Ecological Inventory
Rolling Trails Area Redevelopment Plan
Cochrane, AB

Prepared for:
Canopy Lands
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W W W .E N V I R O L E A D.C A

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APPENDICES

1.0 Introduction

Under the authorization of Canopy Lands ("Client"), Envirolead Canada Ltd. ("Envirolead") has conducted an Ecological Inventory (EI) to accompany a submission for approval of the Rolling Trails Area Redevelopment Plan (ARP) in Cochrane, Alberta. The EI has been completed in accordance with City of Calgary's EI Framework and meets requirements of a Biological Overview (BO) as described within the Town of Cochrane's Biological Impact Assessment Guidelines.

1.1. Project Description

In 2004, the areas of Tower Trails and Rolling Range Estates were annexed by The Town of Cochrane for future urban growth. Prior to urban redevelopment proceeding on these lands, an urban overlay plan is required for the existing large country residential lots in the area, which will create a vision for the area and minimize any unplanned future development.

Canopy Lands is pursuing approval of an ARP that will guide the future redevelopment of the area, in alignment with the Town of Cochrane's vision and plans for growth. The ARP boundary encompasses approximately 156 hectares or 386 acres of land and is shown on the Location Map below as well as on technical figures in Appendix A.

Location Map – Rolling Trails ARP Area

1.2. Objectives

Specific objectives of this report have been determined in accordance with the Town of Cochrane Biophysical Overview requirements and include the following:

- Establish the baseline ecological conditions by reviewing existing data and collecting new data for the Rolling Trails ARP area; and
- Identify Environmentally Significant Areas

2.0 Methods

Methods of investigation included desktop review of publicly available materials listed below and field investigation by resource specialists.

Alberta's Fish and Wildlife Information Management System (FWMIS)

The Alberta Conservation Information Management System (ACIMS)

Alberta Soil Information Viewer

GeoDiscover Alberta

Alberta Listing of Historic Resources

A field sampling program was conducted in Spring & Summer of 2019. Components included field visits to map, photograph, and characterize habitats (including wetlands) as well as surveys targeted to sensitive wildlife species and features. Site photographs taken during field surveys are provided in Appendix E. Specific methods are listed below by resource.

2.1 Natural Subregion

Natural Regions and Subregions of Alberta (GoA 2006) was reviewed to determine the location of the ASP area relative to the Natural Subregions. A description of the relevant regional and sub-regional environmental setting is provided.

2.2 Landforms & Soils

A field assessment of the subject site was completed as well as review of the Alberta Soil Information Viewer (AEP 2019b), previous studies, and available topographic GIS data to assess the existing terrain and soil conditions on site. Hand-augered soil cores were taken during field investigations for the purpose of confirming wetland boundaries and classifications.

2.3 Vegetation

2.3.1 Plants & Plant Communities

Comprehensive land cover type, weeds, and wetland surveys were conducted during the field visits in Spring & Summer of 2019. A query of the ACIMS database and review of previous studies were conducted to determine if known rare element occurrences have been reported on or near the subject site. A list of rare plants with the potential to occur was prepared using desktop methods.

Prior to commencing the vegetation survey, a desktop review of the ARP area was performed. During this review, ecological areas were delineated and labelled according to dominant vegetation types. A search was conducted of the Alberta Conservation Information Management System (ACIMS) to determine any tracked elements in the Foothills Parkland Natural Subregion. A list of likely weed species to be encountered in the area was also created including both noxious and prohibited noxious weeds (ABMI 2015, Rocky View County 2019).

The vegetation survey was conducted on July 15, 2019. A representative sampling of vegetation types was assessed on the properties for which access was available.

2.3.2 Wetland/Waterbody Identification, Delineation, & Classification

Methods for identifying, delineating, and classifying wetlands and other waterbodies on the property aligned with the Alberta Wetland Identification and Delineation Directive (GoA 2015a). Alberta Environment & Parks' (AEP) Alberta Merged Wetland Inventory (AMWI) was used to identify waterbodies and current and historical aerial imagery from Google Earth were used to delineate and classify the wetlands. Where available, wetlands delineated by the AMWI were incorporated into the inventory directly. Further delineation was required to capture wetlands not identified by the AMWI. These wetlands were identified by visual evidence of (seasonal) inundation over several years evident in the aerial imagery.

The classification and delineation of wetlands were conducted using a combination of Pathway 2 – Comprehensive Desktop Delineation and Pathway 5 – Comprehensive Desktop Delineation with Field Verification. Wetland boundaries were digitized on Google Earth imagery from 2002, 2003, 2011, 2013, 2014, 2015, 2016, 2017, & 2018. Further review of historical imagery from 1966, 1974, 1981, 1988, &1994 was conducted to confirm historical wetland conditions and classifications. Due to historical changes in hydrology and anthropogenic alteration of wetlands, focus was placed on recent conditions of the wetlands and waterbodies occurring within the ASP area.

Delineated wetlands were provided a classification using the Alberta Wetland Classification System (AWCS). Each wetland was assessed using the historical aerial imagery and classifications were determined based on permanence on the landscape and an approximation of vegetation type within each wetland.

Where access permission was granted, wetlands were visited in the field to confirm boundaries by presence or absence of wetland soil & vegetation indicators in accordance with Pathway 5 of the Wetland Identification and Delineation Directive.

2.4 Wildlife

Wildlife inventory was focused on the presence of species of conservation concern and assessing the potential for wildlife movement across the property. Where applicable, methods align with the Sensitive Species Inventory Guidelines (SSIG; GoA 2013). Specific methods by wildlife component are described below.

2.4.1 Desktop Searches for Vertebrate Species of Conservation Concern

A search of Alberta Environment and Parks' (AEP's) Fish and Wildlife Management Information System (FWMIS) was conducted to determine known species occurrences within a 2-km radius from the centre of the ARP area.

2.4.2 Field Surveys for Vertebrate Species of Conservation Concern

Breeding Songbird Point Counts

Breeding songbird surveys were undertaken to document the presence of species of conservation concern and the diversity of breeding songbirds. In accordance with the SSIG, survey locations were located approximately 600 meters apart to capture full coverage of the property. Point count surveys were conducted from 0.5 hr before sunrise until 11:00 a.m. Each point count consisted of a 1-minute "quiet down" period followed by a 5-minute detection period. All birds detected by sight or sound within 300-m radius of the survey point were recorded. Weather conditions (i.e. temperature, sky condition, and wind) were recorded at the start and end the survey. Generalized habitat characteristics and GPS coordinates were also recorded at each survey location. Wildlife observed incidentally between point count locations were also recorded.

Each point count was recorded by handheld recording device in the field and further reviewed both auditorily and visually in Audacity audio software to ensure complete inventory of all species occurrences.

