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REPORT

City of Edmonton
Fort Edmonton Park Area

Utility Replacement Design (CP-3247)
Environmental Impact Assessment

May, 2016

CANADA'S BEST MANAGED COMPANIES Platinum member

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Executive Summary

The Fort Edmonton Park attraction (FEP) is one of the City of Edmonton's (City's) cultural highlights. Situated on 64 hectares (158 acres) parcel of parkland in Edmonton's North Saskatchewan River Valley (NSRV), the FEP currently includes over 80 original and reconstructed historical structures, representing the history of Edmonton from 1846 to 1929. Fort Edmonton Park attraction is one facility, which together with the John Janzen Nature Centre and a large parking area to the east, combine to form the Fort Edmonton Park Area (Park Area).

The City of Edmonton and the Fort Edmonton Management Company are proposing to complete the following eight new infrastructure re-development projects over the next several years, starting with the utilities upgrade scheduled for completion by 2020.

- Utilities Upgrade
- New Entrance Building
- Midway Realignment and Expansion
- Hotel Selkirk Expansion
- New Artifact Warehouse Building
- New Commercial Block
- Streetcar Barn Expansion
- Fort Edmonton Freight Shed Expansion

Since all of the Park Area re-developments are located in the NSRV, which is regulated by the North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188), an Environmental Impact Assessment (EIA) is required to be reviewed and approved by the City of Edmonton Parks and Biodiversity office before construction can occur. In addition, the new commercial block; streetcar barn expansion; and Fort Edmonton freight shed expansion require a Site Location Study to comply with Bylaw 7188. This study is completed under a separate cover (Associated Engineering Alberta Ltd 2015).

The EIA considers environmental sensitivities relating to vegetation; soil contamination; wildlife; surface runoff; hydrology; fisheries; and historical resources within the Park Area and the immediately surrounding areas.

In general, the utility replacement will have greatest potential for environmental impacts due to the large project footprint and removal of mature vegetation. The construction of the seven buildings and expanded entertainment initiatives (secondary projects) is expected to have negligible impacts to the surrounding area. Any short-term impacts identified in this report are anticipated to be minimized with proper mitigation strategies and implementing best management practices during construction. Once the new construction is complete, appropriate landscaping is scheduled to replace native vegetation and will minimize residual impacts associated with the re-development within the park.

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1 Introduction

1.1 PROJECT BACKGROUND

There are three distinct sites that together are referred to as the Fort Edmonton Park Area (Park Area). They include: Fort Edmonton Park attraction (FEP); the John Janzen Nature Centre; and a large parking area to the east. These are situated on 64 ha (158 acres) parcel of parkland in Edmonton's North Saskatchewan River Valley.

An Environmental Impact Assessment (EIA) of the proposed re-development projects in the Fort Edmonton Park Area (Park Area) was undertaken by Associated Environmental Consultants Inc., a division of Associated Engineering (AE), to meet the requirements of the North Saskatchewan River Valley Redevelopment Area Plan, Bylaw 7188 (City of Edmonton 2014). This Bylaw establishes principles for protection of the river valley as part of Edmonton's valuable open space heritage. Major goals of the Bylaw include ensuring the preservation of the natural character and environment of the North Saskatchewan River Valley while providing opportunities for recreation, aesthetic and cultural activities. The Bylaw's Environmental Protection Policy requires that an environmental impact screening assessment is completed for proposed publicly funded development on municipal lands within Edmonton's river valley.

The Fort Edmonton Park (FEP) 2010 Master Plan Update (City of Edmonton 2010b), sets the stage for re-development of FEP through a range of new programs, buildings and entertainment initiatives. Achieving the FEP's vision for growth and development in future years and meeting the Fort Edmonton Park 2010 Master Plan Update development initiatives requires upgrading of the aging supporting infrastructure, including the utilities which will disturb the entire Park Area.

During a May 4, 2015 project meeting (AE, 2015d), it was determined that an Environmental Impact Assessment (EIA) would be more suitable to cover all redevelopment projects, including the two buildings not included in the 201 Master Plan Update. This would facilitate the project review by City Council.

The objectives of this EIA are to evaluate the potential environmental impacts of each project under the re-development initiative and develop strategies and recommendations to avoid, minimize or mitigate potential impacts.

1.2 SITE DESCRIPTION

Fort Edmonton Park attraction(FEP), located on the south bank of the North Saskatchewan River Valley, is one of the City of Edmonton's cultural highlights (**Figure 1-1**). The FEP currently includes more than 80 original and reconstructed historical structures that represent the history of Edmonton from 1846 to 1929.

The surrounding land lends itself to many types of recreational activities. Popular multi-use trails are located within the Park Area and connect to other river valley parks within Edmonton. The Park Area is bordered by the neighbourhoods of Riverbend (0.2 km south of the Park Area) and nearby residences along Whitemud

Road (60 m west of the Park Area). Other nearby communities include: Rio Terrace, Quesnell Heights, Westridge and Oleskiw located north of the river, all approximately 0.4 km from the Park.

Table 1–1 provides a description of the spatial boundaries used in the environmental assessment.

Table 1-1
Spatial Boundaries Used in the EIA

Area Designation	Definition
Regional Area	Edmonton River Valley and neighbouring communities in proximity to the Fort Edmonton Park Area (**Figure 1–1**).
Park Area	The Park Area includes Fort Edmonton Park, the John Janzen Nature Centre and a large parking area to the east. This is the area subject of the re-development projects where there is the potential for immediate environmental impacts (**Figure 1–2**).
Project Footprint	This includes the lands subject to direct disturbance from the multiple projects and associated infrastructure. It includes the areas that will be disturbed for the purposes of the re-development projects including construction and laydown areas (**Figure 1–2**).

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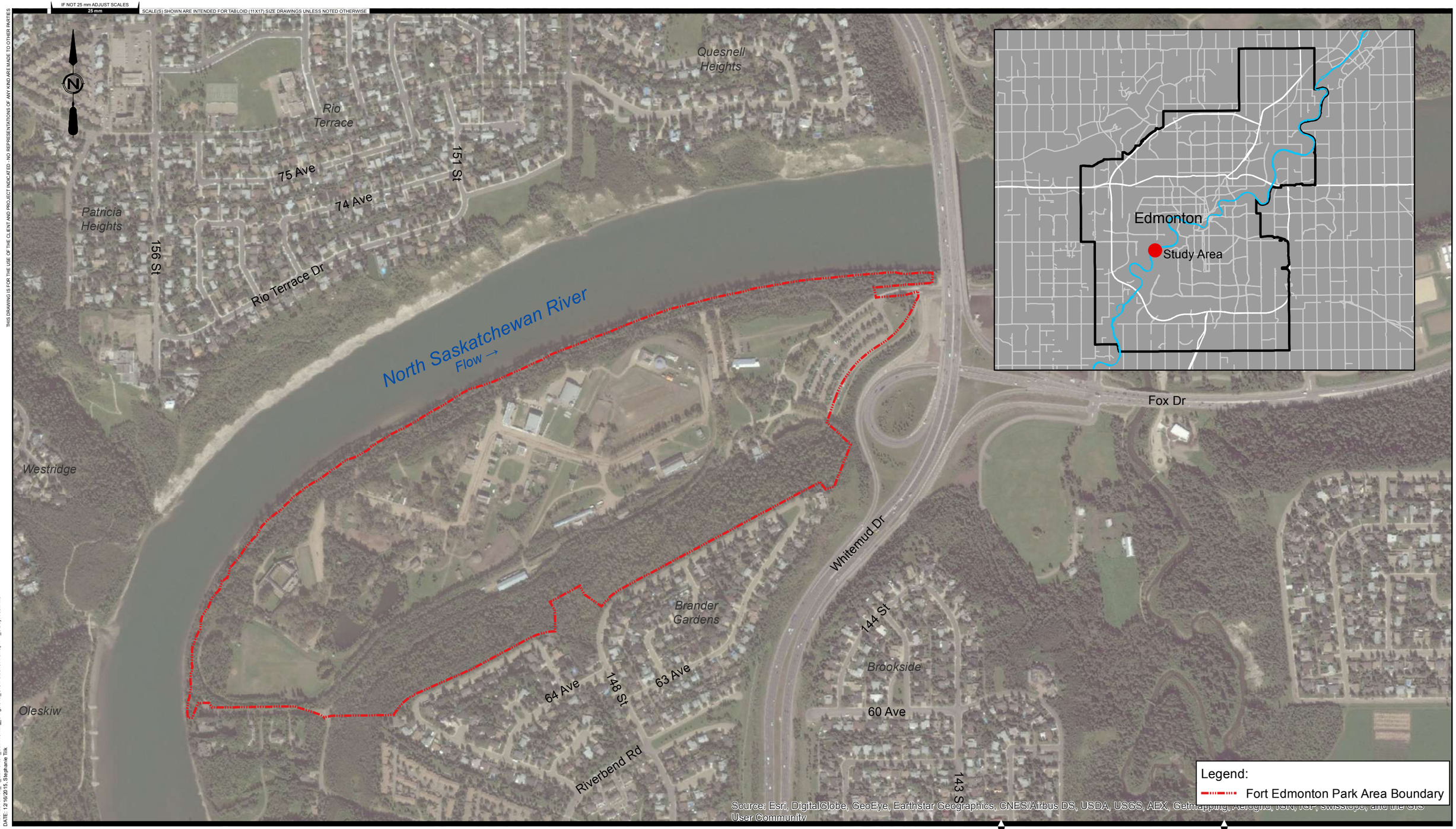

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THE CITY OF Edmonton

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FIGURE No. 1-1

FORT EDMONTON PARK AREA
ENVIRONMENTAL IMPACT ASSESSMENT

STUDY AREA

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FIGURE No. 1-2

FORT EDMONTON PARK AREA
ENVIRONMENTAL IMPACT ASSESSMENT

PROJECT LOCATIONS

1.3 REPORT OUTLINE AND ORGANIZATION

This report adheres to the Terms of Reference (TOR) for the Fort Edmonton Park Area Re-development submitted for review to the City of Edmonton in May 2015 (**Appendix A**). The assessment focused on environmental features that could be impacted by the Fort Edmonton Park Area re-development projects.

- The following ecosystem components were assessed to define impacts from construction of the projects, long-term residual impacts and appropriate mitigation measures:
  - geology, soils and slope stability;
  - vegetation, including rare plants, impacts of tree removal, site restoration and landscaping requirements;
  - wildlife, wildlife habitat and movement corridors;
  - surface water runoff, hydrology and aquatic habitat;
  - historical resources; and
  - contamination management and remediation.

This report provides:

- an outline of the proposed redevelopment projects;
- a description of the baseline environment;
- an assessment of the potential environmental impacts from the construction, operation, and maintenance associated with the redevelopment projects;
- mitigation strategies and procedures to avoid or reduce identified impacts; and
- an assessment of potential residual environmental impacts that cannot be reasonably mitigated.

1.4 PREVIOUS STUDIES AND REPORTS

The following studies and reports were completed as part of this EIA, and are provided as appendices to this report.

- Initial Project Reviews and a summary table for the following eight projects are provided in **Appendix B**:
  - utilities upgrade;
  - new entrance building;
  - midway realignment and expansion;
  - Hotel Selkirk expansion;
  - new artifact warehouse building;
  - new commercial block;
  - streetcar barn expansion; and
  - Fort Edmonton freight shed expansion.

Changes to project details were made since the Initial Project Reviews were completed.

Projects Removed:

- Parking lot in Phase 5 area will not be paved. It will be retained as a grassed overflow parking.
- Stormwater Treatment Structures west of Phase 2 are in Phase 5 area
- Indigenous Peoples' Experience (postponed development plans)

Projects Added:

- Fort Edmonton Freight Shed Expansion
- Realignment of east loop of the streetcar track and steam train track.
- Three ancillary facilities; two structures to house meter and pressure reducing valves for the water line and a guardhouse building.

Previous assessments completed in the Park Area where the results are summarized in this report include:

- Fort Edmonton Park Rare Plant Survey (Associated Engineering 2015c) (**Appendix D**).
- Phase I Environmental Site Assessment, Fort Edmonton Park, Edmonton, AB (Nichols Environmental Ltd., 2015) (**Appendix E**).
- Historical Resources Impact Assessment, Fort Edmonton Park (Circle CRM Group Inc. 2015) (**Appendix F**).

1.5 REGULATORY FRAMEWORK

1.5.1 Approvals and Clearance

Municipal, provincial, and federal, legislation were reviewed to ensure compliance of the projects. The redevelopment projects will require permitting as required under one City Bylaw and two provincial acts.

1.5.1.1 North Saskatchewan River Valley Area Plan – Bylaw 7188

Adopted in 1985, the North Saskatchewan River Valley Area Plan (Bylaw 7188) identifies a boundary for the river valley and ravine system and a set of policies and development approval procedures for lands within this boundary. The purpose of Bylaw 7188 is to protect the North Saskatchewan River Valley and Ravine System as part of Edmonton's valuable open space heritage and to establish the principles for future implementation plans and programs for parks development. It also supports the retention of the designated residential areas of Rossdale and Cloverdale (City of Edmonton 2014).

> "*One of the purposes of the Plan is to eventually create a recreation-orientated land use system which incorporates formal and informal parks and mature areas which are linked through a series of paths, trails, and open spaces. This system will be developed so as to respect the overall natural environment of the River Valley and its tributary ravine lands. Because of its large size, relative to the City of Edmonton and the restricted access to it, other land uses whose functions are compatible with*

major parks use will be incorporated. These may include, for example entertainment, cultural facilities, restaurants."

[City of Edmonton 2014]

The major goals of Bylaw 7188 are to:

1. ensure preservation of the natural character and environment of the North Saskatchewan River Valley and its Ravine System;
2. establish a public urban recreation area;
3. provide the opportunity for recreational, aesthetic and cultural activities in the North Saskatchewan River Valley for the benefit of Edmontonians and visitors to Edmonton; and
4. ensure the retention and enhancement of the Rosedale and Cloverdale communities in the River Valley.

The Park Area re-development projects conform to a number of objectives and policies of Bylaw 7188 because they will contribute to cultural and recreational opportunities within and alongside the natural features of the river valley.

Bylaw 7188 provides direction for the development of a "Major Facility" that is publicly owned or is developed on public lands. If the project was not already approved by City Council, it requires a Site Location Study to establish the need for it to be located within the context of the River Valley and must be subject of environmental impact assessments. These studies must be undertaken prior to Council committing funds for capital expenditure for the development of the project (Section 3.5.3 in City of Edmonton, 2014).

