BIOPHYSICAL IMPACT ASSESSMENT

Centron Group – Clearwater Park ASP

September 2021

Prepared by

Nathan L. Erik, P.Biol., R.P.Bio, AWP
403-921-7057
nathanerik@sage-eco.com
sage-eco.com

sage
ecological solutions

Contents

Tables

Figures

Appendices

ABBREVIATIONS

AEP	Alberta Environment and Parks
AMWI	Alberta Merged Wetland Inventory
ASP	area structure plan
AWCA	Alberta Wetland Classification System
AWRET	Alberta Wetland Rapid Evaluation Tool
BIA	biophysical impact assessment
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ESRD	Alberta Environment and Sustainable Resource Development
FAN	Federation of Alberta Naturalists
FWMIS	Fish and Wildlife Management Information System
GoA	Government of Alberta
LLR	Large Lot Rural Residential
the City	The City of Chestermere
the Proponent	Centron Group
SRD	Alberta Sustainable Resource Development
UT	Urban Transition

EXECUTIVE SUMMARY

SAGE Ecological Solutions Inc. (SAGE) was commissioned in April 2020 by Centron Group (Centron) to conduct a Biophysical Impact Assessment (BIA) for the proposed Clearwater Park development in Chestermere, Alberta. The site is located to the southeast of the intersection of Highway 1 and Centre Avenue East and is bound to the north by Centre Avenue East, to the east by Secondary Highway 791, and on the south and west sides by Highway 1. The BIA has been prepared to support Area Structure Plan (ASP) approval for all four stages and all ASP lands, as well as for Outline Plan approval for Stage 1.

Stage 1 construction is anticipated to begin in late 2021 or in 2022, with subsequent stages beginning following approval of the area structure and outline plans. The ultimate buildout will result in the development of approximately 353 ha of land. The ASP lands consist mostly of previously disturbed vegetation. Vegetation community types include 73% cultivated cropland, 12% disturbed grassland/pasture, 8% wetland, and 7% anthropogenic land types. Wetlands cover 29.29 ha. The 29 wetlands include two Semi-Permanent-Freshwater-Shallow Open Water (Class IV), one Seasonal-Freshwater-Shallow Open Water (Class III), 10 Seasonal-Freshwater-Marsh (Class III), and 16 Temporary-Freshwater-Marsh (Class II) wetlands.

Fieldwork for Stage 1 was completed in 2020 to support the submission of a Wetland Assessment and Impact Report and outline plan approval and a BIA was submitted in February 2021 with a commitment to conduct field surveys for the outstanding stages later in 2021. Supplemental field verification surveys for the greater ASP area were completed in spring and summer 2021. This report is provided to present results of field surveys for the entire ASP area.

Key findings of this report include the occurrence of three wildlife species conservation concern (e.g., At Risk species) that were identified onsite, as well as wetlands that occur on the property. Mitigation measures provided to avoid or minimize impacts include conducting clearing activities outside of the migratory bird breeding period and conducting nest sweeps if activities take place inside the migratory bird breeding period. Unavoidable wetland disturbance should be mitigated through replacement fees and the design of onsite stormwater management to maintain pre-development water quality and quantity.

With the implementation of the mitigation measures outlined in this document, impacts resulting from the Project are considered to be effectively mitigated and will not contribute to the cumulative impacts in the general project area. These conclusions consider the previously disturbed nature of the site, and the low ecological value of the wetlands and terrestrial land cover that will be disturbed.

1 INTRODUCTION

This Biophysical Impact Assessment (BIA) has been prepared to support land use applications for the City of Chestermere (the City) Centron Group's (Centron; the Proponent) Clearwater Park Project. The proponent is applying for Area Structure Plan (ASP) approval for all lands within the ASP boundary, and Outline Plan approval for Stage 1. Field surveys were completed in 2020 for Stage 1 lands and in 2021 for stages 2, 3, and 4.

1.1 Purpose, Size and Scope

The proposed project is the development of a portion of formerly agricultural land into a new urban development including residential, commercial, and industrial land use. The project also includes the creation of four stormwater evaporation ponds to store and retain community runoff.

Site development is planned to occur in multiple stages due to the project size and dependent upon the receipt of regulatory permits for rezoning and impacts to wetlands.

For purposes of this BIA, the ultimate buildout (i.e., the ASP) includes the development of approximately 353 hectares (ha) with the following uses:

- 240 ha residential
- 26 ha mixed use commercial
- 82 ha employment lots and associated infrastructure; and
- 35 ha stormwater evaporation/infiltration ponds.

For the short-term, Stage 1 lands are being submitted for Outline Plan approval.

The drawing set in Appendix A shows the planned land and development stages.

Centron has requested updates to the zoning for land under Stage 1 and Stage 2, in accordance with the ASP's Land Use Plan. The remaining land covered under stages 3 and 4 (Area structure plan) is Large Lot Rural Residential (LLR) and Urban Transition (UT).

1.2 Location

The site is located in Chestermere, Alberta, southeast of the intersection of Highway 1 and Centre Avenue East. The site is bound to the north by Centre Avenue East, to the west by Secondary Highway 791, and on the south and west sides by Highway 1. The ASP lands include the entirety of 13-24-28 W4M, most of the east half of 14-24-28 W4M, and a portion of the west half of 14-24-28 W4M. See Figure 1 and Appendix A for the project location and plans.

1.3 Consumptive Use of Natural Resources for Construction

The proposed development will result in cut, fill, and construction on approximately 391 ha. Approximately 285 ha of agricultural land, 47 ha of disturbed grassland/pasture, 24 ha of anthropogenic land (either vegetated or non-vegetated) and 35 ha of wetland area.

The existing topsoil will be stockpiled on site for later use and/or sold and moved offsite.

1.4 Timing

Pending the receipt of authorizations from the City and AEP, stripping and grading in Stage 1 could occur in late 2021 or in 2022. Scheduling of project activities will observe any sensitive time periods for breeding birds and other wildlife. Mitigation measures are provided (see Section 3).

1.5 Maintenance Requirements

Site maintenance requirements are expected to be minimal but will include weed control, storm water maintenance, winter snow removal, and a site safety and spill response plan.

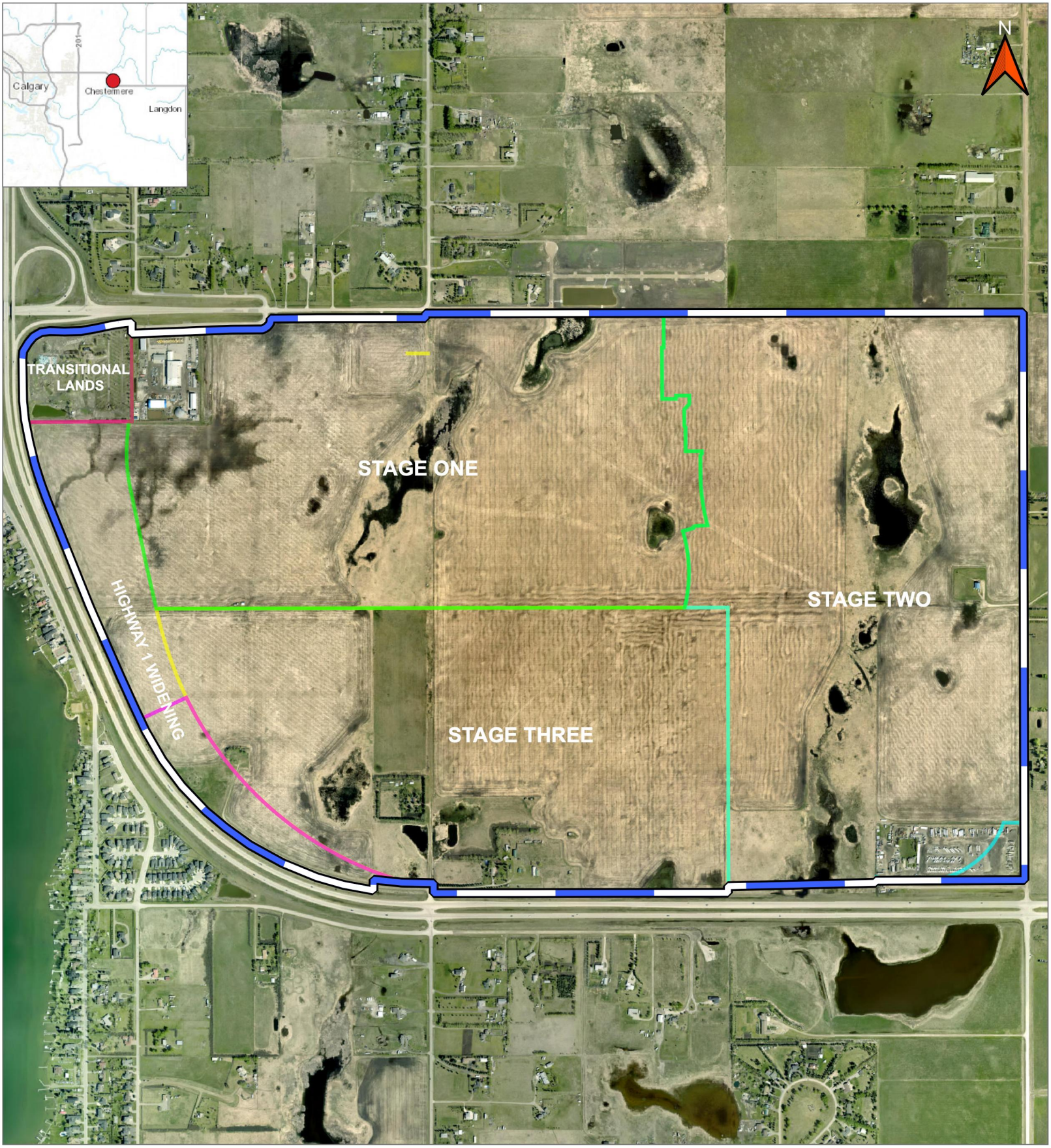


Figure 1. Centron - Clearwater Park Area Structure Plan - Overview and Staging.

Legend

Area Structure Plan Boundary

0 100 250 500

Meters

1 : 13,500

sage ecological solutions

NAD 1983 UTM Zone 12N. Esri, Maxar, GeoEye, CNES/Airbus DS and the GIS User Community

Produced by Tyler Lingnau, September 2021

2 INVENTORY

2.1 Methods

Methods of investigation included desktop review of publicly available materials and comprehensive field investigation by resource specialists. Eight separate site visits were conducted during 2020 within the Stage 1 development boundary; nine visits were conducted during 2021. Targeted vegetation, soil and wildlife surveys were completed in 2020 on May 5 and 19; June 3, 10, 22 and 23; November 4 and 5. Field surveys were completed in 2021 on January 29, April 27, May 1 and 26, June3, 16, 25, and 26, and August 3. Survey plot locations are shown on Figure 2 and site photographs taken during field surveys are provided in Appendix B. Specific methods are listed below by resource.

2.1.1 Terrain and Soils

A visual assessment of the subject site was completed as well as review of the Alberta Soil Information Viewer (AEP 2020a), the previous BIA completed for the property (EnviroConsult, 2008), and available topographic GIS data to assess the existing terrain and soil conditions on site.

2.1.2 Vegetation

A search of the Alberta Conservation Information Management System (ACIMS) was conducted to determine if known rare element occurrences have been reported on or near the subject site (GoA 2020a). Comprehensive, ground-based wetland surveys were conducted on June 22, 2020, and June 25 and 26, 2021, with wetland soil sampling conducted during frost-free conditions on November 4 and 5, 2020.

The identification and delineation of land cover types (including wetlands) on the property included desktop reviews of data from AEP's Alberta Merged Wetland Inventory (AMWI) data, the previous BIA (EnviroConsult Inc 2008), and current and historical aerial imagery, as well as field-verification during ground-based vegetation surveys.

Rare plant surveys were completed for the Project area over the course of two survey rounds. An early-blooming rare plant survey was completed between June 25 and 26, 2021. A follow-up late-blooming rare plant survey was completed on August 3, 2021.

During the surveys, meandering patterned transects were used in areas of higher rare plant potential based on the observed habitat conditions. The surveys followed the guidance provided in the *Guidelines for Rare Vascular Plant Surveys in Alberta – 2021 Update* (Alberta Native Plant Council 2012). The start and end locations of each meander were geo-referenced, and photographs were taken in the four cardinal directions to provide a visual representation of the landscape where the surveys were being conducted. During the surveys, all new plant species encountered were recorded.

2.1.3 Wildlife

A search of AEP's Fish and Wildlife Management Information System (FWMIS) was conducted to determine known species occurrences within a 3-km radius from the centre of the property (AEP 2020b). Incidental observations of wildlife were recorded during all site investigations.