Amphibian Auditory Survey

Amphibian auditory surveys were completed to document the presence of species of conservation concern and the diversity of amphibians. Sites were surveyed beginning 0.5 hr after sunset and ending before 01:00 a.m. Surveys were carried out at temperatures of 10 degrees Celsius or above. Surveys at each site consisted of a 1-minute "quiet down" period followed by a 3-minute auditory observation period. Calls were identified by species and an abundance index category was determined given the number that species calling ("0" = 0 individuals; "1" = 1 to 5; "2" = 6 to 10; & "3" = more than 10). Weather conditions including temperature, wind speed, and sky conditions were recorded at the start of the survey.

Sensitive Raptor Stick Nest Survey

Raptor stick nest searches were conducted prior to leaf out in May 2019. Roadside 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 ARP area were fully investigated for behaviour or sign of active nesting. Active nesting behaviour includes nest building, territorial displays, nest defence (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.

2.4.3 Fragmentation and Wildlife Movement Potential

The property was evaluated in terms of its contribution as a part of a larger ecological system. Key aspects of this assessment were: regional availability of habitats on the property; existing habitat fragmentation; and, the potential for the property to sustain or enhance regional wildlife movement.

2.5 Hydrology

Local hydrology at the site was determined by review of watercourse data available through AEP's GeoDiscover Alberta online web application as well as a review of local topography.

2.6 Historical Resources

A search of Alberta Culture's Listing of Historic Resources (Alberta Culture 2019) 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.

2.7 Environmentally Significant Areas (ESAs) and Aquatic Environmentally Significant Areas (AESAs)

A search of the ESA layer available through GeoDiscover Alberta was conducted to determine if any previously identified ESAs or Aquatic ESAs (AESAs) occur within the subject property. There are no previously identified and mapped ESAs or AESAs occurring within the project area. For the purposes of this assessment, ESAs and AESAs were classified and mapped at a finer scale according to applicable municipal policy.

ESAs in the project area were classified and mapped following the criteria outlined in Town of Cochrane's Biophysical Impact Assessment Guidelines and Appendix C of the City of Calgary's Open Space Plan (City of Calgary 2003).

The Calgary Open Space Plan defines an ESA as follows:

"An Environmentally Significant Area (ESA) is defined as a natural area, which because of its features or characteristics, is significant to the City from an environmental perspective and has the potential to remain viable within an urban environment."

Aquatic Environmentally Significant Areas (AESAs) are defined similarly to ESAs but also include areas that contribute to the quality of water resources (GoA 2011). Within the project area, potential AESAs might include wetlands, watercourses with defined bed and banks, and associated buffered riparian areas.

Landcover types occurring on the property were considered under the following ESA criteria as described in Appendix C of the City of Calgary Open Space Plan (2003):

1. Quality of Biotic Habitat - Biotic communities of high native integrity and/or diversity for a specific habitat type,
2. Ecological Function - Level of importance for the healthy maintenance of a natural system beyond its boundaries by maintaining biodiversity and/or acting as a staging area or corridor for wildlife within the system.
3. Distinctive and/or Unusual Landform - The area possesses a distinctive and/or unique landform (geologic and geographic).

4. Uniqueness - The habitat or ecosystem component has limited representation within the municipality; and/or the area provides representative habitat for wildlife of recognized importance.

Section 3.3 provides an assessment of landcover types occurring on the property for their qualification as ESA under these criteria.

3.0 Results

Results of technical studies are listed below by resource.

3.1 Natural Subregion

The ARP area is located within the Parkland Natural Region and the Foothills Parkland Natural Sub Region of Alberta (Natural Regions Committee 2006). The Foothills Parkland Natural Sub-Region extends south through the Cochrane area as a narrow discontinuous north-south band along the foothills; extending to the Alberta-Montana border. Dominant land cover types include (mostly disturbed) grassland, aspen forest, and patches of white spruce, wild rose & buckbrush low shrub, and upland willow tall shrub patches. Most of the Natural Sub-region has been avoided by cultivation but has been used extensively as rangeland.

3.2 Landform & Soils

The site topography is described as undulating to hummocky generally sloping to the north and the east. At the north end of the ARP area there is an escarpment sloping down into the Bow River valley. This escarpment is discussed further in Section 3.X Environmentally Significant Areas.

Native soil material over most of the site is described as discontinuous, fine-textured glaciolacustrine blanket overlying medium textured till (primary = DVSFS1/H1m; secondary = FSH1/U1h) (AEP 2019b; Alberta Research Council 1994). Dominant soils at surface are well drained Black Chernozems with minor imperfectly to poorly drained soils. Soils on the northeast facing escarpment “face” are described as miscellaneous coarse-textured soils in the Black zone (ZCOzbl).

3.3 Vegetation

3.3.1 Plants & Plant Communities

3.3.1.1 Land Cover Types

Eight distinct broad land cover types (i.e., plant communities) occur on the property. These are cropland, wetland, disturbed grassland, anthropogenic, treed aspen, and treed spruce. No native grassland, or shrubland exist on the property. Broad land cover types are shown on Figure 2.1. Representative photographs are provided in Appendix E.

Table 3.1 Land Cover Types within West Belvedere Outline Plan Area

Land Cover Type	Area		
	# of Polygons	Hectares	Percentage
Anthropogenic	9	58.4	37%
Disturbed Grassland	14	51.3	33%
Tall Shrub	39	11.0	7%
Low Shrub	14	4.9	3%
Treed - Deciduous	25	9.5	6%
Treed - Coniferous	7	3.4	2%
Treed - Mixedwood	6	5.4	3%
Wetland	46	12.3	8%
Total	**160**	**156.2**	**100%**

Anthropogenic

Anthropogenic covers 58.4 ha or 37% of the total property and is the most commonly occurring land cover type within the ARP area. This type is comprised of man-made or altered features including roads, disturbed areas, as well as residential areas and associated debris piles, outbuildings, and work areas. These lands have very limited native ecological integrity and are characterized by buildings, roadbeds, parking areas, gravelled or paved areas, exposed soil weedy areas, manicured lawns, ornamental or native trees and shrubs.

Disturbed Grassland

Disturbed grassland is the second most commonly occurring land cover type and covers 51.3 ha or 33% of the ARP area. Disturbed grassland is dominated by non-native graminoid species introduced for livestock forage. Characteristic species include Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromine inermis*), and western wheatgrass (*Pascopyrum smithii*) in the graminoid layer. Dominant herbaceous species include dandelion (*Taraxacum officinale*), northern hedysarum (*Hedysarum sulphurescens*), yarrow (*Achillea millefolium*), and three-flowered avens (*Geum triflorum*). Sparse amounts of low shrub occur in this type including prairie rose (*Rosa arkansana*) and buckbrush (*Symphoricarpus occidentalis*).

Tall Shrub

Tall shrub patches (>1m height) make up 7% (11.0 ha) of the ARP area and are dominated by willow species including Bebb's willow (*Salix bebbiana*) as well as occasional clusters of wolf willow (*Elaeagnus commutata*). Scattered trees occur including trembling aspen (*Populus tremuloides*), balsam poplar (*Populus* balsamifera), and white spruce (*Picea glauca*). The graminoid layer is dominated by non-native species Kentucky bluegrass and smooth brome. Forbs include prairie sagewort (*Artemesia ludoviciana*), wild strawberry (*Fragaria* virginiana) and goldenrod (*Solidago sp.*).