The Park Area re-development projects require an EIA for approval by the City of Edmonton Parks and Biodiversity office because they are "Major Facilities" proposed on public lands. Most of the projects were described in the Fort Edmonton Park 2010 Master Plan Update (City of Edmonton 2010b) and approved by City Council. Three buildings considered in this EIA are part of the re-development projects but were not originally discussed as part of the Fort Edmonton Park 2010 Master Plan Update (City of Edmonton 2010b). As required under Bylaw 7188, a Site Location Study for these three buildings has been completed and is presented under a separate cover. The purpose of the Site Location Study is to examine the financial, social, environmental and institutional constraints and opportunities that make the completion of the three buildings essential as an integral part of the Park Area re-development initiatives.

1.5.1.2 Alberta Historical Resources Act

Alberta Ministry of Culture and Tourism evaluates and coordinates the review of land-based development proposals that potentially affect historic resources such as archaeological and paleontological resources, historic sites or structures, and Aboriginal traditional use sites considered as historic resources under the *Historical Resources Act* (Alberta Tourism and Culture 2015). Under this Act, assessments of the potential impacts of development on historic resources are required.

Because of the potential for archaeological and paleontological resources within the area, clearance under the provincial *Historical Resources Act* for the Fort Edmonton Park Area re-development project was

needed. A Historical Resources Impact Assessment (HRIA) was conducted for the site. Results of the study did not reveal any historical resources on the site and clearance will be requested (Circle CRM Group Inc. 2015).

1.5.1.3 Environmental Protection and Enhancement Act

The purpose of the *Environmental Protection and Enhancement Act* (EPEA) is to support and promote the protection, enhancement and wise use of the environment (Government of Alberta 2000). The Park Area projects will require upgrades to existing stormwater and wastewater systems as part of the construction, which triggers the *Wastewater and Storm Drainage Regulation* established under EPEA. Under Section 6(1) of the Regulation, extension and replacement of wastewater or stormwater collection systems require a notification to undertake the extension or replacement (Government of Alberta 1993).

1.5.2 Guiding Federal Legislation

Provisions under the federal *Fisheries Act* apply to activities that have the potential to affect fish and fish habitat. No direct impacts to fish or fish habitat are expected from construction activities. Given that the Park Area is located next to the North Saskatchewan River, appropriate soil and erosion control measures will be required to ensure that sediments are not released to the river during construction.

The *Migratory Birds Convention Act* seeks to protect migratory birds as well as their eggs and nests. Timing for vegetation clearing during construction should consider nesting season to avoid impacts to migratory birds.

1.6 OVERVIEW OF RE-DEVELOPMENT PROJECTS

Eight infrastructure development projects are planned as part of the Park Area re-development initiatives.

The projects described in the Fort Edmonton Park 2010 Master Plan Update that were considered and approved by City Council include:

1. **Utilities Upgrade**: Replace and upgrade the existing water, storm, sanitary, gas and electrical utilities to support the Park Area's existing and new infrastructure. As part of the utility work, three ancillary facilities will be installed; two structures will house meter and pressure reducing valves for the water line and one will be a guardhouse building. These buildings are included in the footprint for the utilities upgrade.

2. **New Entrance Building**: Build a new entrance to the Park Area. The new structure will function as the park's main entrance where visitors will purchase admission tickets.

3. **Midway Realignment and Expansion**: Create new attractions in the midway to advance Fort Edmonton Park as a premier tourist attraction that will generate a permanent fair-like atmosphere.

4. **Hotel Selkirk Expansion**: Expand the existing Hotel Selkirk by re-creating the historic Windsor block to attract more overnight visitors to Fort Edmonton Park.

5. **New Artifact Warehouse Building**: The warehouse will display the collection of artifacts rather than have them in storage and inaccessible to visitors.

6. **New Commercial Block:** Located in front of the Blatchford Field Air Hangar, this project will further highlight businesses from the 1920's era.

Projects that are the subject of a Site Location Study to comply with Bylaw 7188 include:

1. **Streetcar Barn Expansion**: Expand the existing streetcar facilities located to the north side of the existing Streetcar Barn.

2. **Fort Edmonton Freight Shed Expansion**: Provide space to display Edmonton's railway history as well as offer a glimpse into life surrounding the construction of the railways of Canada and their impacts on the economic growth of the prairies.

Three minor operational maintenance projects are included in the EIA. Taken separately, these projects would only require an Initial Project Review to be approved to proceed. They are scheduled for completion in conjunction with the re-development initiatives to minimize impacts to Park Area visitors. The following projects are designed to improve public safety and maintenance of infrastructure:

- East loop of the streetcar track realignment,
- Steam train track realignment, and
- Old fort train station relocation.

As required to meet regulatory procedures under Bylaw 7188, Initial Project Reviews were completed for the projects listed above except for the Fort Edmonton freight shed expansion, for which a Project Request Form was submitted following a change in administrative processes. The Initial Project Review documents are provided in **Appendix B**.

To simplify City Council's review and approval of all projects, City of Edmonton's Parks and Biodiversity and Community Services departments requested that all project applications be combined in one document. As a result, some projects, such as the utilities upgrade, are detailed while others are only conceptual in nature. The footprint for some facilities is approximate with additional details to be provided as the structures reach the design phase. Funding to complete the structures is anticipated to be in place by the time construction of the re-development projects begins.

The cumulative area of the project footprints considered in this EIA represents about 22.7 ha, or 35.5% of the Park Area. **Appendix B** provides details related to the size of footprint, laydown areas and alternatives considered for each project.

1.7 ALTERNATIVE OPTIONS CONSIDERED

Three alternative options were identified in the Initial Project Reviews completed by Thurber (2015). These included:

1) No Re-development

This option involves doing no work to upgrade the Park Area infrastructure. This option was not selected because the existing utilities do not have capacity to support the additional planned infrastructure, so upgrade or replacement of current utilities is required to support the vision described in the Park Master Plan. Also, the existing utilities are reaching the end of their service life; failures necessitating emergency repairs are expected to become more frequent.

2) Defer Re-development to a Later Date

Though viable, this option was not selected as it would prevent capitalizing on cost savings associated with carrying out all the projects at the same time. Doing the projects individually would increase disruption to Park operations and potentially affect patrons' experiences. Some of the re-development projects address public safety issues, which are a growing concern. In addition, deferring construction would not assist the Park in maintaining a premier cultural and heritage experience and would not relieve the issues associated with increasing the number of visitors to the Park Area.

3) Proceed with the Re-development

This option involves moving forward with the planned re-development projects outlined in section 1.6. This option was considered to be optimal for future planning in contrast with options 1 and 2. Replacing the Park's existing utility lines and updating existing facilities will contribute to the critical path of proceeding with future enhancement projects, aligning with the Fort Edmonton Park 2010 Master Plan Update.

The FEP 2010 Master Plan Update (City of Edmonton 2010b) included extensive public consultation and feedback regarding the social significance and cultural value of the Park. The conclusion was that FEP provides a socially important experience for Edmontonians and tourists. Therefore, the re-development was determined to be preferable to either not redeveloping or redeveloping at a later date (Fort Edmonton Management Company 2010).

The utilities upgrade and the seven buildings contribute to the overall social benefits of the FEP and the larger Park Area. These were reiterated in the 2010 Master Plan Update, because they will increase opportunities for the public to view artifacts, enjoy period themed activities, and experience more cultural resources.

1.8 PUBLIC PARTICIPATION PLAN

Upon completion of the EIA, we recommend that residents in communities neighbouring the FEP Area and the public be invited to review the project details. Key findings from this EIA report could be used to support various communication activities or other engagement approaches. The key findings would enhance public understanding of the projects and the mitigation measures that will be undertaken during construction to

protect environmental values. The EIA also provides landscape restoration plans that will create suitable wildlife habitats, which will contribute to landscape connectivity with areas surrounding the Park Area.

The Fort Edmonton Management Company undertook public consultation as part of the Fort Edmonton Park 2010 Master Plan Update. The purpose of the consultation was to gather feedback on this proposed plan for Fort Edmonton Park and assess whether the plan supports the fulfillment of Fort Edmonton Park's mission (Johnston Research 2010).

The public consultation process for the park re-development included three focus group discussions:

- one with regular Fort Edmonton Park visitors and pass holders;
- one with members of the public who are casual users; and
- one with members of the public who have not visited the Park or are rare users.

Other methods used to gather feedback included: an open house, workshops, an online survey, and online general public forums. There were opportunities to comment on all re-development projects in each of these public involvement opportunities.

Additionally, the public had one week to comment on the proposed projects when the Fort Edmonton Park re-development information report was submitted to City Council and scheduled as an agenda item for the Community Services Committee in June, 2014.

Three buildings were not included in the public consultation process for the Fort Edmonton Park 2010 Master Plan Update: the New Commercial Block; the Streetcar Barn Expansion, and the Fort Edmonton Freight Shed Expansion. Two buildings are expansions of existing facilities and one is a new structure. All buildings support the achievement of the vision described in the Fort Edmonton Park 2010 Master Plan Update and are proposed to be located in previously disturbed areas. Since these are minor additions to the overall development plan for FEP attraction, we recommend that public notifications of the addition of these buildings be addressed as part of the ongoing communication strategy for the overall project.

2 Environmental Assessment Methods

2.1 DATABASE SEARCHES

An initial review of publicly available data and information was completed to identify potential environmental constraints within the project area. Sources of information included:

- Fish and Wildlife Management Information System (FWMIS[1]);
- Alberta Conservation Information Management System (ACIMS[2]);
- Historical Resources Act listings;
- Agricultural Region of Alberta Soil Inventory Database (AGRASID[3]);
- Water Act/Environmental Protection and Enhancement Act Authorization Viewer;
- Alberta Flood Hazard Map application; and
- Public aerial imagery collections.

2.2 LITERATURE REVIEW

Previous studies and reports, regulatory documents and other pertinent materials reviewed in preparation of this assessment included:

- Fort Edmonton Park 2010 Master Plan Update (City of Edmonton 2010b);
- Bylaw No. 7188, North Saskatchewan River Valley Area re-development Plan (City of Edmonton 2014);
- Corporate Tree Management Policy (City of Edmonton 2010a);
- Seven Initial Project Reviews (Thurber Engineering Ltd. 2015 a to g);
- Project Request; Fort Edmonton Freight Shed Expansion (Edmonton Model Edmonton Model Railroad Association);
- Fort Edmonton Park Utility Replacement Edmonton, Alberta Geotechnical Investigation (Thurber Engineering Ltd. 2013);
- Fort Edmonton Park Rare Plants Survey (Associated Engineering 2014, revised 2015b);
- Phase I Environmental Site Assessment, Fort Edmonton Park (Nichols Environmental Ltd. 2015);
- Historical Resources Impact Assessment, Fort Edmonton Park (Circle CRM Group Inc., 2015)
- Research Summary Report, Fort Edmonton Park Public Consultation: Proposed Plan (Jonhston Research 2010);
- Blatchford Kitchen EIA (Associated Engineering 2015a); and
- Fort Edmonton Park Utility Replacement Design, Detailed Design Package under development(Associated Engineering Alberta Ltd 2015b)

[1] Access date: June 1, 2015
[2] Access date: July 15, 2015
[3] Access date: June 24, 2015

2.3 SITE VISITS AND FIELD SURVEYS

An initial orientation and site reconnaissance visit was conducted in May to gain a high level understanding of the Park Area re-development projects and to record site characteristics. More comprehensive field studies were completed on June 9, 10, and 15, August 19 and September 11, 2015 to assess environmental sensitivities associated with planned development areas. Observations regarding vegetation, wildlife habitat, erosion, sediment control and drainage conditions within the Park Area were documented.

In addition, AE completed rare plant surveys within the park boundary in August, 2014 and early June, 2015. Prior to the field visits, randomized geo-referenced points across the various habitat types within the regional study area were identified. Ecosite data were gathered at each plot, followed by a circular survey around the geo-referenced point, within a radius of approximately 2.5 m. Data collection protocols to determine each plot's habitat type followed those outlined in the Ecological Land Survey Site Description Manual (Alberta Environmental Protection 1994). The plot location was recorded at plot center using a GPS unit and representative photographs of the site were taken. General site characteristics such as slope, surface expression, and slope position were recorded. The results of the two surveys have been included in this assessment.

The environmental impacts for the utilities upgrade project were assessed based on the footprint defined in the detailed design. For this project, restoration strategies will work in concert with landscaping plans to achieve the vision for Fort Edmonton Park established in the Master Plan Update 2010.

For other projects that are still in conceptual stages of design, the anticipated sizes for each structure and its location on the site were used to assess potential environmental impacts. Identified potential environmental impacts and recommended mitigation strategies are anticipated to influence the final design of structures.

3 Baseline Environment

Fort Edmonton Park has been a cultural and historical tourist attraction since its opening in 1969. The Park owes its featured historical ambiance in part to its surrounding dense river valley forests that keep the nearby bustling city out of sight for Park visitors. Additionally, the North Saskatchewan River, lying within 50 m of the Park's northern edge, is an important natural aquatic feature. While the surrounding natural features of the river valley contribute aesthetic and experiential value to Park visitors, they also contribute important ecosystem value to the larger connectivity of Edmonton's river valley parks system.

The landscape within the Park Area has changed over time. In general, the property has been altered as it has been developed over many years with parking lots, utilities, trails, buildings and various attractions. Much of the trees currently found on the site have regrown over the past 65 years. An aerial photograph, from 1952, shows that the site was a ploughed field at that time (**Appendix H**). Today, the landscape within the Park is designed to complement the historical messages of the original Fort Edmonton. Park vegetation ranges from manicured lawns and gardens to mature trees that line the Park Area's roads, rail alignments and structures.

With its forested areas around the periphery of the built spaces, the Park Area continues to contribute to the landscape connectivity for wildlife and natural biodiversity of the river valley. Naturalized areas within the Park include:

- treed areas throughout the Park,
- riparian areas along the man-made river on the Park's northern edge, and
- Egge's Pond, a small man-made water feature that supports established wildlife habitat.

3.1 TOPOGRAPHY AND SITE DRAINAGE

The topography within the Park Area is relatively flat with a general aspect facing north, towards the river. North of the park boundary, the gradient declines with a slope down towards the river (approximately 20%). A bench along the slope provides a level space for a recreation trail. The gradient again decreases from the recreation trail down towards the river (approximately 30%). Along the river, the slopes are well-vegetated; no evidence of scouring or erosion was noted during the field visit. On the south side of the park, slopes increase (approximately 20%) and continue uphill further south beyond paved recreation trails (approximately 35%).

Drainage within the Park is generally poor and some areas have constricted overland flows. Stormwater catch basins are located throughout the park and drain through buried pipes to two outfalls on the North Saskatchewan River. Soil drainage is affected by heavily compacted soils in some areas, which augments overland/surface flows and low water infiltration of soils in the Park Area.