The following surveys were conducted in accordance with the Sensitive Species Inventory Guidelines (GoA 2013):

- Breeding Songbird Points Counts (June 10 & 23, 2020; June 3 & 16, 2021)
- Amphibian Auditory Surveys (May 5, 19, and June 3, 2020; Apr 27, May 12 & 26, 2021)
- Sensitive Raptor Spring Nest Survey (June 23, 2020; June 3, 2021)
- Wildlife Movement Survey (January 29, 2021)

It should be noted that formal sharp-tailed grouse lek surveys were not conducted as preferred lekking habitat does not occur on site and the likelihood of a lek was assessed to be low. No sharp-tailed grouse or evidence of a lek were observed during any of the 17 survey bouts nor did they appear in databases searches (e.g., FWMIS).

2.1.3.1 Potential for Vertebrate Species of Conservation Concern

Desktop review of site imagery, the Fisheries and Wildlife Management Information System (FWMIS), and relevant provincial and federal references, as well as 2020 and 2021 field visits were conducted to assess habitat potential for vertebrate species of conservation concern (e.g., At Risk). A list of species of conservation concern with potential to reside, breed, or overwinter within the assessment area was produced using range and habitat requirements and FWMIS records. From this list, status and abundance determinations were made based on recent regulatory wildlife status documents (COSEWIC 2020, and SRD 2015). Status and abundance definitions are presented below and at-risk definitions in Appendix C.

Status

S = summer resident, migrates out of study area for the winter

W = winter resident, present only during late fall, winter, and early spring

R = permanent resident, present year-round although not necessarily active during winter

M = migrant, passes through area during spring and/or fall, not normally resident at any time of year

T = transient, expected to occur only in passing, not normally resident at any time of year

Abundance

C = common, detected whenever suitable habitat is investigated during an appropriate season

U = uncommon, detected often, but not always, whenever suitable habitat is investigated during an appropriate season

S = scarce, detected occasionally, but not usually, even when suitable habitat is investigated during an appropriate season

R = rare, unexpected but could occur in any given year, would not generally be considered a regular component of the study area fauna

2.1.3.2 Habitat Suitability Assessment for Vertebrate Species of Conservations Concern

The suitability of each occurring habitat/wetland type on the property was assessed based on scientific literature, first-hand knowledge resulting from the reconnaissance site visits, and the authors' knowledge of wildlife-habitat relationships in the region. These ratings are based on the quality of the habitat for foraging, breeding, stopover/staging, or overwintering and consider the level of native integrity of each habitat type.

2.1.3.3 Targeted Surveys for Vertebrate Species of Conservation Concern

Amphibian Point Count Call Survey

The primary objective of the amphibian survey was to detect species occurrence and relative abundance, particularly those listed provincially or federally. Sites were surveyed beginning 0.5-hrs after sunset. At each survey site a 1-minute quiet down period was honoured to allow disturbed amphibians to resume calling. This was followed by a 3-minute listening period. Calls were identified to species and a qualitative index value was recorded to represent the number present (1=1 or 2 individuals, 2=3 to 5, and 3= more than 5). Weather conditions including temperature, wind speed, and percentage cloud cover were recorded at each survey location. Coordinates (UTM) were recorded at all survey sites using hand-held global positioning units.

Breeding Bird Point Count Survey

Breeding bird surveys (point counts) were undertaken to document both the diversity of breeding birds and the presence of known species of conservation concern. Point counts were surveyed between approximately 06:30 and 09:00 hours. All birds heard or seen were recorded at each location. Additionally, all incidental observations between point count locations were recorded. Each point count consisted of a 1-minute "quiet down" period followed by a 5-minute detection period. Weather data (temperature, sky condition, wind) were recorded during the survey. Coordinates (UTM NAD83) were recorded at all survey sites using a hand-held global positioning unit.

Sensitive Raptor Spring Nest Survey

Raptor stick nest searches were conducted in conjunction with field visits to survey for breeding birds. Ground searches with binoculars and digital camera with telephoto lens were conducted to identify any evidence of active nesting or inactive multi-year nests. In accordance with the SSIG, potential raptor nesting sites, including treed, tall shrub, and cliff sites within and adjacent to the work area were fully investigated for behaviour or sign of active nesting. Active nesting behaviour includes nest building, territorial displays, nest defense (e.g., swooping calling, or aggressive behaviour), or carrying food. Sign

of active nesting includes eggs or young, eggshell pieces, significant down or feathers, whitewash, and food or prey carcasses in or around the nest site.

Mammals and Reptiles

A survey of mammal and reptile sign was completed simultaneously with the breeding bird point counts and the inventory of wetland areas. General notes were taken on the presence of mammal and reptile sign/activity. Sign consists of burrows, dens, tracks, reptile hibernacula, and visual sightings. A wildlife movement survey was also conducted, including a winter wildlife track study, to assess wildlife movement patterns within the property.

2.1.4 Hydrology

Local hydrology at the site was determined by review of available watercourse data as well as a review of local topography.

2.1.5 Cultural Resources

A search of Alberta Culture's Listing of Historic Resources (Alberta Historic Resources 2021) was conducted to determine if any known historical resources have been inventoried on the subject site or if Historical Resource Value (HRV) has been identified for the subject site. In addition, approval by Alberta Culture, Multiculturalism, and Status of Women was granted to conduct ground disturbance for the land use plan submitted in February 2020. Approval is subject to Section 31 of the Act that requires Minister notification should a historic resource be discovered. A heritage resource impact analysis was completed by IBI Group and submitted under a different cover.

2.1.6 Socieconomic Value

Socioeconomic conditions including traffic and aesthetic value were considered for the project.

A traffic impact assessment was completed for the project by ISL Engineering and submitted to the City under a separate cover. A determination of impacts to the amount of local traffic was developed for the analysis.

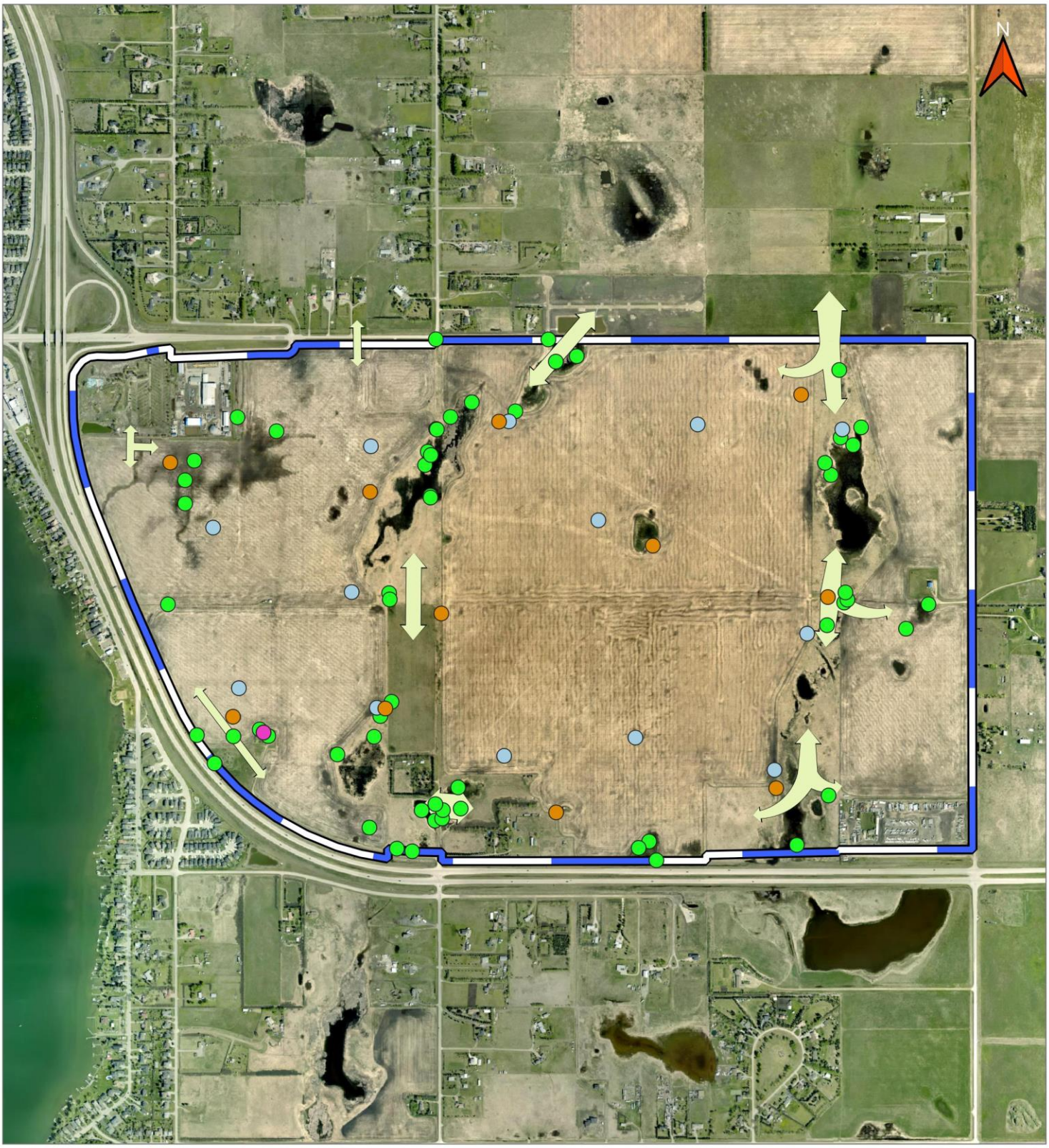
A determination of current and future aesthetic value was made for the project.

2.1.7 Existing Policy

A review of the Chestermere Environmental Resources Inventory (Clare and Sass 2012) was used where necessary to inform the biophysical inventory. The provincial *Water Act* and Alberta Wetland Policy, the City of Chestermere Wetland Policy (Policy 311), and Stepping Back from the Water (ESRD 2012) have been considered regarding decisions involving wetlands. Mitigation for wildlife have been provided in consideration of the federal *Species at Risk Act* and Alberta *Wildlife Act*.

2.2 Results

Survey locations and site observations are shown on Figure 2.



Legend

- Area Structure Plan Boundary
- Wildlife Movement (size indicates relative amount)
- ASP Breeding Bird Survey Location (2021)
- ASP Amphibian Survey Location (2021)
- ASP Rare Plant Survey Location (2021)
- Swainson's Hawk Nest

Figure 2. Centron - Clearwater Park Area Structure Plan - Wildlife Survey Locations.

0 100 250 500

Meters
1 : 15,000

sage ecological solutions

NAD 1983 UTM Zone 12N. Esri, Maxar, GeoEye, CNES/Airbus DS and the GIS User Community

Produced by Tyler Lingnau, September 2021

2.2.1 Terrain and Soils

The site topography is generally flat, with a gently undulating nature. The location lacks a consistent directional slope, although it displays a topographic high near the center that slopes into two low lying areas that run N-S through the location. The site is dominated by well drained, medium textured orthic black chernozemic soils – Delacour and Rockyview series (Figure 3, GoA 2020b).

2.2.2 Vegetation

Five land cover (i.e., vegetation) types occur on the property. These are Cropland, Pasture/Disturbed Grassland, Anthropogenic – Vegetated, Anthropogenic – Non-Vegetated, and wetland. No native grassland, shrubland, or forested land exist on the property (Figure 4). The majority of the site consists of cropland which occupies 285 ha or 73% of the total property. Wetlands

29 individual wetlands occur within the ASP boundary, with seven occurring within stage 1. Four wetland types occur including Temporary-Freshwater-Marsh, Seasonal-Freshwater-Marsh, Seasonal-Freshwater- Shallow Open Water, and Semi-Permanent-Freshwater-Shallow Open Water. In addition, 71 ephemeral waterbodies occur on the property. These do not classify as wetlands under the Alberta Wetland Policy but are considered under the *Water Act* for the water which is stored ephemerally for short periods at certain times of year.

Table 2.1 provides the size, classification, and relative wetland value category for the wetlands occurring in Stage 1. Table 2.2 provides wetland area by type and total wetland area within the ASP boundary. Relative wetland value categories were determined for wetlands within Stage 1 in 2020 in accordance with the Alberta Wetland Assessment and Impact Report Directive (Government of Alberta (GoA) 2017) and the Alberta Wetland Rapid Evaluation Tool (ABWRET-A) (GoA 2015a). Wetlands 1, 3, & 16 scored a relative wetland value category of Moderate (B) and wetlands 15, 17, 25, & 26 scored a value of Moderately Low (C) (ESRD 2013). Figure 4 shows wetland locations and class. Detailed ABWRET-A scores are provided in Appendix D.

ABWRET scores were not determined for wetlands outside of Stage 1 as there are no immediate plans for wetland disturbance in these areas. Wetland work and ABWRET scores have an expiry of three years under the current regulations and would need to be re-done closer to the time of application if disturbance is planned.