Low Shrub

Low shrub patches (<1m height) are composed of buckbrush or a mix of buckbrush and prairie or prickly rose (Rosa acicularis). Common forb species include dandelion, wild strawberry, cream-coloured vetchling (*Lathyrus ochroleucus*), and veiny meadow rue (*Thalictrum venulosum*).

Dominant grasses are Kentucky bluegrass and smooth brome. This land cover type makes up 4.9 ha or 3% of the ARP area.

Treed – Deciduous

Closed canopy forest dominated by trembling aspen (*Populus tremuloides*) occupies 9.5 ha (6%) of the property. Canopy closure is approximately 60% in these stands. Trees average 10-12 m in height with an average diameter at breast height (DBH) of 15 cm. The understory is dominated by non-native species including Kentucky bluegrass, smooth brome, Canada thistle, and dandelion. Native shrub species buckbrush and prickly or wood rose (*Rosa* woodsia) occur in small amounts. Native forbs include common pink wintergreen (*Pyrola asarifolia*), northern hedysaryum, and wild strawberry.

Treed – Coniferous

Coniferous-dominated forested lands occur only on the escarpment sloping down to the Bow River valley. The land cover type occupies 2% (3.4 ha) of the ARP area. Observers did not have access these land cover polygons, but the general make-up includes a closed canopy of white spruce with an understory made up of feathermoss, smooth brome, Kentucky bluegrass, sparse low shrub including prickly rose, and forbs include bunchberry (*Cornus canadensis*) and cream-coloured vetchling.

Treed – Mixedwood

Mixedwood occupies 5.4ha or 3% of the ARP area. This land cover type consists of both mature deciduous and coniferous trees including aspen, balsam poplar, and white spruce. The understory has a dense shrub component including wolf willow, wood rose, gooseberry (*Ribes oxycanthoides*), Canada buffalo-berry (*Sheperdia canadensis*), and red-osier dogwood (*Cornus stolonifera*). Grass species are predominately Kentucky bluegrass and smooth brome and dominant forbs include dandelion, northern hedysarum, and wild strawberry.

Wetlands

Temporary, seasonal, semi-permanent wetlands make-up 8% of the ARP area or 12.3 ha. Detailed wetland descriptions are provided in the Section 3.3.2.

3.3.1.2 Potential Rare Plant & Rare Ecological Communities

No rare plants or rare ecological communities were observed during field visits. In accordance with Town of Cochrane's BO requirements, a list of 50 rare plants (tracked elements) with the potential to occur was created through a search of ACIMS data for the Foothills Parkland Natural Subregion. Of these species, only one observation has been recorded in all sections of land which overlap the Rolling Trails ASP area. Smooth cliffbrake (*Pellaea glabella*) is a rare plant in the fern family which has been previously identified within 34-25-4W5M. Its habitat consists of dry limestone rock faces and it was likely observed outside the ARP area and within cliff faces in the immediate Bow River valley.

Please see Appendix C for the detailed list of potential rare plants and description of status designations.

3.3.1.3 Weeds

A list of weed species with potential to occur in the area ARP was also created including both noxious and prohibited noxious weeds (ABMI 2015, Rocky View County 2019). 50 invasive species were identified that have the potential to occur in the sub-region and ARP area. Of these, 25 are listed as Noxious and 16 are listed as Prohibited Noxious. Please see Appendix C for the detailed list of weeds with potential to occur.

Nine invasive species were confirmed to occur on-site during field surveys. These are shown in Table 3.2.

Table 3.2 – Weeds Observed in the Rolling Trails ARP Area

Common Name	Scientific Name	Observed
Smooth Brome	*Bromus inermis*	Widespread
Lamb's Quarters	*Chenopodium album*	Disturbed areas
Flixweed	*Descurainia sophia*	Disturbed areas
Kentucky Bluegrass	*Poa pratensis*	Widespread
Common Dandelion	*Taraxacum officinale*	Widespread
Common Goat's Beard	*Tragopogon dubius*	Widespread
Noxious		
Creeping Thistle	*Cirsium arvense*	Widespread
Blueweed	*Echium vulgare*	11U 676503 E 5670897 N 11U 676117 E 5671704 N 11U 676524 E 5670911 N
Prohibited Noxious		
Sulphur Cinquefoil	*Potentilla recta*	11U 676554 E 5670945 N

Please note, this is not an exhaustive list of weeds present on the subject property.

3.3.2 Wetlands

48 individual wetlands occur within or intersect the ARP boundary (Figure 2 – Appendix A). Table 3.3 provides the total number and area for each wetland type occurring within or intersecting the ARP boundary.

Table 3.3 – Wetland Types Occurring Within or Intersecting the ARP Area

ALBERTA WETLAND CLASSIFICATION SYSTEM	NUMBER OF WETLANDS	TOTAL AREA (ha)
Temporary-Freshwater-Marsh	14	0.99
Seasonal-Freshwater-Marsh	12	3.6
Seasonal-Freshwater Shrubby Swamp	5	1.63
Seasonal-Freshwater Wooded Swamp	1	0.11
Seasonal-Freshwater Shallow Open Water	12	4.18
Semi-Permanent-Freshwater Shallow Open Water	4	4.47

The total area of all wetlands is 14.98 ha with 12.35 ha occurring within the ARP area. Descriptions of each wetland type occurring on the property are below. Table D-1 in Appendix D provides detailed information for each wetland. Representative photos are in Appendix E.

Wetlands WL16 & WL42, both Semi-Permanent-Freshwater-Shallow Open Water, were previously determined to be Crown-claimable waterbody by AEPs Water Boundaries Unit. All other wetlands are considered not sufficiently permanent to be Crown-claimable. See Appendix F for correspondence with Water Boundaries.

Temporary-Freshwater-Marsh

14 individual Temporary-Freshwater-Marsh wetlands occur on or intersect the ARP boundary. A total of 0.99 ha of these wetlands occurs and sizes range from 0.02 ha to 0.29 ha with the average being 0.07 ha.

These wetlands are temporarily inundated with water at the wettest time of year or when snowmelt occurs over frozen ground conditions; but are dry most of the growing season. A wet meadow zone occurs in the deepest part of the basin. Characteristic graminoid species include water sedge (*Carex aquatilis*), bluegrass (*Poa spp.*), marsh reed grass (*Calamagrostis* canadensis), and wire rush (*Juncus balticus*). Dominant forb species were mostly weedy non-native species and include dandelion, Canada thistle (*Cirsium arvense*), sow thistle (*Sonchus arvensis*), common plantain (*Plantago major*), western dock (*Rumex occidentalis*), common plantain (*Plantago major*), rough cinquefoil (*Potentilla* norvegica), and wild mint (*Mentha arvense*). Shrubs are mostly absent from this type although trace amounts of willow (*Salix spp.*) occurred.