The Park Area immediately adjacent to the North Saskatchewan River at the bottom of the banks is located within the 1-in-100 year floodway as designated by provincial flood hazard mapping (Government of Alberta 2015b). The majority of the Park Area is generally about 11 m higher than the River. This means that only a

small portion of the Park Area is potentially affected by the flood fringe areas as shown in **Figure 3-1**. The floodway is defined as the area “where the flows are the deepest, fastest and most destructive”; while the flood fringe area is defined as “the hazard area outside the floodway. Water in the flood fringe is shallower and flows more slowly than in the floodway” (Government of Alberta 2015b). The Park Area infrastructure is located outside the potential flood fringe area.

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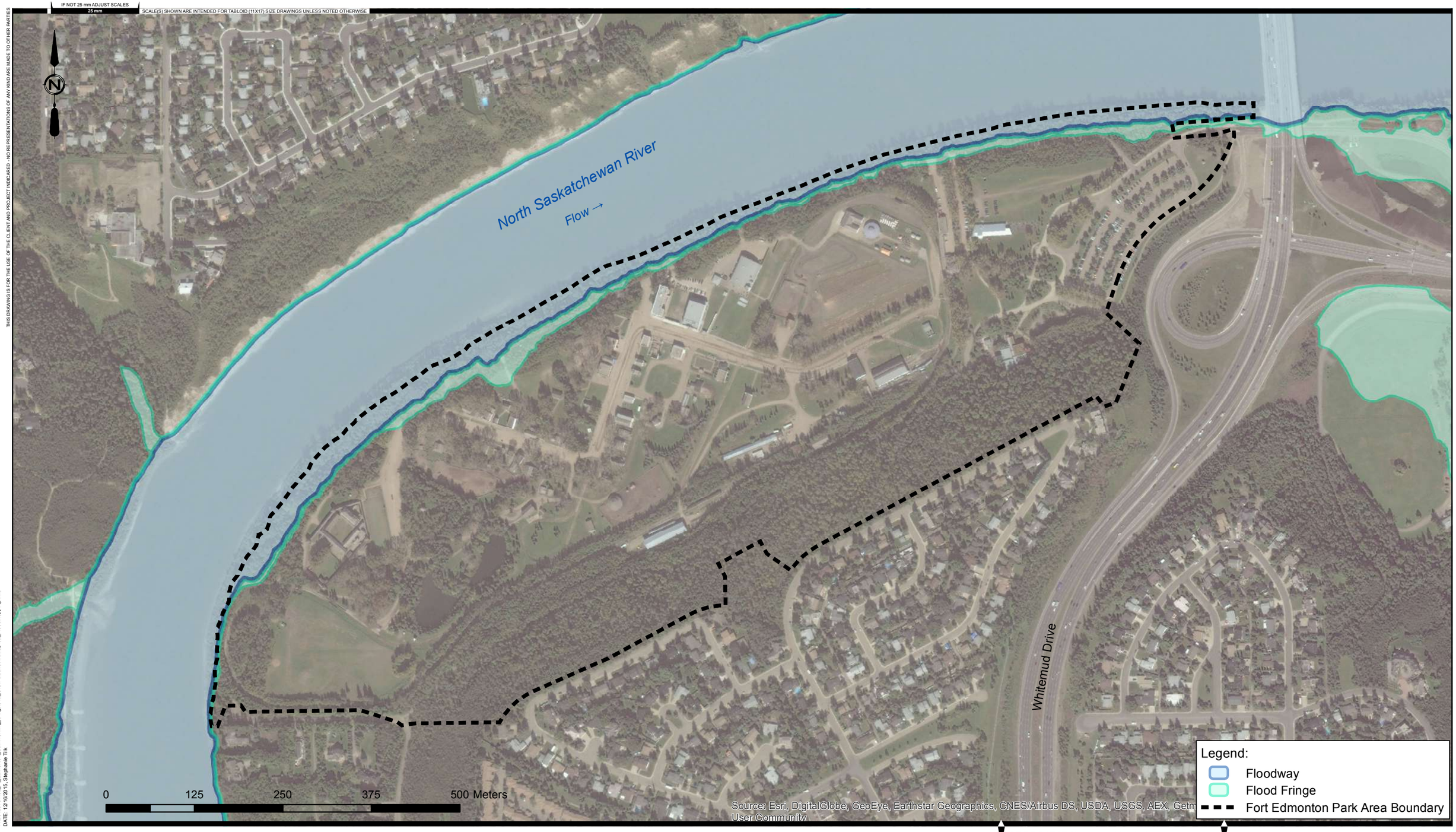

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FIGURE No. 3-1

FORT EDMONTON PARK AREA
ENVIRONMENTAL IMPACT ASSESSMENT

FORT EDMONTON PARK FLOOD MAPPING

3.2 NATURAL SUB-REGION AND VEGETATION

The City of Edmonton is located within the Central Parkland natural sub-region near a seam between the Aspen Parkland and the Boreal Transition eco zones (Government of Alberta 2006a). The sub-region features a gradual transition from northern rough fescue grassland, with intermittent trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*) stands in the south of the natural subregion), towards the dense aspen forests with rich understories that are characteristic of the Edmonton area. White spruce (*Picea glauca*) forests are often dominant on north-facing slopes. Many of the characteristics of the sub-region have been altered due to agriculture and urban development. However, in its native state, the landscape is characterized by trembling aspen, oak groves, mixed tall shrubs, and intermittent fescue grasslands (Government of Canada 2014).

A search of the Alberta Conservation Information Management System (ACIMS) database revealed no protected areas, Crown reservations or occurrence of sensitive element triggers in the project's Alberta Township System (ATS) section (Government of Alberta 2014a).

Baseline vegetation in the Park Area was documented during field studies in August 2014 (rare plant study) as well as during the June 9, 10, and 15, August 19 and September 11, 2015 field studies. A complete inventory of documented trees, shrubs, forbs, and weed species within the proposed project footprint is provided in **Appendix C**.

Five habitat types were delineated within the Park Area. General descriptions of each of the habitat types are as follows:

- **Field/Pasture** – agricultural fields/pasture utilized for grazing of livestock and/or open field areas adjacent to the forest habitat type; typical plant species include agronomic grass species such as timothy (*Phleum pratense*) and smooth brome (*Bromus inermis*). This community type occurs in patches mostly adjacent to the anthropogenic areas.
- **Forest** – a natural deciduous treed area consisting of trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*) in the overstory, with a white spruce (*Picea glauca*) understory, occurring along the southern, northern, and west sides of the Park Area.
- **Wetland** – five areas exist where the water table is at or near the surface for most of the year and aquatic or hydrophytic vegetation is present, deeming the site a wetland (National Wetlands Working Group, 1988). The wetlands appear to be concentrated in the west end, with one wetland at the east end of the FEP attraction.
- **Anthropogenic** – the main area of the Park Area consists of various streets and buildings in FEP attraction with a parking lot on the east end.

Canola was found within the fields of the Park Area during surveys indicating that clubroot may be present. Clubroot (caused by the pathogen *Plasmodiophora brassicae*) is a parasitic disease that affects the roots of crucifer crops, which include canola and mustard (Government of Alberta 2013). The Edmonton region has

a high clubroot infestation currently involving 10 – 49 fields (Canola Council of Canada 2015a). Testing for clubroot was not undertaken as part of this assessment.

3.2.1 Rare Plant Survey

Two rare plant species were found in separate locations near Egge's Pond and the man-made creek (**Figure 3-4**).

Turned sedge (*Carex retrorsa*), shown in **Figure 3-2**, was found at one location along the shallow, slower flowing portion of a man-made stream, on the west end of the Park Area (**Figure 3-2**). Turned sedge is similar to the more common, beaked sedge (*Carex utriculata*) and awned sedge (*Carex atherodes*); the main differences being the closely packed female spikes and crowded perigynia that bend downwards (Johnson et al. 1995, Kershaw et al. 2001). It is usually found in marshes and slower flowing streams within the parkland and boreal forest regions of Alberta (Johnson et al. 1995, Kershaw et al. 2001).

Slender naiad (*Najas flexilis*), shown in **Figure 3-3**, was found at two different wetlands within the study area. Slender naiad is a pale green submerged aquatic annual, 30-60 cm long, with 1 mm thick stems, and alternate branches giving the plant a tufted appearance. The flowers are tiny and appear in the axils of the lower pair of leaves from April to August. Slender naiad grows in quiet ponds and streams in the Central Parkland and southern Boreal Forest regions of Alberta (Kershaw et al. 2001).

The Rare Plant Survey report (Associated Engineering 2015c) is provided in **Appendix D**.

Figure 3-2
Photograph of Turned Sedge (Carex retrorsa)

Figure 3-3
Photograph of Slender Naiad (Najas flexilis)

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Associated Engineering

THE CITY OF Edmonton

AE PROJECT No.	20123701
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FIGURE No. 3-4

FORT EDMONTON PARK AREA
ENVIRONMENTAL IMPACT ASSESSMENT

RARE PLANTS

3.3 WILDLIFE AND WILDLIFE HABITAT

3.3.1 Wildlife within the Regional Area

The presence of wildlife is a valued component of urban parks and natural areas. The North Saskatchewan River Valley within the Regional Area is home to several wildlife species that are adapted to living within an urban green space. Wildlife species face particular stressors by living in an urban setting. These stressors include, but are not limited to, habitat loss, competition with non-native species, encounters with domestic pets, a heightened exposure to pollutants and an increased chance of collision with vehicles, power lines or windows (Westworth 2001).

A chain-link fence around the perimeter of the Park Area reduces access to the habitat for some species, but it is not a barrier to movement. In addition to the diversity of waterfowl, songbirds, jays, crows and small mammals, there are populations of deer (*Odocoileus* spp.), coyote (*Canis latrans*), beaver (*Castor canadensis*), fox (*Vulpes vulpes*), porcupine (*Erethizon dorsatum*), skunk (*Mephitis mephitis*) and occasionally, larger mammals (black bears [*Ursus americanus*] and cougars [*Puma concolor*]) that pass through the City using the river valley as a movement corridor (Westworth 2001). This wildlife diversity reflects the City's efforts to preserve the North Saskatchewan River Valley as a natural ecosystem interwoven with human communities.

Desktop database searches of the Fish and Wildlife Management Information System (FWMIS) revealed that most of the wildlife species documented in the Regional Area have a provincial or federal conservation status. **Appendix C** provides an inventory of the wildlife species recorded in the Regional Area. This search also revealed that the Park Area lies within the following sensitive wildlife zones:

- Sharp-tailed Grouse (*Tympanuchus phasianellus*) Survey Area,
- Key Wildlife and Biodiversity Zone, and
- Sensitive Raptor Range (Government of Alberta 2014b).

There are no guidelines or timeline restrictions provided by the Alberta Government in association with the Sharp-tailed Grouse Survey Area. If construction is occurring within the mating season (**between March and late June**), it is recommended that a lek survey be conducted prior to the start of construction. Section 4.3 provides further details on mitigation measures. The highly-developed condition of the Regional Area may reduce the likelihood of this sensitive species depending on the habitat. However, the Park Area includes brush, aspen groves and edges of forest clearings near grain fields such as those located adjacent to the horse pasture, which are considered habitat for sharp-tailed grouse (Government of Alberta 2009).

As noted above, the River Valley is noted as a Key Wildlife and Biodiversity Zone (Government of Alberta 2015d). These are areas that are important for ungulate overwintering habitat as well as areas that have a high species biodiversity (Government of Alberta 2015d). Due to the seasonal importance of these zones they have restricted activity periods (for construction) based on their locations within Alberta. For the Park Area there is a restricted activity period between **January 15th and April 30th** (Government of Alberta 2015d). Alberta Environment and Parks should be consulted prior to construction activities taking place during this period.

The noted sensitive raptor range specifically relates to bald eagle (*Haliaeetus leucocephalus*). Bald eagles have a provincial status of "sensitive" (Government of Alberta 2010), but a federal status of "not at risk" (Government of Alberta 2015a; COSEWIC 2015). Section 4.3 describes mitigation measures and best management practices that should be applied to all projects to reduce potential impacts.

3.3.2 Wildlife within the Park Area

Incidental observations of wildlife were recorded during the field surveys: Canada goose (*Branta canadensis*) and mallards (*Anas platyrhynchos*) were observed near Egge's Pond. Songbirds, woodpeckers, and coyotes were observed during the September field work.

3.4 FISH, WATER QUALITY AND AQUATIC RESOURCES

3.4.1 Aquatic Resources within the Regional Area

A 50-m wide edge of forest along the south bank of the North Saskatchewan River forms the North boundary of the Park Area (see **Figure 1-2**). The project footprint will not include the riparian zone of the river and no instream work is expected as part of the re-development projects. Information is provided to document baseline conditions and provide context for discussion of mitigation strategies such as sediment and erosion control during re-development construction.

The majority of fish species previously recorded in the North Saskatchewan River are provincially listed as either "secure" or "no listing" (Government of Alberta 2015a). None of these species are listed federally (Government of Canada 2015). A list resulting from a search of the FWMIS database for fish that have been recorded within a 5 km radius in the Park Area is provided in **Appendix C** including the conservation status.

Lake sturgeon (*Acipenser fulvescens*) are among the rare species that have been recorded in the North Saskatchewan River. They have a provincial conservation status of "Threatened" (Government of Alberta 2015a). Though the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2015) has listed lake sturgeon as "Endangered" (Government of Canada, 2015), this species is not yet included in Schedule 1 of the federal *Species at Risk Act* (Government of Canada, 2015). Lake sturgeon spawn and overwinter in the North Saskatchewan River. There are only 11 areas of critical habitat for lake sturgeon in the Alberta portion of the North Saskatchewan River; three of these areas are located within the City of Edmonton portion of the river (Government of Alberta 2006b, 2006c, 2006d).

3.4.2 Aquatic Resources within the Park Area

The Park Area contains two water features: the man-made Egge's Pond wetland complex in the southwest corner and the man-made creek that flows from the pond to North Saskatchewan River. Historical air photos (one from 1952 before the opening of the park in 1969; and one from 1975 after the opening of the Park) confirm that no natural wet areas previously existed at the Egge's Pond location (see **Appendix G** for historical images). The pond water level is managed by periodically pumping water from the North

Saskatchewan River (Friedrich, K. personal communication. 2015). Over time, the pond water both evaporates and drains back into the river, particularly after heavy rainfall. Though anthropogenic, the pond and wetland complex currently provide habitat for a variety of plants (including rare ones) and aquatic birds.

The park upgrade projects, with the exception of the proposed stormwater grit separators, are outside of the river's floodway (**Figure 3-1**).

3.5 GEOLOGY AND SOILS

The soils throughout the Park Area have been impacted over the years by historical agricultural practices and site development activities, including the construction of the roads and buildings on site. Packed gravel was placed over the subsoil to create the existing parking lot (depth of the packed gravel is not known).

