdix* |
| Ring-necked Pheasant | *Phasianus colchicus* |
| Wild Boar | *Sus scrofa* |

Source: Saskatchewan Conservation Data Centre (2014)

### 2.2.7 Fish and Fish Habitat

The ASP area is located in the Southern Fishing Zone (SK CDC 2019) (Appendix F). Potential fish habitat in the ASP area is limited to waterbodies which contain water on a year-round basis and do not freeze to the bed, of which the ASP area contains potential. The HABISask Database for Saskatchewan does not contain fisheries data in the ASP area, however the absence of data does not equate to an absence of fish (SKCDC 2019). The FWMIS database in nearby Alberta contained an occurrence of Brook Stickleback, presumably this species could occur on the Saskatchewan side of the border (AEP 2015) (Appendix G).

### 2.2.8 Soil

Soils in the H1 Landscape Area are dominantly Black Loam with Dark Gray and Gray Luvisolic soils in heavily treed north facing slopes (Padbury et al. 1998). The soil is classified Index 2 in the Saskatchewan Soil Capability Index (SK CDC 2018). Soils in this class have moderate limitations that reduce the choice of crops or require moderate conservation practices (Shields et al. 1968).

### 2.2.9 Wetlands

In the ASP area, 58 wetland features were identified, delineated, and Classed using current and historical aerial imagery (Appendix H). Wetlands include Marshes, Swamps, and a watercourse. One Artificial feature was also identified in the ASP area (A Water Treatment Plant, Figure 1.1). Of the wetland features, 10 are likely to be reasonably permanent (Class IV or a Swamp). Table 2.5 summarizes the results of the desktop aerial interpretation within the Area. Some wetlands are connected to each other via ephemeral drainages however the majority appear to be isolate potholes.

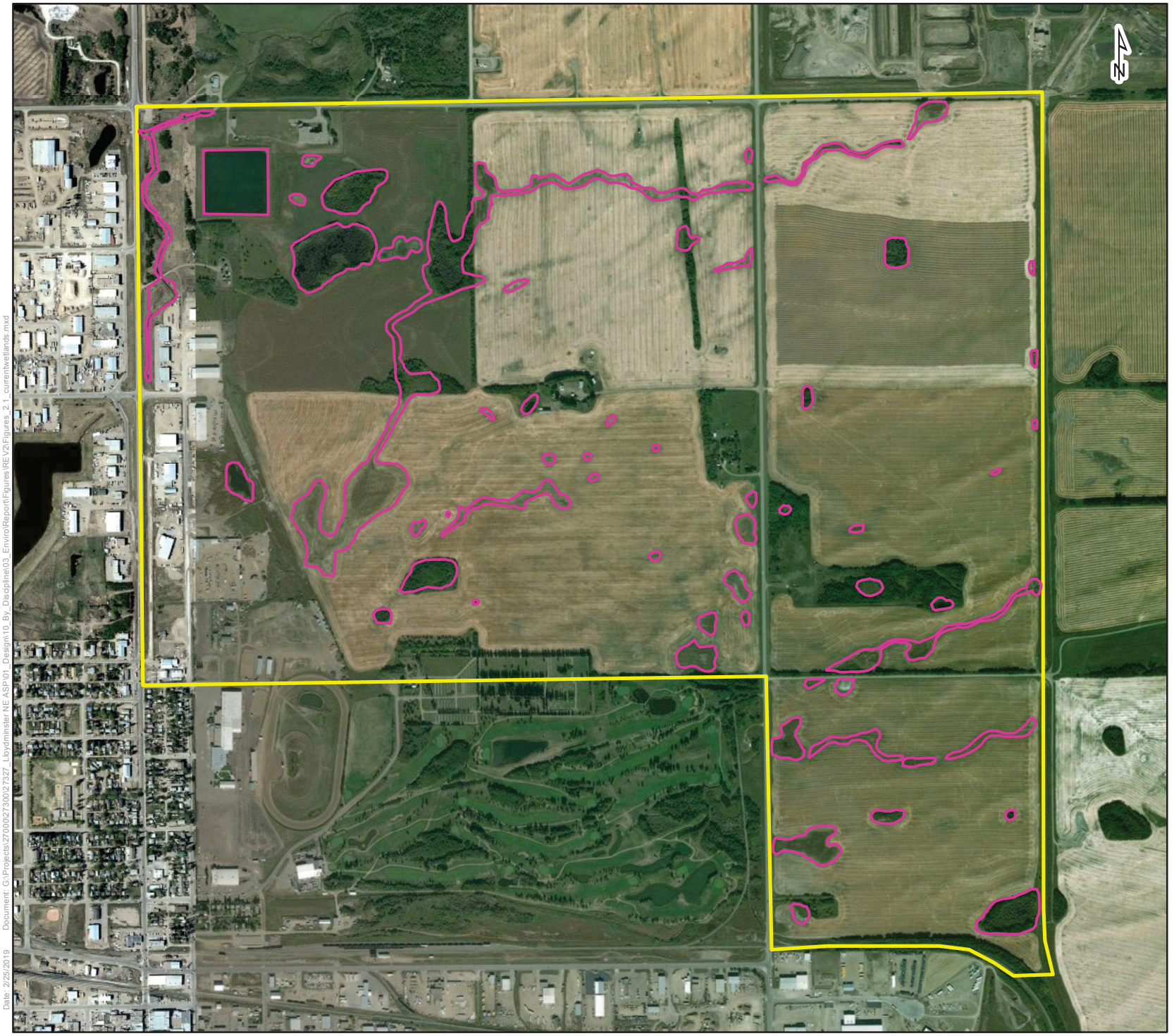
Figure 2.1 below illustrates the probable extents and locations of wetlands existing in the ASP currently, based on current ESRI Imagery. Figure 2.2 below Illustrates the greatest probable extent and number of wetlands as all visible wetlands over all historical photographs area combined and superimposed on current ESRI Imagery. Figure 2.3 below illustrates the probable most permanent and still existing wetlands.

Table 2.5: Desktop Wetland Assessment Results[1]

| Wetland Class[1] | S&K Class | Number of Features | Area (ha) |
|---|---|---|---|
| Artificial | - | 3 | 4.0 |
| Watercourse | - | 1 | 1.5 |
| Wetland Complex | - | 1 | 10.8 |
| Marsh [M] | I | 13 | 2.6 |
| | II | 10 | 0.8 |
| | III | 15 | 6.4 |
| | IV | 1 | 3.1 |
| | V | 0 | 0 |
| | VI (Alkaline) | 1 | 0.2 |
| Swamp [S] | - | 9 | 3.9 |
| **Total:** | | **58** | **36.1** |

Notes:

1. This table is an estimate of wetland numbers and types based on the most current imagery available (Figure 2.1) and does not take potential wetlands that exist in other historical imagery. Fieldwork by a QP during the growing season is recommended.
2. Wetlands that contain more than one Class are considered complexes. If a portion of a complex is potentially permanent it is separately mapped and shown on Figure 2.3



Legend

Approximate ASP Area

Potential Currently Existing Wetlands, Watercourses and Waterbodies

1:15,000

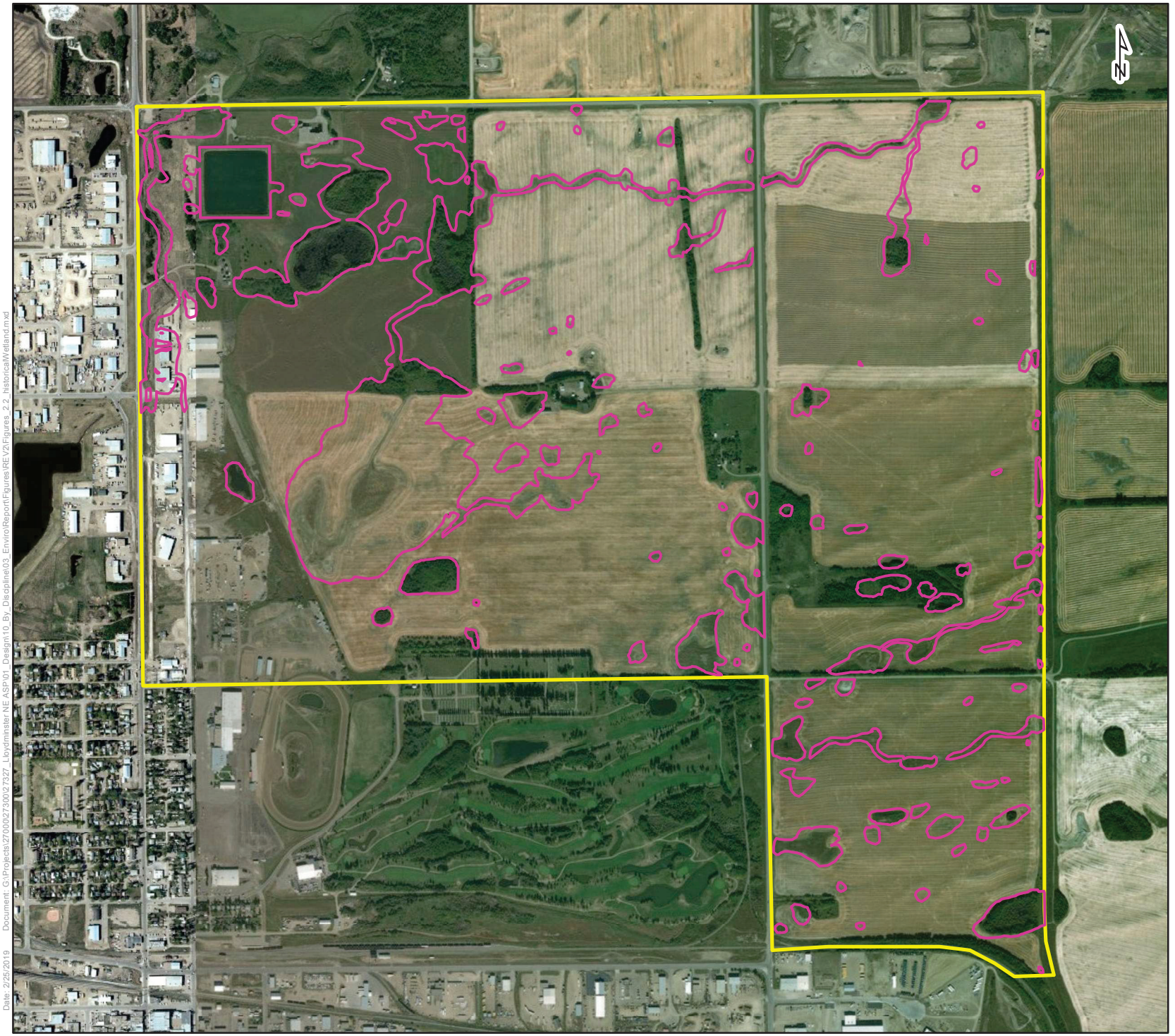
0 62.5125 250 375 500 Meters

FIGURE 2.1
WETLANDS, WATERCOURSES AND WATERBODIES
(POTENTIAL CURRENTEXTENTS WITH CURRENT ESRI IMAGERY)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/25/2019 Document: G:\Projects\27000\27300\27327_Lloydminster.NE.ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\REV2\Figures_2.1_currentwetlands.mxd



Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

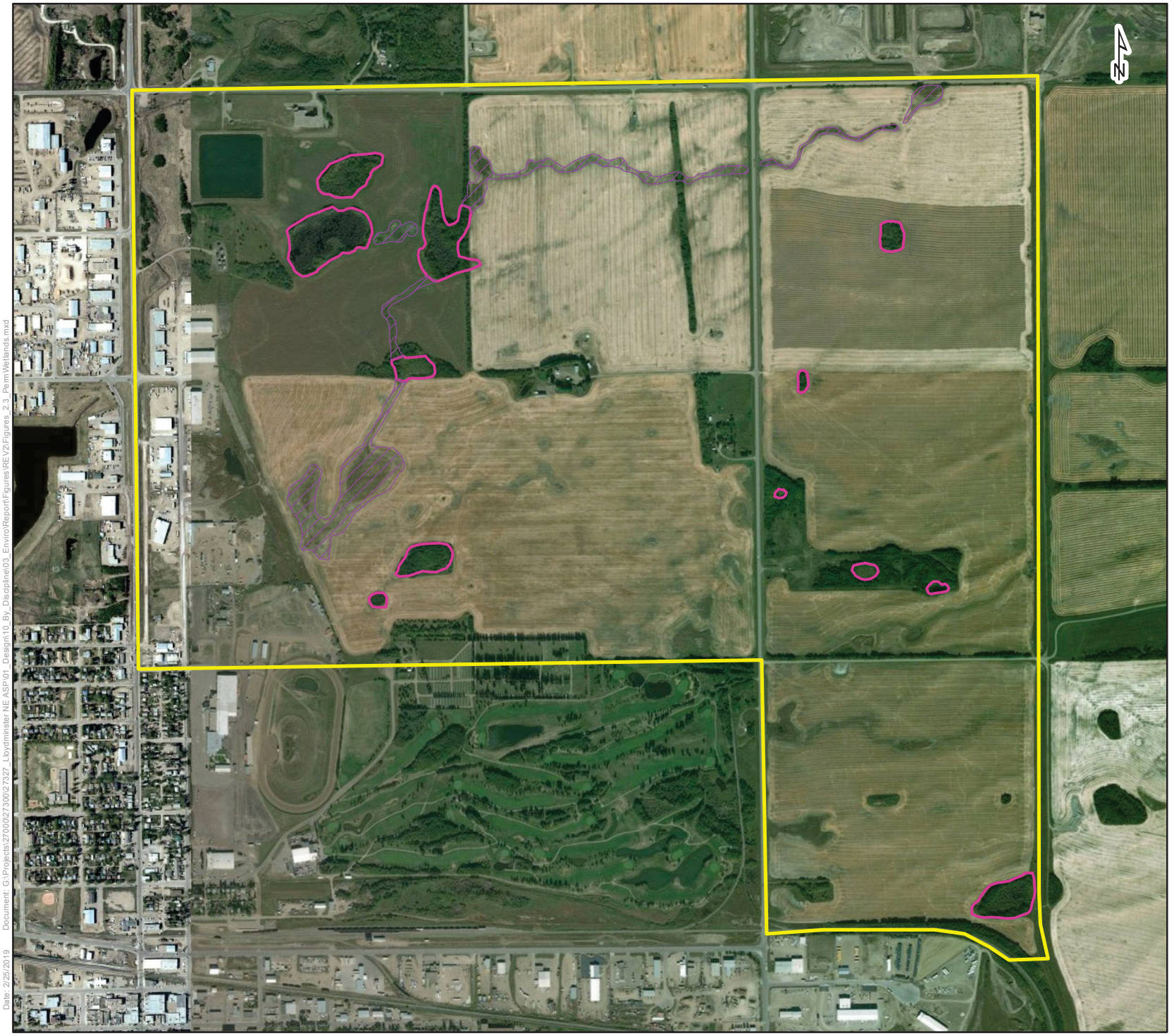
1:15,000

0 62.5125 250 375 500 Meters

FIGURE 2.2
WETLANDS, WATERCOURSES AND WATERBODIES POTENTIAL CURRENT AND HISTORICAL EXTENTS WITH CURRENT ESRI IMAGERY

Integrated Expertise. Locally Delivered.

Date: 2/25/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\REV2\Figures_2.2_historicalWetland.mxd



Legend

Approximate ASP Area

Potential Permanent (Class IV and Swamp) Wetlands

non-permanent connections

1:15,000

0 62.5125 250 375 500 Meters

FIGURE 2.3
WETLANDS, WATERCOURSES AND WATERBODIES
(POTENTIAL PERMANENT WETLANDS WITH CURRENT ESRI IMAGERY)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/25/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\REV2\Figures_2.3_PermWetlands.mxd



# 3.0 Effects on Biophysical Elements

## 3.1 Study Limitations

Aerial imagery interpretation is an effective way to identify biophysical features such as wetlands during project planning stages. However, some biophysical features may not be evident on imagery and to be appropriately assessed, fieldwork should be conducted during an appropriate time of the year. Examples include wildlife such as birds, mammals, reptiles, and rare plants.

Pertaining to wetlands, the inconspicuous physical characteristics of some wetlands may have potentially hindered their identification during interpretation due to their small size or often temporary and seasonal occurrence especially on agricultural land. Additionally, Swamp wetlands are particularly difficult to differentiate from wet forest during imagery interpretation. Due to the limitations of imagery interpretation, the wetland location, size, and Class provided in Section 2 above should be used as a guideline for planning purposes only.

The absence of data available in provincial databases does not equate to the absence of species in an assessment area. Databases can only confirm presence of a species at a particular moment at the time of collection.

## 3.2 Prediction of Effects on Biophysical Elements

The ASP is a plan for the future neighbourhood and no immediate impacts as a direct result of the ASP are planned. The following table describes potential impacts of the future neighbourhood that may occur as a result of an ASP implementation. The table evaluates typical impacts that may occur as a result of infrastructure (residential, commercial, industrial and institutional) development on the ASP area.

Table 3.1: Potential Biophysical Effects

| Potential Biophysical Impacts of Future Development in the ASP Area | | | | |
|---|---|---|---|---|
| **Environmental Elements** | **Description of Interaction (How, When, Where, Positive, Negative)** | **Type of Potential Impact** | **Mitigation Recommendations** | **Potential Residual Adverse Impact** |
| **Topography** | Topography along the ASP Area is generally flat with depressional wetland areas. Topography is likely to change with the future construction of a neighbourhood in this area. | If permanent earthworks are planned to occur There is a risk for erosion and sedimentation across the study area. Additionally. water management will be critical if wetlands are infilled. | Implement an erosion and sediment control plan and a water management plan. | Loss of natural landscape contours, alteration of surface drainage patterns. |
| **Hydrogeology/ Groundwater** | Construction of infrastructure in the ASP area has the potential to interact with groundwater. Groundwater is expected to be a muted representation of surface water and surface water is present in multiple locations in the ASP area. | If permanent earthworks occur, this may cause a change in groundwater quality and/or quantity during construction and flow, post construction. | Implement a groundwater monitoring plan, implement erosion and sediment control as well as a spill response plan. | Alteration of groundwater flows, potential for contamination. |

| | | | | |
|---|---|---|---|---|
| **Aquatic Resources** | Wetlands, a watercourse and dugouts occur within the ASP area. Construction has potential to interact with these aquatic resources. | Earthworks may cause a temporary change in surface water quality during construction. Loss of aquatic habitat area may occur. | Flag or fence off waterbodies that are not to be disturbed, include a buffer for protection from sedimentation. | If wetland or waterbodies are infilled, loss of aquatic habitat will occur. |
| **Soils** | Earthworks will occur during the construction of the Project. Admixing of soils has potential to occur as does erosion and sedimentation. Soils from outside the project area may be brought in. | Loss of topsoil, erosion and sedimentation. Potential admixing. It is unknown if soils have contamination issues. | -Implement an erosion and sediment control plan.<br>-Conduct an Environmental Site Assessment to determine potential contamination issues. | Loss of capability for cultivation, admixing. |
| **Vegetation** | No historical rare plant occurrences overlap the project area, however some native areas exist and there is low to moderate potential for rare plants. Introduction of soils and dirty construction equipment may result in the introduction of weeds. | Transportation and introduction of weeds. Loss of rare plants or native plants. Loss of native plants and potential habitat for them. | -Prior to construction, manage weeds. Do not park or store vehicles/equipment on infestations and if needed, control weeds prior to use.<br>-Ensure vehicles and soils brought on site are clean and free of weed seeds.<br>-Flag or fence off areas of native vegetation to be retained. | Loss of rare plants, stands of native vegetation, introduction of weeds. |
| **Wildlife and Wildlife habitat** | No historical records of wildlife are in the area. However, potential bird habitat (tree stands and wetlands) exist in the ASP area therefore migratory birds and other wildlife may occur within the Project area. | Construction activities may cause sensory disturbance to wildlife species, causing avoidance. Some wetland and tree/shrub/herbaceous habitat is likely to be removed. | -Follow the recommended timing and setbacks for Species at Risk (if they occur).<br>-Complete pre-disturbance surveys during the migratory bird nesting window.<br>-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.<br>-In the event that active nests, dens, burrows, etc. are found during clearing and construction activities, consultation with the appropriate regulator is required. Active nests may be subject to an appropriate buffer until the nest is no longer active or a permit may be granted for removal.<br>-Do not harass or feed wildlife.<br>-Avoid removal of nests and/or nest buffer, wildlife trees, important habitat features such as ungulate browse, or other habitat features, where practical. | Loss of nesting habitat, migratory refuges and foraging habitat. |

| | | | | |
|---|---|---|---|---|
| **Fish and Fish Habitat** | The ASP occurs in an area with wetlands that may be partially or completely infilled in the future. If fish are present in the wetlands, loss of aquatic habitat may impact them and their populations. | Construction activities have potential to cause sedimentation. Loss of aquatic habitat area is anticipated with the introduction of a permanent roadway feature. | -Determine if fish are present within the wetland areas-<br>If applicable, follow guidance on screen design found in DFO's Freshwater Intake End-of- Pipe Fish Screen Guideline (DFO 1995).<br>-Monitor to assess sediment release (i.e., turbidity and Total Suspended Solids [TSS]) if required by the applicable regulatory approvals.<br>-If present, fish must be salvaged from within isolated work site and returned to a suitable location<br>-Do not wash equipment or machinery near any waterbody. Control wastewater from construction activities to avoid discharge directly into water<br>-Prohibit fuel storage, refuelling, or servicing of equipment within 100 m of any waterbody, except where secondary containment and/or tertiary containment is provided. | Loss of aquatic habitat, fish mortality. |
| **Species at Risk (COSEWIC, SARA)** | No federally listed species have been previously identified within the 2km Study Area. The Project area is unlikely to have preferred habitat, however field studies will confirm.<br>Construction activities may cause sensory disturbance to wildlife species, causing avoidance. | Preconstruction surveys will provide appropriate mitigation measures specific for species found. | See wildlife, vegetation and fish and fish habitat, above. | Loss of potential habitat. |
| **Land and Resource Use** | No recreational or resource use of any wetland appears to occur. The current cultivation will no longer occur with infrastructure/community development. | Change in land use and users. | Public consultation will aid in mitigation for concerns over land use changes. | Loss of crop area. |



# 4.0 Recommendations

## 4.1 Regulatory Framework

ISL recommends adhering to all federal and provincial regulations and municipal policies. Provincial regulations that have potential to be applicable in the ASP Area are described below. This list should not be considered comprehensive and may be reduced or increased as the ASP project evolves and post ASP when construction occurs. Regulations often change over time, new ones introduced or repealed and requirements may change by the time of construction. Fieldwork one to two years prior to ground disturbance, and well prior to vegetation stripping or tree clearing is recommended to determine requirements that are applicable at that time.

### 4.1.1 Federal

#### *Migratory Birds Convention Act*

The *Migratory Birds Convention Act (MBCA)* is administered by Environment and Climate Change Canada (ECCC) to ensure protection of migratory birds, their nests, and their eggs. Birds protected by the *MBCA* include waterfowl (such as ducks, geese, and swans), insectivorous birds (such as wrens, robins, shrikes, and woodpeckers), and some nongame birds (such as herons and gulls) (ECCC 2014).

To protect migratory birds, ECCC provides general nesting periods based on geographic location (ECCC 2014). The general nesting period covers the majority of species covered under the *MBCA*; however, it may not be accurate for species that can breed at any time during optimal conditions (*e.g.* crossbill species), or species that may nest earlier or later (ECCC 2014).

The general migratory bird-nesting period for the Project (located within zone B5) is mid-April to late August (ECCC 2014). During this period, construction activities require a pre-construction sweep to avoid disturbance and nest sweeps every 3-7 days where habitat occurs. In the event that nesting migratory birds are identified during the nest sweep, a setback may be identified through consultation with ECCC where feasible, or a permit would be required to remove the nest.

Depending on the timing of construction, pre-disturbance mitigation such as nest sweeps may be required.

#### *Species at Risk Act*

The *Species at Risk Act (SARA)* includes several prohibitions to protect species listed on Schedule 1 of *SARA*. Under Sections 32 and 33 of *SARA*, it is an offence to:

- Kill, harm, harass, capture, or take an individual of a species listed under *SARA* as extirpated, endangered, or threatened
- Possess, collect, buy, sell, or trade an individual of a species listed under *SARA* as extirpated, endangered, or threatened, or any part or derivative of such an individual
- Damage or destroy the residence of one or more individuals of a listed endangered or threatened species or of a listed extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada

#### *Navigation Protection Act*

The *Navigation Protection Act (NPA)* includes a List of Scheduled Waters under which Transport Canada regulates works and activities that have the potential to affect navigation. Non-scheduled waterways also may be covered under the *Act*, if the works pose a risk to public navigation.