Seasonal-Freshwater-Marsh

12 individual Seasonal-Freshwater-Marsh wetlands occur on or intersect the ARP boundary. A total of 3.60 ha of these wetlands occurs and sizes range from 0.004 ha to 1.02 ha with the average being 0.30 ha.

These wetlands are inundated with water in the deepest zone (i.e., shallow marsh zone) for most of the growing season but are dry at the driest times of year and/or by the end of the growing season. These wetlands are dominated by cattail (*Typha latifolia*), water sedge, sloughgrass (*Beckmannia syzigachne*), reed canary grass (*Phalaris* arundinacea), and bluegrass graminoid species. Characteristic forbs include water crowfoot (*Ranunculus spp*.), water smartweed (*Polygonum amphibium*), and silverweed (*Potentilla anserine*). Weedy forbs, including dandelion, Canada thistle, and sow thistle, also occurred. Shrubs are mostly absent from this type although trace amounts of willow (*Salix spp.*) occurred.

Seasonal-Freshwater-Shrubby Swamp

Five individual Seasonal-Freshwater-Shrubby Swamp wetlands occur in the ARP area. The have a combined area of 1.63 ha and range from 0.04 ha to 0.57 ha in size with a mean size of 0.33 ha. This type has similar characteristics to Seasonal-Freshwater-Marsh with respect to seasonal persistence of water and hydrophytic graminoid and forb species but is dominated by a willow shrub zone within the wetland boundaries (that is absent from Marsh types).

Seasonal-Freshwater-Wooded Swamp

One Seasonal-Freshwater-Wooded Swamp occurs within the ARP that is 0.11 ha in size (WL14). Wooded swamps are distinct from marshes and shrubby swamps by the presence of more than 25% cover of trees. WL14 contains approximately 50% cover of deciduous trees including trembling aspen and balsam poplar.

Seasonal-Freshwater-Shallow Open Water

12 individual Seasonal-Freshwater-Shallow Open Water wetlands occur on or intersect the ARP boundary. A total of 4.18 ha of these wetlands occurs and sizes range from 0.04 ha to 1.26 ha with the average being 0.35 ha. Seasonal-Freshwater-Shallow Open Water wetlands differ from marshes by the presence of a distinct open water zone covering more than 25% of the total wetland area in most years (as opposed to graminoid marshes which have open water intermixed with emergent vegetation throughout). Dominant graminoid species surrounding open water areas is similar to marsh vegetation and includes cattail, water sedge, marsh reed grass, bluegrass, sloughgrass, wire rush, western dock, dandelion, and Canada thistle.

Semi-Permanent-Freshwater-Shallow Open Water

Four Semi-Permanent-Freshwater-Shallow Open Water wetlands occur on or intersect the ARP boundary. A total of 4.47 ha of these wetlands occurs and sizes range from 0.35 ha to 2.52 ha with the average being 1.17 ha. Semi-permanent wetlands are inundated with water year-round most years. Drying up only in drought years or periods of years. Zones surrounding the open water zone include shallow wetland and wet meadow zones containing similar species as in other freshwater shallow open waters and marshes.

A review by AEP's Water Boundaries Unit determined that wetlands WL16 & WL42 are sufficiently permanent and naturally occurring to be considered Crown-claimable. The other two Semi-Permanent-Freshwater-Shallow Open Water wetlands, WL4 & WL28, have been anthropogenically altered by impoundment and/or dredging which have caused sufficient persistence of water to be classified as semi-permanent but they are not Crown-claimable naturally occurring wetlands. Please see correspondence in Appendix F.

3.4 Wildlife

Table 3.4 shows species detected during field surveys or confirmed in provincial data to occur within or near the Rolling Trails ARP boundary. A total of 43 vertebrate wildlife species were detected by sign, sight, or sound or previously known to occur including 37 bird species, 5 mammal species, and 1 amphibian species.

No Species of Conservation Concern were detected during field surveys.

Table 3.4 – Species Detected in Field Surveys or FWMIS Searches

COMMON NAME	SCIENTIFIC NAME	STATUS			
		AEP	COSEWIC	SCHEDULE	SARA
Reptiles and Amphibians					
Boreal Chorus Frog	*Pseudacris maculata*	Secure	-	-	-
Birds					
American Crow	*Corvus brachyrhynchos*	Secure	-	-	-
American Goldfinch	*Spinus tristis*	Secure	-	-	-
American Robin	*Turdus migratorius*	Secure	-	-	-
Bald Eagle*	*Haliaeetus leucocephalus*	**Sensitive**	**Not at Risk**	**No**	-
Black-Billed Magpie	*Pica hudsonia*	Secure	-	-	-
Boreal Chickadee	*Poecile hudsonicus*	Secure	-	-	-
Black-capped Chickadee	*Poecile atricapillus*	Secure	-	-	-
Brewer's Blackbird	*Euphagus cyanocephalus*	Secure	-	-	-
Brown-headed Cowbird	*Molothrus ater*	Secure	-	-	-
Cedar Waxwing	*Bombycilla cedrorum*	Secure	-	-	-
Chipping Sparrow	*Spizella passerina*	Secure	-	-	-
Clay-coloured Sparrow	*Spizella pallida*	Secure	-	-	-
Common Grackle	*Quiscalus quiscula*	Secure	-	-	-
Common Raven	*Corvus corax*	Secure	-	-	-
Franklin's Gull	*Leucophaeus pipixcan*	Secure	-	-	-
Golden Eagle*	*Aquila chrysaetos*	**Sensitive**	**Not at Risk**	**No**	-
Gray Catbird	*Dumetella carolinensis*	Secure	-	-	-
House Wren	*Troglodytes aedon*	Secure	-	-	-
Lincoln's Sparrow	*Melospiza lincolnii*	Secure	-	-	-
Mallard	*Anas platyrhynchos*	Secure	-	-	-
Northern Flicker	*Colaptes auratus*	Secure	-	-	-
Northern Shoveller	*Anas clypeata*	Secure	-	-	-
Northern Pygmy-Owl*	*Glaucidium gnoma*	Secure	-	-	-
Northern Waterthrush	*Seiurus noveboracensis*	Secure	-	-	-
Peregrine Falcon*	*Falco peregrinus*	**At Risk**	**Not at Risk**	**Yes**	**Special Concern**
Prairie Falcon*	*Falco mexicanus*	**Sensitive**	**Not at Risk**	**No**	-
Red-breasted Nuthatch	*Sitta canadensis*	Secure	-	-	-
Red-winged Blackbird	*Agelaius phoeniceus*	Secure	-	-	-
Savannah Sparrow	*Passerculus sandwichensis*	Secure	-	-	-
Sharp-tailed Grouse*	*Tympanuchus phasianellus*	**Sensitive**	-	-	-
Solitary Sandpiper	*Tringa solitaria*	Secure	-	-	-
Spotted Sandpiper	*Actitis macularius*	Secure	-	-	-
Tree Swallow	*Tachycineta bicolor*	Secure	-	-	-
Vesper Sparrow	*Pooecetes gramineus*	Secure	-	-	-
White-throated Sparrow	*Zonotrichia albicollis*	Secure	-	-	-
Wilson's Snipe	*Gallinago delicata*	Secure	-	-	-
Yellow Warbler	*Dendroica petechia*	Secure	-	-	-
Mammals					
Coyote	*Canis latrans*	Secure	-	-	-
Deer spp.	*Odocoileus spp.*	Secure	-	-	-
Grizzly Bear*	*Ursus arctos*	**At Risk**	**Special Concern**	**Yes**	**Special Concern**
Moose	*Alces alces*	Secure	-	-	-
Red Squirrel	*Tamiasciurus hudsonicus*	Secure	-	-	-