A search of the Agricultural Region of Alberta Soil Inventory Database (AGRASID) identified soils in the area as undetermined miscellaneous mineral soils (Government of Alberta 2014c). This confirms a high level of previous disturbance typical of a developed urban park. Soils are heavily compacted in some areas, which contribute to overland/surface flows and low water infiltration of soils in the Park Area (Thurber 2013).

Thurber Engineering Ltd. undertook a desktop analysis and field investigation of FEP in 2013. Seventeen test holes were drilled between 8.4 and 10.4 m below existing ground level.

Thurber (2013) determined that the FEP Area is on an alluvial terrace and the toe of the slide on the south side is inactive or shows minor activity. During field verification, Thurber (2013) observed small size active creep movements along the pedestrian trail, and gullies in the slope. The top of the slope along the valley crest appeared inactive.

Based on geotechnical investigations, the generalized soil stratigraphy encountered in test hole locations consisted of topsoil or asphalt, overlying fills, clays, silt and sand mixtures, gravel, clay shale and sandstone bedrock in descending order (Thurber 2013). Topsoil was encountered at depths extending to maximum of 0.2 m. The depth to bedrock ranged from 3.8 m to 10.0 m below the ground surface. The depth to groundwater at the time of the investigation ranged from about 5 to 7 m below ground surface. Groundwater levels could be encountered at a higher elevation depending on the season of excavation and the stage of the adjacent North Saskatchewan River (Thurber 2013). Near surface soils consisted of highly plastic clay fill with moisture contents between 25 percent and 30 percent at the time of testing (Thurber 2013).

3.6 ARCHAEOLOGICAL, CULTURAL AND HISTORICAL RESOURCES

Known historic resource sites are recorded by the Historic Resources Management Branch of Alberta Culture and Tourism. Listings are assigned a Historic Resource Value (HRV) ranging from 1 to 5 (high to low). Sites with an HRV value of 1 have high importance to historical resources conservation. They have been designated under the Act as Provincial Historic Resources, are identified as World Heritage Sites or are lands owned by Alberta Culture and Tourism for historic resource protection and promotion purposes.

The Park Area was assigned an HRV of 5p and 5a, which indicates high likelihood of encountering both paleontological and archaeological resources (Government of Alberta 2015c, OPaC HR Appl #: 007487234). Alberta Culture and Tourism determined that a Historical Resources Impact Assessment (HRIA) for archaeology is required for the Park Area Re-development Projects. The HRIA was required to "*target high potential landforms where significant project impacts are anticipated in areas of minimal previous disturbance*". The HRIA focused on the areas that will be excavated for utility replacement and building expansions, particularly those areas that were not disturbed as part of original Park Area development, road construction, or building construction. The restricted areas for the HRIA were discussed with Alberta Culture and Tourism. The proposed exploration plans were reviewed by Alberta Culture and Tourism staff prior to work commencing, as part of the archaeology permit acquired for HRIA field work. Additionally, clearance under Bylaw 7188 was sought for the ground disturbance (i.e. soil pits) required for the HRIA field work. This Assessment avoided the rare plants areas that were identified in the EIA work; trees were not removed during the work.

The HRIA field assessment did not identify any historical sites or historical resources. However, given the size of the project footprint, and the depth of the potential deposits, the HRIA recommended that monitoring for archaeological resources be completed during excavation of deeper trenches (Circle CRM Group Inc. 2015). Clearance was received from Alberta Culture and Tourism on February 17, 2016 (**Appendix F**). A condition of the clearance is that construction monitoring must occur during excavation for the utilities upgrade.

3.7 ANTHROPOGENIC FEATURES

There are a number of anthropogenic features, such as historical buildings, roads, parking lots and supporting infrastructure within the Park Area.

The existing Kinder Morgan Trans Mountain Pipeline route crosses the west corner of the Park Area in the centre of the east loop of the train track (**Figure 3-5**). The area is an open pasture with a treed area towards the north side on each side of the service road along the edge of the river. There are restrictions along the pipeline right-of-way that limit the height of vegetation.

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FIGURE No. 3-5

FORT EDMONTON PARK AREA
ENVIRONMENTAL IMPACT ASSESSMENT

KINDER MORGAN TRANS MOUNTAIN
PIPELINE LOCATION

3.8 CONTAMINATED SITES

Nichols Environmental Ltd. was contracted to complete a Phase I Environmental Site Assessment (ESA) and provide a summary of records from previous contaminated sites studies conducted in Fort Edmonton Park (**Appendix E**). The objectives of the records review and interviews were to gain a clear understanding of the Park history and to judge the contamination risk that former and current activities may have had on the groundwater or surficial material underlying the Park (Nichols Environmental Ltd., 2015). Activities included an examination of relevant aerial photographs, maps, reports, and other data, and a site and area-based government/industry database search of environmental records. The objective of the site inspection was to review the conditions at the park, and to refine the risk of contamination determined from the historical review. The report presents professional judgment concerning the risk of soil and groundwater contamination in the Park Area with specific reference to the existing development plan, recommending further assessment or remediation (**Appendix E**).

Several locations in the Park Area were identified as having petroleum hydrocarbon contamination associated with the operation of and storage of fuel for trains (**Figures 3-6** and **3-7**). The report indicates that remediation work was conducted in 2013, but petroleum hydrocarbon contamination remains at about 0.91 m below grade at the main Train Station and the Fort Station (Nichols Environmental Ltd., 2015).

Contaminant management strategies (Section 4.3) will be required during work on the train track at locations where petroleum hydrocarbons were noted in previous reports as reviewed by Nichols Environmental Ltd (2015).

Figure 3-6
Photograph of Potential Site Contamination of the Streetcar Track

Figure 3-7
Photograph of Potential Site Contamination Along Streetcar Track

4 Environmental Impact Analysis and Mitigation Strategies

4.1 IMPACT ANALYSIS METHODS

The observations made during the desktop and the field verification described in Section 2 guided the assessment of environmental impacts related to the re-development projects. The baseline site conditions (Section 3) were considered, in combination with planned construction activities and the placement and operation of permanent structures. Anticipated impacts to visitors during construction activities in the Park Area will be addressed through mechanisms outside the EIA.

Environmental impacts were assessed by analyzing existing site conditions (baseline) in relation to the anticipated conditions during construction (short term) and post-construction (residual, long term) impacts.

The key environmental features for the Park Area include 1) the presence of rare plants, 2) important wildlife habitat, and 3) vegetation that supports key species and biodiversity. Therefore, for the purpose of this report, the potential impacts were evaluated for each project using a high, moderate and low rating as described in **Table 4-1**.

Table 4-1
Significance Rating of Potential Impacts

Significance	Rating[1]	Legend Symbol
High	The differences between baseline and post-construction/operation are expected to be greatest in the context of the Park Area, such as loss of functional wildlife habitat or significant vegetation loss.	
Moderate	The differences between baseline and post-construction/operation are expected to be noticeable but will be mitigated through landscape restoration and re-planting efforts.	
Low	The differences between baseline and post-construction/operation are expected to be of short duration or may easily be mitigated.	

Generally, a project that removes trees from areas that are functionally connected to habitats within the Regional Area is considered to have the highest potential for impact since it results in overall loss of habitat, may affect landscape connectivity for wildlife, and return to current baseline conditions will take several years. The significance would be deemed as “high” for that portion of the work. The same project in areas that already have a high degree of anthropogenic disturbances would have a significance deemed as “low”. Each project activity may have one or more potential environmental impacts. In this EIA, none of the projects have been assessed as having a “high” significance rating.

The general rating categories defined by Thurber (2015) in the Initial Project Reviews completed for a sub-set of the re-development projects were used as a guide to define impact categories.

Using baseline field observations, vegetated areas were grouped into sensitivity classes of A, B, C, or D (**Table 4-2** and **Figure 4-1**). The sensitivity is based on qualitative assessments of the potential for the areas to provide functioning wildlife habitat that contribute to maintaining landscape connectivity within the Regional Area.

Table 4-2
Description of Class Sensitivity Ratings for Vegetation and Wildlife Habitat

Class	Description
Class A Sensitivity	These areas present **high sensitivity** when considering vegetation removal and/or excavation. They are relatively large, unbroken, and undisturbed patches of mature forest with well-developed canopy, floor, and mid-story habitat structures. Class A sensitivity areas are found along much of the park's perimeter and therefore also provide edge effect. These areas contain excellent habitat for migratory species, raptors and mammals and likely contribute to wildlife movement corridors along the river valley.
Class B Sensitivity	These areas present **moderate sensitivity** as wildlife habitat when considering vegetation removal and/or excavation. They contain nesting habitat for migratory species and large edge effects as they are typically isolated stands of shrubs and trees. They are large enough that some raptor species may establish nests in these patches, but not so large as to be considered continuous or unbroken forest. They are not as likely to contribute to wildlife movement as they are not part of a continuous corridor.
Class C Sensitivity	These areas present **low sensitivity** as wildlife habitat when considering vegetation removal and/or excavation. Generally, these areas are comprised of a single large tree or a cluster of small trees and shrubs. Migratory bird nests in these areas are relatively easy to locate as the Class C areas are not large and habitat features are not as hidden as those of Class A and B areas.
Class D Sensitivity	These areas present **limited sensitivity** when considering impacts to wildlife habitat of vegetation removal and/or excavation. Generally, they are high traffic areas containing mostly grasses, forbs, and weeds. Few species are likely to use these areas due to the presence of park guests in visitor areas and livestock in the holding pens.

Where impacts to baseline conditions are expected, the following considerations apply:

- **Mitigation Strategies**: in some cases, impacts may be minimized or eliminated via mitigation strategies and/or best management practices (BMPs). Mitigation strategies are discussed under each specific re-development project's sub-heading below. More general mitigation strategies that apply to all proposed projects including suggestions for BMPs are provided in Section 4-3.
- **Restoration and re-planting efforts**: the final restoration/naturalization plans in the detailed designs package under development by AE will reduce the overall impact of a project.

Consideration was given to minimizing impacts through mitigation strategies and BMPs. All impacts will require mitigation strategies and implementation of BMPs to reduce their overall environmental impact to the Park and its surroundings.

Mitigation strategies particular to a specific project are discussed within the project. Mitigation strategies of a more general nature that apply to all proposed projects are provided Section 4-3.

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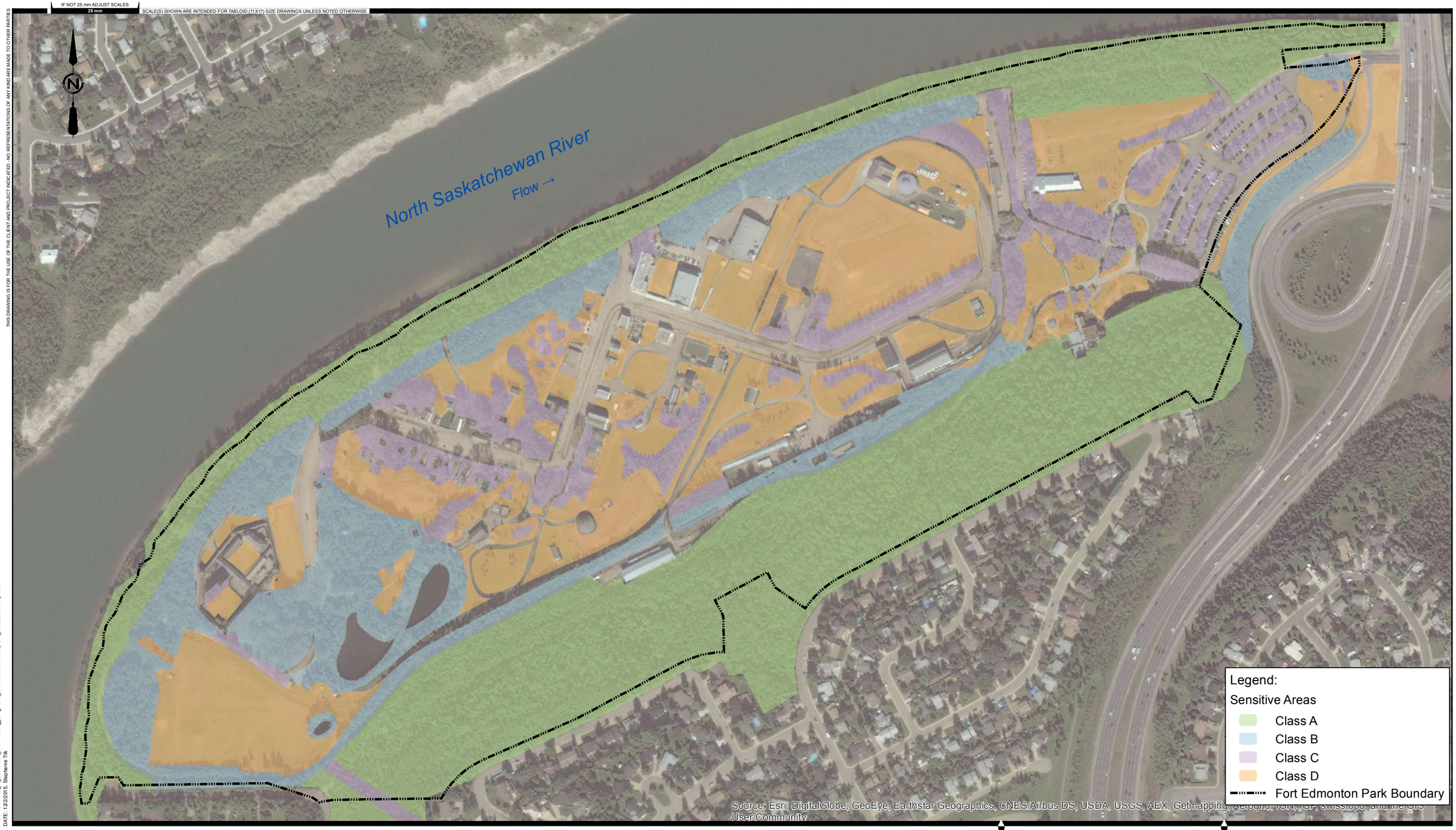

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FIGURE No. 4-1

FORT EDMONTON PARK
ENVIRONMENTAL IMPACT ASSESSMENT

CLASS SENSITIVITIES

4.2 PROJECT-SPECIFIC DESCRIPTION AND IMPACT ANALYSIS

4.2.1 Park Area Utilities Upgrade

4.2.1.1 Project Description and Location

The current water, storm, sanitary, gas and electrical utilities within the Park Area are considered to be nearing the end of their service life and are scheduled to be replaced.

This will include:

- Storm drainage collection;
- Water distribution;
- Sanitary sewerage collection;
- Sanitary lift station;
- Gas distribution;
- Power distribution; and,
- Access roads to service the historical buildings.

The construction footprint for upgrade of the utilities is anticipated to cover 19.6 ha or about 30.7% of the Park Area. This project represents 86.3% of the overall disturbances to the Park Area during construction.