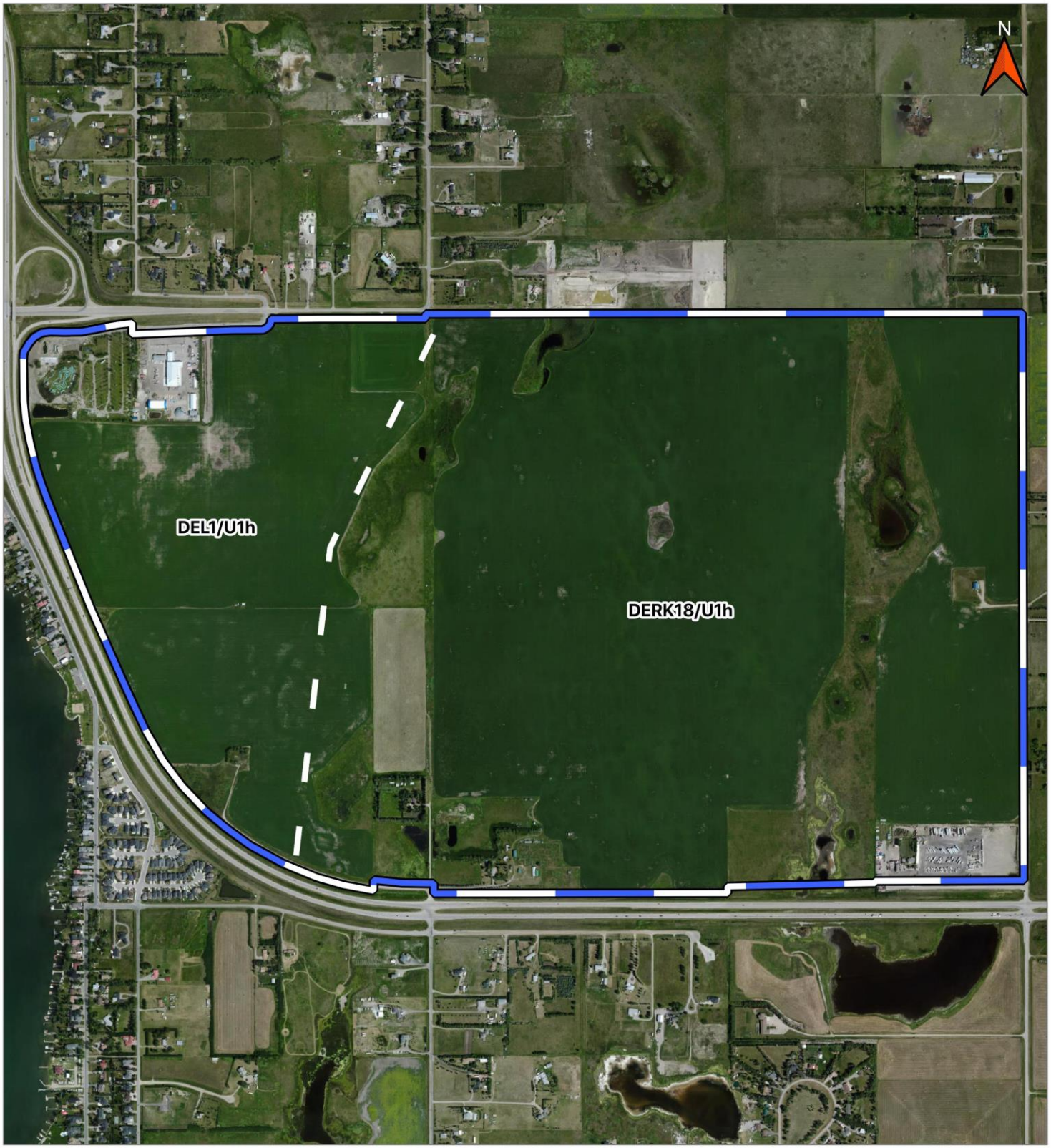


Figure 3. Centron - Clearwater Park Area Structure Plan - Soil Types (Agricultural Region of Alberta Soil Inventory Database).

Legend

Area Structure Plan Boundary

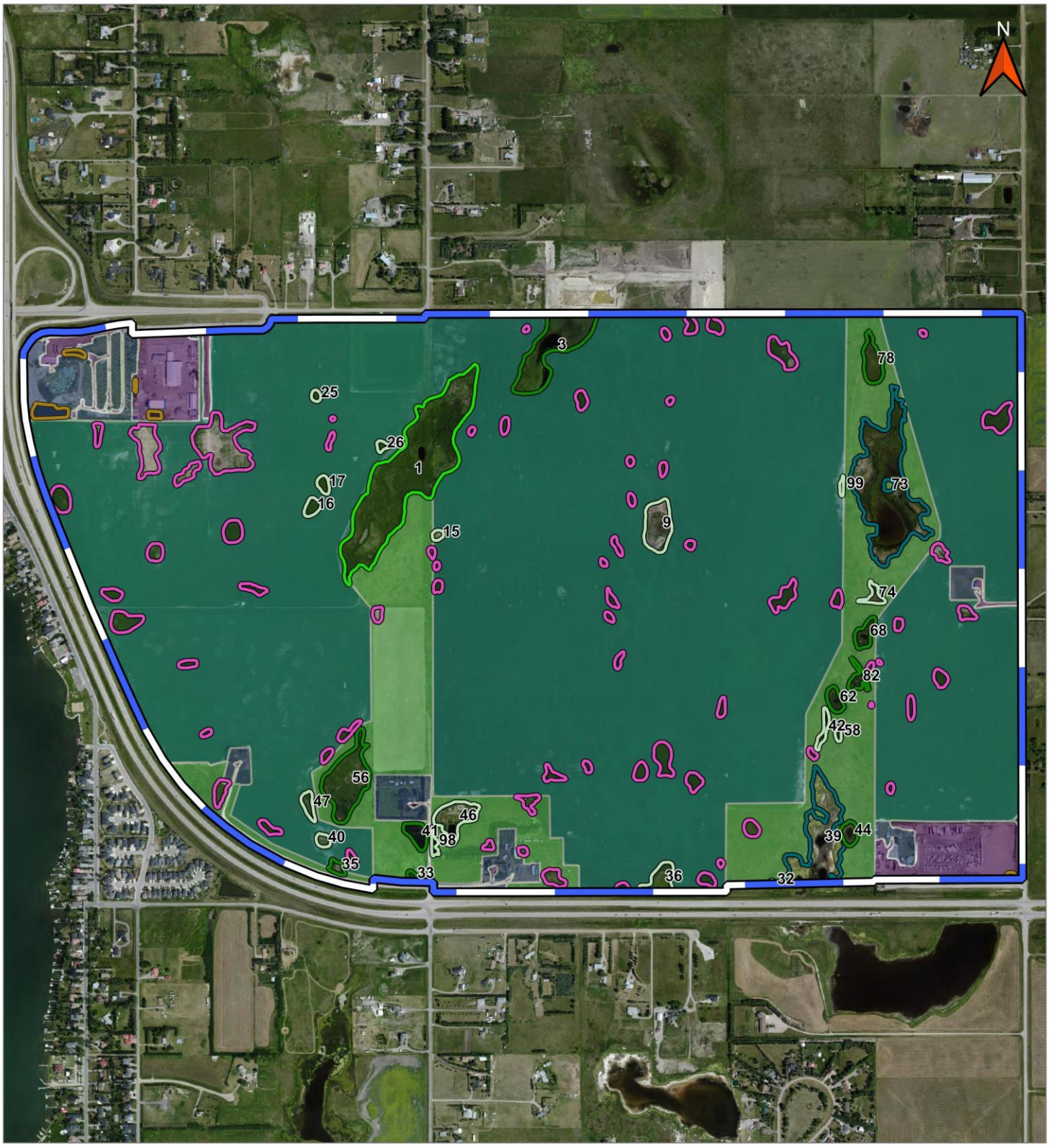
0 100 250 500

Meters
1 : 13,500

sage
ecological solutions

NAD 1983 UTM Zone 12N. AGRASID4.1 - AEP Informatics Branch 2020, Esri, Maxar, GeoEye, CNES/Airbus DS and the GIS User Community

Produced by Tyler Lingnau, January 2021



Legend

Area Structure Plan Boundary

Landcover
- Anthropogenic - Non-vegetated
- Anthropogenic - Vegetated
- Cropland
- Pasture/Disturbed Grassland

Wetlands
- Ephemeral
- Temporary Freshwater Marsh
- Seasonal Freshwater Marsh
- Seasonal Freshwater Shallow Open Water
- Semi-permanent Freshwater Shallow Open Water
- Dugout/Anthropogenic

0 100 250 500
Meters
1 : 13,500

Figure 4. Centron - Clearwater Park Area Structure Plan - Landcover and Habitat Types.

sage ecological solutions

NAD 1983 UTM Zone 12N. Esri, Maxar, GeoEye, CNES/Airbus DS and the GIS User Community

Produced by Tyler Lingnau, February 2021

Table 2.1 Wetland ID, Size, and Classification Information for ASP

WETLAND ID	AREA[3] (ha)	WETLAND CLASSIFICATION	ABWRET-A SCORE *(Relative Wetland Value Category)*
WL1	7.268	Seasonal-Freshwater-Shallow Open Water[1] (Class III[2])	Moderate (B)
WL3	2.161	Seasonal-Freshwater-Marsh[1] (Class III[2])	Moderate (B)
WL15	0.07	Temporary-Freshwater-Marsh[1] (Class II[2])	Moderately Low (C)
WL16	0.165	Temporary-Freshwater-Marsh[1] (Class II[2])	Moderate (B)
WL17	0.125	Temporary-Freshwater-Marsh[1] (Class II[2])	Moderately Low (C)
WL25	0.064	Temporary-Freshwater-Marsh[1] (Class II[2])	Moderately Low (C)
WL26	0.07	Temporary-Freshwater-Marsh[1] (Class II[2])	Moderately Low (C)
WT44	0.233	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT62	0.220	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT68	0.283	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT78	0.522	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT82	0.215	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT39	2.547	Semi-permanent-Freshwater-Shallow Open Water[1] (Class IV[2])	n/a
WT73	4.916	Semi-permanent-Freshwater-Shallow Open Water[1] (Class IV[2])	n/a
WL9	0.864	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT32	0.018	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT42	0.147	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT58	0.057	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT74	0.165	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT99	0.044	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT36	0.459	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT33	0.055	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT41	0.313	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT56	1.709	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
WT40	0.116	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT47	0.180	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT98	0.093	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT46	0.811	Temporary-Freshwater-Marsh[1] (Class II[2])	n/a
WT35	0.120	Seasonal-Freshwater-Marsh[1] (Class III[2])	n/a
1 - Alberta Wetland Classification System			
2 - Stewart & Kantrud Wetland Classification System			
n/a – not yet assessed			

Table 2.2 Wetland Classes and Areas Information for ASP

WETLAND CLASSIFICATION	COUNT	AREA[3] (ha)
Temporary-Freshwater-Marsh[1] (Class II[2])	16	3.451
Seasonal-Freshwater-Marsh[1] (Class III[2])	10	5.554
Seasonal-Freshwater-Shallow Open Water[1] (Class III[2])	1	12.822
Semi-permanent-Freshwater-Shallow Open Water[1] (Class IV[2])	2	7.463
Total Wetland Area	**29**	**29.290**

Ephemeral waterbodies (Class I)

Sixty-nine Ephemeral water bodies occur within the ASP boundary. Ephemeral ponding occurs briefly after snowmelt or heavy precipitation events early in the season when the soil is frozen or previously saturated, and drainage is inhibited. Ephemeral water bodies did not display characteristic vegetation and are not recognized as wetlands under the Alberta Wetland Policy.

Temporary-Freshwater-Marsh (Class II)

Sixteen Temporary Marshes occur within the ASP Boundary. Temporary marshes display visible surface water for short periods of time after snowmelt or heavy precipitation events. As a result, these wetlands are typically tilled over in agricultural lands. Characteristic vegetation in undisturbed settings consists of wet meadow and fine-stemmed graminoid species (i.e., grasses, sedges, rushes) in the deepest zones of the wetland.

Seasonal-Freshwater-Marsh (Class III)

Eleven Seasonal Marshes occur within the ASP Boundary. Seasonal marshes display visible surface water for the majority of the growing season and are dry by mid-summer during average years. These wetlands are characterized by shallow marsh vegetation in the deepest zone and surrounding by wet meadow and low prairie zones . Seasonal marshes are not normally tilled, except in years with especially low late winter/early spring snowfall or rain.

Seasonal-Freshwater-Shallow Open Water (Class III)

One Seasonal Shallow Open water wetland occurs within the ASP boundary. The seasonality or permanence is the same as the Seasonal Marshes occurring on the property. Vegetation characteristics are similar except for the presence of a seasonal open water zone in the deepest part of the basin that occupies more than 25% of the wetland's total area. This area is non-vegetated (i.e., bare soil) during periods of drawdown.

Semi-Permanent-Freshwater-Shallow Open Water (Class IV)

Two Semi-Permanent Shallow Open Water wetlands occur within the ASP Boundary. Semi-Permanent Shallow Open Water wetlands are inundated into late fall for most years, except during droughts. Characteristics include a central deep-marsh zone with emergent and submergent species within an

open water area in the deepest part of the wetland (occupying more than 25% of the wetland's total area), with shallow marsh, wet meadow, and low prairie zones making up the transition from deep marsh to upland.