*** Identified in FWMIS records; not detected during field surveys.**

3.4.1 Desktop Searches for Vertebrate Species of Conservation Concern

Please see Appendix B for FWMIS search area and results. The search of the FWMIS database identified known observations of grizzly bear, northern pygmy owl, peregrine falcon, and prairie falcon within a 2-km radius of the Towers Trail & Rolling Range Estates ASP area. The ASP boundary also overlaps Sensitive Raptor Ranges for bald eagle, golden eagle, and prairie falcon as well as sharp-tailed grouse Survey Area.

3.4.2 Field Surveys for Vertebrate Species of Conservation Concern

Breeding Songbird Point Counts

Breeding songbird point count surveys were completed on June 26th, 2019. Conditions were considered good with an average temperature of 10 degrees Celsius, light winds (10 to 15 km/h) from the northwest, and cloudy conditions. 11 point counts locations were surveyed (Figure 3; Appendix A). 32 bird species were detected during the surveys (Table 3.4). No avian Species of Conservation Concern were detected during the surveys.

Amphibian Auditory Survey

Amphibian auditory surveys were conducted the evening of June 11, 2016. Conditions were considered good with an average temperature of 11 degrees Celsius, little to no wind (6 to 9 km/h) from the southeast, and clear sky conditions. 11 locations were surveyed (Figure 3; Appendix A). Boreal chorus frog was the only amphibian species detected. The mean abundance index category observed was “2” or six to 10 individuals.

Sensitive Raptor Stick Nest Survey

Raptor stick nest searches were conducted under good conditions, prior to leaf out on May 8, 2019. All treed areas were surveyed within the property and no raptor stick nests were observed within the ARP area. One active osprey nest was observed approximately 120 m east of the property boundary at the west end of River Heights Drive (11 U 676789E 5671074N). The nest occurs on a nesting platform placed above an existing transmission tower to deter osprey from nesting on the transmission structures.

3.4.3 Field Surveys for Vertebrate Species of Conservation Concern

Assessments of the property’s regional habitat availability, fragmentation, and wildlife movement potential are provided below based on landscape-level ecological conditions occurring on and adjacent to the Project Area.

Fragmentation Assessment

Total or partial loss of a habitat type in a landscape and apportionment of the remaining habitat into smaller more isolated habitats are the main causes of fragmentation (Meffe et al. 1997). Human settlement in urban and country residential areas routinely results in a patchwork of small isolated natural areas within a matrix of developed land (Adams and Dove 1989). This is currently the trend in the local area. Native habitats on the property have been significantly fragmented by habitat loss and non-native plant invasion. Adjacent lands include paved and gravel roads, highways, disturbed grasslands, cultivated fields, commercial areas, and residential development. Existing land clearing, residential and agricultural activities, and linear disturbance on and around the Project Area has resulted in severe fragmentation of habitats into small, discontinuous, isolated patches. Distinct

fragmentation effects by major residential and commercial development are evident on the north, east, and south sides.

Wildlife Movement Potential

Wildlife corridors are defined as "linear landscape features that facilitate the biologically effective transport of animals between larger patches of habitat to accommodate daily, seasonal and dispersal movements" (Paquet et al. 1994.). Protection of routes for wildlife movement is important in order to provide safe travel opportunities between important habitats and to facilitate dispersal and population exchanges. Historically, the Rolling Trails ARP area likely contributed to some wildlife movement considering the existence of treed and shrub types which can provide hiding and thermal cover but vegetation clearing for agriculture of by livestock grazing (west of Rolling Trails Drive) and commercial and residential development (to the east and south) have reduced or removed the potential for most of the ARP area to contribute to regional wildlife movement.

The northeast facing escarpment that is intersected by the northern boundary of the ARP area has been largely protected from development along its east-west alignment and holds some potential to provide cover for wildlife and to sustain wildlife movement. This land feature however has also been fragmented by several roads and other linear and residential development.

Recent infrastructure development has severely increased the local and sub-regional fragmentation of potential corridor areas. The overall ARP area is not considered to be part of a regional wildlife movement corridor considering the historic and current trend of development.

3.5 Hydrology

No mapped watercourses occur within the ASP boundaries. Minimal offsite drainage from the property appears to occur except during extreme rainfall or runoff events. The site is generally sloped southwest to northeast towards the Bow River valley but most drainage is expected to occur through wetland infiltration and evaporation.

3.6 Historical Resources

A search of the June 2019 version Alberta Culture's Listing of Historic Resources was conducted. HRV ratings rank from 1-5 with 1 being the most significant and are defined as follows:

- HRV 1: designated under the *Historical Resources Act* as a Provincial Historic Resource.
- HRV 2: designated as a Municipal Historic Resource or Registered Historic Resource under the *Historical Resources Act*.
- HRV 3: contains a known and significant historic resource that is of great significance and will require avoidance or assessment.
- HRV 4: contains a historic resource that may require avoidance or assessment.
- HRV 5: has high potential to contain a historic resource.

Each listing is also assigned a category to describe the resource of concern. They are as follows:

- a: archaeological
- c: cultural
- gl: geological
- h: historic period
- n: natural

- p: palaeontological

Table 3.5 shows quarter sections that occur within the ARP area that have been assigned an HRV rating.

Table 3.5 Quarter Sections (and LSDs) Assigned HRV Ratings within the Rolling Trails ARP

Quarter Section	LSD	ATS Section	Historical Resources Value	Category
NE-27-25-4 W5M	10,15	27-025-04 W5M	5	archaeological
NW-27-25-4 W5M	12,13	27-025-04 W5M	5	archaeological
NE-33-25-4 W5M	9	33-025-04 W5M	5	archaeological
NE-33-25-4 W5M	16	33-025-04 W5M	5	archaeological, palaeontological
NE-33-25-4 W5M	16	33-025-04 W5M	4	archaeological
NW-34-25-4 W5M	13	34-025-04 W5M	4	archaeological
SW-34-25-4 W5M	3,6	34-025-04 W5M	5	archaeological, palaeontological
SW-34-25-4 W5M	4,5	34-025-04 W5M	5	archaeological

3.7 Environmentally Significant Areas (ESAs) and Aquatic Environmentally Significant Areas

No provincially mapped ESAs or AESAs occur within or adjacent to the Rolling Trails ARP boundaries. Further study and fieldwork were conducted to assess ESAs. Landcover types and landforms occurring on the property were assessed under the City of Calgary's ESA criteria. Table 3.6 provides the assessment of each land cover type or landform with respect to ESA criteria described in Section 2.7.