Utilities will be installed at varying depths, ranging from 3 m to 11 m. Utility upgrades that require deep trenching (e.g. stormwater and wastewater systems) will be completed first, followed by upgrades with shallower trenching, like the gas, power and communication systems. Any excavations deeper than 5 m may encounter groundwater (Thurber 2013). Where excavations are expected to extend below the water table, trench dewatering may be required, including the use of well points. The width of the surface workspace will vary from 10 m in areas where the trenches are shallow, to 20 m for the deeper trenches to accommodate surface workspace and appropriate bank stabilization.

Deep and shallow utility installations will be coordinated, where possible, to minimize disruption in the Park Area. The mode of construction for the installations will be determined by the construction contractor(s). It is expected that the majority of excavations/trenching will be open cut with some potential for directional drilling due to known local logistical constraints with drilling methods. In a small sub-set of locations along the alignment, utilities will be installed by trenchless methods to minimize disturbance of other utilities and surface features. Currently, the only trenchless method planned in the design is auger boring.

The existing utilities are located beneath the middle of the roads in front of buildings. Repairs and maintenance activities create disturbances that negatively affect the visitor experience. As part of the “back-of-house” principles applied to the utility designs, the utilities will all be installed in the back of structures accompanied by construction of the necessary access/maintenance roads. The roadway alignments are based on the approved Park Area Development Plan. The Development Plan additionally includes provisions for a new Emergency access road that will tie into the existing Park Area Emergency Access road east of The Fort, and will also connect with Whitemud Road west of the Park Area. This new

emergency access road will be a secondary access point to the main entrance roads, where, in the event of an emergency, it will support both an emergency route and visitor evacuation corridor.

Topography and Site Drainage

The topography within the Park Area is relatively flat with a general aspect facing north, towards the river. Re-designed site drainage and stormwater catch basins and drains located throughout the Park convey water to buried pipes and eventually to outfalls located on the banks of the North Saskatchewan River. New swales and ditches will be sized with sufficient grade to accommodate the major 1-in-100 year storm event and may contribute to improved site drainage.

Vegetation and Rare Plants

The utilities upgrade represents the largest disturbance to functioning wildlife habitat. Residual impacts following implementation of mitigation and reclamation measures will include the loss of trees that are growing too close to historic structures as well as the loss of about 1 ha of Class A habitat. Changes will also be due to implementation of new landscape management tools including FireSmart, a program led by the provincial government that uses preventative measures to reduce wildfire threat on the landscape and other safety-oriented guidelines. Landscaping strategies will be used to restore conditions, where ever possible, that provide functional wildlife habitat.

Maintaining the character and historic presence of Park Area is a priority for the landscape rehabilitation. **Figure 4-4** shows the planned locations and associated habitat sensitivity classes for vegetation removal within the Park Area. Areas of Class A sensitivity habitat that will be removed are also shown in **Figure 4-5**, highlighting the relatively small proportion of Class A habitat that will be removed. Due to the large size of some clearing areas and the level of sensitivity associated with Class A areas, we recommend that a qualified environmental professional be on-site during vegetation removal to monitor activities and help to minimize impacts to wildlife.

Four large laydown/stockpile areas are proposed across the Park Area mostly in Class C Sensitivity habitat. One laydown/stockpile area contains some Class B Sensitivity habitat. Trees will be retained in the area. In construction and laydown areas where trees will be retained, measures to protect trees must be undertaken. Mitigation strategies described in *Tree Protection; Hoarding Requirements* (City of Edmonton 2008) must be followed.

The utilities upgrade project is the only project that could potentially impact rare plants as documented during field surveys. Specifically, deep trench utilities will be installed under the man-made creek, where the turned sedge habitat area is located (see the rare plants **Figure 3-4** for the specific footprint).

Re-vegetation plans are provided in the Detailed Design Report (AE, 2015b). Plant selection in the final landscape, particularly on berms along the edges of the Park Area, can be used to provide a natural transition from the manicured Park to the areas of more native vegetation along the river's edge. This would also create functional wildlife habitat to provide food, cover and contribute to the wildlife migration corridor along the river valley.

Wildlife and Wildlife Habitat

Despite its current level of development, the Park Area contains a high proportion of natural areas that provide wildlife habitat (shown in **Figure 4-1**) for a variety of species, including migratory and non-migratory birds, small and large mammals, amphibians and reptiles. Construction and management of this project area should assume the presence of the species listed in **Appendix C**.

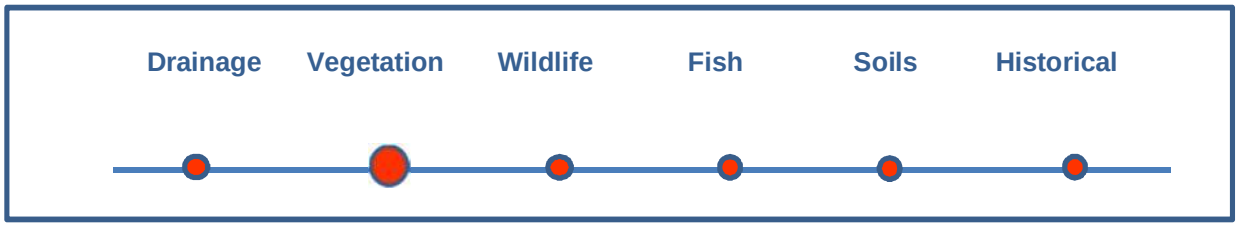
The most significant impact to wildlife resulting from the utilities upgrade project will be to bird species within the Park Area. Several significant wildlife habitat trees are proposed to be removed. Where possible, these trees should be preserved, however where they must be removed, they must be cleared outside of nesting periods.

Fish Habitat and Water Quality

Fish habitat is not expected to be affected by the re-development projects. Erosion and sediment control measures previously described will be implemented around the construction area to prevent stormwater from carrying sediment-laden water from the site to the river.

In some areas, streetcar or steam train tracks will be removed for utilities upgrade. Contamination management strategies will be required during work on the track at locations where petroleum hydrocarbons were noted in the existing Phase I and II reports. Management strategies will also be required to ensure that creosote-treated rail ties are appropriately stored during construction to avoid leaching to the surrounding areas.

4.2.1.2 Project-Specific Impact Assessment and Mitigation Strategies



The utilities upgrade is considered to have short-term "**moderate"** environmental impacts because construction will remove a significant amount of vegetation and soils throughout the Park within a large footprint area. The work will result in removal of 1 ha of Class A sensitivity habitat (**Figure 4-4**). This habitat is a feature known to be significant for migratory birds. Longer term residual impacts should be "**low"** overall, following site restoration and landscaping activities. It should be noted that though re-vegetation will be relatively large scale, limitations pertaining to line-of-site visibility along train and streetcar tracks, visitor safety, and fire protection may restrict the number and size of trees that will be re-planted.

Utilities replacement will require extensive soil excavation, stockpiling or transporting, trenching, vegetation removal, and site restoration. Generally, the utilities are located in difficult to access areas, such as beneath train and streetcar tracks or boardwalks, and near historical buildings and congested areas

(**Figure 4-2** and **Figure 4-3**). The new designs are intended to streamline maintenance access for the future, by way of the “back-of-house” principles applied.

Minimizing the amount of Class A sensitivity habitat affected by the project will contribute to reducing the overall environmental impact of this project. Additionally, minimizing the amount of Class B habitat, especially where avoidable (i.e. laydown and stockpile areas in Class B habitat to leave trees in place, and work around the trees), will further reduce the overall impact.

Key mitigation strategies will include clearing trees during suitable timing periods for migratory birds, and other sensitive species, as well as ensure disturbed areas are suitably reforested/replanted with native vegetation.

Table 4-3 provides a summary of potential impacts and mitigation strategies from the utilities upgrade projects.

Table 4-3
Summary of Environmental Impacts and Mitigation Strategies – Utilities Upgrade

Environmental Component	**Impacts**	**Mitigation Strategies**
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. See Section 4.3 for details.
Vegetation	Removal of the mature trees will result in loss of shade.	Evaluate options to replace shade trees in the landscaping plans under development as part of the Detailed Design Package being developed by Associated Engineering Alberta Ltd.
	Removal of Class A sensitivity areas.	Class A sensitivity areas should be scanned for large nests, stick nests, platforms nests, and tree cavities during winter months when trees lack leaves and nests are more visible. Consider vegetation selection in the landscape plan, particularly on berms along the edges of the Park Area, to provide functional wildlife habitat that offers a natural transition from the manicured areas to the more native vegetation along the river's edge. Functional wildlife habitat would provide food, cover and contribute to the wildlife migration corridor along the river valley.
	Potential damage to trees in construction and laydown areas where trees will be retained, measures to protect trees must be undertaken.	Mitigation strategies described in Tree Protection; Hoarding Requirements (City of Edmonton 2008) must be followed. The ECO Plan developed for construction activities should outline the protection measures that will be put in place for trees located within 5 m of construction areas. The applicable sections of the ECO Plan should be submitted to the City of Edmonton Forestry Office for review. A site meeting should be scheduled with the Forestry Office at a minimum of four weeks before start of

Environmental Component	Impacts	Mitigation Strategies
		construction to review and discuss the sections of the ECO Plan. Construction activities are planned in the area of the man-made creek. This work will alter the stream and water regime for this site. We recommend transplanting the turned sedge found in the man-made creek prior to construction or ground disturbance to prevent a net loss of this specie.
	Utilities upgrade in the area near the man-made creek may impact the habitat in which turned sedge (rare plant) was found.	
Wildlife and Wildlife Habitat	Selective tree removal in the Park Area will result in the loss of some wildlife habitat, particularly in the Class A sensitivity areas adjacent to the River Valley along the northeast end of the Park Area. Wildlife depending on vegetation in or near the path of the utilities replacement could be disturbed during construction, particularly during nesting season.	Construction and management of this project area should assume the potential presence of migratory and non-migratory birds, small and large mammals, amphibians and reptiles and other species listed in **Appendix C**. The River Valley is noted as a Key Wildlife and Biodiversity Zone. Alberta Environment and Parks should be consulted prior to construction activities taking place during the restricted activity period between January 15th and April 30th. Construction activities should occur outside the nesting period for owls and migratory birds from February 15 to August 31 following the vegetation clearing restrictions described in **Figure 4-18**. Proposed landscape restoration planting plans provided in **Appendix G**, are included as part of the Design Submission (AE Dec 2015b) submitted to the City of Edmonton. They show the proposed locations where restored natural vegetation is suggested as well as the species, types, and planting patterns. In summary, naturalized areas on berms and in selected areas will create suitable wildlife habitats

Environmental Component	**Impacts**	**Mitigation Strategies**
		that contribute to landscape connectivity with existing areas surrounding the Park Area.
Fish and Fish Habitat	The nearest point of activity for the utility upgrades will occur at 50 m away from the river. There are no direct impacts expected to fish and fish habitat.	None required. Temporary ESC measures discussed below will help prevent indirect impacts to fish by preventing sediment-laden water from migrating away from the construction site to nearby surface drainage.
Soils	There is a high potential for soil erosion and sediment management required due to the high degree of excavation activity that will take place within the Park Area. Contaminated soils could be disturbed since construction activities for the utilities upgrade will involve moving and re-aligning the railway and streetcar tracks.	Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. See Section 4.3 for additional details. For excavations in the vicinity of the train and streetcar tracks, it will be assumed that the soil is contaminated based on the results from the Phase I ESA study completed by Nichols Environmental Ltd. (2015). Areas of potentially contaminated soil were identified during the detailed design stages of the utilities upgrade project. The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report. The Contamination strategy should also address containment of any groundwater found during excavation within the contaminated areas.
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

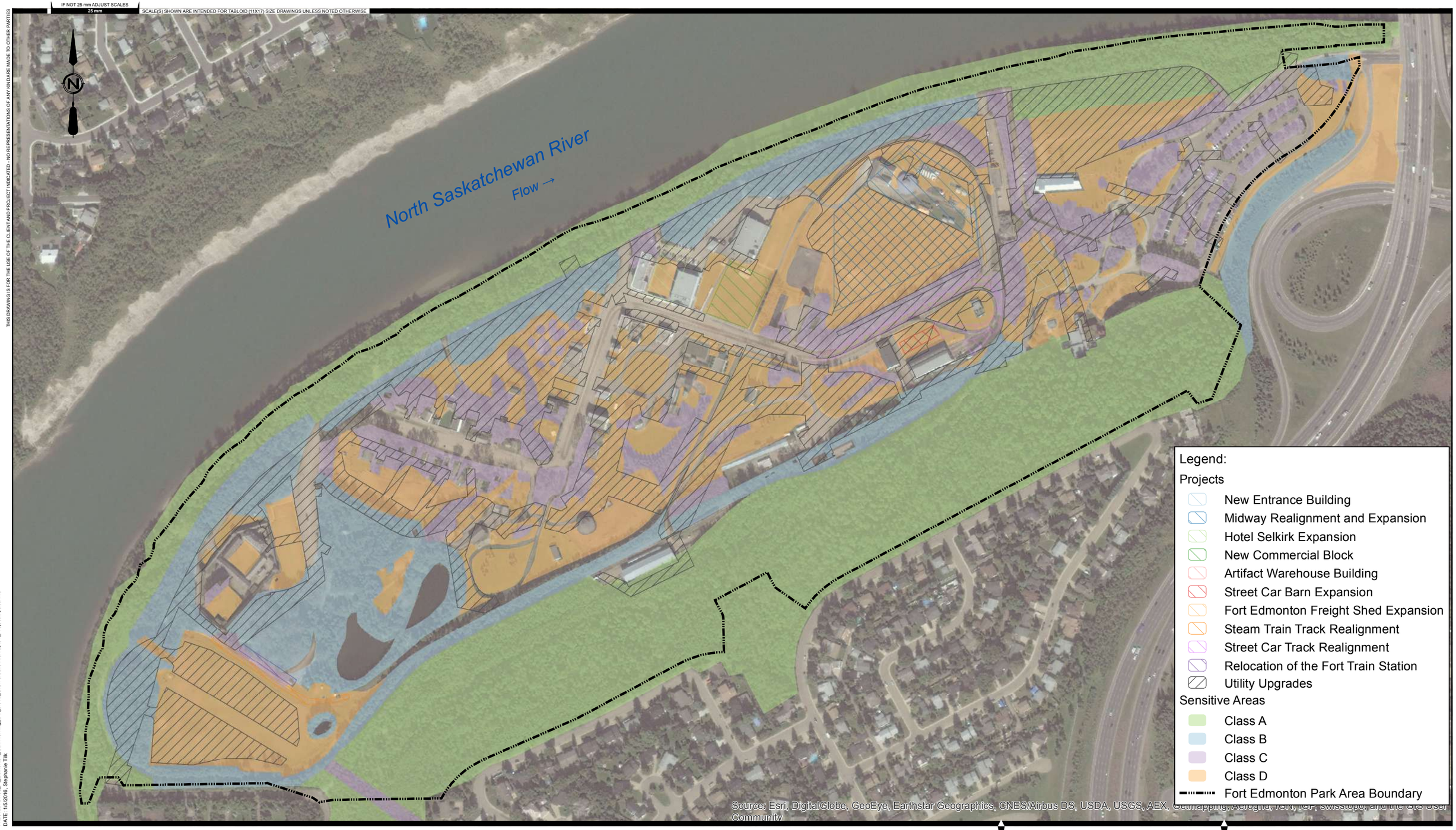
Figure 4-2
Photograph of Existing Entrance Street Car Line

Photo taken from existing Park entrance looking west.
Utility lines will follow boardwalk and road south of Mellon's Farm.