#### *Fisheries Act*

The *Fisheries Act* includes provisions to avoid causing serious harm to fish. This would apply to work being conducted in or near waterbodies supporting fish that are part of or that support a commercial, recreational, or Aboriginal fishery. If any activities associated with the Project could result in death of fish or a permanent

alteration to or destruction of fish habitat, a review by DFO may be required to determine the requirement for an Authorization and potentially an offsetting plan.

### 4.1.2 Provincial

#### *Saskatchewan Environmental Assessment Act*

The Saskatchewan Environmental Assessment Act pertains to impacts on the environment from new developments. Development means any project, operation or activity or any alteration or expansion of any project, operation of activity likely to have an effect on rare and unique or endangered features, substantially use a provincial resources, emit pollutants in a manner that is not regulated by another Act or regulation, cause widespread public concern or others as listed in Part 1(2(d)) of Chapter E-10.1 of the Environmental Assessment Act. This ASP and subsequent development is anticipated as unlikely be subject to the EAA.

#### *The Saskatchewan Environmental Protection Management and Habitat Act*

To conduct work in or near water, an individual or corporation must obtain an Aquatic Habitat Protection Permit. Work requiring a permit includes: road developments such as culvert or bridge installations; shoreline stabilization; recreational development such as docks, beaches and boat launches; riparian and aquatic vegetation removal; channelization; wetland infilling or drainage; ditch maintenance; and water use infrastructure such as pumphouses (Saskatchewan Water Security Agency 2017).

Applications require a technical contact. Agriculture drainage permits specifically require a Qualified Person (QP) defined as a Professional Engineer, Professional Agrologist, Applied Science Technologist, or Certified Technician.

If wetland infilling or other applicable activities are planned, a Habitat Protection Permit will be required. Allow at minimum 6 weeks for permit processing.

#### *Saskatchewan Wildlife Habitat Protection Act (WHPA)*

The Wildlife Habitat Protection Act pertains to crown lands designated as wildlife habitat and ecological lands. The Act prohibits lands alteration of designated lands (Government of Saskatchewan 1983). No WHPA lands are in or nearby the ASP area.

#### *The Wildlife Act*

The Saskatchewan Wildlife Act determines the protection of wild species considered “designated”. The minister can prepare and implement recovery plans for designated species (Government of Saskatchewan 1998). The Wildlife Act may be applicable if designated species are discovered prior to construction.

#### *Saskatchewan Fisheries Regulation*

A fisheries license is required to obtain or possess fish by any method for scientific purposes (Section 86(1)). A number of fish are considered invasive in Saskatchewan and if designated so by a Minister, prohibitions such as importation, buying, selling, transporting, introduction and deposition is prohibited. Prohibited fish species are listed in Table 10 (Section 88.1) of The Fisheries Regulations (F-16.1 REG 1). A fisheries license will be required to conduct fish studies, if required.

#### *The Weed Control Act*

The Weed Control Act designates weeds as Prohibited, Noxious or Nuisance. A prohibited weed shall be eradicated while a noxious weed is prohibited from movement by any material, machine, or domestic animal. A ministerial order designates the weed species included (Government of Saskatchewan 2010). A weed survey in the growing season may be beneficial, weed control prior to area development, if needed, is recommended.

## 4.2 Wetland Conservation and Protection

Generally, ISL recommends retention of reasonably permanent, large, and/or complex wetlands due to the potential landscape hydrologic impact. Typically, these basins have limited anthropogenic disturbance resulting in native plant communities, high potential for rare species, and stable wildlife habitat for waterfowl, shorebirds, amphibians, and invertebrate species. Additionally, these basins typically hold more water than other wetlands and may be significant to catchment hydrology. To infill them during development would not only displace this water, but also likely impact the overland flow dynamics, which could lead to flooding and/or spring melt and stormwater management issues.

It should also be noted that less permanent wetlands also provide important wetland functions such as stormwater retention, sediment and nutrient retention, as well as wildlife habitat, however, they occur as smaller features on the landscape within the Study Area and the impact of their disturbance is anticipated to be less since the majority of them have been historically disturbed by cultivation. ISL recommends that during development, conservation of these wetlands be considered.

### 4.2.1 Setbacks and Environmental Reserve

Wetland setbacks are important to consider for development planning. Setbacks provide a buffer of vegetation and help to filter water and other inputs, provide habitat for wildlife, and help protect the wetland from disturbance. Lloydminster has no mandated setbacks for wetlands, nor does the government of Saskatchewan or the Government of Alberta have required setbacks.

The Alberta government recommends 20 m for glacial till or 50 m for coarse textured sands and gravels adjacent to Class III (Stewart and Kantrud 1971) and above wetlands as well as lakes, rivers, streams, seeps and springs (Government of Alberta 2012). Class II wetlands (Stewart and Kantrud 1971) have a recommended 10 m setback (Government of Alberta 2012).

ISL recommends that permanent and intact wetlands be claimed as Environmental Reserve and have a 50 m setback applied. A 20 m setback is recommended for other intact wetlands and watercourse areas that have low disturbance and/or high potential for habitat.

## 4.3 Future Recommended Studies

ISL recommends field studies prior to the time of ground disturbance, as data collected for fieldwork is generally considered expired 3-5 years from collection. ISL recommends wildlife studies, specifically migratory bird assessments during the spring season to assess for protected species and the need for mitigation specific to those species and to remain in compliance with the Wildlife Act and Migratory Bird Convention Act.

ISL also recommends wetland field studies by a Qualified Person prior to ground disturbance to provide accuracy in the Habitat Protection Permit application and to provide baseline information for future Water Management Plans. Additionally, assessment for fish presence is recommended to remain in compliance with the Fisheries Act. Additional recommendations and options for mitigation at the time of construction are provided in Table 3.1, above.



# 5.0 Decision Making Framework

At the desktop stage, there do not appear to be encumbrances to future a development that cannot be mitigated for. Fieldwork prior to ground disturbance will provide site and species-specific mitigation and is recommended.

Table 5.1: Decision Framework

| Task | Main Recommendations |
|---|---|
| Further Biological Assessments? | Recommended, See Section 4.2 and Table 3.1 |
| Regulatory Approvals Required? | Likely, but are dependant on results of fieldwork at appropriate time of year and construction details. |
| Environmental Reserve and setbacks? | ISL recommends retention of wetland where possible. Preferably those that appear most permanent. |



# 6.0 References

Alberta Environment and Parks. 2015. Fisheries and Wildlife Management Information System (FWMIS). Website: http://aep.alberta.ca/fish-wildlife/fwmis/default.aspx. Accessed: February 2019.

Bird Studies Canada and Nature Canada. 2015. Important Bird Areas. Website: http://www.ibacanada.ca/mapviewer.jsp?lang=EN . Accessed: February 2019.

Bureau of the Convention on Wetlands. 2014. The Ramsar Sites. Website: http://www.ramsar.org/sites-countries/the-ramsar-sites . Accessed: February 2019.

Committee on the Status of Endangered Wildlife in Canada. 2015. Wildlife Species Search. Last updated June 19, 2015. Website: http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm. Accessed: February 2019.

Department of Fisheries and Oceans. 2013. Fisheries Protection Policy Statement. Projects Near Water. Website: http://www.dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html . Accessed: February 2019.

Ducks Unlimited Canada. 2019. Duck Navigator (interactive map). Website: http://maps.ducks.ca/ducknavigator/. Accessed: February 2019.

Environment and Climate Change Canada. 2014. Birds Protected in Canada under the Migratory Birds Convention Act, 1994 and Regulations. Website: https://www.ec.gc.ca/nature/default.asp?lang=En&n=496E2702-1#_003 Accessed: February 2019.

Environment and Climate Change Canada. 2017a. General Nesting Periods of Migratory Birds in Canada. Website: https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_01_4 . Accessed: February 2019.

Environment and Climate Change Canada 2017b. Migratory Bird Sanctuaries. Website: https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries/locations.html#sk. Accessed: February 2019.

Government of Alberta. 2012. Stepping Back from the Water: a beneficial management practices guide for new development near water bodies in Alberta's settled region. Website: https://open.alberta.ca/publications/9781460100592. Accessed: February 2019.

Government of Canada. 2015. Species at Risk Public Registry. Website: http://www.sararegistry.gc.ca/species/default_e.cfm. Accessed: February 2019.

Government of Saskatchewan. 1980. The Environmental Assessment Act. Accessed at: http://www.publications.gov.sk.ca/freelaw/documents/English/Statutes/Statutes/E10-1.pdf. Accessed: February 2019.

Government of Saskatchewan. 1983. The Wildlife Habitat Protection Act. Accessed at:http://www.publications.gov.sk.ca/freelaw/documents/English/Statutes/Statutes/W13-2.pdf. Accessed: February 2019.

Government of Saskatchewan. 2010. The Weed Control Act. Accessed at: http://www.publications.gov.sk.ca/freelaw/documents/English/Statutes/Statutes/W11-1.pdf. Accessed: February 2019.

Government of Saskatchewan. 2010. Ministers Order: Designation of Prohibited, Noxious and Nuisance Weeds in Accordance with the Weed Control Act. Accessed at: http://publications.gov.sk.ca/documents/20/84083-44fb5d3e-a7e0-461c-84d5-876f651a3ed4.pdf. Accessed: February 2019.

Government of Saskatchewan. 2015. NAWMP Target Landscapes for the WSA Southwest Region. Website: http://crwatershed.ca/wp-content/uploads/2018/01/NAWMP_Target_Landscapes_SW_11x17.pdf. Accessed: February 2019.

Parioplan. 2013. Lloydminster Municipal Development Plan. Wesbite: https://www.lloydminster.ca/en/business-and-growth/resources/Documents/Municipal-Development-Plan.pdf . Accessed: February 2019.

Saskatchewan Conservation Data Centre. 2014. Saskatchewan's Ecoregions. Website: http://www.biodiversity.sk.ca/eco.htm. Accessed: February 2019.

Saskatchewan Conservation Data Centre. 2014. Taxa-list: Non-Native Species (Current as of November 2014). Website: http://www.biodiversity.sk.ca/SppList/non-native.pdf. Accessed: February 2019.

Saskatchewan Conservation Data Centre. 2019. HABISask Database. Accessed at: https://gisappl.saskatchewan.ca/html5ext/?viewer=habisask. Accessed: February 2019.

Saskatchewan Conservation Data Centre. February 2019. Tracked Vascular Plant Taxa by Ecoregion. Regina, Saskatchewan. Website: http://www.biodiversity.sk.ca/SppList.htm. Accessed: February 2019.

Padbury, G.A., D. Acton, and C. Stushnoff. 1998. Ecoregions of Saskatchewan. University of Regina. Canadian Plains Research Centre. University of Regina Press. 205pp.

Shields, J.A., H.P.W., Rostad, and J.S. Clayton. 1968. A guide to Soil Capability and Land Inventory Maps in Saskatchewan (Second Edition). Publication No. M8. Saskatchewan Institute of Pedology, University of Saskatchewan, Saskatoon, Saskatchewan. 60 pp.

Government of Saskatchewan. 1995. The Fisheries Regulations (Chapter F-16.1 REG 1). Accessed at: http://www.qp.gov.sk.ca/documents/English/Regulations/Regulations/F16-1R1.pdf#page=50. Accessed: February 2019.

Government of Saskatchewan. 1998. The Wildlife Act. Accessed at: http://www.qp.gov.sk.ca/documents/English/Statutes/Statutes/W13-12.pdf. Accessed: February 2019.

Saskatchewan Water Security Agency. 2017. Aquatic Habitat Protection. Website: https://www.wsask.ca/Water-Programs/Aquatic-Habitat-Protection/. Accessed: February 2019.