2.2.2.1 Rare Plants and Rare Ecological Communities

No rare plants or rare ecological communities were observed on site during vegetation field surveys and no known occurrences of rare plants or rare ecological communities were recorded in searches of provincial databases. The potential for rare plants to occur on this site is considered low due to the previously disturbed nature of the site.

2.2.2.2 Weeds

Several non-native invasive weed species, listed as Noxious under the Alberta *Weed Act,* were observed during field surveys. These include creeping thistle (*Cirsium arvense*), sow thistle (*Sonchus arvensis*), scentless chamomile (*Tripleurospermum inodorum*), common toadflax (*Linaria vulgaris*), black henbane (*Hyoscyamus niger*). No Prohibited Noxious weeds were recorded on site.

2.2.3 Wildlife

2.2.3.1 Potential for Vertebrate Species of Conservation Concern

Based on habitat requirements and known distributional ranges, 39 vertebrate species of conservation concern have potential to occur on the property. These species are listed in Table 2.3 and include 33 bird species, two mammal species, four reptile species and one amphibian species.

A search of the FWMIS database was completed prior to field surveys. The results of the search yielded previous observations of 18 species of conservation concern within a three-kilometer radius from the center of the property (Appendix E).

2.2.3.2 Habitat Suitability Assessment for Vertebrate Species of Conservation Concern

Available habitat types found within the subject lands include disturbed grasslands, cultivated cropland, wetlands, and anthropogenic vegetated and non-vegetated. Table 2.4 provides habitat suitability ratings for all potential vertebrate species of conservation concern to occur within the subject lands.

Seasonal (Class III) and Semi-permanent (Class IV) wetlands are considered to have a moderate potential for the occurrence of species of conservation concern. Disturbed Grassland/Patire and Anthropogenic – Vegtetd habitat types have Low to Moderate potential for species of conservation concern. Ephemeral water bodies (Class I), Temporary wetlands (Class II), cultivated cropland, and anthropogenic vegetated and non-vegetated habitat types were rated as low for species of conservation concern habitat suitability because of limited native habitat integrity and lack of species-specific habitat requirements.

Table 2.3 Vertebrate Species-at-Risk with Potential to Occur on the Property

COMMON NAME	SCIENTIFIC NAME	STATUS	ABUNDANCE	STATUS			
				ALBERTA	COSEWIC	SCHEDULE	SARA
BIRDS							
Northern Pintail	*Anas Acuta*	S	U	Sensitive	Special Concern	Schedule 1	Special Concern
Lesser Scaup	*Aythya affinis*	S	U	Sensitive	-	-	-
Sora	*Porzana 16arolina*	S	S	Sensitive	Not At Risk	No	-
Pied-Billed Grebe	*Podilymbus podiceps*	S	R	Sensitive	-	-	-
Horned-Grebe	*Podiceps auritus*	S	U	Sensitive	Special Concern	Schedule 1	Special Concern
Western Grebe	*Aechmophorus occidentalis*	S	U	At Risk	Special Concern	Schedule 1	Special Concern
Upland Sandpiper	*Bartamia longicauda*	R	S	Sensitive	Not At Risk	No	-
Piping Plover	*Charadrius melodus*	S	U	At Risk	Endangered	Schedule 1	Endangered
Long-billed Curlew	*Numenius americanus*	S	C	Sensitive	Not At Risk	No	-
Peregrine Falcon	*Falco peregrinus*	S	U	At Risk	Not At Risk	No	-
Prairie Falcon	*Falco mexicanus*	S	U	Sensitive	Not At Risk	No	-
Broad-winged Hawk	*Buteo platypterus*	S	U	Sensitive	-	-	-
Swainson's Hawk	*Buteo swainsoni*	S	C	Sensitive	-	-	-
Sharp-tailed Grouse	*Tympanuchus phasianellus*	R	U	Sensitive	-	-	-
Cape May Warbler	*Setophaga tigrina*	S	S	Sensitive	-	-	-
Black-crowned Night-heron	*Nycticorax nycticorax*	S	U	Sensitive	-	-	-
Great Blue Heron	*Ardea herodias*	S	C	Sensitive	-	-	-
Great Gray Owl	*Strix nebulosa*	R	S	Sensitive	Not At Risk	No	-
Burrowing Owl	*Athene cunicularia*	S	U	At Risk	Endangered	Schedule 1	Endangered
Common Nighthawk	*Chordeiles minor*	S	U	Sensitive	Special Concern	Schedule 1	Threatened
Black-backed Woodpecker	*Picoides arcticus*	R	S	Sensitive	-	-	-
Pileated Woodpecker	*Dryocopus pileatus*	R	U	Sensitive	-	-	-
Eastern Phoebe	*Sayornis phoebe*	S	S	Sensitive	-	-	-
Alder Flycatcher	*Empidonax alnorum*	S	R	Sensitive	-	-	-
Least Flycatcher	*Empidonax minimus*	S	U	Sensitive	-	-	-
Eastern Kingbird	*Tyrannus tyrannus*	S	C	Sensitive	-	-	-
Western Wood-Pewee	*Contopus sordidulus*	S	U	May Be At Risk	-	-	-

COMMON NAME	SCIENTIFIC NAME	STATUS	ABUNDANCE	STATUS			
				ALBERTA	COSEWIC	SCHEDULE	SARA
Bank Swallow	*Riparia riparia*	S	U	Sensitive	Threatened	Schedule 1	Threatened
Barn Swallow	*Hirundo rustica*	S	C	Sensitive	Threatened	Schedule 1	Threatened
Common Yellowthroat	*Geothlypis trichas*	S	C	Sensitive	-	-	-
Western Tanager	*Piranga ludoviciana*	S	U	Sensitive	-	-	-
Sprague's Pipit	*Anthus spragueii*	S	U	Sensitive	Threatened	Schedule 1	Threatened
Grasshopper Sparrow	*Ammodramus savannarum*	S	U	Sensitive	-	-	-
MAMMALS							
Long-tailed Weasel	*Mustela frenata*	R	S	May Be At Risk	-	-	-
Silver-haired Bat	*Myotis lucifucus*	R	U	Sensitive	-	-	-
REPTILES AND AMPHIBIANS							
Western Tiger Salamander	*Ambystoma mavortium*	R	S	Secure	Special Concern	No Schedule	No Status
Western Terrestrial (Wandering) Garter Snake	*Thamnophis elegans*	R	S	Sensitive	-	-	-
Red-sided Garter Snake	*Thamnophis sirtalis*	R	S	Sensitive	-	-	-
Western (Boreal) Toad	*Anaxyrus boreas*	R	C	Sensitive	Special Concern	Schedule 1	Special Concern

(Table 2.3 continued)

Table 2.4 Habitat Suitability Rankings for Potential Species-at-Risk.

Common Name	Upland Habitat				Wetland Habitat			
	AN Non-Veg	AN Veg	PA/DG	CC	Ephem	Temp	Seas	Semi-Perm
Birds								
Northern Pintail	L	L	L	L	L	L	H	H
Lesser Scaup	L	L	L	L	L	L	H	H
Sora	L	L	L	L	L	L	H	H
Pied-Billed Grebe	L	L	L	L	L	L	M	H
Horned-Grebe	L	L	L	L	L	L	M	H
Western Grebe	L	L	L	L	L	L	M	H
Upland Sandpiper	L	L	M	L	L	M	M	M
Piping Plover	L	L	L	L	L	L	L	L
Long-billed Curlew	L	L	L	L	L	L	M	M
Peregrine Falcon	L	M	H	L	L	M	H	H
Prairie Falcon	L	L	M	M	L	M	M	M
Broad-winged Hawk	L	L	L	L	L	L	L	L
Swainson's Hawk	L	L	M	M	L	M	M	M
Sharp-tailed Grouse	L	L	L	L	L	L	L	L
Cape May Warbler	L	L	L	L	L	L	L	L
Black-crowned Night-heron	L	L	L	L	L	L	M	H
Great Blue Heron	L	L	L	L	L	M	H	H
Great Gray Owl	L	M	L	L	L	L	L	L
Burrowing Owl	L	L	L	L	L	L	L	L
Common Nighthawk	L	M	M	M	M	M	M	M
Black-backed Woodpecker	L	M	L	L	L	L	L	L
Pileated Woodpecker	L	M	L	L	L	L	L	L
Eastern Phoebe	L	M	M	M	M	L	L	L
Alder Flycatcher	L	L	M	L	L	L	M	M
Least Flycatcher	L	L	M	L	L	L	L	L
Eastern Kingbird	L	L	M	L	L	L	L	L
Western Wood-Pewee	L	M	L	L	L	L	L	L
Bank Swallow	L	L	L	L	L	L	L	L
Barn Swallow	H	H	M	L	L	L	L	L
Common Yellowthroat	L	L	L	L	L	L	H	H
Western Tanager	L	L	L	L	L	L	L	L

Common Name	Upland Habitat				Wetland Habitat			
	AN Non-Veg	AN Veg	PA/DG	CC	Ephem	Temp	Seas	Semi-Perm
Sprague's Pipit	L	M	M	L	L	L	L	L
Grasshopper Sparrow	L	L	M	L	L	L	L	L
Mammals								
Long-tailed Weasel	L	M	M	L	M	M	M	M
Silver-haired Bat	M	M	M	L	L	L	M	M
Reptiles and Amphibians								
Western Tiger Salamander	L	L	L	L	L	M	H	H
Western Terrestrial (Wandering) Garter Snake	L	M	M	L	M	M	M	M
Red-sided Garter Snake	L	M	M	L	M	M	M	M
Western (Boreal) Toad	L	M	L	L	L	L	L	L
Total No. of Species Rated H	**1.00**	**1.00**	**1.00**	**0.00**	**0.00**	**1.00**	**7.00**	**11.00**
Total No. of Species Rated M	**1.00**	**13.00**	**15.00**	**4.00**	**5.00**	**7.00**	**14.00**	**10.00**
Total No. of Species Rated L	**37.00**	**25.00**	**23.00**	**35.00**	**34.00**	**31.00**	**18.00**	**18.00**
Habitat Composite Rating	***Low***	***Low-Mod***	***Low-Mod***	***Low***	***Low***	***Low***	***Mod***	***Mod***

(Table 2.4 continued)

2.2.3.3 Targeted Surveys for Vertebrate Species of Conservation Concern

Species observed during wildlife field surveys are provided in Table 2.4.

Amphibian Point Count Call Survey

Three replicates of amphibian point count call surveys were completed at four sites within Stage 1 in 2020 (May 5, 19 and June 23, 2020). Another three replicates of amphibian surveys were completed in 2021 at 13 sites covering the entire ASP boundary (April 27, May 12 and 26, 2021).

Boreal chorus frog was the only amphibian species detected during all three surveys, with an average call index of "1" (i.e., one or two individuals at each plot) during each survey. No other amphibian species were identified.

Breeding Songbird Point Counts

In 2020, two replicates of breeding bird surveys were completed at four locations within Stage 1 (June 10 and 23, 2020). Another two replicates were completed in 2021 at 11 sites covering the entire ASP boundary (June 3 & 16, 2021).

43 individual avian species were detected during the breeding songbird surveys (Table 2.5). Four species of conservation concern were identified during the breeding bird point counts including barn swallow, chestnut-collared longspur, olive-sided flycatcher, and sora. The status details are available in Table 2.5.

Sensitive Raptor Spring Nest Survey

Raptor nest searches were conducted during the late mornings of June 23, 2020 and June3, 2021. A single Swainson's hawk nest was observed in a residual white spruce yard tree occurring in an Anthropogenic - Vegetated patch at the southwest of the property. See Figure 2 for location.

Mammalian and Reptile Survey

Surveys for mammalian and reptile signs were done congruently with the other targeted surveys. Mammal movement potential was assessed on January 29, 2021. American crow, white-tailed jack rabbit, least weasel, red fox, coyote, deer, and microtine sign and/or tracks were observed. Mammal sign was not common on the property. Richardson ground squirrel and northern pocket squirrel burrows were observed but occurred at low densities. No sign of mammalian or reptile species of conservation concern was recorded.

Figure 2 shows movement patterns of medium-bodied mammals (deer and coyote) within the property as recorded during the January 29, 2021 winter tracking bout. The bout was conducted several days after a snowfall for tracks to accumulate. Most of the movement occurs in and out of the north boundary of the property and through wetland complexes which are naturally preferred areas of topographic relief. See Figure 2 for movement patterns.