Figure 4-3
Photograph of Streetcar Tracks

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE.



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DATE: 1/6/2016, Stephanie Tilk

Associated Engineering

THE CITY OF Edmonton

AE PROJECT No.	20123701
SCALE	1:4,000
APPROVED	
DATE	2016JAN05
REV	
DESCRIPTION	ISSUED FOR REPORT

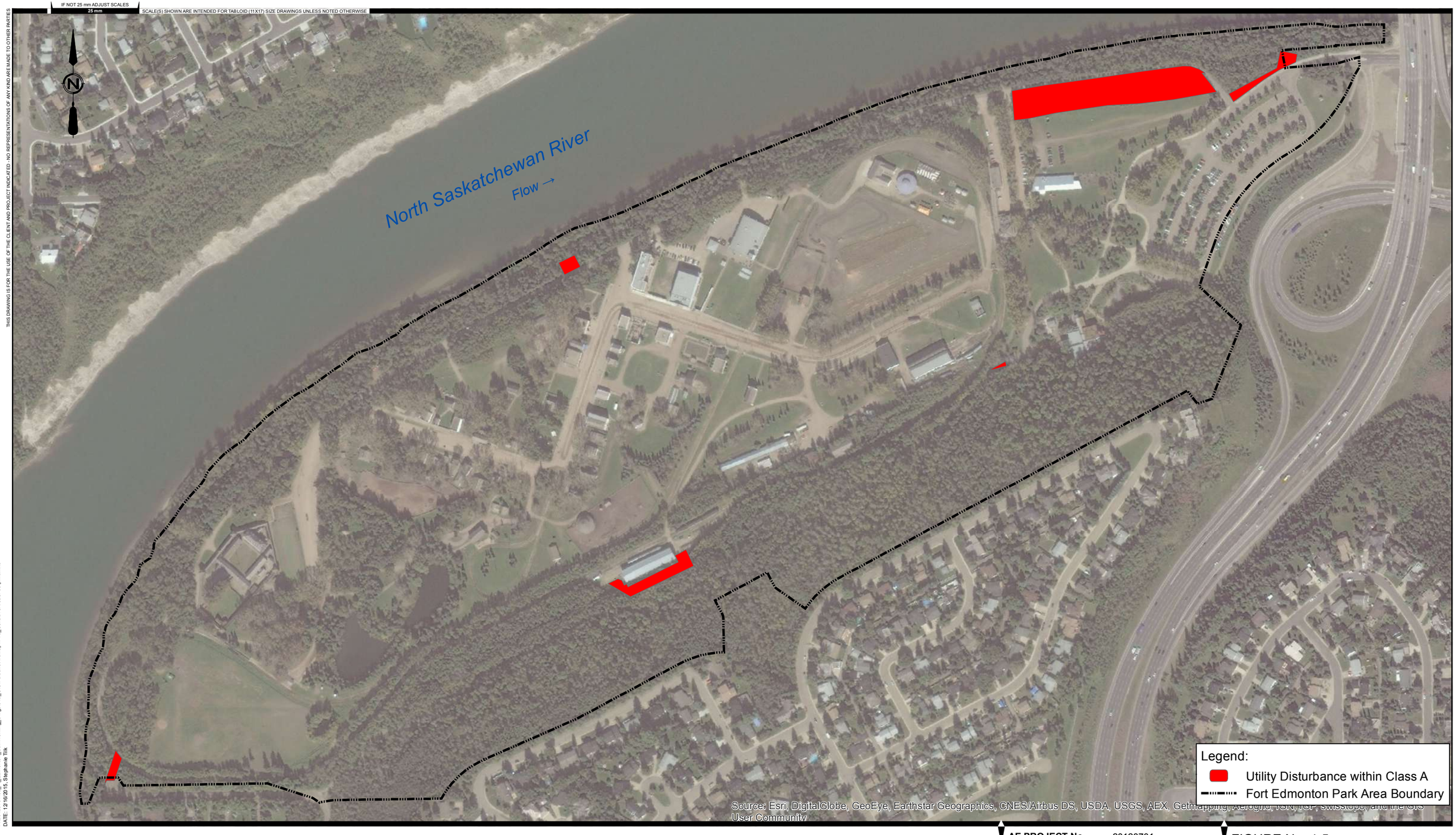
FIGURE No. 4-4

FORT EDMONTON PARK AREA
ENVIRONMENTAL IMPACT ASSESSMENT

PROJECT IMPACT LOCATIONS

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



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DATE: 12/16/2015, Stephanie Tilk

Associated Engineering

THE CITY OF Edmonton

AE PROJECT No.	20123701
SCALE	1:4,000
APPROVED	
DATE	2015DEC16
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE No. 4-5

FORT EDMONTON PARK AREA
ENVIRONMENTAL IMPACT ASSESSMENT

CLASS A DISTURBANCE AREA

4.2.2 New Entrance Building

4.2.2.1 Project Description and Location

The new entrance and admissions building will be located south and east of the currently used, modified train station (**Figure 4-6** and **Figure 4-7**). The new entrance building will be connected to the existing entrance building by a 15 m, circular, interlocking block plaza and will include ticket booths, public washrooms, a gift shop, storage spaces, staff spaces and a lobby. The North Saskatchewan River is approximately 230 m from the proposed building site.

The construction footprint for the new entrance building is anticipated to cover 726 m^2 or about 0.1% of the Park Area. This project represents 0.3% of the re-development disturbance to the Park Area.

Topography and Site Drainage
The proposed location of the new entrance building is a landscaped lawn space with gentle slopes surrounding it. Re-grading of these slopes may be required to accommodate the new structure.

Vegetation
The new entrance building is proposed in an area that currently has landscaped trees, shrubs and lawn area within approximately 20 m in all directions surrounding the project footprint. There are four mature white pine trees located south of the existing entrance building. These white pines are ornamentals, and are not one of the two species endangered in Alberta.

Wildlife and Wildlife Habitat
The entrance area of the Park Area is a developed site near the main parking lot, multi-use paths, picnic areas and the John Janzen Nature Centre in Class D sensitivity habitat. The nearby forested areas provide habitat for a variety of wildlife species, including migratory and non-migratory birds, small and large mammals, amphibians and reptiles.

Fish and Fish Habitat
Fish habitat is not expected to be affected by the re-development projects. Erosion and sediment control measures previously described will be implemented around the construction area to prevent storm water from carrying sediment-laden water from the site to the river.

Soils
Some excavation for the new entrance building's slab foundation, utilities and loading dock will be required for construction.

4.2.2.2 Project-Specific Impact Assessment

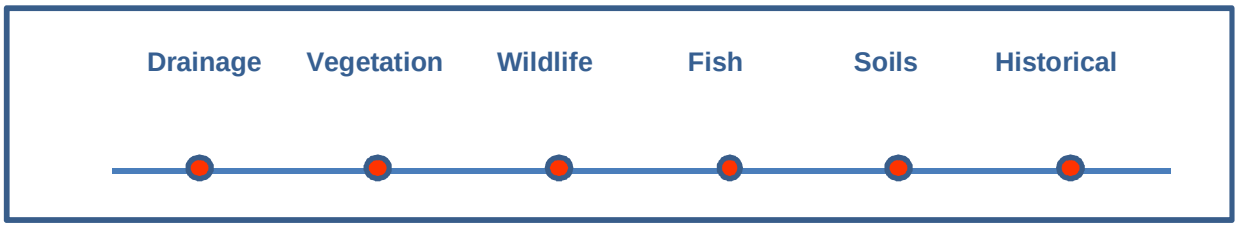


Table 4-4 below provides a summary outline of anticipated potential impacts and mitigation strategies from construction of the new entrance building.

The addition of a new structure in this area is unlikely to be disruptive to wildlife habitat and movement. Environmental impacts from construction are considered "**low**". Once the new building is complete, appropriate landscaping will ensure that there is no long-term environmental impact associated with the project area.

Table 4-4
Summary of Environmental Impacts and Mitigation Strategies – New Entrance Building

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. See Section 4.3 for additional details.
Vegetation	Removal of the mature trees will result in loss of shade and wildlife habitat.	Evaluate options to replace shade trees in the landscaping plans under development as part of the Detailed Design Package being developed by Associated Engineering Alberta Ltd.
Wildlife and Wildlife Habitat	Wildlife depending on vegetation in or near the path of the entrance building could be disturbed during construction.	Construction and management of this project area should assume the potential presence of migratory and non-migratory birds, small and large mammals, amphibians and reptiles and other species listed in **Appendix C**. Construction activities should occur outside the nesting period for migratory birds described in

Environmental Component	Impacts	Mitigation Strategies
		Figure 4-18.
Fish and Fish Habitat	The North Saskatchewan River is approximately 230 m away from the new entrance site; impacts to fish and fish habitat are not expected.	None required.
Soils	Soils erosion and sediment are potential due to re-grading in the project area.	Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. Implement an Environmental Construction Operations (ECO) Plan. See Section 4.3 for additional details.
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

Figure 4-6
Photograph of Existing Entrance Building Area
Taken from Outside the Admission Gate Looking North

Figure 4-7
Photograph of Potential Location for New Entrance Interlocking Plaza

4.2.3 Midway Realignment – Expansion

4.2.3.1 Project Description and Location

The midway realignment and expansion will be constructed west of the existing midway, expanding into Mellon Farm in the eastern end of the Park Area (**Figure 4-8**). The planned midway expansion will include a tethered helium balloon ride, a corn or hay bale maze, the addition of period-appropriate children's rides and a new double Ferris wheel (Thurber 2015). Shops, food service kiosks and opportunities for day and evening entertainment will be constructed, along with added staff spaces.

The construction footprint for the expanded midway is anticipated to cover 1.93 ha or about 3.0 % of the Park Area. This project represents 8.5% of the disturbance to the Park Area during the re-development process.

Sizing of the midway expansion will be reviewed prior to construction to maximize efficiency and flow as the project proceeds. No basements are expected to be required as part of this expansion (Thurber 2015). Buildings and attractions will be constructed using piles and slab on grade, and will vary in height. There will be changes to the existing walkways, and new walkways will be constructed (Thurber 2015). Landscaping will likely also be required.

Topography and Site Drainage
Once the new building construction is complete, the increased surface area of the building roofs could channel increased runoff volume to the surrounding area. The stormwater flow direction will be maintained for the midway expansion.

Vegetation
The existing midway area is planned to expand into Mellon Farm (west of the Midway area). Mellon Farm currently contains a mix of crop species with some sparsely landscaped trees around its perimeter.

The Park Area is located in a region prone to clubroot infestation and the project is taking place in a crop field that currently contains canola. Compliance is required under the *Agricultural Pests Act* (Alberta): *The owner or occupant of land has the responsibility to take measures to prevent the establishment of any pest on land, property and livestock and to control or destroy all pests in the land or property*.

Wildlife and Wildlife Habitat
The midway area is part of a developed site near the main entrance and the access road that already contains several buildings. Adding structures in this area is unlikely to be additionally disruptive to wildlife and wildlife movement as the area is assessed as a Class D sensitivity habitat.

The nearby forested areas provide habitat for a variety of wildlife species, including migratory and non-migratory birds, small and large mammals, amphibians and reptiles.

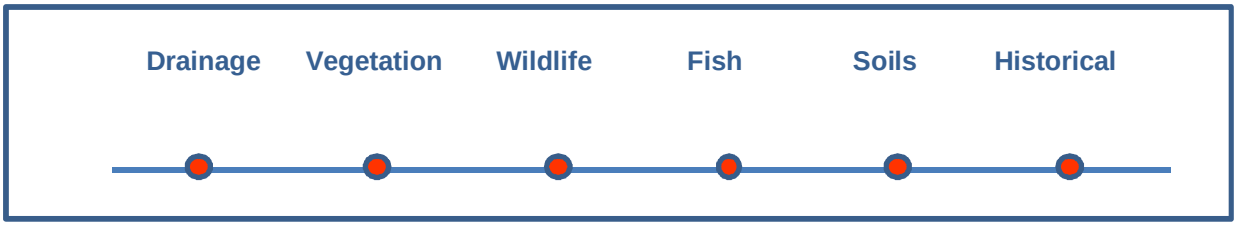
Fish and Fish Habitat
Fish habitat is not expected to be affected by the re-development projects. Erosion and sediment control measures previously described will be implemented around the construction area to prevent storm water from carrying sediment-laden water from the site to the river.

Geology and Soils
Some excavation for the slab foundations of the new structures and utilities will be required during construction; however, the final grade of the site will not change.

All soil stockpiles should be planned toward the south side of the project area, away from the river and any natural drainage areas. Proper erosion and sediment control (ESC) measures should be applied to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site.

Potential Contamination
Potential contaminated soils surround the perimeter of the site along the steam train track to the north, east and west of the site and the streetcar track to the south. In some areas these potential contaminated sites are within 10 m of the proposed new development sites. The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of submission of this report.

4.2.3.2 Project-Specific Impact Assessment and Mitigation Strategies



Construction related impacts are considered "**low**". Once the project is complete, appropriate landscaping will result in negligible long-term impacts.

Table 4-5 provides a summary of potential impacts and mitigation strategies from the realignment and expansion of the midway.