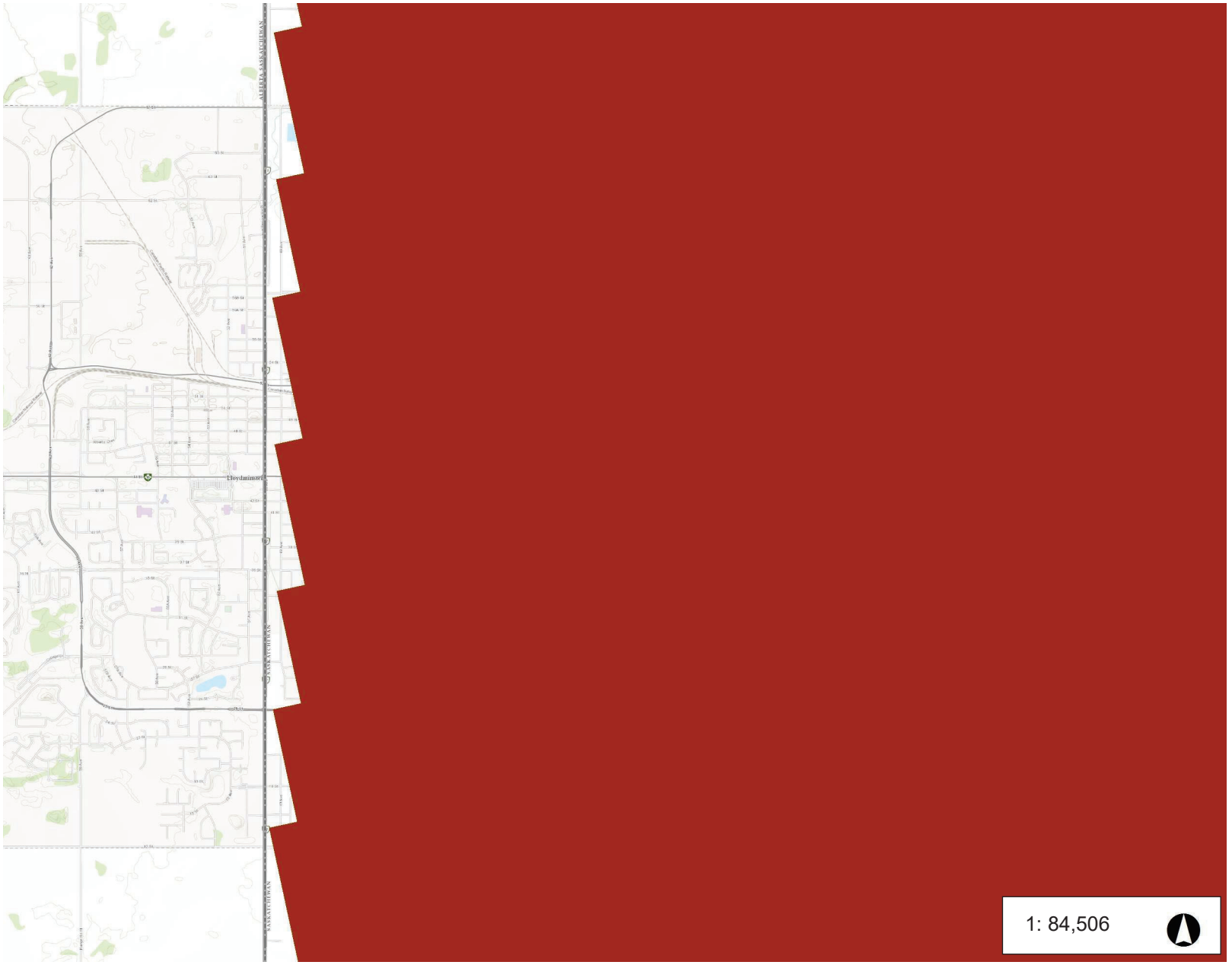
Stewart, Robert E., and Harold A. Kantrud. 1971. Classification of natural ponds and lakes in the glaciated prairie region. Resource Publication 92, Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. Website: http://www.npwrc.usgs.gov/resource/wetlands/pondlake/index.htm (Version 16APR1998). Accessed: May 2016.

United Nations Educations, Scientific and Cultural Organization. 2015. World Network Biosphere Reserves. Website: http://unesdoc.unesco.org/images/0023/002314/231407M.pdf . Accessed: February 2019.

Western Hemisphere Shorebird Reserve Network. 2012. Sites in the Western Hemisphere Shorebird Reserve Network (interactive map). Website: https://www.whsrn.org/sites-1 . Accessed: February 2019.

# APPENDIX A
HABISask Soil Output

# HABISask-Soil







## Legend

- Provincial Boundary
- National Park
- Provincial Park

Saskatchewan Soil Capability (

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6
- Class 7
- Organic

1: 84,506

## Notes

4.3 0 2.15 4.3 Kilometers

WGS_1984_Web_Mercator_Auxiliary_Sphere

© Latitude Geographics Group Ltd.

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

# APPENDIX B
Photo Plates




**Plate 1** Google Streetview southeast on 67th Street with AB-17 to the right (NW 11-50-28 W3M) (Google Streetview 2013).




**Plate 2** View on 67th Street in the NW portion of the ASP area showing a culvert and drainage (NW 11-50-28 W3M). Also evident is a Canada thistle infestation (arrow) (Google Streeview 2013).




**Plate 3** View south on 67th Street showing cultivated field and potential wetland (arrow) in NW 11-50-28 W3M (Google Streeview 2013).




**Plate 4** View south on 67th Street, at the intersection of the CNR East Till Battery, showing a windrow in NE/NW 11-50-28 W3M(Google Streeview 2013).




**Plate 5** View southwest near the intersection of 67th Street and 40th Avenue, showing cultivation in NE 11-50-28 W3M (Google Streeview 2013).




**Plate 6** View southeast near the intersection of 67th Street and 40th Avenue, showing cultivation in NW 12-50-27 W3M (Google Streeview 2013).




**Plate 7** View east on 40th Avenue, showing wetland (arrow) in NE 11-50-28-W3M (Google Streeview 2013).




**Plate 8** View east on 40th Avenue, showing wetland (arrow) in SW 12-50-27-W3M (Google Streeview 2013).




**Plate 9** View west on 40th Avenue, showing wetland (arrow) in NE/SE 11-50-28-W3M (Google Streeview 2013).




**Plate 10** View west on 40th Avenue, showing wetland (arrow) in SE 11-50-28-W3M (Google Streeview 2013).



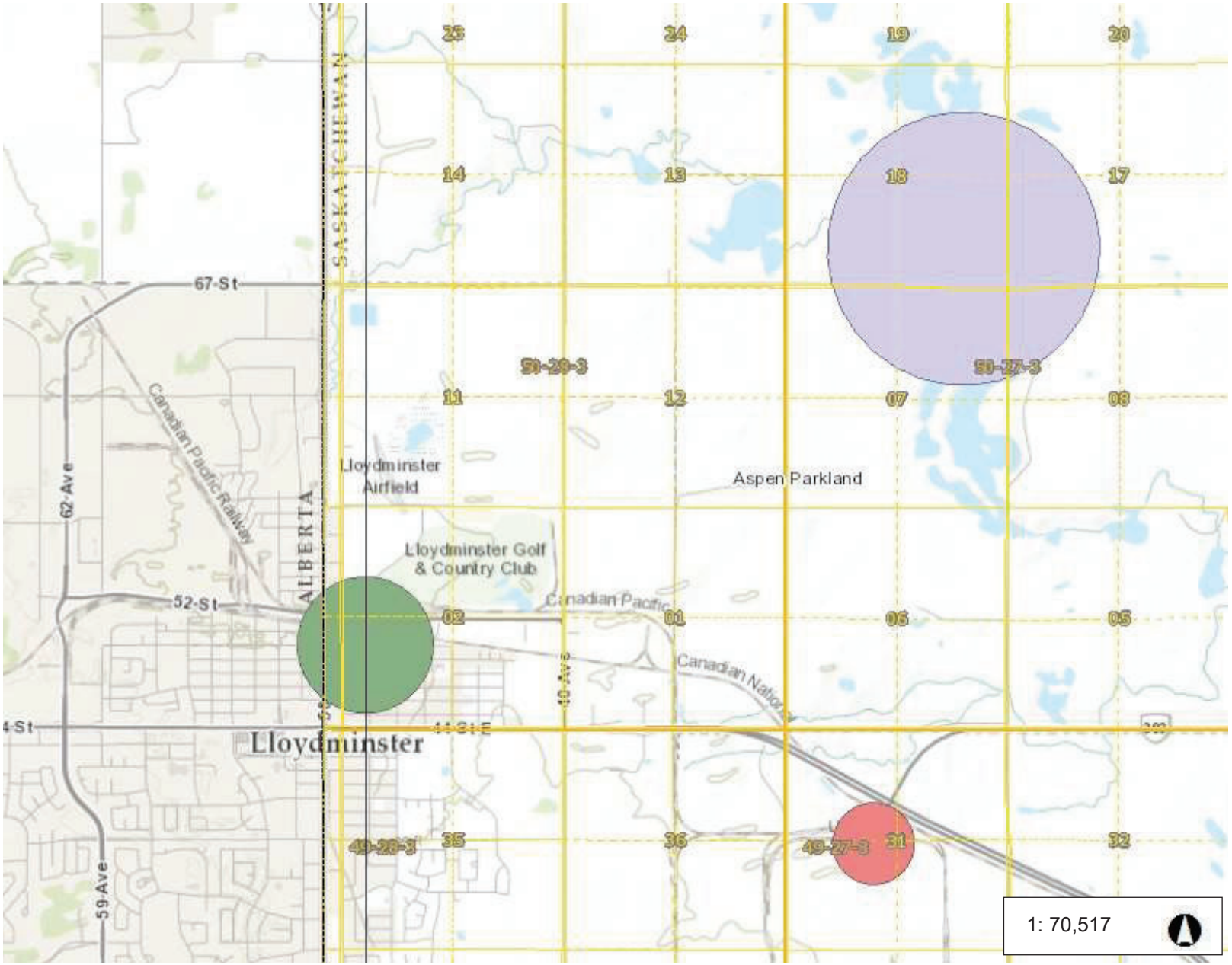

**Plate 11** View southeast on 40th Avenue into NW 1-50-28 W3M, showing wetlands (arrow) (Google Streeview 2013).




**Plate 12** View east on 40th Avenue near the intersection with 52nd Street, view into NW 1-50-28 W3M (Google Streeview 2013).

# APPENDIX C
HABISask Rare Species Public Output

# HABISask-Rare Species







## Legend

- Provincial Boundary
- Natural Ecoregions
- Township
- Section
- Quarter Section
- Rare and Endangered Species
  - Vertebrate Animal
  - Invertebrate Animal
  - Animal Assemblage
  - Vascular Plant
  - Nonvascular Plant
  - Other (Botanical)
  - Fungus
- Game Preserve
- National Wildlife Area
- Migratory Bird Sanctuary
- Wildlife Habitat Protection (WH
- Wildlife Refuge
- National Park
- Provincial Park

## Notes

3.6 0 1.79 3.6 Kilometers

WGS_1984_Web_Mercator_Auxiliary_Sphere

© Latitude Geographics Group Ltd.