Table 2.5 Wildlife Species Detected During Surveys and Status Designations

COMMON NAME	SCIENTIFIC NAME	STATUS			
		AEP	COSEWIC	SCHEDULE	SARA
Reptiles and Amphibians					
Boreal Chorus Frog	*Pseudacris maculata*	Secure	-	-	-
Birds					
American Avocet	*Recurvirostra americana*	Secure	-	-	-
American Crow	*Corvus brachyrhynchos*	Secure	-	-	-
American Robin	*Turdus migratorius*	Secure	-	-	-
American Wigeon	*Anas americana*	Secure	-	-	-
Barn Swallow	*Hirundo rustica*	Sensitive	Endangered	Schedule 1	Threatened
Black-Billed Magpie	*Pica hudsonia*	Secure	-	-	-
Black-capped Chickadee	*Poecile atricapillus*	Secure	-	-	-
Brewer's Blackbird	*Euphagus cyanocephalus*	Secure	-	-	-
Brown-headed Cowbird	*Molothrus ater*	Secure	-	-	-
California Gull	*Larus californicus*	Secure	-	-	-

COMMON NAME	SCIENTIFIC NAME	STATUS			
		AEP	COSEWIC	SCHEDULE	SARA
Canada Goose	*ranta canadensis*	Secure	-	-	-
Cedar Waxwing	*Bombycilla cedrorum*	Secure	-	-	-
Chestnut-collared Longspur	*Calcarius omatus*	May Be At Risk	Endangered	Schedule 1	Threatened
Clay-coloured Sparrow	*Spizella pallida*	Secure	-	-	-
Eastern Kingbird	*Tyrannus tyrannus*	Sensitive	-	-	-
Eurasian Collared Dove	*Streptopelia decaocto*	Exotic/Alien	-	-	-
European Starling	*Sturnus vulgaris*	Exotic/Alien	-	-	-
Franklin's Gull	*Leucophaeus pipixcan*	Secure	-	-	-
Gadwall	*Mareca strepera*	Secure	-	-	-
Green-winged Teal	*Anas carolinensis*	Secure	-	-	-
House Sparrow	*Passer domesticus*	Exotic/Alien	-	-	-
Killdeer	*Charadrius vociferus*	Secure	-	-	-
Le Conte's Sparrow	*Ammodramus leconteii*	Secure	-	-	-
Mallard	*Anas platyrhynchos*	Secure	-	-	-
Marbled Godwit	*Limosa fedoa*	Secure	-	-	-
Nelson's Sparrow	*Ammodramus nelsoni*	Secure	-	-	-
Northern Shoveler	*Spatula clypeata*	Secure	-	-	-
Olive-sided Flycatcher	*Contopus cooperi*	May Be At Risk	Special Concern	Schedule 1	Threatened
Pine Siskin	*Spinus pinus*	Secure	-	-	-
Redhead	*Aythya americana*	Secure	-	-	-
Red-tailed Hawk	*Buteo jamaicensis*	Secure			
Red-winged Blackbird	*Agelaius phoeniceus*	Secure	-	-	-
Ring-billed Gull	*Larus delawarensis*	Secure	-	-	-
Rock Pigeon	*Columba livia*	Secure	-	-	-
Savannah Sparrow	*Passerculus sandwichensis*	Secure	-	-	-
Solitary Sandpiper	*Tringa solitaria*	Secure	-	-	-
Sora	*Porzana arolina*	Sensitive	-	-	-
Swainson's Hawk	*Buteo swainsoni*	Secure	-	-	-
Vesper Sparrow	*Pooecetes gramineus*	Secure	-	-	-
Western Meadowlark	*Sturnella neglecta*	Secure	-	-	-
Wilson's Snipe	*Gallinago delicata*	Secure	-	-	-
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	Secure	-	-	-
Willet	*Tringa semipalmata*	Secure	-	-	-

COMMON NAME	SCIENTIFIC NAME	STATUS			
		AEP	COSEWIC	SCHEDULE	SARA
Mammals					
White-tailed Jack Rabbit	*Lepus townsendii*	Secure	-	-	-
Microtine mammals	*Microtine spp.*	Secure	-	-	-
Least Weasel	*Mustela nivalis*	Secure	-	-	-
Red Fox	*Vulpes vulpes*	Secure	-	-	-
Coyote	*Canis latrans*	Secure	-	-	-
Deer	*Odocoileus spp.*	Secure	-	-	-

2.2.4 Hydrology

Minimal offsite drainage from the property appears to occur due to the location of Highway 1. Wetland 3 discharges into a larger wetland complex to the north of the property only during extreme high flow events. Most surface water collects in wetlands 1 and 3 and the north to south wetland complex on the east half of the ASP area (including the larger semi-permanent wetlands 73 and 39) from which it evaporates or infiltrates the groundwater table. During extreme precipitation years and high flow events, water will move south off the property through these drainages.

2.2.5 Cultural Resources

No known historical resources are listed for this site. *Historical Resources Act* Clearance was granted for the Land Use Plan submitted in February 2020. Clearance documents are included in Appendix F.

2.2.6 Socioeconomic Value

The site holds moderate to low aesthetic value in its current state as previous agricultural/residential.

The conclusion of the traffic analysis completed for the project is that multiple improvements are necessary in order to handle the increased traffic load proposed by the ASP. The recommended improvements include an upgrade to the Highway 1/1A interchange by upgrading the southbound movement through the west junction via the addition of signals, dual lanes and eventually upgrading the interchange to its ultimate configuration. Building the Highway 1/791 interchange and dual lanes for Highway 1A through Chestermere will also be necessary as development progresses. The details of these plans are provided in the report submitted by ISL in January 2020.

3 IMPACT ASSESSMENT

Table 3.1 Impact of Project Activities and Mitigation

Resource-Specific Component	Project Phase	Potential Impact	Mitigation
Terrain and Soils			
Terrain and Soils	Construction	Soil compaction from heavy equipment. Removal of natural topsoil. Soil contamination from heavy equipment fuelling and maintenance and historical deposition of debris.	• Restrict operation of machinery to designated areas to minimize impact on surrounding areas. • Conserve and store topsoil to be re-used onsite or sold. • Establish staging area for fuelling and maintenance of equipment and ensure equipment is clean and leak-free prior to project initiation. • Implement project-specific ESC Plan. • Have spill response plan and materials in place prior to project initiation and during operation.
Vegetation			
Weeds	Construction; Operation	Increase in weeds in disturbed areas.	• Implement controls to prevent spread of noxious or prohibited noxious weeds during growing season (e.g., mowing, spraying). • Where appropriate, re-seed disturbed areas with native species (certified weed-free) to deter noxious weed invasion and capture overland flow during rain events or snowmelt.
Wetlands and Water Bodies	Construction; Operation	Change in wetland function due to wetland disturbance. Decrease in wetland area Change in water quantity and quality caused by construction within and removal of wetlands and ephemeral waterbodies.	• Design stormwater management system to meet or exceed *Environmental Quality Guidelines for Alberta Surface Waters* (ESRD 2014). • Design stormwater system to maintain the pre-development runoff capacity. The stormwater system design will consider pre- and post-development conditions and will result in no change upstream or downstream of the site with respect to water quantity (runoff) or quality. • Register Stormwater Management System & facilities under EPEA. • Obtain approval under the Alberta *Water Act* for alteration of wetlands and ephemeral water bodies. • Pay in-lieu fees for replacement of wetland area within the watershed. • Maintain wetland function within the property by incorporating constructed wetland design into stormwater management. • Conduct no clearing, stripping, or grading within wetlands and ephemeral water bodies without *Water Act* approval.

			• Have spill response plan and materials in place prior to project initiation and during operation. • Implement project-specific ESC Plan.
Wildlife			
Species of Conservation Concern	Construction; Operation	Disturbance to breeding due to wetland disturbance.	• Conduct clearing of vegetation between September 1 and April 14 to avoid incidental take of migratory birds, nests, or eggs and to maintain compliance with the *Migratory Birds Convention Act, the Species at Risk Act,* and the Alberta *Wildlife Act.* • If clearing is required within known breeding periods, migratory bird breeding surveys (sweeps) should be completed by a qualified avian specialist; if breeding activity is observed appropriate disturbance buffers should be implemented until young have fledged and left the nesting area. • Maintain habitat within the property by incorporating constructed wetland design into stormwater management.
Migratory Birds	Construction; Operation	Decrease in breeding habitat potential due to disturbance during breeding period (April 15 to August 31).	• Conduct clearing of vegetation between September 1 and April 14 to avoid incidental take of migratory birds, nests, or eggs and to maintain compliance with the *Migratory Birds Convention Act*, the *Species at Risk Act*, and the Alberta *Wildlife Act*. • If clearing is required within known breeding periods, migratory bird breeding surveys (sweeps) should be completed by a qualified avian specialist; if breeding activity is observed appropriate disturbance buffers should be implemented until young have fledged and left the nesting area. • Maintain habitat within the property by incorporating constructed wetland design into stormwater management.
Nesting or Denning Wildlife	Construction	Disturbance of nesting or denning wildlife and their young.	• Avoid disturbance of intact habitats by minimizing work footprint to established rights-of-way, disturbed/graveled areas, pads, etc. • Work only within designated areas within the project work area. • If construction occurs within the breeding period, an inclusive wildlife sweep should be conducted by a qualified professional. • If any nesting (e.g., hawks, owls, migratory birds) or denning (e.g., coyotes, foxes, snakes) wildlife are suspected within or near the work area during construction, establish a 30-m work buffer and contact a qualified environmental professional immediately.
All Wildlife	Construction	Human-Wildlife Conflict	• Keep worksite tidy and free of food waste or other wildlife attractants. • Store food in appropriate facilities or vehicles and secure litter, waste, and garbage in appropriate containers. • Report and Keep record of wildlife sightings via safety reports and meetings. • If any human-wildlife conflict occurs contact a qualified environmental professional immediately.

Hydrology			
Hydrology	Construction; Operation	Change in local hydrology due to removal of natural water bodies and implementation of stormwater management system.	• Design stormwater management system to meet or exceed Environmental Quality Guidelines for Alberta Surface Waters (ESRD 2014). • Design stormwater system to maintain the pre-development runoff capacity. The stormwater system design will consider pre- and post-development conditions and will result in no change upstream or downstream of the site with respect to water quantity (runoff) or quality. • Register Stormwater Management System & facilities under EPEA. • Obtain approval under the Alberta Water Act for alteration of wetlands and ephemeral water bodies. • Pay in-lieu fees for replacement of wetland area within the watershed • Maintain wetland function within the property by incorporating constructed wetland design into stormwater management. • Conduct no clearing, stripping, or grading within wetlands and ephemeral water bodies without Water Act approval. • Have spill response plan and materials in place prior to project initiation and during operation. • Implement project-specific ESC Plan. • Follow designs provided in the Stormwater Report prepared for the project and submitted to the City and AEP
Historical Resources			
Historical Resources	Construction; Operation	No historical resources have been identified and impacts are not anticipated	• Clearance has been granted under the provincial *Historical Resources Act*. • Alberta Culture should be notified in the event that artifacts are uncovered during excavation/construction.
Socioeconomic			
Aesthetic	Construction; Operation	Changes in aesthetic value with change from agricultural to commercial use.	• Ensure site design and maintenance to satisfy Community Standards Bylaw.
Human use	Construction; Operation	No human use has been identified and impacts are not anticipated	• N/A
Cumulative Impact			
Cumulative Impact	Construction; Operation	The project is expected to have a negligible increase in cumulative impacts of development within the project area	• The mitigation measures proposed in this table would off-set any potential effects which could result in an increase in cumulative impacts in general the project area.

4 CONCLUSIONS

With the implementation of all mitigation described in Table 3.1, residual impacts of the project on the existing biophysical conditions are considered to be not significant. This conclusion considers:

- the previously disturbed nature of the property,
- the limited ecological significance of the terrestrial land cover,
- low value of the wetlands scheduled for disturbance, and
- payment of in-lieu fees for wetland replacement at multiplying ratios.

5 REFERENCES

Alberta Environmental Protection (AEP). 2020a. *Alberta Soil Information Viewer*. http://www4.agric.gov.ab.ca/agrasidviewer/. Spring 2020.

Alberta Environmental Protection (AEP). 2020b. *Fish and Wildlife Management Information System*. http://esrd.alberta.ca/fish-wildlife/fwmis/access-fwmis-data.aspx. Accessed Spring 2020.

Alberta Environment and Sustainable Resource Development (ESRD). 2013. *Alberta Wetland Policy*. Edmonton, Alberta. 25 pp. http://aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandPolicy-Sep2013.pdf

Alberta Environment and Sustainable Resource Development (ESRD). 2012. *Stepping Back from the Water: A Beneficial Management Practices Guide for New Development Near Water Bodies in Alberta's Settled Region*. Edmonton, Alberta. 86 pp. http://environment.gov.ab.ca/info/library/8554.pdf

Alberta Historic Resources. 2021. Listing of Historic Resources. https://www.alberta.ca/listing-historic-resources.aspx. Accessed January 2021

Alberta Sustainable Resource Development (SRD). 2010. *Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta*. Alberta Sustainable Resource Development, Fish and Wildlife Division. Edmonton, Alberta. 5 pp.

Alberta Sustainable Resource Development (SRD). 2015. *The General Status of Alberta Wild Species 2015*. Alberta Sustainable Resource Development, Fish and Wildlife Division. Edmonton, Alberta. https://extranet.gov.ab.ca/env/wild-species-status/default.aspx. Accessed Spring 2020.