Table 3.6 ESA Determination for the Rolling Trails ARP

Landcover Type	Habitat Quality	Ecological Function	Distinctive/ Unusual Landform	Uniqueness	ESA?
Coniferous Treed	-	-	-	-	No
Deciduous Treed	-	-	-	-	No
Mixedwood	-	-	-	-	No
Escarpment	-	Y	Y	Y	Yes
Disturbed Grassland	-	-	-	-	No
Tall Shrub	-	-	-	-	No
Low Shrub	-	-	-	-	No
Anthropogenic	-	-	-	-	No
Temporary-Freshwater Marsh	-	-	-	-	No
Seasonal-Freshwater Marsh	-	-	-	-	No
Seasonal-Freshwater Shallow Open Water	-	-	-	-	No
Seasonal-Freshwater Shrubby Swamp	-	-	-	-	No
Seasonal-Freshwater Wooded Swamp	-	-	-	-	No
Semi-Permanent–Freshwater Shallow Open Water	-	Y	-	Y	Yes

Escarpment

The northeast-facing escarpment running from northwest to southeast in the northern portion of the property qualifies as a distinct and unique type within the region and municipality. It is comprised mostly of mixedwood, coniferous, and deciduous forest land cover types that together provide ecological benefits to wildlife including structural and biological diversity, thermal and hiding cover, and contribution to wildlife movement. Natural coniferous forest in the Town of Cochrane is essentially limited solely to this escarpment as in runs east to west through the south portion of Town along the southern side of the Bow River valley. Preservation of escarpment areas as ESA provides an opportunity to preserve ecologically valuable landcover types occurring within.

Semi-Permanent-Freshwater Shallow Open Water

Two semi-permanent-freshwater-shallow open water (Class IV) wetlands intersect the project area. Wetland 16 is contained wholly within the project area and Wetland 42 is intersect by the project boundary at the southeast corner. The two wetlands are sufficiently naturally occurring and permanent on the landscape to be Crown-claimable. Other wetlands occurring on the property are temporary (Class II) or seasonal (Class III). The general status of temporary and seasonal wetlands in the project area is assessed to be degraded due to historical human-caused disturbance including grazing, dredging, infilling, draining, dumping, and other activities. Historical disturbance has reduced floristic and faunal biodiversity.

Semi-permanent-freshwater shallow open water wetlands (WL16 & WL42) qualify as AESAs for their higher ecological complexity and relative uniqueness in the area and the municipality. A 20-m riparian vegetated filter strip (VFS) buffer (i.e., development setback) has been prescribed in accordance with Stepping Back from the Water (ESRD 2012) and included with these wetlands as AESA. Preservation of these wetlands and riparian buffers provides an opportunity to maintain ecologically important and unique habitat types that can also provide amenities to the community.

4.0 Closure

We trust this meets your requirements at this time. Please do not hesitate to contact the undersigned at (403) 921-7057 or natherik@sage-eco.com.

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Appendix A – Figures

Figure 1

Figure 2

Figure 3

Figure 4

Appendix B – FWMIS & ACIMS 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 Created: 28-Mar-2019 14:28

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Stocked Inventory
BROOK STICKLEBACK	GRIZZLY BEAR	BROOK TROUT
BROOK TROUT	NORTHERN PYGMY-OWL	BROWN TROUT
BROWN TROUT	PEREGRINE FALCON	CUTTHROAT TROUT
BULL TROUT X BROOK TROUT HYBF	PRAIRIE FALCON	RAINBOW TROUT
BURBOT		
CUTTHROAT TROUT		
LAKE CHUB		
LONGNOSE DACE		
LONGNOSE SUCKER		
MOUNTAIN SUCKER		
MOUNTAIN WHITEFISH		
RAINBOW TROUT		
SUCKER FAMILY		
TROUT-PERCH		
WHITE SUCKER		

Buffer Extent

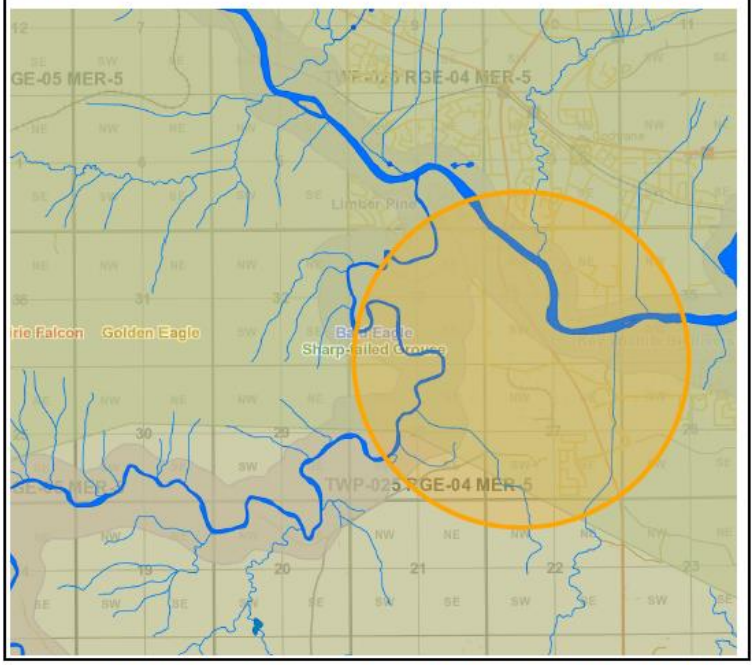
Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Radius or Dimensions
536069, 5666495	10-TM AEP Forest	SW 34 25 4 5	2 kilometers

Contact Information

For contact information, please visit:

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

28-Mar-2019 14:28 **Map Results**



ACIMS Search: SEC 27-025-04 W5M

Search ACIMS Data

Date: 4/4/2019
Requestor: Consultant
Reason for Request: Land Use Planning
SEC: 27 TWP: 025 RGE: 04 MER: 5

Alberta Parks

Non-sensitive EOs: 0 (*Data 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: 0 (*Data 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: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS
PROTECTED AREA NAME
TYPE
IUCN
No Protected Areas Found

Crown Reservations/Notations: 0 (*Data Updated:October 2017*)

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

ACIMS Search: SEC 33-025-04 W5M

Search ACIMS Data

Date: 4/4/2019
Requestor: Consultant
Reason for Request: Land Use Planning
SEC: 33 TWP: 025 RGE: 04 MER: 5

Alberta Parks

Non-sensitive EOs: 0 (*Data 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: 0 (*Data 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: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS
PROTECTED AREA NAME
TYPE
IUCN
No Protected Areas Found

Crown Reservations/Notations: 0 (*Data Updated:October 2017*)