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

# APPENDIX D
iMapInvasives Output

iMapInvasives
Sharing information for strategic management

## Saskatchewan User Tools

# Generated Report

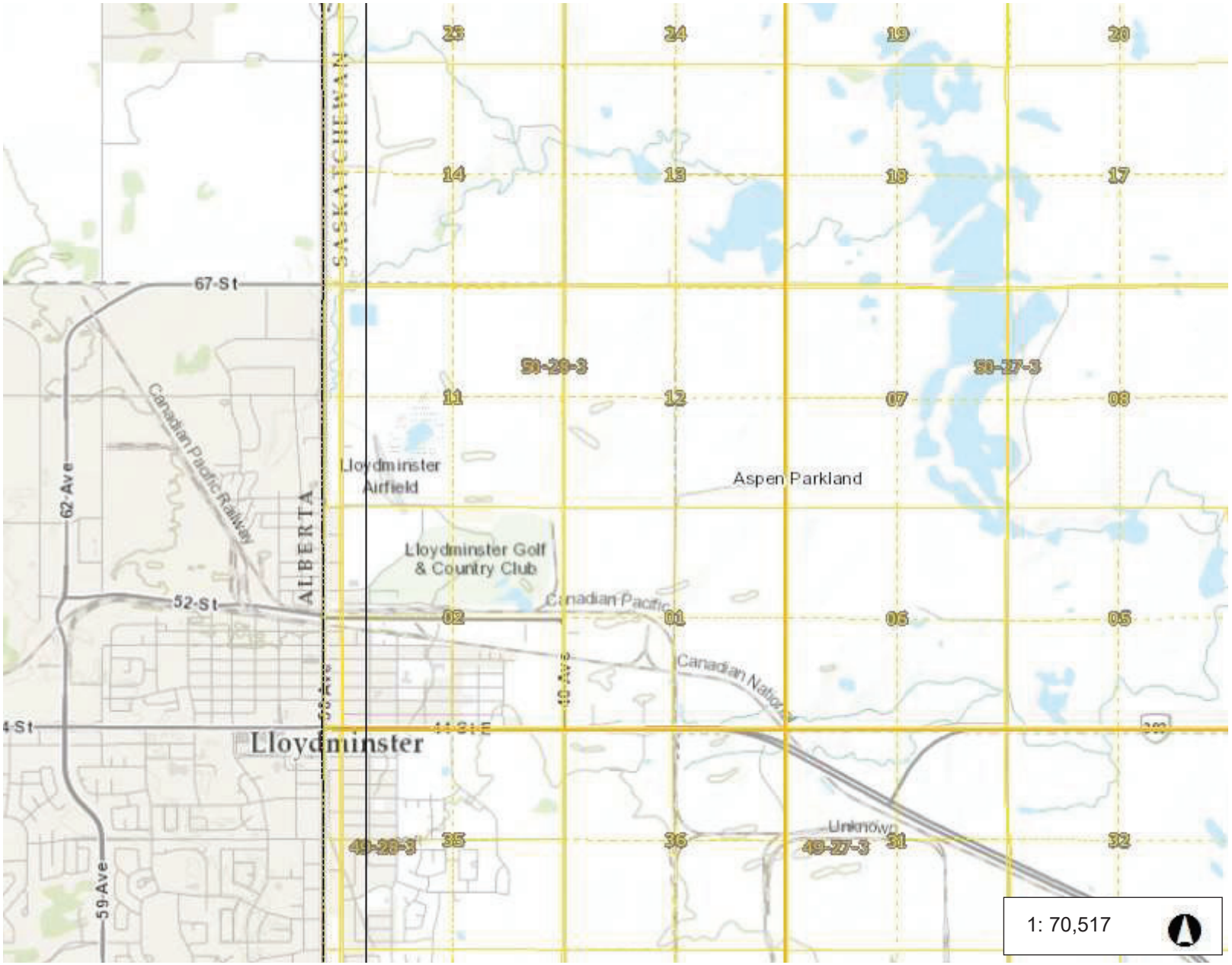
### Report for Municipality : Lloydminster , Buffer_distance: 100

No records found

Copyright © 2019 NatureServe.

# APPENDIX E
HABISask Important Habitat Public Output

# HABISask-Biodiversity







## Legend

- Bird Species
- Provincial Boundary
- Natural Ecoregions
- Township
- Section
- Quarter Section
- Game Preserve
- National Wildlife Area
- Migratory Bird Sanctuary
- Wildlife Habitat Protection (WH
- Wildlife Refuge
- National Park
- Provincial Park
- SK Woodland Caribou Range

1: 70,517

## Notes

3.6 0 1.79 3.6 Kilometers

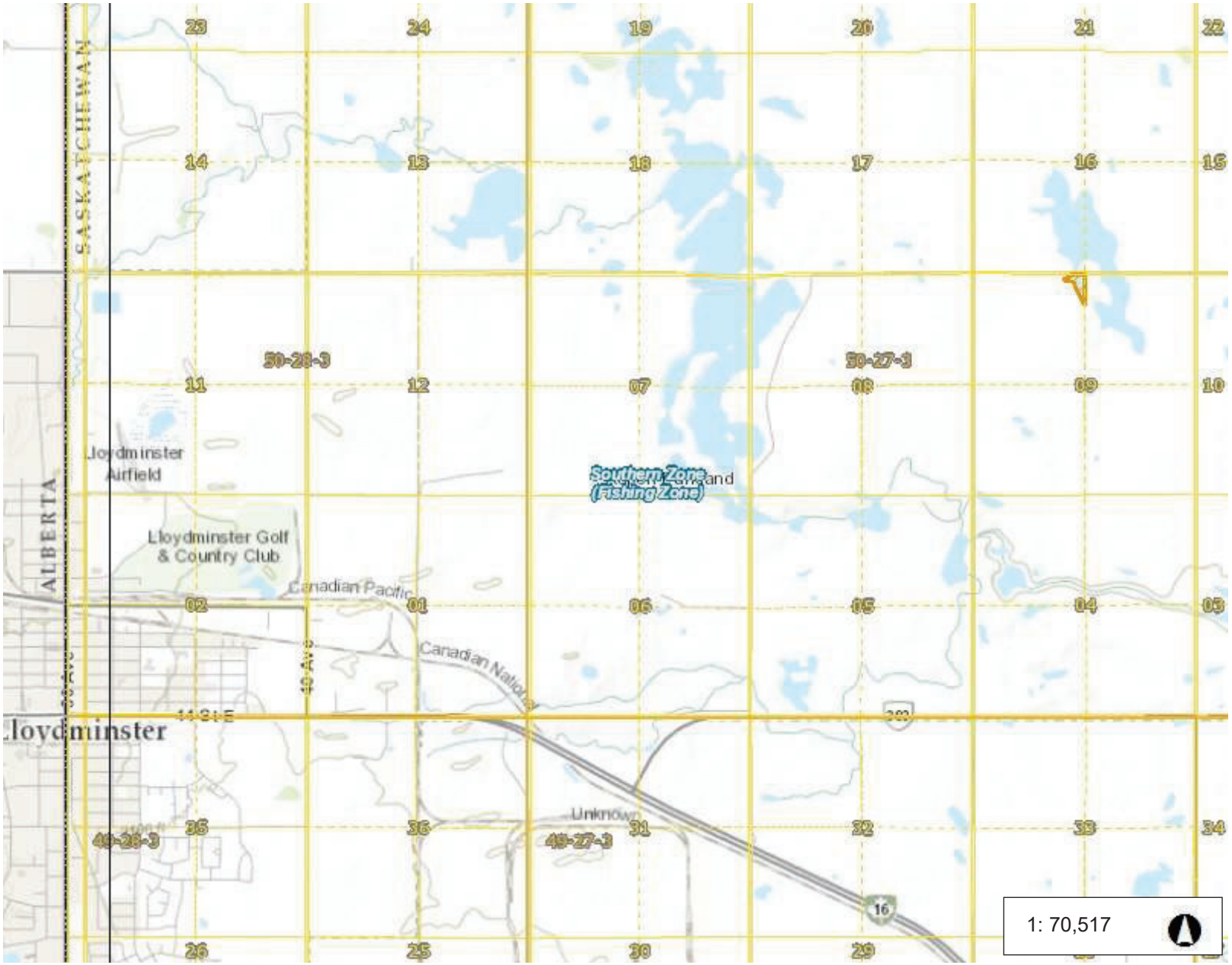
WGS_1984_Web_Mercator_Auxiliary_Sphere

© Latitude Geographics Group Ltd.

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

# APPENDIX F
HABISask Fisheries Output

# HABISask-Fish







## Legend

- Provincial Boundary
- Sport Fish Management Zones
- Natural Ecoregions
- Township
- Section
- Quarter Section
- Game Preserve
- National Wildlife Area
- Migratory Bird Sanctuary
- Wildlife Habitat Protection (WH
- Wildlife Refuge
- National Park
- Provincial Park
- Fisheries - Special Regulations
  - Special Regulations Info Available
  - 2 - 4
  - 5 - 7
  - 8 - 10
  - 11+

1: 70,517

## Notes

3.6 0 1.79 3.6 Kilometers

WGS_1984_Web_Mercator_Auxiliary_Sphere

© Latitude Geographics Group Ltd.

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

# APPENDIX G
FWMIS Output

# Fish and Wildlife Internet Mapping Tool (FWIMT)

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

## Species Summary Report

**Report Created:** 10-Feb-2019 16:50

### Species present within the current extent :

| Fish Inventory | Wildlife Inventory | Stocked Inventory |
|---|---|---|
| BROOK STICKLEBACK | No Species Found in Search Extent | No Species Found in Search Extent |

### Buffer Extent

| Centroid (X,Y): | Projection | Centroid: (Qtr Sec Twp Rng Mer) | Radius or Dimensions |
|---|---|---|---|
| 832621, 5914039 | 10-TM AEP Forest | NE 1 50 1 4 | 2 kilometers |

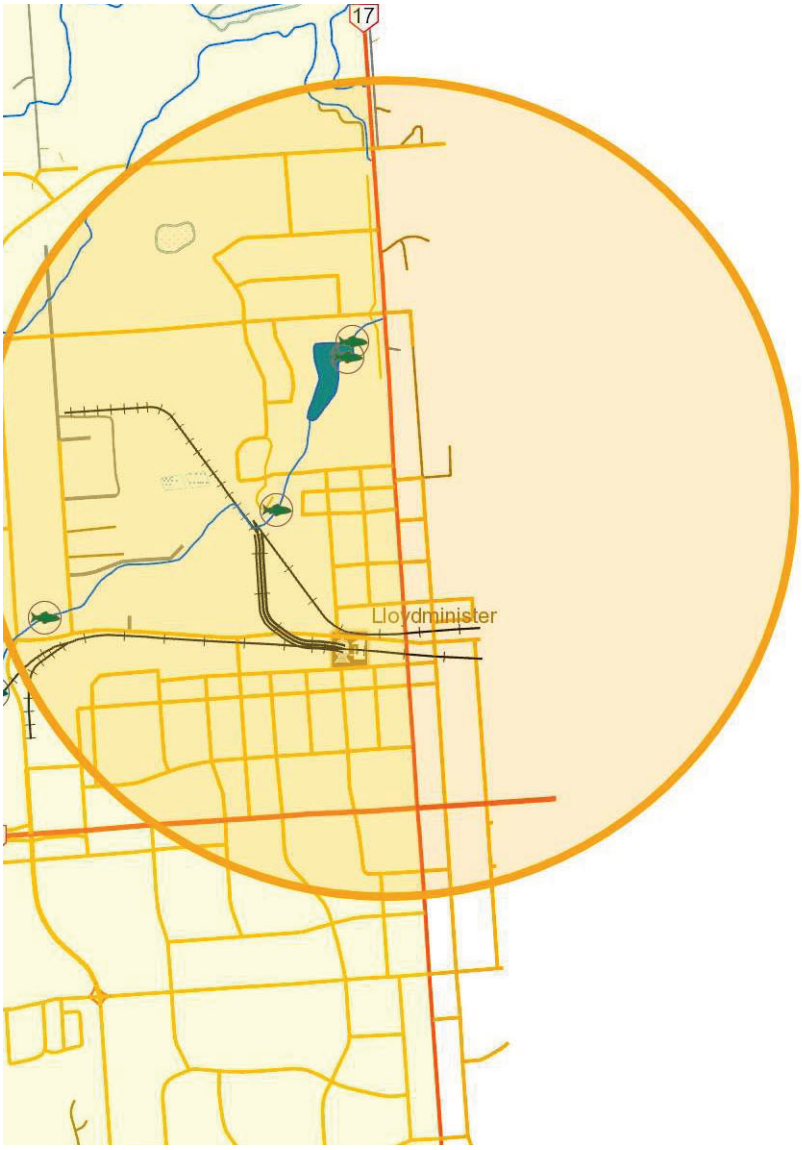
### Contact Information

For contact information, please visit:

http://aep.alberta.ca/about-us/contact-us/fisheries-wildlife-management-area-contacts.aspx

10-Feb-2019 16:50

## Map Results




Display may contain: Base Map Data provided by the Government of Alberta under the Alberta Open Government Licence. Cadastral and Dispositions Data provided by Alberta Data Partnerships.©GeoEye, all rights reserved. Information as depicted is subject to change, therefore the Government of Alberta assumes no responsibility for discrepancies at time of use.