Clare, S and G. Sass. 2012. Environmental Resources Inventory. Report prepared for the Town of Chestermere, Chestermere, Alberta. Fiera Biological Consulting Ltd. 31 pp.

COSEWIC. 2020. *Canadian Species-at-risk*. Committee on the Status of Endangered Wildlife in Canada. https://species-registry.canada.ca/index-en.html#/species?sortBy=commonNameSort&sortDirection=asc&pageSize=10Accessed. January 2021.

EnviroConsult Inc. 2008. Mountain View Park Development in East Chestermere. Prepared for Centron Residential Corporation for discussion with the City of Chestermere. 59 pp.

Federation of Alberta Naturalists (FAN). 2007. *The Atlas of Breeding Birds of Alberta: A Second Look (2nd Ed.)*. Federation of Alberta Naturalists, Edmonton, AB. 626 pp.

Fisher, C. and J. Acorn. 1998. *Birds of Alberta*. Lone Pine Publishing, Edmonton, Alberta.

Fisher, C., A. Joynt and R.J. Brooks. 2007. *Reptiles and Amphibians of Canada*. Lone Pine Publishing, Edmonton, Alberta.

Government of Alberta (GoA). 2013. *Sensitive Species Inventory Guidelines*. Environment and Sustainable Resource Development. Edmonton, Alberta.

Government of Alberta (GoA). 2015a. Alberta Wetland Rapid Evaluation Tool –Actual (ABWRET- A) Manual. Water Policy Branch, Alberta Environment and Parks. Edmonton, Alberta.

Government of Alberta (GoA). 2015b. *Alberta Wetland Identification and Delineation Directive*. Water Policy Branch, Alberta Environment and Parks. Edmonton, Alberta.

Government of Alberta (GoA), 2017a. Alberta Wetland Assessment and Impact Report Directive. Water Policy Branch, Alberta Environment and Parks (AEP). Edmonton, Alberta.

Government of Alberta (GoA), 2020a. *Alberta Conservation Information Management System*. http://www.albertaparks.ca/acims-data#.

Government of Alberta (GoA). 2020b. Agricultural Region of Alberta Soil Inventory Database (AGRASID4.1). https://www.alberta.ca/alberta-soil-information-viewer.aspx.

Pattie, D. and C. Fisher. 1999. *Mammals of Alberta*. Lone Pine Publishing, Edmonton, AB.

Russell, A.P. and A.M. Bauer. 2000. *The amphibians and reptiles of Alberta 2nd Edition*. University of Calgary Press, Calgary, AB. 279 pp.

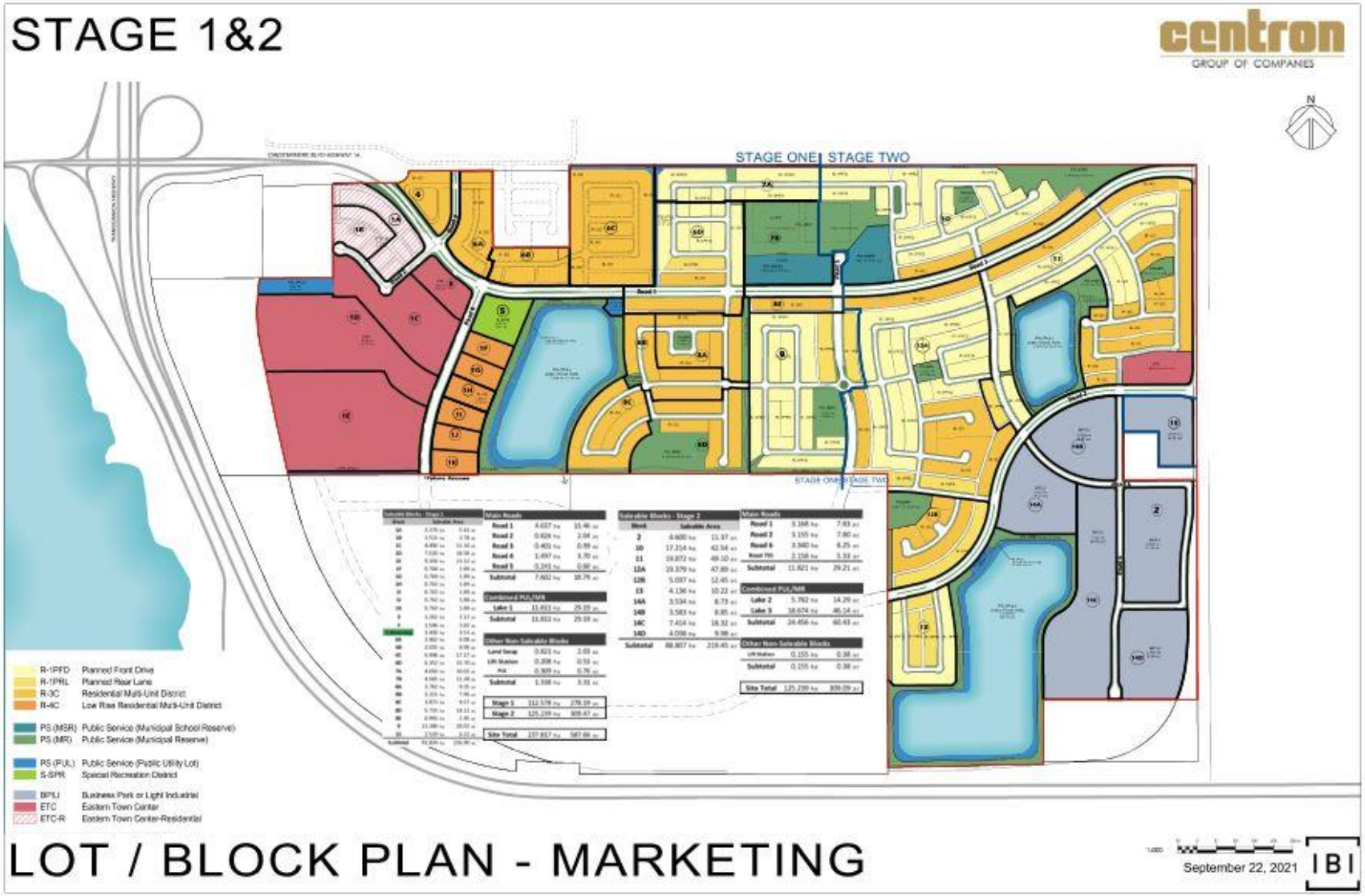
Semenchuk, G.P. 1992. *The atlas of breeding birds of Alberta*. Federation of Alberta Naturalists, Edmonton, AB. 391 pp.

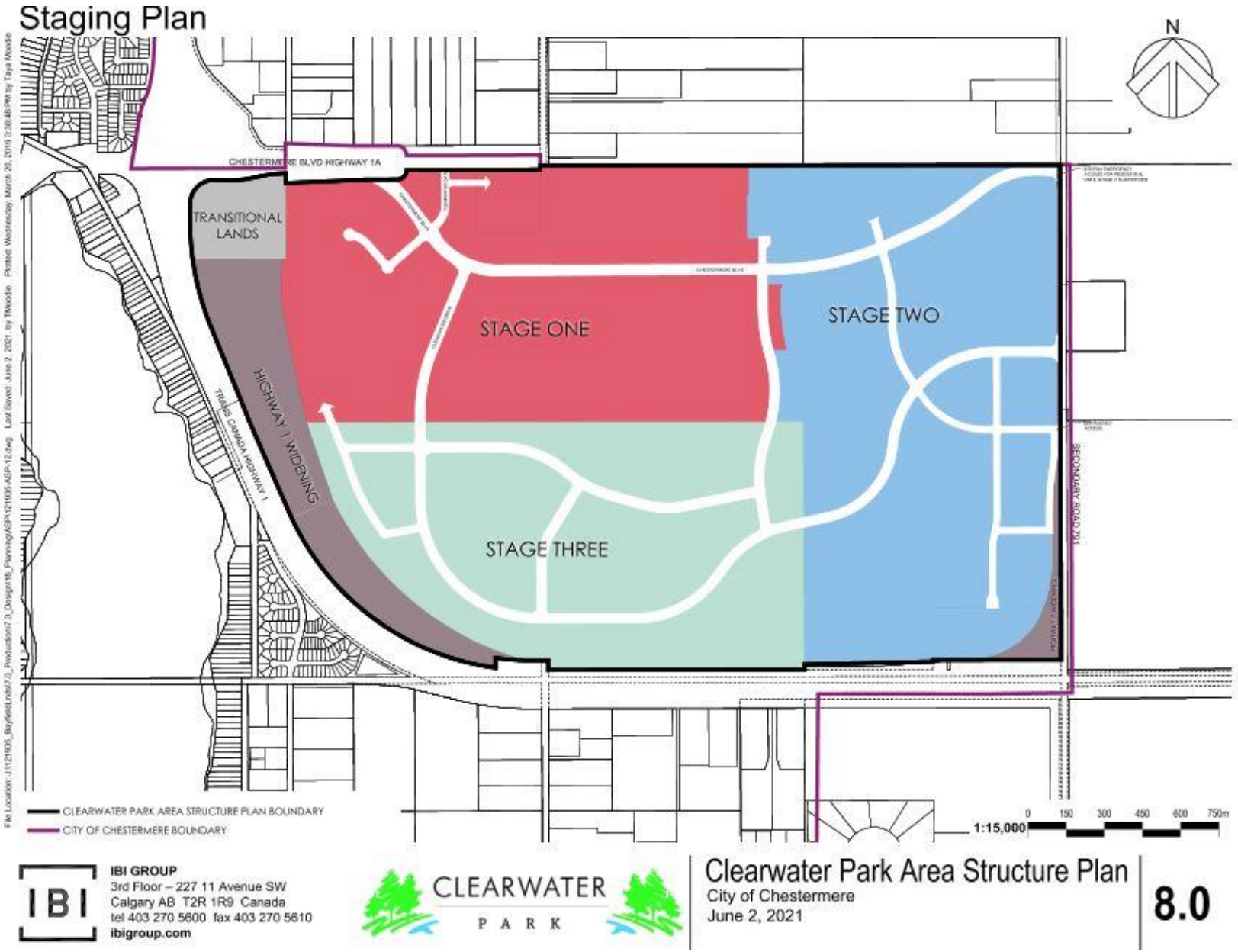
Smith, H.C. 1993. *Alberta Mammals - An Atlas and Guide*. The Provincial Museum of Alberta, Edmonton, AB. 239 pp.

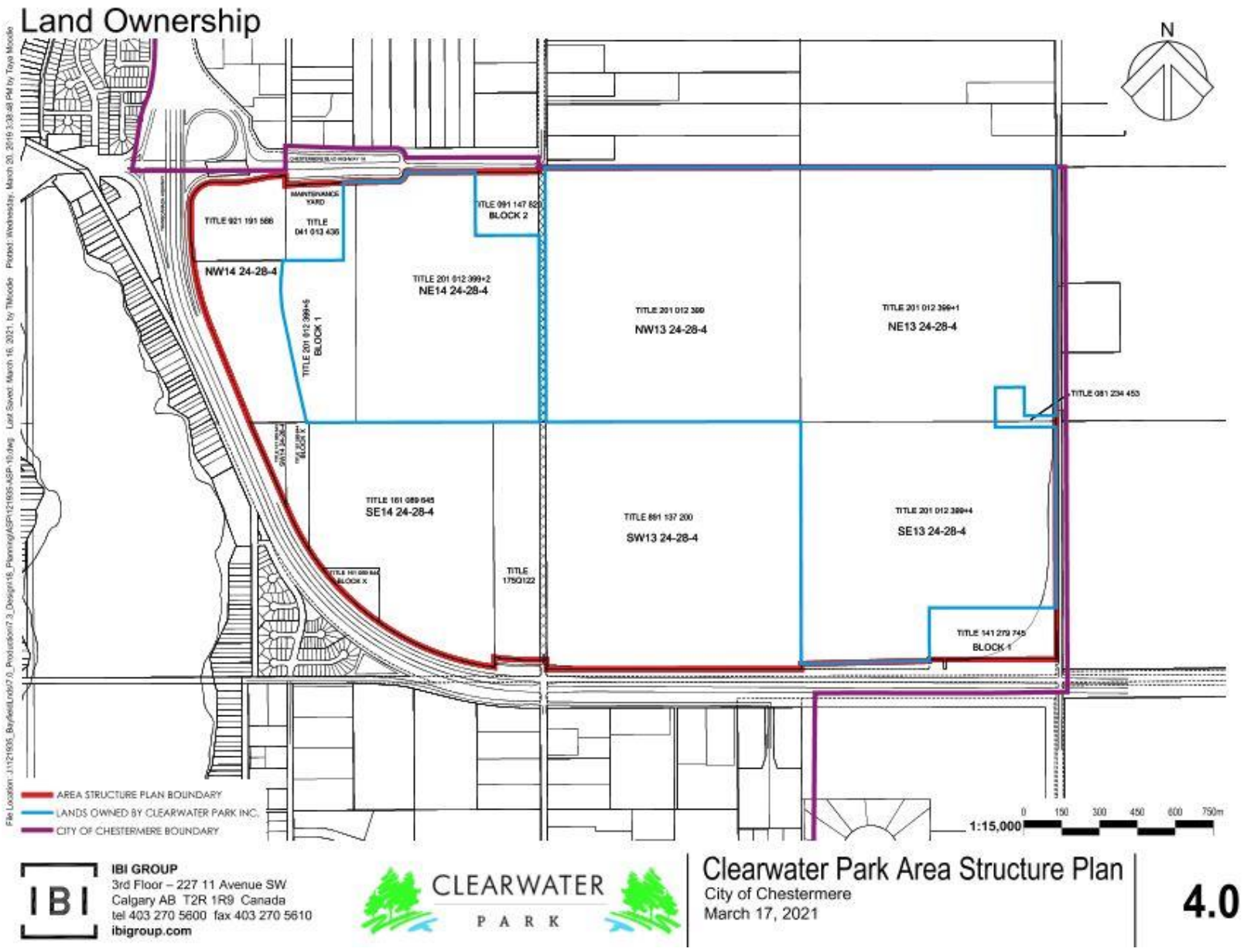
Stewart, R.E. and H.A. Kantrud. 1971. *Classification of Natural Ponds and Lakes in the Glaciated Prairie Region.* Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Washington, D.C., USA. Resource Publication 92. 57 pp.