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

ACIMS Search: SEC 34-025-04 W5M

Search ACIMS Data

Date: 4/4/2019
Requestor: Consultant
Reason for Request: Land Use Planning
SEC: 34 **TWP**: 025 **RGE**: 04 **MER**: 5

Alberta Parks

Non-sensitive EOs: 1 (*Data Updated:October 2017*)

M-RR-TTT-SS	EO_ID	ECODE	S_RANK	SNAME	SCOMNAME	LAST_OBS_D
5-04-025-34	13982	PPADI0H066	S2	Pellaea glabella ssp. simplex	smooth cliff brake	1940-09-20

Next Steps: See FAQ

Sensitive EOs: 0 (*Data 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: 0 (*Data Updated:October 2017*)

M-RR-TTT-SS	PROTECTED AREA NAME	TYPE	IUCN
No Protected Areas Found			

Crown Reservations/Notations: 0 (*Data Updated:October 2017*)

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

Appendix C – Rare Plants & Weeds with Potential to Occur within the Rolling Trails ARP Area

Table C-1 – Rare Plants with Potential to Occur in the Foothills Parkland Sub-Region

Common Name	Scientific Name	*S Class	**G Class	Observed
long-leaved arnica	*Arnica longifolia*	S2	G5	n
northern wormwood	*Artemisia borealis ssp. borealis*	S2S3	G5T5	n
large-flowered brickellia	*Brickellia grandiflora*	S2	G5	n
thorough-wax	*Bupleurum americanum*	S2	G5	n
blue camas	*Camassia quamash var. quamash*	S3	G5T4T5	n
open sedge	*Carex aperta*	S2	G4	n
yellow sedge	*Carex flava*	S2S3	G5	n
blister sedge	*Carex vesicaria*	S1	G5	n
meadow thistle	*Cirsium scariosum*	S2	G5	n
conimitella	*Conimitella williamsii*	S2	G4	n
hairy bugseed	*Corispermum villosum*	S2	G4?	n
mountain lady's-slipper	*Cypripedium montanum*	S2	G4	n
creeping fleabane	*Erigeron flagellaris*	S2	G5	n
bearded fescue	*Festuca subulata*	S1	G5	n
mountain gentian	*Gentiana calycosa*	S2	G4	n
marsh gentian	*Gentiana fremontii*	S3	G3G4	n
mountain hollyhock	*Iliamna rivularis*	S1	G5	n
western blue flag	*Iris missouriensis*	S2	G5	n
small-flowered rockstar	*Lithophragma parviflorum*	S2	G5	n
least lupine	*Lupinus minimus*	S2	G3G4	n
tansy aster	*Machaeranthera tanacetifolia*	S1	G5	n
Smith's oniongrass	*Melica smithii*	S2	G4	n
onion grass	*Melica spectabilis*	S2	G5	n
lance-leaved lungwort	*Mertensia lanceolata*	S2	G5	n
linear-leaved montia	*Montia linearis*	S2	G5	n
small baby-blue-eyes	*Nemophila breviflora*	S3	G5	n
low yellow evening-primrose	*Oenothera flava*	S3	G5	n
Gaston's cliff brake	*Pellaea gastonyi*	S2	G3	n
smooth cliff brake	*Pellaea glabella ssp. simplex*	S2	G5T4?	n
blue phlox	*Phlox alyssifolia*	S2	G5	n
limber pine	*Pinus flexilis*	S3	G4	n
western bistort	*Polygonum bistortoides*	S2	G5	n
Engelmann's knotweed	*Polygonum engelmannii*	S2	G5T3T5	n
western polypody	*Polypodium hesperium*	S1	G5	n
longleaf pondweed	*Potamogeton nodosus*	S1	G5	n
sandhills cinquefoil	*Potentilla lasiodonta*	S3	G3	n
Macoun's cinquefoil	*Potentilla macounii*	S1	G3?	n
hairy cinquefoil	*Potentilla villosa*	SU	G5	n
purple rattlesnakeroot	*Prenanthes sagittata*	S1	G4	n
white cudweed	*Pseudognaphalium thermale*	SH	G5T4T5	n
bracken fern	*Pteridium aquilinum var. pubescens*	SU	G5T5	n
mountain gooseberry	*Ribes inerme var. inerme*	S2?	G5T5	n
widgeon-grass	*Ruppia cirrhosa*	S3	G5	n
large-flowered ragwort	*Senecio megacephalus*	S1	G4	n
poison suckleya	*Suckleya suckleyana*	S3	G5	n
few-flowered salt-meadow grass	*Torreyochloa pallida var. pauciflora*	S1	G5T5	n
tall trisetum	*Trisetum canescens*	S2	G5	n
nodding trisetum	*Trisetum cernuum*	S2	G5	n
awnless trisetum	*Trisetum wolfii*	S2	G4	n
yellow wood violet	*Viola glabella*	S2	G5	n

**Subnational Rank*
***Global Rank*

Table C-2 – Weeds Occurring or with Potential to Occur within the Rolling Trails ARP Area

Common Name	Scientific Name	Observed
Smooth Brome	*Bromus inermis*	Widespread
Lamb's Quarters	*Chenopodium album*	Disturbed areas
Annual Hawk's Beard	*Crepis tectorum*	
Flixweed	*Descurainia sophia*	Disturbed areas
Wild Buckwheat	*Fallopia convolvulus*	
Alfalfa	*Medicago sativa*	
Kentucky Bluegrass	*Poa pratensis*	Widespread
Common Dandelion	*Taraxacum officinale*	Widespread
Common Goat's Beard	*Tragopogon dubius*	Widespread
Noxious		
Common Burdock	*Arctium minus*	
Japanese Brome	*Bromus japonicus*	
Downy Brome	*Bromus tectorum*	
Creeping Bellflower	*Campanula rapunculoides*	
Creeping Thistle	*Cirsium arvense*	Widespread
Yellow Clematis	*Clematis tangutica*	
Field Bindweed	*Convolvulus arvensis*	
Hounds Tongue	*Cynoglossum officinale*	
Blueweed	*Echium vulgare*	11U 676503 E 5670897 N 11U 676117 E 5671704 N 11U 676524 E 5670911 N
Leafy Spurge	*Euphorbia esula*	
Baby's Breath	*Gypsophila paniculata*	
Dames Rocket	*Hesperis matronalis*	
Black Henbane	*Hyoscyamus niger*	
Field Scabious	*Knautia arvensis*	
Broad-leaved Pepper-grass	*Lepidium latifolium*	
Hoary Cress	*Lepidium spp.*	
Oxeye Daisy	*Leucanthemum vulgare*	
Dalmation Toadflax	*Linaria dalmatica*	
Common Toadflax	*Linaria vulgaris*	
Tall Buttercup	*Ranunculus acris*	
White Cockle	*Silene latifolia Poiret ssp*	
Perennial Sow Thistle	*Sonchus arvensis*	
Common Tansy	*Tanacetum vulgare*	
Scentless Chamomile	*Tripleurospermum perforatum*	
Common Mullein	*Verbascum thapsus*	
Prohibited Noxious		
Russian Knapweed	*Acroptilon repens*	
Jointed Goatgrass	*Aegilops cylindrica Host*	
Garlic Mustard	*Alliaria petiolata*	
Nodding Thistle	*Carduus nutans*	
Diffuse Knapweed	*Centaurea diffusa*	
Yellow Starthistle	*Centaurea solstitialis*	
Spotted Knapweed	*Centaurea stoebe*	
Orange Hawkweed	*Hieracium aurantiacum*	
Meadow Hawkweed	*Hieracium caespitosum*	
Himalayan Balsam	*Impatiens glandulifera*	
Yellow Flag Iris	*Iris pseudacorus*	
Purple Loosestrife	*Lythrum salicaria*	
Red Bartsia	*Odontites vernus*	
Sulphur Cinquefoil	*Potentilla recta*	11U 676554 E 5670945 N
Tansy Ragwort	*Senecio jacobaea*	
Salt Cedar (aka Tamarisk)	*Tamarix ramosissima*	