Table 4-5
Summary of Environmental Impacts and Mitigation Strategies – Midway Expansion

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. See Section 4.3 for additional details. Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site.
Vegetation	No impact anticipated. The midway expansion is proposed for the site of the existing midway area and the nearby Mellon Farm, which currently produces grain crops. There are weeds present in the expansion area.	Implement a weed control strategy. Section 4.3 provides details on weed control strategies.
Wildlife and Wildlife Habitat	The most significant potential impact is to bird species nesting in the Mellon Farm fields. Depending on the time of year and crop grown in the field west of the midway, some birds may nest in the field and could be impacted by activity during nesting season.	Construction and management of this project area should assume the potential presence of migratory and non-migratory birds, small and large mammals, amphibians and reptiles and other species listed in **Appendix C**. Construction activities should occur outside the nesting period for migratory birds described in **Figure 4-18**.
Fish and Fish Habitat	The North Saskatchewan River is approximately 100 m away from the midway expansion, impacts to fish and fish habitat are not expected.	None required

Environmental Component	Impacts	Mitigation Strategies
Soils	Construction will take place on a previously disturbed site, it is anticipated that impacts to soils will be negligible. Contaminated soils could be disturbed since construction activities for the midway expansion because some areas are within 10 m of the steam train and streetcar tracks	The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report.
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

Figure 4-8
Photograph of the Existing Midway

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4.2.4 Hotel Selkirk Expansion

4.2.4.1 Project Description and Location

The existing Hotel Selkirk accommodation services will be expanded by re-creating the historic Windsor Block as a second hotel in the current parking lot southeast of the Hotel Selkirk (**Figure 4-9**). This project is anticipated to enhance the potential to attract more overnight visitors to Fort Edmonton Park.

The proposed enlarged hotel will encompass a conference centre, banquet facilities, staff and meeting spaces.

The construction footprint for the new hotel is anticipated to be 1,875 m^2 or about 0.3% of the Park Area. This project represents 0.8% of the disturbance to the Park Area during the re-development process.

The building is conceptually sized to be 30 m wide and 45 m long (Thurber 2015). The height of the building is expected to be three stories and it is assumed that a basement will be constructed. Changes to the existing walkways will be required, along with the construction of new walkways. A parking lot may be added and landscaping will be required (Thurber 2015).

Topography and Site Drainage
Once the new building construction is complete, the increased surface area of the new Windsor Block could channel increased runoff volume to the surrounding area. The stormwater flow direction will be maintained for the building expansion.

Vegetation
Landscaped vegetation can be found within approximately 5 m north of the project area. The natural river valley forested area is within 30 m of the project area. Vegetation is not expected to be removed as part of this project.

Wildlife and Wildlife Habitat
The Hotel Selkirk expansion will likely have minor impacts on wildlife movement through the stand of trees north of the hotel expansion as a result of construction noise and traffic. It is located in a Class D sensitivity habitat area. Once the expansion is complete, it is expected that the increased hotel services at the new Windsor Block will lead to increased vehicle traffic (i.e. patrons and service personnel) on the north service road. This could result in more frequent disturbance to wildlife and wildlife habitat (in particular, nesting birds) in the forests near the road.

Additionally, the increased regular odours (laundry, food services) and noise from the facility might influence the natural behaviour of wildlife in the area through increased attraction (odour) or greater detraction (frequent noise). The residual impacts that the new hotel and its activities will have on wildlife behaviour and habitat is unknown.

Fish and Water Quality

Fish habitat is not anticipated to be affected by re-development projects. Since the North Saskatchewan River is approximately 70 m away from the Hotel expansion site, impacts to fish and fish habitat are expected to be negligible. Erosion and sediment control measures will be implemented around the construction area to prevent stormwater from carrying sediment-laden water from the site to the river. Once the new Hotel construction is complete, no long-term impacts to fish or fish habitat are expected.

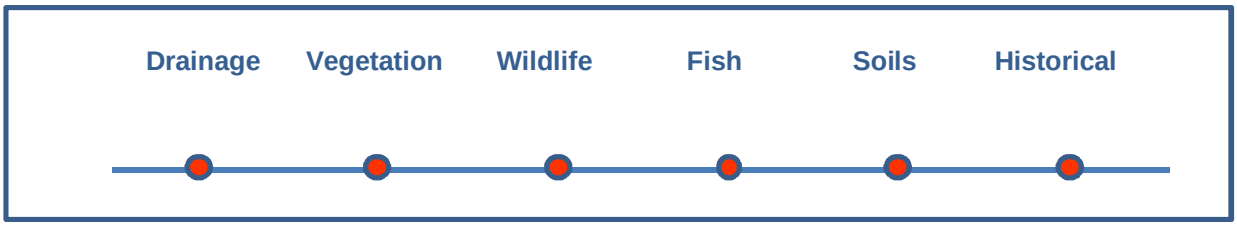
Geology and Soils

Construction will take place on a pre-existing open lot and is anticipated to have negligible impacts to soils. Some excavation for the new structure's slab foundation, utilities and loading dock will be required during construction; however, the final grade of the site will not change. All soil stockpiles should be planned toward the east side of the parking lot north of the project footprint, away from the river and any natural drainage areas. Proper erosion and sediment control measures should be applied to all drainage pathways, ditches and around any soil stockpiles to prevent sedimentation from leaving the construction site.

Potential Soil Contamination

Potentially contaminated soils exist within 15 m south of the proposed hotel expansion area along the steam train track. The final contaminated soils strategy will be defined in the project's contamination management plan, which was not yet completed at the time of submission of this report.

4.2.4.2 Project-Specific Impact Assessment and Mitigation Strategies



Environmental impacts from construction are considered "**low**". Once the project is complete, appropriate landscaping will result in negligible long-term impacts associated with the project area.

Table 4-6 provides a summary of potential impacts and mitigation strategies from the expansion of Hotel Selkirk.

Table 4-6
Summary of Environmental Impacts and Mitigation Strategies – Hotel Selkirk Expansion

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. See Section 4.3 for mitigation details.
Vegetation	Removal of a small forested area north of hotel, which is considered moderate sensitivity Class B; is expected to have negligible impact. The trees are located adjacent to the Class A buffer between the Park and the North Saskatchewan River.	None required
Wildlife and Wildlife Habitat	Impact will be negligible. Wildlife using the stand of trees north of the lot for habitat may be affected by habitat loss.	Construction and management of this project area should assume the potential presence of migratory and non-migratory birds, small and large mammals, amphibians and reptiles and other species listed in **Appendix C**. Construction activities should occur outside the nesting period for migratory birds described in **Figure 4-18.**
Fish and Fish Habitat	The North Saskatchewan River is approximately 70 m away from the hotel expansion; impacts to fish and fish habitat are not expected.	None required

Environmental Component	Impacts	Mitigation Strategies
Soils	Construction will take place on a previously disturbed site, it is anticipated that impacts to soils will be negligible. Contaminated soils could be disturbed since construction activities for the hotel expansion are within 15 m of the steam train tracks.	The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report.
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

Figure 4-9
Photograph of lot next to the Hotel Selkirk site of the new Windsor Block

4.2.5 New Artifact Warehouse Building

4.2.5.1 Project Description and Location

The warehouse will display the collection of artifacts rather than have them in storage and inaccessible to visitors. (**Figure 4-11**). The artifact warehouse building will be built immediately west of the existing *Motordrome*, the publicly-accessible historical automobile storage and maintenance facility (Thurber 2015). The building will primarily be a warehouse with a viewing/display area. It will also include staff spaces, storage spaces and staff washrooms.

The construction footprint for the new artifact warehouse is anticipated to be about 602 m^2 or about 0.1 % of the Park Area. This project represents 0.3% of the disturbance to the Park Area during the re-development process. The warehouse will be single story, and will be constructed using piles and slab on grade. Changes to existing walkways, construction of new walkways and landscaping will be required as part of this project.

Topography and Site Drainage
Once the new building construction is complete, the increased surface area of the new artifact warehouse could channel increased runoff volume to the surrounding area. The stormwater flow direction will be maintained for the building expansion.

Vegetation
Although landscaped trees surround this project area, vegetation removal is not expected to be required. The edge of river valley forested area is located approximately 130 m south of the project area.

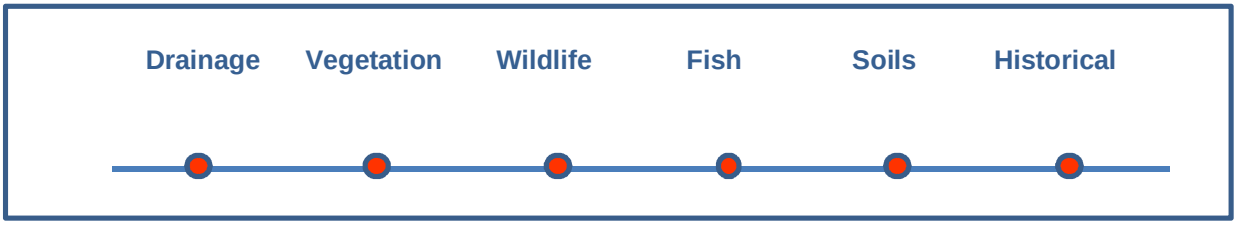
Wildlife and Wildlife Habitat
Construction activities will occur in Class C and D sensitivity areas and will have minor impacts to wildlife habitat. Construction should occur outside the nesting period to minimize potential impacts to migratory birds.

Fish, Water Quality and Aquatic Resources
Fish habitat is not anticipated to be affected by re-development projects. Erosion and sediment control measures will be implemented around the construction area to prevent stormwater from carrying sediment-laden water from the site to the river. Once the new structure is complete, no long-term impacts to fish or fish habitat are expected.

Geology and Soils
Some excavation for slab foundations and utilities will be required during construction; however, the final grade of the site is not expected to change. All soil stockpiles should be placed toward the east end of the field, away from the river and the storm drain near the west end of the field. Proper erosion and sediment control measures should be installed to all drainage pathways, ditches and around any soil stockpiles to prevent sedimentation from leaving the construction site.

Once the artifact warehouse building is complete, no long-term impacts to the project area's soils are expected.

4.2.5.2 Project-Specific Impact Assessment and Mitigation Strategies



Environmental impacts from constructing the artifact warehouse building are considered "**low**". Once the new building is complete, appropriate landscaping will ensure that there is no long-term environmental impacts associated with the project area.

Table 4-7 provides a summary of potential impacts and mitigation strategies from the construction of the new artifact warehouse building.

Table 4-7
Summary of Environmental Impacts and Mitigation Strategies – New Artifact Warehouse Building

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. See Section 4.3 for mitigation details.

Environmental Component	Impacts	Mitigation Strategies
Vegetation	Minor impacts from the potential removal of the stand of trees (Class C and D sensitivity area).	N/A
Wildlife and Wildlife Habitat	The empty lot where construction of the artifact warehouse building will be built has very little pre-existing wildlife habitat, therefore the project will likely have negligible impacts on wildlife.	Construction and management of this project area should assume the potential presence of migratory and non-migratory birds, small and large mammals, amphibians and reptiles and other species listed in **Appendix C**. Construction activities should occur outside the nesting period for migratory birds described in **Figure 4-18.**
Fish and Fish Habitat	The North Saskatchewan River is approximately 275 m away from the new artifact warehouse building; impacts to fish and fish habitat are not expected.	None required
Soils	Construction will take place on an open lawn area site; impacts to soils are not anticipated.	None required
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

Figure 4-10
Photograph of Proposed Site for the Artifact Warehouse Building West of the Motordrome

4.2.6 New Commercial Block

4.2.6.1 Project Description and Location

The new commercial block is proposed for the green space south of Blatchford Air Hangar (**Figure 4-10**). The new commercial block will consist of two buildings that feature replicas of businesses from the era such as the Capitol Barber Shop and Beauty Parlour, including a café, restaurant, and art house

The construction footprint for the new commercial block is anticipated to be about 3,120 m^2 or about 0.5 % of the Park Area. This project represents 1.4% of the disturbance to the Park Area during the re-development process.

The structure will consist of two buildings, each 76 m long by 15 m wide. The buildings will be located from the boardwalk on 1920 Street to the Hangar. Each building will be subdivided to look like up to five individual buildings using facades. Each unit would be a single story in height on a concrete floor. The expansion will be constructed using piles and slab on grade. Walkways, roadways and landscaping will be required activities.

Topography and Site Drainage
Once construction is complete, the increased surface area of the commercial block rooftops could channel increased runoff volume to the surrounding area. The stormwater flow direction will be maintained for the building expansion.

Vegetation
The commercial block project will be constructed on a currently open lawn area. A stand of landscaped trees is located within 15 m east of the project area. The natural river valley forested area is within 80 m of the project area. Construction of the commercial block is not expected to require the removal of vegetation. Once construction is complete, only a small amount of vegetation rehabilitation, top dressing and seeding around the construction site perimeter will be required. Should it be deemed necessary to disturb vegetation at a later date, further mitigation measures might be required.

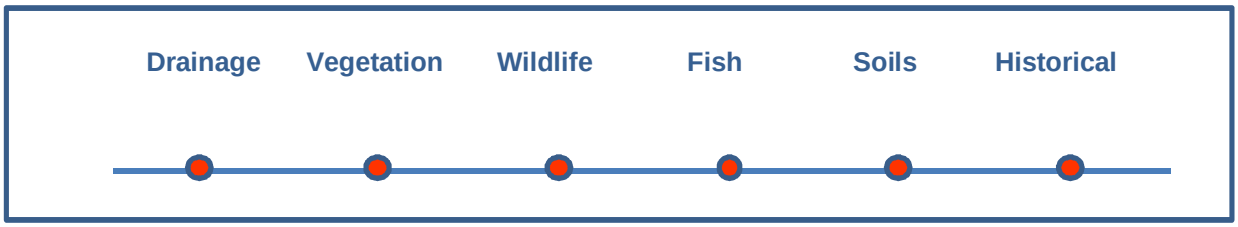
Wildlife and Wildlife Habitat
Construction activities will occur in Class D sensitivity areas and are expected to have minor impacts to wildlife habitat. Construction activities should occur outside the nesting period for migratory birds.

Fish and Water Quality
Fish habitat is not anticipated to be affected by re-development projects. Erosion and sediment control measures will be implemented around the construction area to prevent stormwater from carrying sediment-laden water from the site to the river. Once the new Commercial Block construction is complete, no long-term impacts to fish or fish habitat are expected.

Geology and Soils
Construction will take place in an open field and the proposed structures are not expected to have basements. It is anticipated that impacts to soils will be negligible. Some excavation for slab foundations and utilities will be required during construction. The final grade of the site is not expected to change. All soil stockpiles should be placed toward the east end of the field, away from the river and the storm drain near the west end of the field.

Potential Contamination
There are potentially contaminated soils within 5 m to the east of the project area along the steam train track and within 15 m southwest of the project area along the streetcar track. The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report.

4.2.6.2 Project-Specific Impact Assessment and Mitigation Strategies



Environmental impacts from construction are considered to be "**low**". Once the new building is complete, appropriate landscaping will ensure that there is no long-term environmental impacts associated with the project area.

Table 4-8 provides a summary of potential impacts and mitigation strategies from the construction of the new commercial block.