Appendix A: Site Drawings

A.1 Short Term Build Out




Staging Plan
N
CHESTERMERE BLVD HIGHWAY 1A
TRANSITIONAL LANDS
STAGE ONE
STAGE TWO
STAGE THREE
HIGHWAY 1 WIDENING
TRANS CANADA HIGHWAY 1
SECONDARY ROAD 791
CLEARWATER PARK AREA STRUCTURE PLAN BOUNDARY
CITY OF CHESTERMERE BOUNDARY
1:15,000
0 150 300 450 600 750m
IBI GROUP
3rd Floor – 227 11 Avenue SW
Calgary AB T2R 1R9 Canada
tel 403 270 5600 fax 403 270 5610
ibigroup.com
CLEARWATER PARK
Clearwater Park Area Structure Plan
City of Chestermere
June 2, 2021
8.0



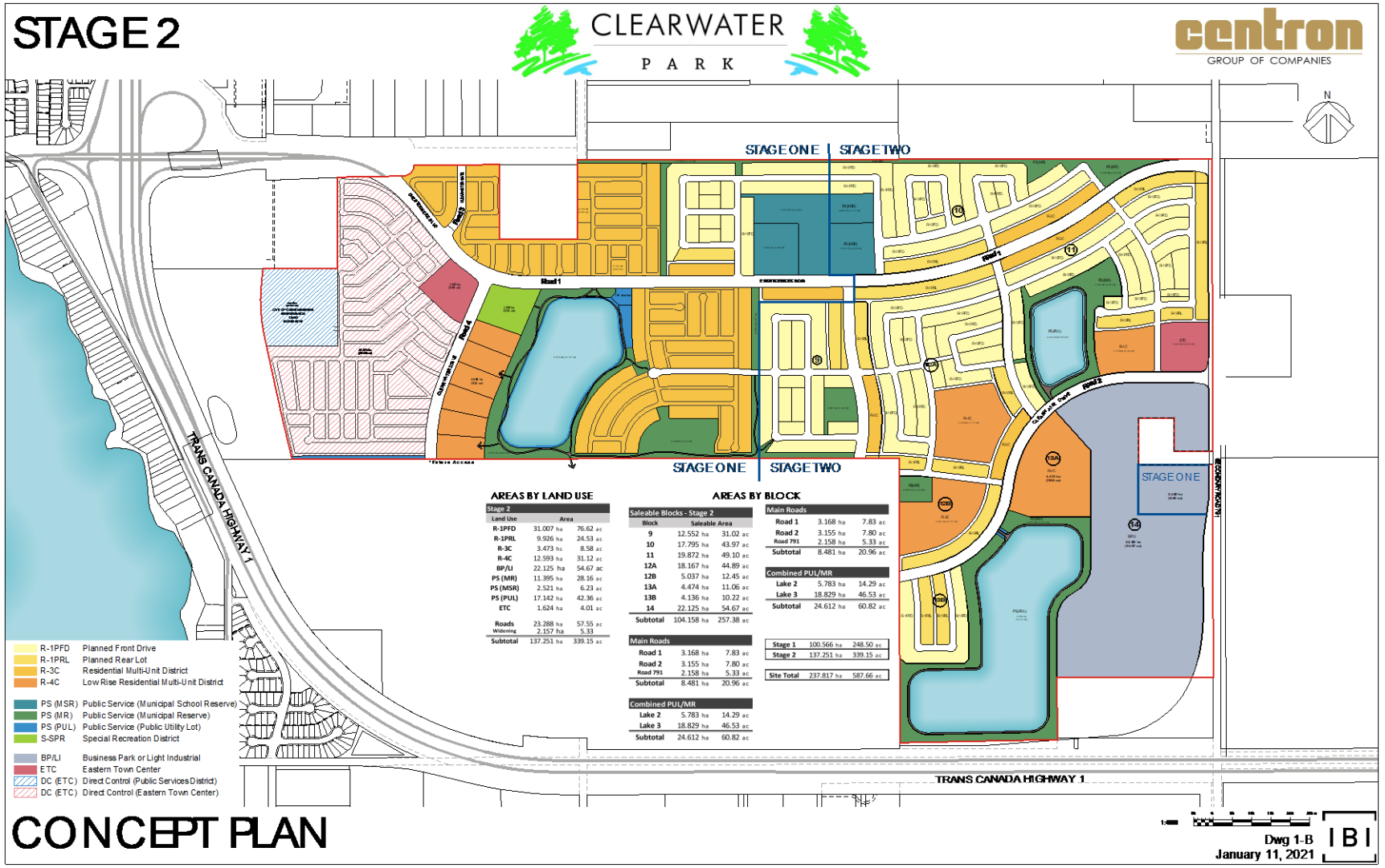
IBI GROUP
3rd Floor – 227 11 Avenue SW
Calgary AB T2R 1R9 Canada
tel 403 270 5600 fax 403 270 5610
ibigroup.com

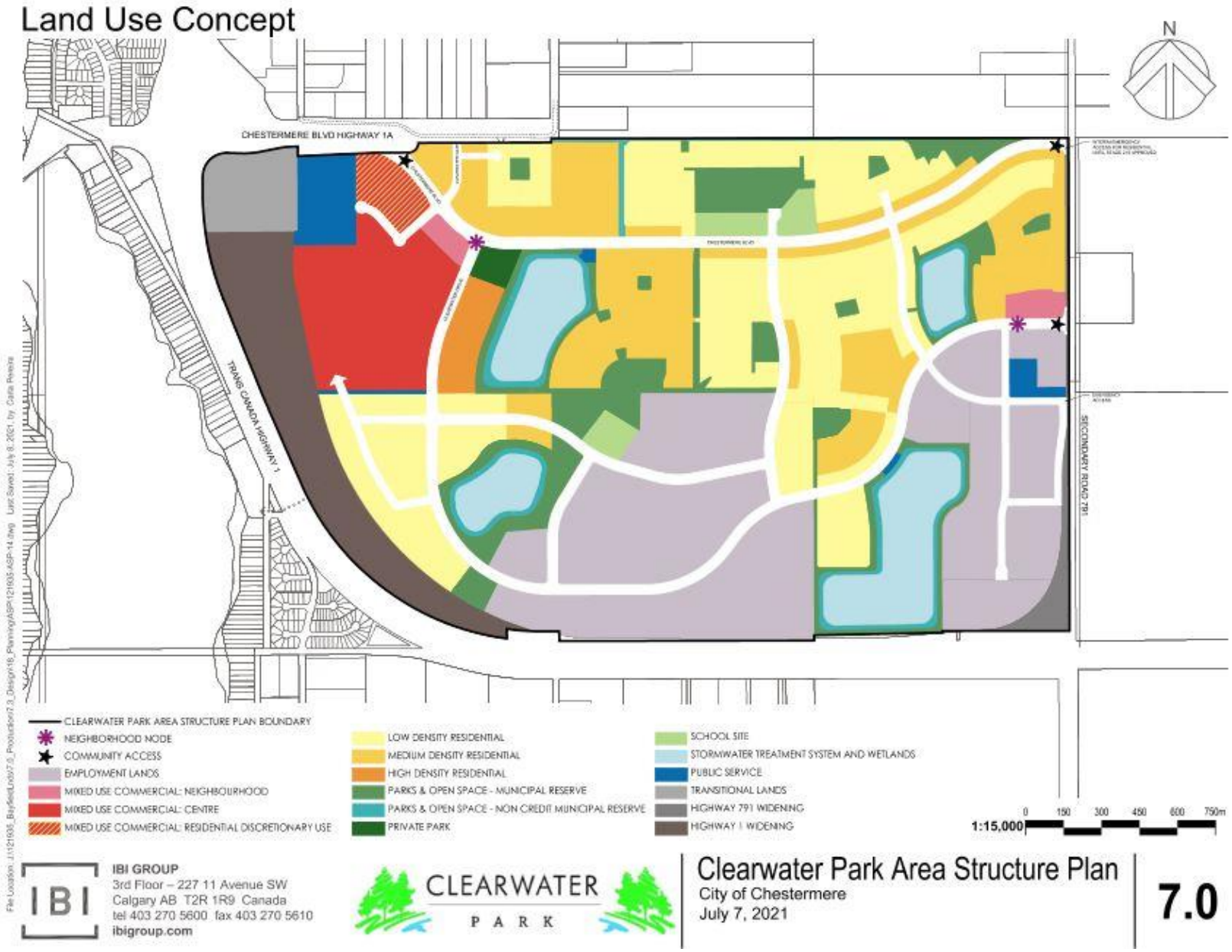
CLEARWATER PARK

Clearwater Park Area Structure Plan
City of Chestermere
March 17, 2021

4.0

A.2 Long Term Build Out




Land Use Concept
N
CHESTERMERE BLVD HIGHWAY 1A
TRANS CANADA HIGHWAY 1
SECONDARY ROAD 791
CLEARWATER PARK AREA STRUCTURE PLAN BOUNDARY
NEIGHBORHOOD NODE
COMMUNITY ACCESS
EMPLOYMENT LANDS
MIXED USE COMMERCIAL: NEIGHBOURHOOD
MIXED USE COMMERCIAL: CENTRE
MIXED USE COMMERCIAL: RESIDENTIAL DISCRETIONARY USE
LOW DENSITY RESIDENTIAL
MEDIUM DENSITY RESIDENTIAL
HIGH DENSITY RESIDENTIAL
PARKS & OPEN SPACE - MUNICIPAL RESERVE
PARKS & OPEN SPACE - NON CREDIT MUNICIPAL RESERVE
PRIVATE PARK
SCHOOL SITE
STORMWATER TREATMENT SYSTEM AND WETLANDS
PUBLIC SERVICE
TRANSITIONAL LANDS
HIGHWAY 791 WIDENING
HIGHWAY 1 WIDENING
0 150 300 450 600 750m
1:15,000
IBI GROUP
3rd Floor – 227 11 Avenue SW
Calgary AB T2R 1R9 Canada
tel 403 270 5600 fax 403 270 5610
ibigroup.com
CLEARWATER PARK
Clearwater Park Area Structure Plan
City of Chestermere
July 7, 2021
7.0

Appendix B: Site Photographs

Photo B-1 – Representative of a Semi-permanent-Freshwater-Shallow Open Water (WL39). Central deep marsh zone and transitional wetland to upland areas are shown.

Photo B-2 – Representative of Seasonal-Freshwater-Shallow Open Water (WL1). Wetland to Disturbed Grassland/Pasture upland is seen; as well as central inundated open water area.

Photo B-3 – Representative of Seasonal-Freshwater-Marsh (WL3). Upland to wetland transition is seen; as well as central inundated open water area.

Photo B-4 – Representative of a Temporary-Freshwater-Marsh (WL9). Upland to wetland transition is seen; as well as central inundated open water area and organic soils in low-lying areas.

Photo B-5 – Representative of a Temporary-Freshwater-Marsh (WL9). Upland to wetland transition is seen; as well as central inundated open water area and organic soils in low-lying areas.

Photo B-6 – Representative of a Temporary-Freshwater-Marsh (WL16). Central inundated open water area is seen, as well as surrounding organic soil and cropland area.

Photo B-7 – Representative of a Temporary-Freshwater-Marsh (WL17) within cultivated cropland. Central inundated open water area is seen, as well as surrounding organic soil.

Photo B-8 –Representative of a Temporary-Freshwater-Marsh (WL25) within cultivated cropland. Central inundated open water area is seen, as well as surrounding organic soil.