Appendix D – Wetlands

Table D-1 – Wetlands Occurring Within or Intersecting the Rolling Trails ARP Area

WATERBODY ID	AREA (ha)	ALBERTA WETLAND CLASSIFICATION SYSTEM	CROWN-CLAIMABLE
WL1	0.06	Temporary-Freshwater-Marsh	N
WL2	0.03	Temporary-Freshwater-Marsh	N
WL3	0.03	Temporary-Freshwater-Marsh	N
WL6	0.05	Temporary-Freshwater-Marsh	N
WL7	0.10	Temporary-Freshwater-Marsh	N
WL15	0.06	Temporary-Freshwater-Marsh	N
WL27	0.03	Temporary-Freshwater-Marsh	N
WL30	0.09	Temporary-Freshwater-Marsh	N
WL31	0.06	Temporary-Freshwater-Marsh	N
WL34	0.07	Temporary-Freshwater-Marsh	N
WL43	0.06	Temporary-Freshwater-Marsh	N
WL44	0.03	Temporary-Freshwater-Marsh	N
WL46	0.29	Temporary-Freshwater-Marsh	N
WL51	0.02	Temporary-Freshwater-Marsh	N
WL5	0.47	Seasonal-Freshwater-Marsh	N
WL10	0.16	Seasonal-Freshwater-Marsh	N
WL11	0.22	Seasonal-Freshwater-Marsh	N
WL13	0.04	Seasonal-Freshwater-Marsh	N
WL17	0.28	Seasonal-Freshwater-Marsh	N
WL18	0.26	Seasonal-Freshwater-Marsh	N
WL20	0.48	Seasonal-Freshwater-Marsh	N
WL22	0.25	Seasonal-Freshwater-Marsh	N
WL25	0.26	Seasonal-Freshwater-Marsh	N
WL26	0.17	Seasonal-Freshwater-Marsh	N
WL33	1.02	Seasonal-Freshwater-Marsh	N
WL52	0.004	Seasonal-Freshwater-Marsh	N
WL19	0.54	Seasonal-Freshwater Shrubby Swamp	N
WL21	0.33	Seasonal-Freshwater Shrubby Swamp	N
WL41	0.57	Seasonal-Freshwater Shrubby Swamp	N
WL49	0.14	Seasonal-Freshwater Shrubby Swamp	N
WL50	0.04	Seasonal-Freshwater Shrubby Swamp	N
WL14	0.11	Seasonal-Freshwater Wooded Swamp	N
WL8	0.40	Seasonal-Freshwater Shallow Open Water	N
WL9	0.29	Seasonal-Freshwater Shallow Open Water	N
WL12	0.47	Seasonal-Freshwater Shallow Open Water	N
WL23	0.63	Seasonal-Freshwater Shallow Open Water	N
WL24	0.11	Seasonal-Freshwater Shallow Open Water	N
WL32	0.27	Seasonal-Freshwater Shallow Open Water	N
WL35	0.04	Seasonal-Freshwater Shallow Open Water	N
WL36	0.17	Seasonal-Freshwater Shallow Open Water	N
WL37	0.21	Seasonal-Freshwater Shallow Open Water	N
WL38	0.21	Seasonal-Freshwater Shallow Open Water	N
WL40	1.26	Seasonal-Freshwater Shallow Open Water	N
WL45	0.12	Seasonal-Freshwater Shallow Open Water	N
WL4	0.46	Semi-Permanent-Freshwater Shallow Open Water	N
WL16	2.52	Semi-Permanent-Freshwater Shallow Open Water	**Y**
WL28	0.35	Semi-Permanent-Freshwater Shallow Open Water	N
WL42	1.13	Semi-Permanent-Freshwater Shallow Open Water	**Y**

Appendix E – Representative Site Photographs

Photo 1 – *Anthropogenic* land cover type; including graveled and paved areas, ornamental/planted trees, mowed lawn, and buildings.

Photo 2 – *Disturbed Grassland*

Photo 3 – *Tall Shrub*

Photo 4 – *Treed – Deciduous*

Photo 5 – *Treed – Coniferous*; on sloped escarpment.

Photo 6 – *Treed – Mixedwood*

Photo 7 – *Temporary-Freshwater-Marsh*

Photo 8 – *Seasonal-Freshwater-Marsh;* heavily grazed on left side of fence.

Photo 9 – *Seasonal-Freshwater-Shrubby Swamp*

Photo 10 – *Seasonal-Freshwater-Shallow Open Water*

Photo 11 – *Semi-Permanent-Freshwater-Shallow Open Water* (WL16)

Appendix F – AEP Water Boundaries – Correspondence

Nathan Erik

From: AEP Water-Boundaries <Water.Boundaries@gov.ab.ca>
Sent: Tuesday, October 23, 2018 4:04 PM
To: Nathan Erik
Subject: File 7523: RE: SW-34-25-4 W5 & N1/2-27-25-4 W5 - Crown Claimability Request

Greetings Nathan,
We have completed the analysis of permanence of water features in the specified study area within the N ½ of Section 27 and SW ¼ of Section 34 of Twp.25-Rge.04-W5M.
All land titles and documents were reviewed and found to be silent on Crown ownership of any water features in the area.
Air photos dated 1950 to 2017 were reviewed and the results of this permanence assessment are shown on the image below.
The water features marked with a green circle were considered Crown-owned under Section 3 of the Public Lands Act.
The remaining features marked with a red circle were reviewed and found to not meet the criteria for Crown ownership under Section 3 of the Public Lands Act.

Note: The above assessment of the water bodies ownership should not be taken to mean that authority has been granted under the provincial Water Act to alter, infill, or drain a water body. Please contact your local Environment Office for additional information regarding approval requirements.

Have a nice day,

Alberta Government
Environment and Parks

Ricardo Barbosa
Waterbody/Boundary Research Analyst
Provincial Wetlands & Water Boundaries Section
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Provincial Programs Branch

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