© 2019 Government of Alberta

# APPENDIX H
Historical Photography



Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

1:15,000

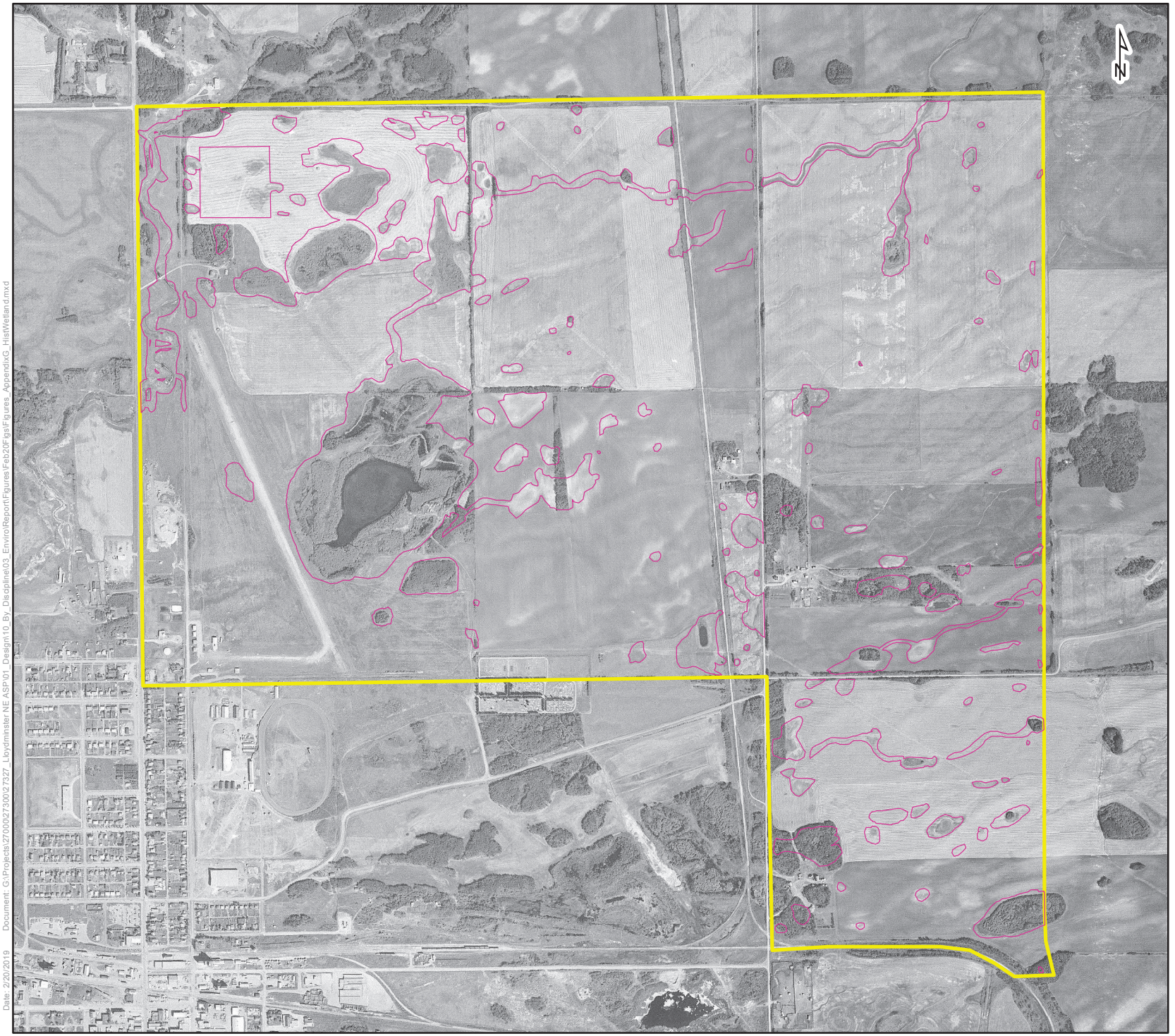
0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (1949)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\Feb20Figs\Figures_AppendixG_HistWetland.mxd




Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

1:15,000

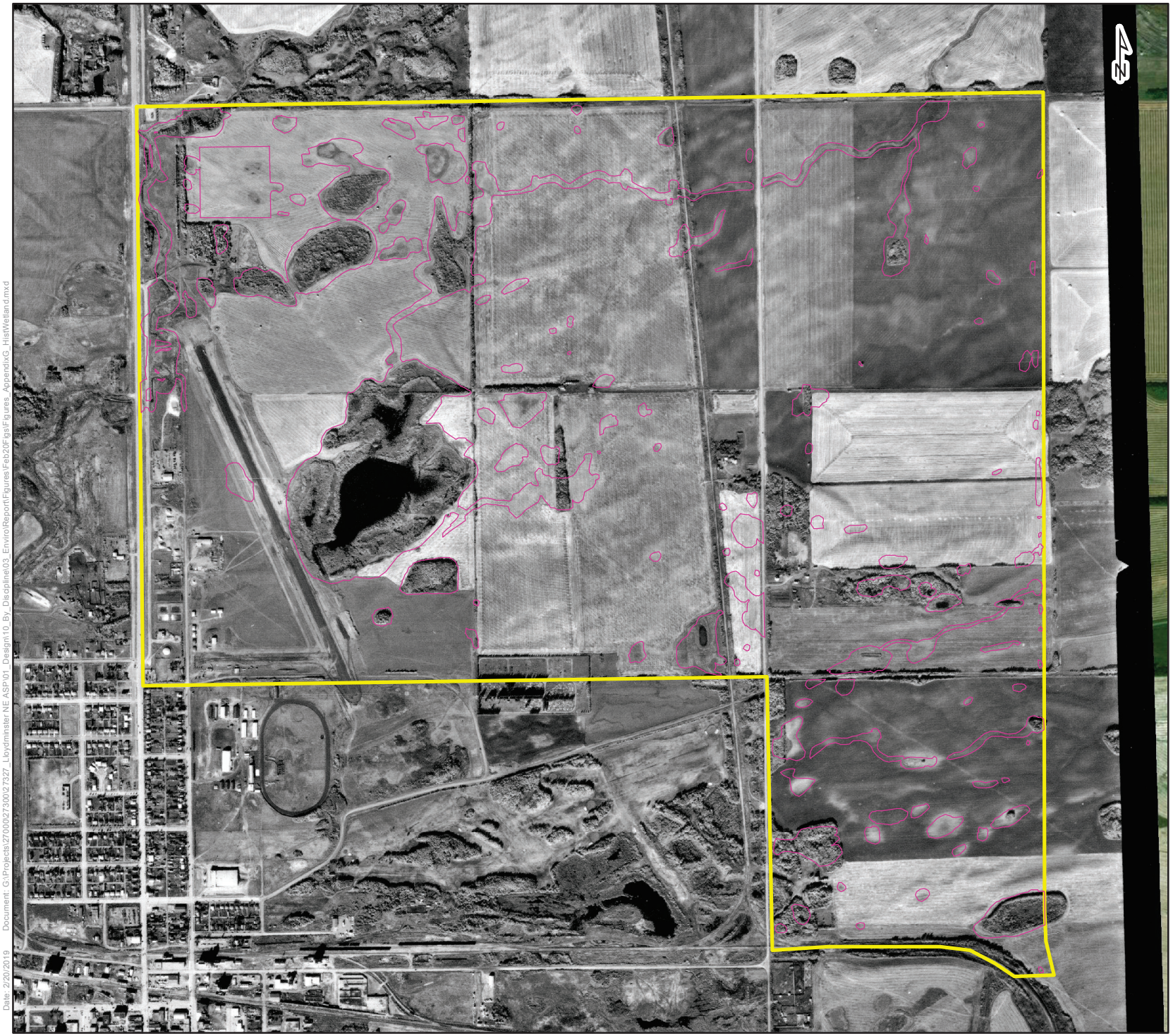
0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (1965)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\Feb20FigsFigures_AppendixG_HistWetland.mxd




Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

1:15,000

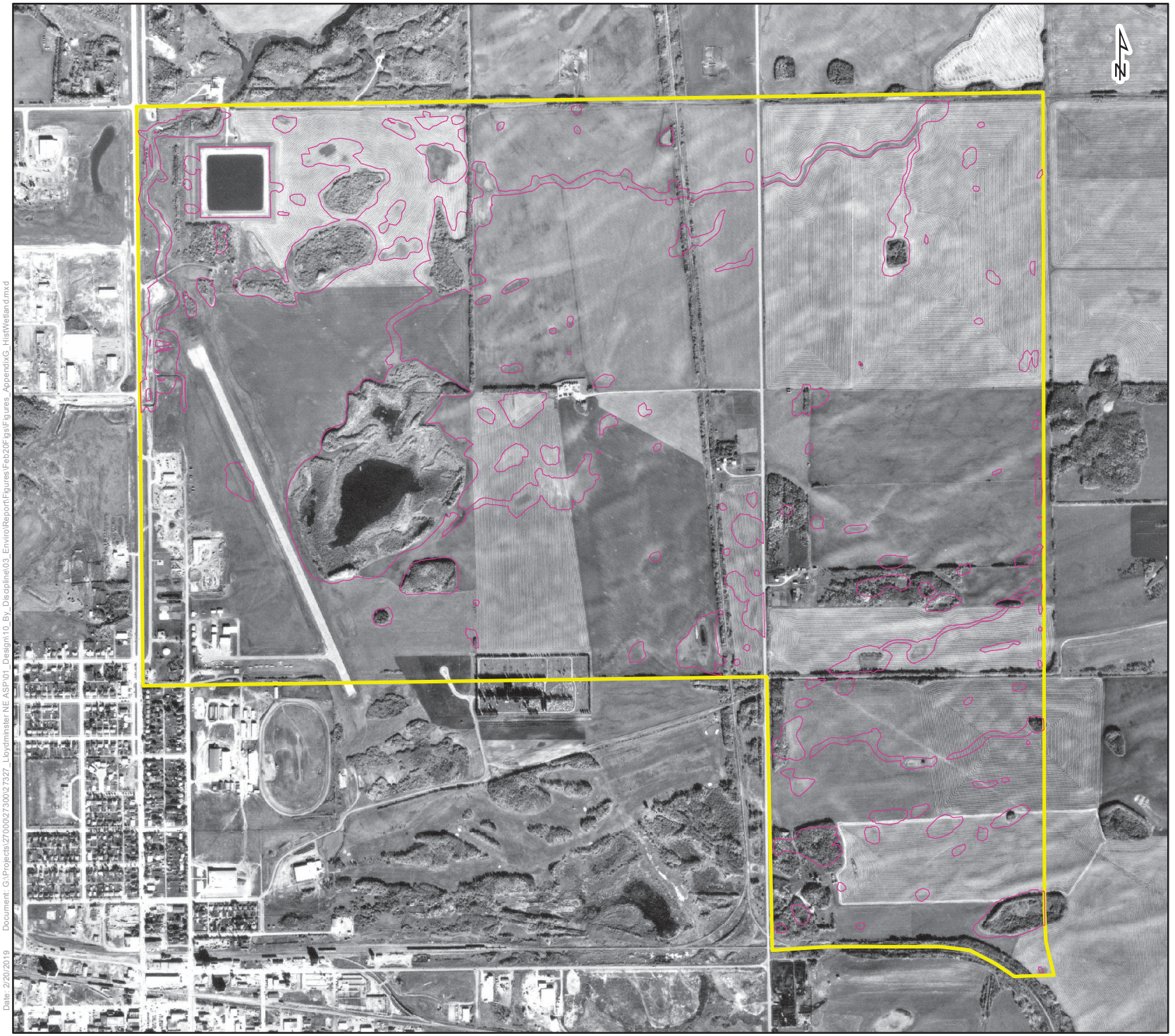
0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (1971)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\Feb20FigsIFigures_AppendixG_HistWetland.mxd



Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

1:15,000

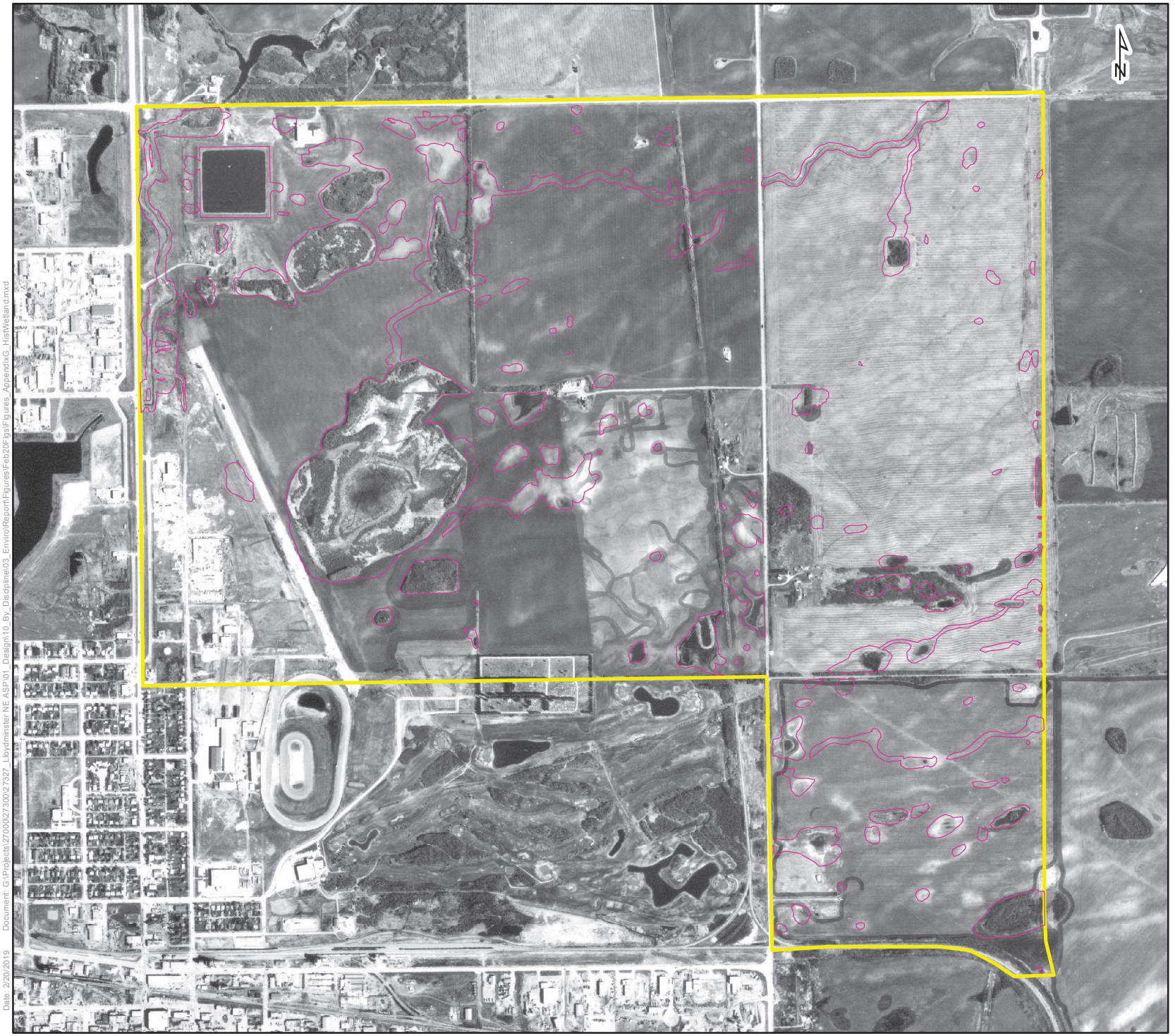
0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (1978)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_EnviroReport\Figures\Feb20FigsIFigures_AppendixG_HistWetland.mxd



Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

1:15,000

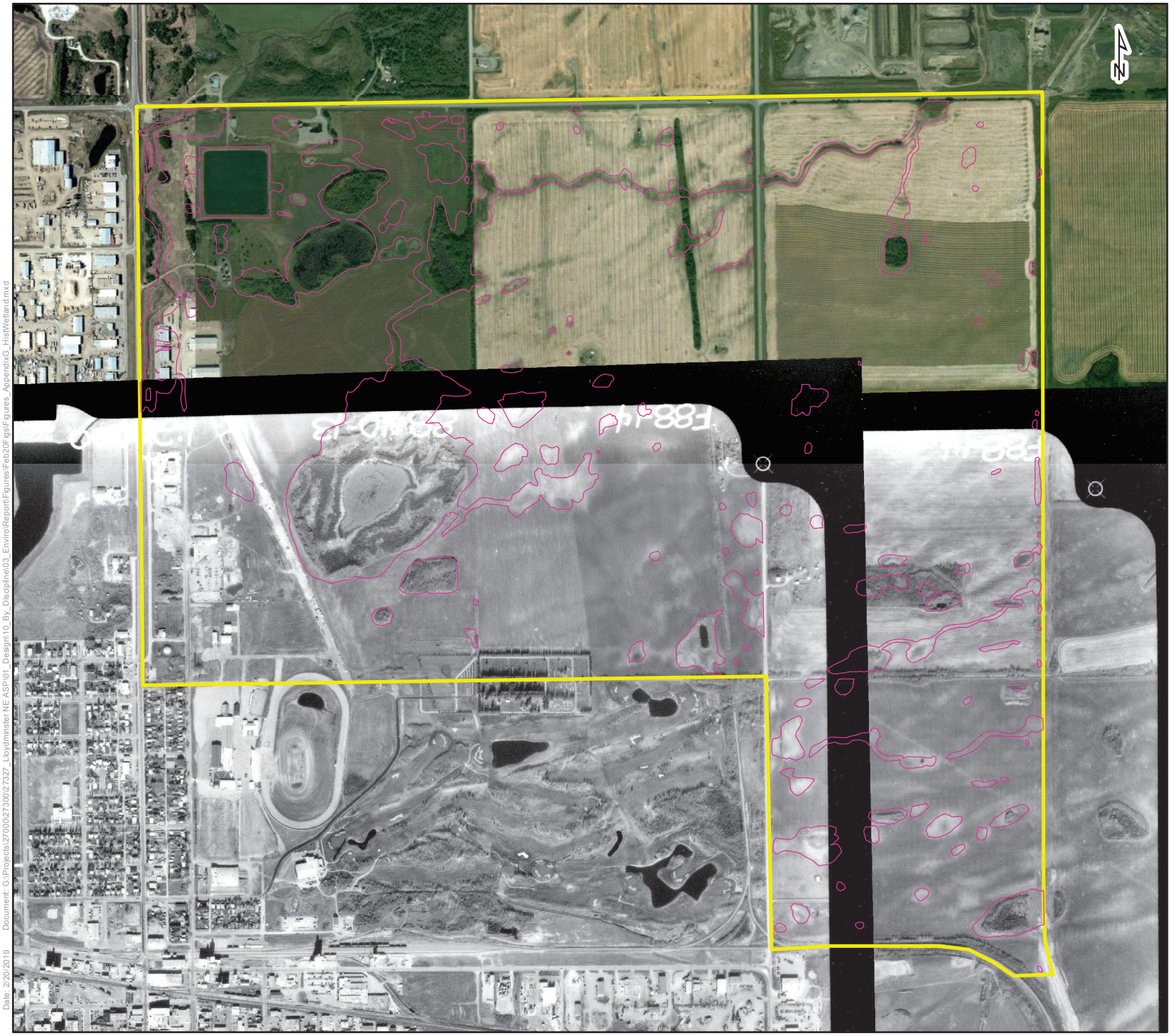
0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (1985)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\Feb20FigsFigures_AppendixG_HistWetland.mxd



Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

1:15,000

0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (1988)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\Feb20Figs\Figures_AppendixG_HistWetland.mxd



Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

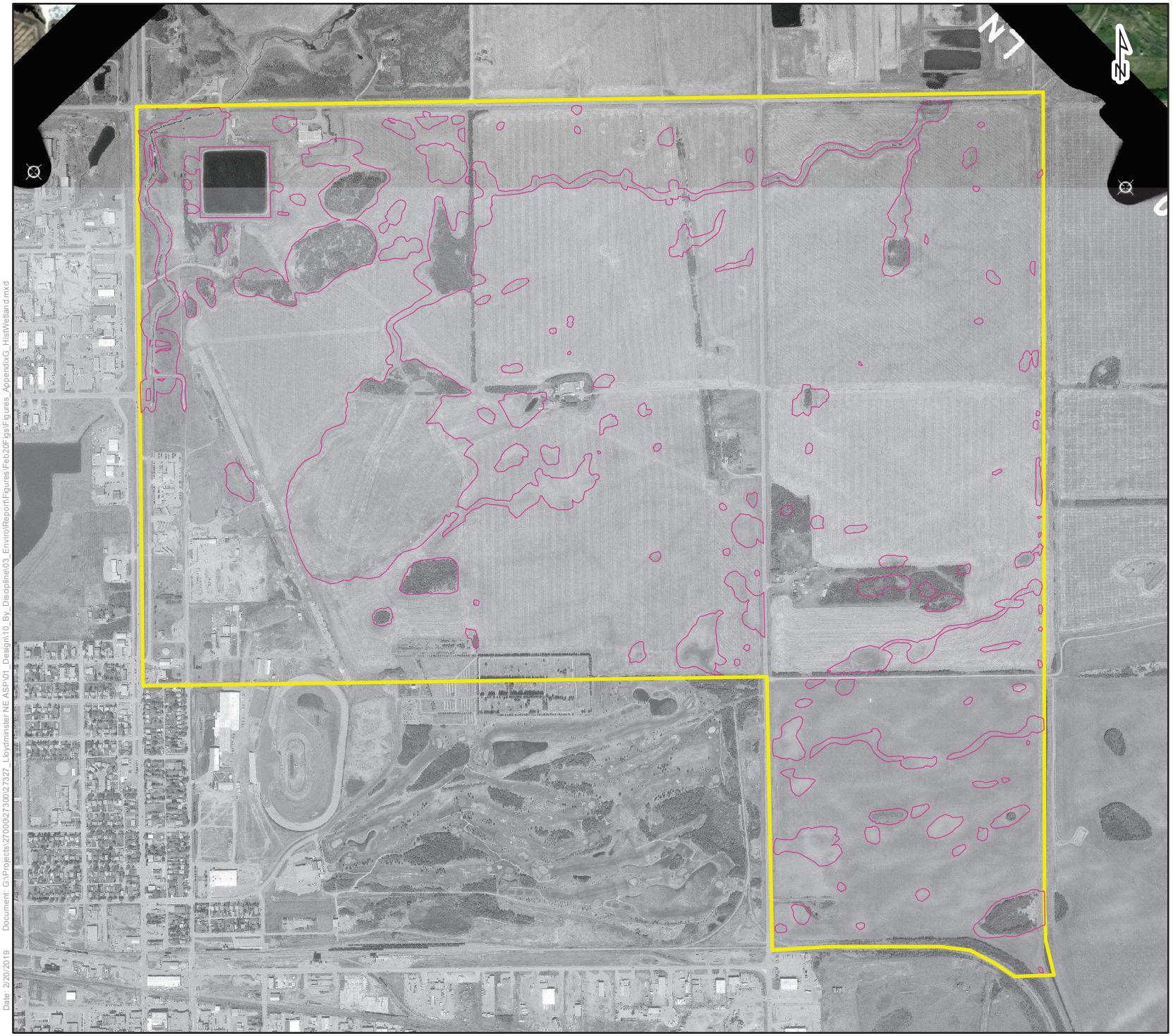
1:15,000

0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (1991)

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01 Design\10 By Discipline\03 Enviro\Report\Figures\Feb20FigsFigures AppendixG HistWetland.mxd



Legend

Approximate ASP Area

Potential Wetlands, Watercourses and other Waterbodies

1:15,000

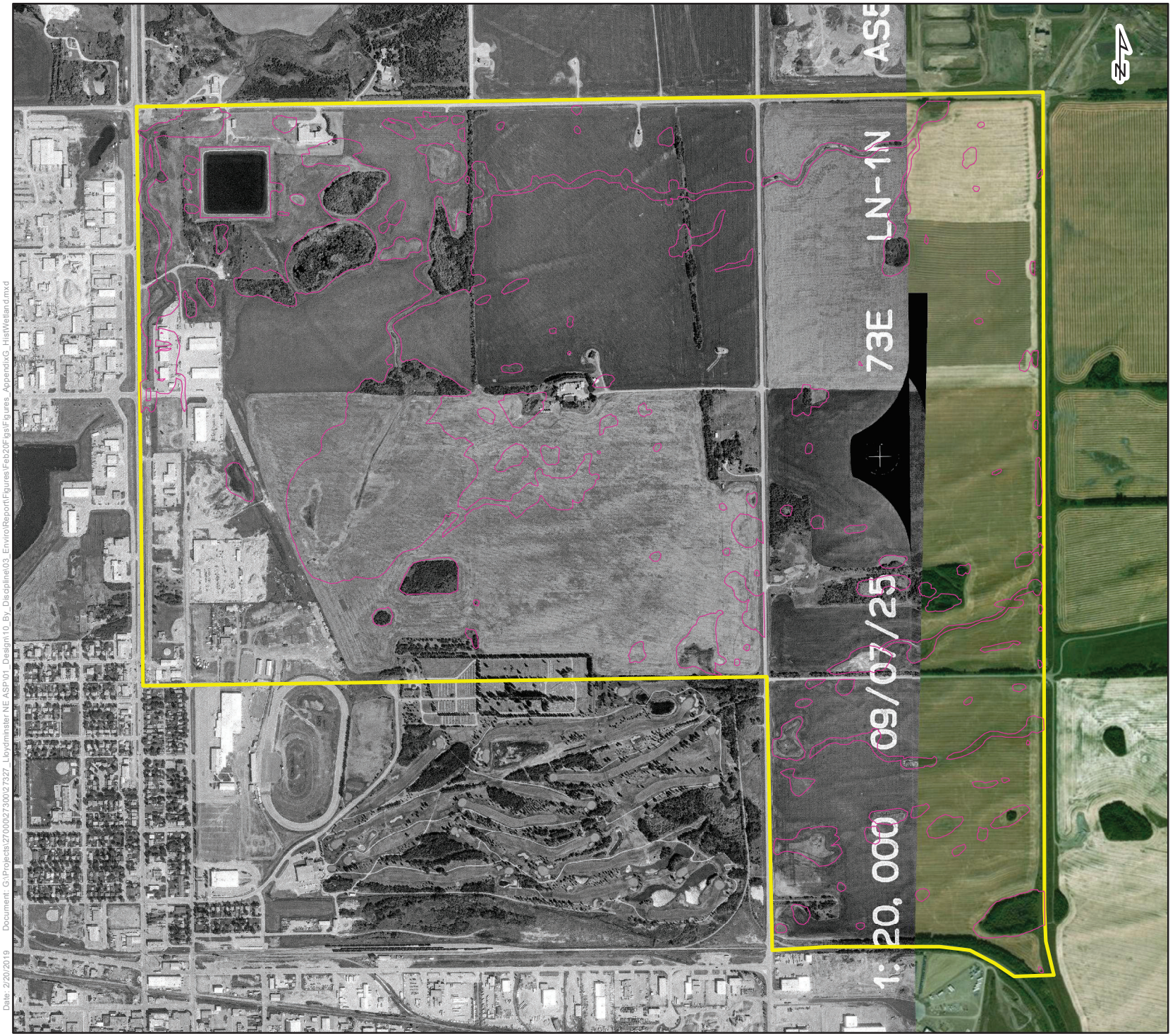
0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (2000)

ISL

Integrated Expertise. Locally Delivered.

Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\Feb20Figs\Figures_AppendixG_HistWetland.mxd




Date: 2/20/2019 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\Report\Figures\Feb20FigsIFigures_AppendixG_HistWetland.mxd

**Legend**

- Approximate ASP Area
- Potential Wetlands, Watercourses and other Waterbodies

1:15,000

0 62.5125 250 375 500 Meters

HISTORICAL PHOTOGRAPHY (2009)

ISL

Integrated Expertise. Locally Delivered.

# APPENDIX I
July 2019 Field Visit Memorandum

# Memorandum

Integrated Expertise. Locally Delivered.

4015 7 Street SE, Calgary, AB T2G 2Y9 T: 403.254.0544 F: 403.254.9186

| | | | |
|---|---|---|---|
| To: | **City of Lloydminster** | Date: | **July 3, 2019** |
| Attention: | | Project No.: | **27327** |
| Cc: | **Sue Paton RPP, MCIP (ISL Engineering)** | | |
| Reference: | **Lloydminster NE ASP** | | |
| From: | **Robyn Gamber, B.Sc., B.GIS., P. Biol., R.P. Bio (ISL Engineering)** | | |

As part of the Lloydminster ASP Project, ISL completed a desktop Environmental Impact Assessment (EIA) in February 2019 for the ASP Area (Figure 1) to direct future environmental considerations and potential regulatory requirements. This memorandum confirms the results on the desktop EIA and provides information additional to the EIA that was obtained during the field visit on June 21, 2019. Photographs obtained during the field visit are provided in an attachment.




Figure 1: ASP Location

### Wildlife

Wildlife incidentally observed visually during the field visit included red-winged blackbirds and mallard ducks in some wetlands. Amphibians were also audibly observed in some wetlands. The remaining natural spaces (within cropland) such as forested areas, wetlands and the watercourse area offer good potential wildlife habitat.

### Wetlands

An area delineated as wetland in the Environmental Impact Assessment is upland remnant forest (Figure provided in an Attachment). To complete the Aquatic Habitat Protection Permit, the locations of proposed disturbance will need to be field confirmed by a Qualified Person. The number of wetlands confirmed by fieldwork are expected to vary slightly from the number provided in desktop wetlands map in the EIA.

### Watercourses and Waterbodies

Fish are likely to be present in the watercourse within the northwestern portion of the ASP area (NE 10-50-28 W3M). Avoidance of any disturbance to this watercourse, including the proposed 20 meter vegetated buffer, is recommended. Installation of fencing at the buffer edge would be prudent to ensure protection.

## Additional Environmental Concerns

### Clubroot Sanitization

Clubroot, caused by *Plasmodiophora brassicae*, is a serious disease of cruciferous crops (*i.e*. mustards, canola, etc.) which can result in reduced to severe yield losses. Clubroot is a listed pest under Saskatchewan's Pest Control Act (Clubroot Management Plan 2018). In rural municipality 502, adjacent to Lloydminster, 1-9 fields have shown clubroot symptoms (Clubroot Distribution in Saskatchewan: Cumulative Testing 2008-2018).

During the site visit canola appeared to be in production in at least two quarter sections of the ASP area. Given the potential for clubroot disease, soil handling specifications should include sanitization procedures to prevent the spread of clubroot disease via machinery. Typical mitigation measures include inspecting machinery for cleanliness and pressure washing prior to entry and exit.

## Closure

Information requests can be directed to Ms. Gamber at 403.254.0544 or rgamber@islengineering.com.

Regards,

Robyn Gamber, P. Biol
Environmental Scientist
ISL Engineering and Land Services

Attachments: Photo Plates
Wetland Update Figure



**Plate 1** View south of the watercourse in the NW area of the ASP (12U 566317/ 5906851; NE 10-50-28 W3M) (June 21, 2019).



**Plate 2** View southeast of the watercourse in the NW area of the ASP (12U 566304/ 5906829; NE 10-50-28 W3M) (June 21, 2019).



**Plate 3** View east showing the culvert of the watercourse in the NW area of the ASP (12U 566487/ 5906886; NW 11-50-28 W3M) (June 21, 2019).



**Plate 4** View south showing cultivation, arrow points to a wetland (12U 566487/ 5906886; NE 11-50-28 W3M) (June 21, 2019).



**Plate 5** View south showing cultivation (likely Canola) (12U 567682/ 5906891; NE 11-50-28 W3M) (June 21, 2019).



**Plate 6** View south showing wetland (12U 5685462/ 5906924; NW 12-50-28 W3M) (June 21, 2019).



**Plate 7** View south showing cropland (12U 568203/ 5906910; NW 12-50-28 W3M) (June 21, 2019).



**Plate 8** View northwest showing cultivation (likely canola) (12U 568019/ 5906106; NW 12-50-28 W3M) (June 21, 2019).



**Plate 9** View east showing cultivation and treed wetland (at arrow) (12U 568042/ 5906103; SW 12-50-28 W3M) (June 21, 2019).



**Plate 10** View west showing cultivation and wetland (at arrow) (12U 568048/ 59055433; SE 11-50-28 W3M) (June 21, 2019).



**Plate 11** View southeast showing cultivation (12U 568048/ 59055433; SW 12-50-28 W3M) (June 21, 2019).



**Plate 12** View northwest showing wetland (12U 568032/ 5905280; SE 11-50-28 W3M) (June 21, 2019).



**Plate 13** View south showing roadside (12U 568032/ 5905280; SE 11-50-28 W3M) (June 21, 2019).



**Plate 14** View northwest showing cultivation (12U 568061/ 5904663; NW 1-50-28 W3M) (June 21, 2019).




**Plate 15** View north showing cultivation (12U 568165/ 5905285; SW 12-50-28 W3M) (June 21, 2019).



**Plate 16** View south showing wetland in foreground with a cultivated field (12U 568277/ 5905288; NW 1-50-28 W3M) (June 21, 2019).



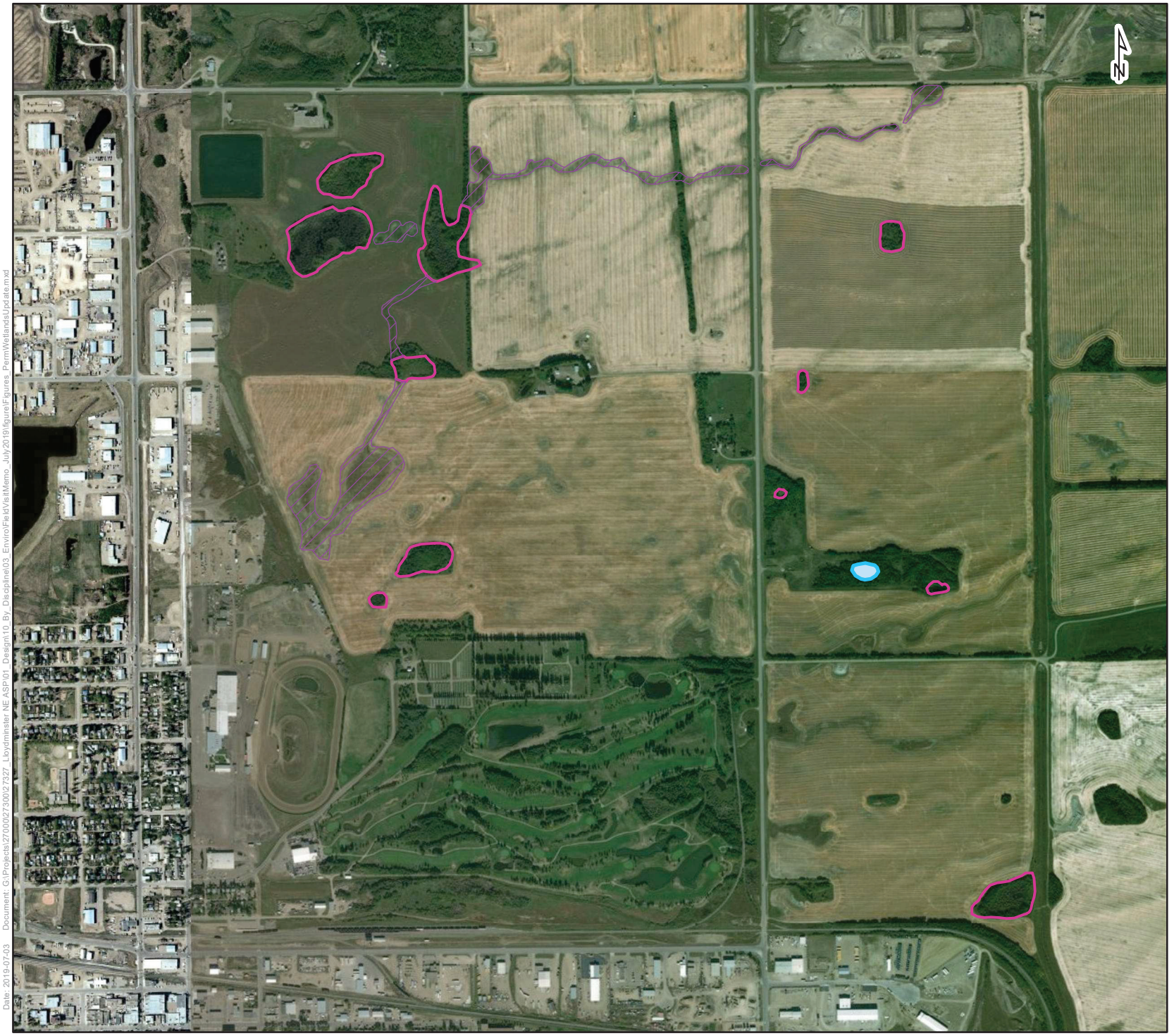
**Plate 17** View north showing cultivation and wetland (12U 568427/ 5905295; SW 12-50-28 W3M) (June 21, 2019).



**Plate 18** View north showing cultivation and remnant treed area (12U 568617/ 5905299; NW 1-50-28 W3M) (June 21, 2019).



**Plate 19** View southeast showing cultivation (12U 568826/ 5905293; NW 1-50-28 W3M) (June 21, 2019).



Legend

- Approximate ASP Area
- Potential Permanent (Class IV and Swamp) Wetlands
- non-permanent connections
- Not a Wetland

1:15,000

0 62.5125 250 375 500 Meters

WETLANDS, WATERCOURSES AND WATERBODIES (POTENTIAL PERMANENT WETLANDS WITH CURRENT ESRI IMAGERY)

ISL

Integrated Expertise. Locally Delivered.

Date: 2019-07-03 Document: G:\Projects\27000\27300\27327_Lloydminster NE ASP\01_Design\10_By_Discipline\03_Enviro\FieldVisitMemo_July2019\figure\Figures_PermWetlandsUpdate.mxd