Photo B-9 – Representative of a Temporary-Freshwater-Marsh (WL26) within cropland. Upland to wetland trasition and bare soil areas caused by temporary indunadion are visible.

Photo B-10 – Representative of Pasture/Disturbed Grassland. Planted windbreak/hedgerow surrounding a residence visible in right background (Anthropogenic – Vegetated).

Photo B-11 - Representative of Anthropogenic non-vegetated land cover type. Snowcovered gravel area/driveway on vacated lot shown, surrounded by planted windbreak/hedgerow.

Photo B-12 – Representative of cultivated cropland land cover type. Anthropogenic – Non-Vegetated Utility yard seen in the background.

Appendix C: At Risk Definitions Table

ALBERTA ENVIRONMENT & PARKS	
At Risk	Any species known to be "At Risk" after formal detailed status assessment and legal designation as "Endangered" or "Threatened" in Alberta.
May Be At Risk	Any species that "May Be At Risk" of extinction or extirpation, and is therefore a candidate for detailed risk assessment.
Sensitive	Any species that is not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk.
Secure	A species that is not "At Risk," "May Be At Risk" or "Sensitive."
Undetermined	Any species for which insufficient information, knowledge or data is available to reliably evaluate its general status.
Not Assessed	Any species that has not been examined during this exercise.
Exotic/ Alien	Any species that has been introduced as a result of human activities.
Extirpated/ Extinct	Any species no longer thought to be present in Alberta ("Extirpated") or no longer believed to be present anywhere in the world ("Extinct").
Accidental/ Vagrant	Any species occurring infrequently and unpredictably in Alberta, i.e., outside its usual range. (These species may be in Alberta due to unusual weather occurrences, an accident during migration, or unusual breeding behaviour by a small number of individuals. If a species appears in Alberta with increasing predictability and more frequently, it may eventually be given a different rank. Changes in "Accidental/Vagrant" species may be a good indicator of general ecosystem or climatic changes.)
COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA (COSEWIC)	
Endangered	A wildlife species facing imminent extirpation or extinction
Threatened	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Not at Risk	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Appendix D: ABWRET-A Relative Wetland Value Category Results (Stage 1)

Table D-1 ABWRET-A Raw Score

Function (ABWRET-A Raw Score)	WL26	WL25	WL17	WL16	WL15	WL9	WL1	WL3
Surface Water Storage (WS)	6.16	6.16	6.16	6.33	6.16	6.55	6.37	6.16
Stream Flow Support (SFS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Phosphorus Retention (PR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	4.66	4.63	4.65	4.74	4.79	5.04	6.19	5.97
Amphibian Habitat (AM)	2.62	2.58	2.61	2.65	2.63	2.74	3.11	3.17
Waterbird Habitat (WB)	4.72	4.70	4.71	4.76	4.74	4.19	5.16	5.15
Songbird, Raptor, & Mammal Habitat (SBM)	2.99	2.88	2.96	3.21	3.31	3.27	4.06	3.95
Pollinator & Native Plant Habitat (PH)	2.28	2.24	2.27	2.51	2.83	2.83	3.57	3.46
Human Use & Recognition (HU)	1.59	1.72	1.63	1.63	1.57	1.54	1.38	1.43

Table D-2 ABWRET-A Normalized Score

Function (ABWRET-A Normalized Score)	WL26	WL25	WL17	WL16	WL15	WL9	WL1	WL3
Surface Water Storage (WS)	0.85	0.85	0.85	0.88	0.85	0.92	0.88	0.85
Stream Flow Support (SFS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Streamwater Cooling (WC)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sediment & Toxicant Retention & Stabilization (SR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Phosphorus Retention (PR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Nitrate Removal & Retention (NR)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Organic Nutrient Export (OE)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fish Habitat (FH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Invertebrate Habitat (INV)	0.45	0.45	0.45	0.46	0.47	0.50	0.65	0.62
Amphibian Habitat (AM)	0.33	0.33	0.33	0.34	0.33	0.35	0.41	0.42
Waterbird Habitat (WB)	0.35	0.34	0.35	0.35	0.35	0.28	0.40	0.40
Songbird, Raptor, & Mammal Habitat (SBM)	0.26	0.24	0.26	0.30	0.32	0.32	0.46	0.44
Pollinator & Native Plant Habitat (PH)	0.10	0.09	0.09	0.14	0.19	0.19	0.32	0.30
Human Use & Recognition (HU)	0.11	0.13	0.12	0.12	0.10	0.10	0.07	0.08

Table D-3 ABWRET-A Normalized Score Based on Wetlands in RWVAU

Normalized Score (ABWRET_A) Based on Wetlands in RWVAU	WL26	WL25	WL17	WL16	WL15	WL9	WL1	WL3
Normalized Hydrological Health (HH)	0.85	0.85	0.85	0.88	0.85	0.92	0.88	0.85
Normalized Water Quality (WQ)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Normalized Ecological Health (EH)	0.45	0.45	0.45	0.46	0.47	0.50	0.65	0.62
Normalized Human Use (HU)	0.11	0.13	0.12	0.12	0.10	0.10	0.07	0.08
RWVAU #	13	13	13	13	13	16	13	13
Normalized Value Score (ABWRET_a)	0.70	0.70	0.70	0.71	0.71	0.73	0.77	0.75
Value Category (a, b, c, d)	d	d	d	c	d	c	c	c
Abundance Factor	1	1	1	1	1	0	1	1
Final Score (A, B, C, D)	C	C	C	B	C	C	B	B

Appendix E: Provincial Database Search Results

Alberta Environment and Parks

Fish and Wildlife Internet Mapping Tool (FWIMT)

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

Species Summary Report

Report Date: 22-Jan-2021 08:48

Species present within the current extent

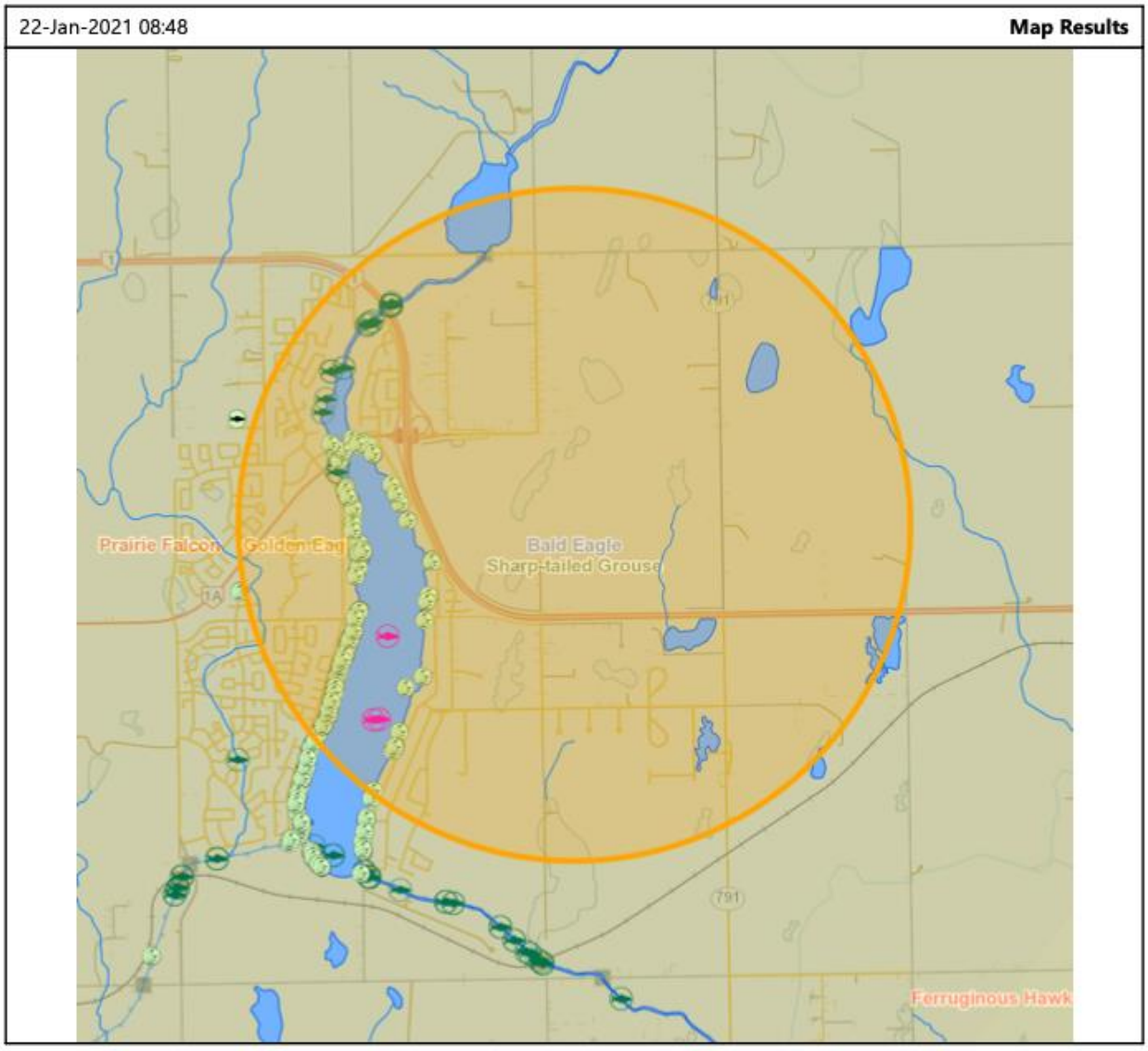
Fish Inventory	Wildlife Inventory	Stocked Inventory
LAKE WHITEFISH	BADGER	LAKE WHITEFISH
MOUNTAIN WHITEFISH	BAIRD'S SPARROW	
NORTHERN PIKE	BALD EAGLE	
RAINBOW TROUT	BANK SWALLOW	
WHITE SUCKER	BLACK-NECKED STILT	
YELLOW PERCH	BURROWING OWL	
	CANADIAN TOAD	
	COMMON YELLOWTHROAT	
	EASTERN KINGBIRD	
	GREAT BLUE HERON	
	HORNED GREBE	
	PIED-BILLED GREBE	
	PIPING PLOVER	
	PLAINS GARTER SNAKE	
	SORA	
	SPRAGUE'S PIPIT	
	UPLAND SANDPIPER	
	WESTERN GREBE	

Buffer Extent

Centroid (X,Y)	Projection	Centroid (Qtr Sec Twp Rng Mer)	Radius or Dimensions
584702, 5653278	10-TM AEP Forest	SW 13 24 28 4	3 kilometers

Contact Information

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



ACIMS Search – 14-024-28 W4M

Date: 10/10/2020
Requestor: Consultant
Reason for Request: Element Occurrence Search
SEC: 14 **TWP**: 024 **RGE**: 28 **MER**: 4

Alberta Parks

Non-sensitive EOs (updated: October 2017)

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: October 2017)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas (updated: October 2017)

M-RR-TTT-SS	PROTECTED_AREA_NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations (updated: October 2017)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

ACIMS Search – 14-024-28 W4M

Date: 10/10/2020
Requestor: Consultant
Reason for Request: Element Occurrence Search
SEC: 13 **TWP**: 024 **RGE**: 28 **MER**: 4

Alberta Parks

Non-sensitive EOs (updated: October 2017)

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: October 2017)

M-RR-TTT	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
No Sensitive EOs Found: Next Steps - See FAQ						

Protected Areas (updated: October 2017)

M-RR-TTT-SS	PROTECTED_AREA_NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations (updated: October 2017)

M-RR-TTT-SS	NAME	TYPE
No Crown Reservations/Notations Found		

Appendix F: HRA Clearance

Alberta

HRA Number: 4835-20-0010-001
February 20, 2020

Historical Resources Act Approval

Proponent: Centron Group of Companies
#104, 8826 Blackfoot Trail SE, Calgary, AB T2J 3J1
Contact: Mr. David Dalen

Agent: IBI Group
Contact: Amanda Polini

Project Name: **Clearwater Park ASP**

Project Components: Area Structure Plan / Outline Plan

Application Purpose: Requesting HRA Approval / Requirements

Historical Resources Act approval is granted for the activities described in this application and its attached plan(s)/sketch(es) subject to Section 31, "a person who discovers an historic resource in the course of making an excavation for a purpose other than for the purpose of seeking historic resources shall forthwith notify the Minister of the discovery." The chance discovery of historical resources is to be reported to the contacts identified within Standard Requirements under the *Historical Resources Act*: Reporting the Discovery of Historic Resources.

Rebecca Traquair
Regulatory Approvals Coordinator
Alberta Culture, Multiculturalism
and Status of Women

Lands Affected: All New Lands

Proposed Development Area:

MER	RGE	TWP	SEC	LSD List
4	28	24	14	1-2,6-11,14-16
4	28	24	13	1-16

Documents Attached:

Document Name	Document Type
DRAFT Outline Plan (Subject to Change)	Illustrative Material

OPaC HR Application # 017494336
HRM Project # 4835-20-0010

Page 1 of 1