Table 4-8
Summary of Environmental Impacts and Mitigation Strategies – New Commercial Block

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. See Section 4.3 for mitigation details.
Vegetation	The new commercial block will be built in the large open lawn area.	None required

Environmental Component	Impacts	Mitigation Strategies
Wildlife and Wildlife Habitat	Construction activities will occur in Class D sensitivity areas where there is little pre-existing wildlife habitat, therefore the project is expected to have negligible impacts on wildlife.	None required
Fish and Fish Habitat	The North Saskatchewan River is 115 m away from the commercial block construction site; impacts to fish and fish habitat are not expected.	None required
Soils	Construction will take place on a previously disturbed site; impacts to soils are not anticipated. Contaminated soils could be disturbed because construction activities in some areas are within 15 m of the stream train track.	None required The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report.
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

Figure 4-11
Photograph of the Location for the Proposed New Commercial Block Field South of the Blatchford Air Hangar, Looking North

4.2.7 Streetcar Barn Expansion

4.2.7.1 Project Description and Location

This project will involve construction of a duplicate building on the north side of the existing streetcar barn and located just south of the midway grounds (**Figure 4-12**). The building will mostly be used for storage and display of an unrestored streetcar collection. The building will also include staff spaces and washrooms. Restored cars may be stored in the new building in the future as space allows. The building will be unheated and will require lighting. In the future, one or more tracks may be electrified to facilitate moving streetcars.

The construction footprint for the streetcar barn expansion is anticipated to be about 592 m^2 or about 0.1% of the Park Area. This project represents 0.3% of the disturbance to the Park Area during the re-development process. The building will be approximately 13 m wide and 45 to 58 m long. Depending on the design, the building height will be approximately 5 m. The building will be constructed using piles and slab on grade. There will be new walkways as well as changes to the existing walkways. Landscaping will also be required.

Topography and Site Drainage
Once construction is complete, the increased surface area of the commercial block rooftops could channel increased runoff volume to the surrounding area. The stormwater flow direction will be maintained for the building expansion.

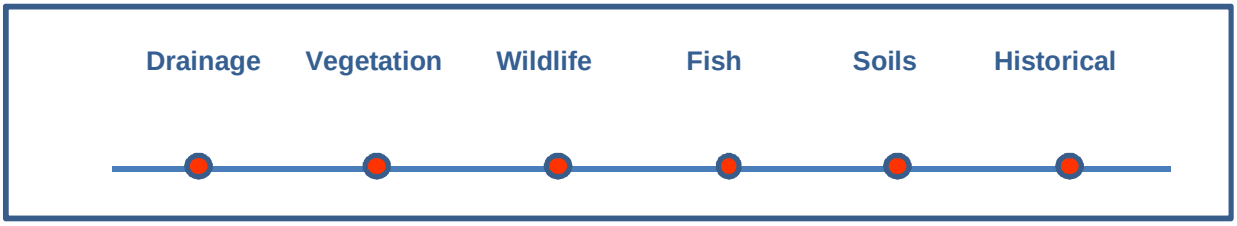
Vegetation
Vegetation removal, apart from moving turf, is not expected to be required for this project. The edge of river valley forested area is located approximately 100 m south of the project area.

Wildlife and Wildlife Habitat
Construction activities will occur in Class D sensitivity areas and are expected to have minor impacts to wildlife habitat. Construction activities should occur outside the nesting period for migratory birds.

Fish and Water Quality
Fish habitat is not anticipated to be affected by re-development projects. Erosion and sediment control (ESC) measures will be implemented around the construction area to prevent stormwater from carrying sediment-laden water from the site to the river. Once the new structure is complete, no long-term impacts to fish or fish habitat are expected.

Geology and Soils
Since construction will take place on an open lawn area, it is anticipated that impacts to soils will be negligible. Some excavation for slab foundations will be required during construction; however, the final grade of the site is not expected to change. Proper erosion and sediment control measures should be installed to all drainage pathways, ditches and around any soil stockpiles to prevent sedimentation from leaving the construction site.

4.2.7.2 Project-Specific Impact Assessment and Mitigation Strategies



Environmental impacts from construction are considered to be "**low**". Once the new building is complete, appropriate landscaping will ensure that there is no long-term environmental impacts associated with the project area.

Table 4-9 provides a summary of potential impacts and mitigation strategies for the expansion of the streetcar barn.

Table 4-9
Summary of Environmental Impacts and Mitigation Strategies – Streetcar Barn Expansion

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. See Section 4.3 for mitigation details.
Vegetation	Minimal impact to vegetation - the project area is proposed for a currently open lawn (Class D sensitivity area).	None required

Environmental Component	Impacts	Mitigation Strategies
Wildlife and Wildlife Habitat	Construction activities will occur in Class D sensitivity areas where there is little pre-existing wildlife habitat, therefore the project is expected to have negligible impacts on wildlife.	None required
Fish and Fish Habitat	The North Saskatchewan River is 280 m away from the construction site; impacts to fish and fish habitat are not expected.	None required
Soils	Construction will take place on a previously disturbed site; impacts to soils are not anticipated. Contaminated soils could be disturbed because construction activities in some areas are within 15 m of the stream train track.	None required The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report.
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

Figure 4-12
Photograph of the Proposed Streetcar Barn Location

A second identical structure will be constructed next to the existing streetcar barn featured above.

4.2.8 Freight Shed Expansion

A. Project Description and Location

The freight shed extension will be a 12 m long by 10 m wide addition to the current facility located north of the existing structure. The freight shed building will be expanded into the adjacent parking lot.

The construction footprint for the freight shed expansion is anticipated to be about 120 m^2 or about 0.1% of the Park Area. This project represents 0.02% of the disturbance to the Park Area during the re-development process. **Figure 4-13** and **Figure 4-14** show the approximate location of the proposed expansion.

Topography and Site Drainage
Once construction is complete, the increased surface area of the commercial block rooftops could channel increased runoff volume to the surrounding area. The stormwater flow direction will be maintained for the building expansion.

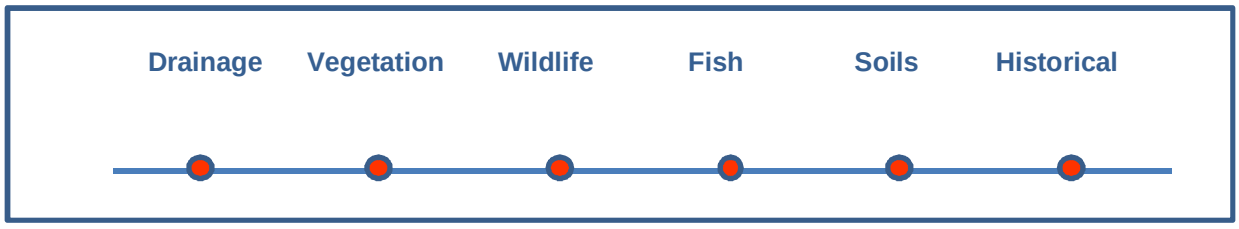
Vegetation
The edge of river valley forested area is located approximately 130 m south of the project area.

Geology and Soils
Construction will take place in a pre-existing parking lot; it is anticipated that impacts to soils will be negligible. Some excavation for slab foundations will be required during construction; however, the final grade of the site is not expected to change. Proper erosion and sediment control measures should be installed to all drainage pathways, ditches and around any soil stockpiles to prevent sedimentation from leaving the construction site.

Wildlife Habitat and Movement Corridors
Construction activities will occur in an area that currently does not support wildlife.

Fish, Water Quality and Aquatic Resources
Fish habitat is not anticipated to be affected by re-development projects. North Saskatchewan River is approximately 100 m away.

4.2.8.1 Project-Specific Impact Assessment and Mitigation Strategies



Construction related impacts are considered to be "**low**". Once the new building is complete, appropriate landscaping will ensure that there is no long-term environmental impacts associated with the project area.

Table 4-10 provides a summary of anticipated impacts and mitigation strategies for the expansion of the freight shed.

Table 4-10
Summary of Environmental Impacts and Mitigation Strategies – Freight Shed Expansion

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. See Section 4.3 for mitigation details.
Vegetation	Minimal impact to vegetation - the project area is proposed for a currently a parking lot.	None required
Wildlife and Wildlife Habitat	The project is expected to have negligible impacts on wildlife.	None required

Environmental Component	Impacts	Mitigation Strategies
Fish and Fish Habitat	The North Saskatchewan River is 100 m away from the construction site; impacts to fish and fish habitat are not expected.	None required
Soils	Construction will take place on a previously disturbed site; impacts to soils are not anticipated.	None required
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

Figure 4-13
The North End of the Existing Freight Shed Railway Building

Figure 4-14
Parking Lot into which the Freight Shed Building will Expand

4.2.9 Secondary Projects

The projects in this section are considered minor maintenance projects, and will generally be covered under the footprint of the utilities. The project description (A) and impacts (B) for each of the secondary projects are discussed briefly below, followed by one section outlining the mitigation strategies for all of the secondary projects together (i.e. such as Section C for the projects above).

East Loop of the Streetcar Track Realignment

A. Project Description and Location

The east loop of the streetcar track will be widened towards the main boardwalk to allow more turnaround space for the streetcars.

Figure 4-15
The East Loop of the Streetcar Track

Steam Train Track Realignment

A. Project Description and Location

The steam train track will be realigned (straightened) at the west end of the park to allow greater visibility for passengers waiting at the Old Fort train station. Vegetation around the southwest loop of the track will be removed to improve visibility for train operators. Forest at the southeast loop of the track (west of the horse pasture) is considered Class B sensitivity area due to its ability to host migratory species and other wildlife. The area is excluded from the adjacent Class A habitat by a tall chain-link fence along the Park's perimeter, and therefore, does not contribute to the North Saskatchewan River valley wildlife corridor.

The area planned for track realignment is generally flat, with surface flows draining north towards the river through forest and riparian buffer.

Figure 4-16
Photograph of the Segment of the Steam Train Track to be Realigned

Fort Train Station Relocation

A. Project Description and Location

The Fort train station will be relocated further north so that it will be closer to the Fort. Mature trees may also be relocated north of the existing train station, although some trees and shrubs will need to be permanently removed. Surface drainage in this relatively flat area flows west to a swale, and east to Egge's Pond. Mature trees are the dominant vegetation north of the existing train station. Species include white spruce, Scotch pine, lodgepole pine and balsam poplar. Ground cover is mostly grass, and weeds occur throughout the local area.

Figure 4-17
Photograph of the Existing Fort Train Station Looking North

B. Impact Assessment and Mitigation Strategies

Table 4-11 provides a summary of anticipated impacts and mitigation strategies for the three maintenance projects.

Table 4-11
Summary of Environmental Impacts and Mitigation Strategies – East Loop of the Streetcar Track Realignment, Steam Train Track Realignment and Old Fort Station Relocation

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from storm water runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Temporary erosion and sediment control (ESC) measures will be implemented in construction site to prevent storm water runoff from eroding sediment in the construction area and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan. Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and, · apply proper erosion and sediment control measures to all drainage pathways, ditches and around any soil stockpiles to prevent soils from leaving the construction site. See Section 4.3 for mitigation details.
Vegetation	Minimal impact to vegetation – some removal of trees in Class B, C, and D will be required to improve the line of sight along the tracks.	None required
Wildlife and Wildlife Habitat	The project is expected to have negligible impacts on wildlife.	None required
Fish and Fish Habitat	Impacts to fish and fish habitat are not expected.	None required
Soils	Construction will take place on a previously disturbed site; impacts to soils are not anticipated.	None required

Environmental Component	Impacts	Mitigation Strategies
	Contaminated soils could be disturbed because construction activities will be moving the steam train and streetcar tracks. Excavations in the vicinity of the train and streetcar tracks will generally assume that the soil contains contamination based on results from the Phase I ESA study completed by Nichols Environmental Ltd in August 2015.	The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report.
Historical Resources	Historical resources could be exposed during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

4.3 GENERAL RECOMMENDED MITIGATION STRATEGIES

The following common mitigation measures should be applied during construction of **all re-development projects**.

For reference in relation to the mitigation measures described below, **Figure 4-1** indicates vegetation and wildlife sensitivity areas by Class A, B, C, and D.

4.3.1 Topography and Site Drainage

Temporary erosion and sediment control (ESC) measures will be required in all construction sites to prevent stormwater runoff from eroding sediment in the construction areas and depositing them into the river. A final erosion and sediment control plan will be included in the contractor's Environmental Construction Operations (ECO) Plan.

Two levels of ESCs will be necessary: one procedure for normal construction conditions, and another procedure for heavy precipitation events. During construction, site runoff should be inspected periodically for any contaminants or high sediment content; the frequency of these inspections will be included in an ECO Plan developed by the contractor (or City of Edmonton). Control measures described in the Erosion and Sediment Control Guidelines (City of Edmonton 2005) will form the basis for ESC mitigation strategies implemented during construction activities. Specifically, the natural drainage pathways in and adjacent to the work area will be protected to minimize the potential for silt, debris, or any other deleterious substances entering the North Saskatchewan River.

The Environmental Construction Operations (ECO) Plan developed for construction activities should outline the protection measures that will be put in place for trees located within 5 m of construction areas. The

applicable sections of the ECO Plan should be submitted to the City of Edmonton Forestry Office for review. A site meeting should be scheduled with the Forestry Office at a minimum of four weeks before start of construction to review and discuss the sections of the ECO Plan.

Stormwater catch basins and drains are located throughout the Park. These drains convey water to buried pipes and eventually to outfalls located on the banks of the North Saskatchewan River. New swales and ditches will be sized with sufficient grade to accommodate the major 1 in 100 year storm event. The swales may include vegetated sedimentation ponds in several locations designed to slow water velocity and trap suspended materials prior to clean water release off site.

Concrete pipes will be used for the culverts, which will include flared end structures, as well as riprap to prevent erosion around the culvert ends.

Permanent erosion and sedimentation control measures may include the following:

- Small riprap or turf reinforcement mats at culvert ends,
- Riprap or hard armouring at pipe outlets,
- Temporary erosion control blankets within flow paths along swales and ditches,
- Hydroseeding, and
- Oil/grit separator structures.

4.3.2 Wildlife and Vegetation Clearing

The following BMPs should be practiced as part of vegetation clearing and restoration processes:

- Migratory bird surveys should be conducted prior to clearing if activities occur within the restricted period from **February 15 to August 31**. Surveys should target key species within the river valley, such as those listed in tables provided in **Appendix C**. If bird nests are identified during nest sweeps, suitable spatial and temporal buffers should be established by appropriate environmental professionals (Government of Alberta 2011). Prior to removal of vegetation, follow the City of Edmonton tree clearing requirements (**Figure 4-18**). If summer clearing activities are anticipated in the project scheduling, surveys of Class A and B sensitivity areas conducted in winter when large stick, platform, or cavity nests are easier to locate would provide greater assurance that migratory birds are not directly affected.
- In cases where vegetation clearing on slopes or on a floodplain occurs more than two days in advance of earthworks, the vegetation should only be removed to ground level and root networks left intact until earthworks begin and ESC measures are in place.
- The ECO Plan developed for construction activities should note the restricted period to ensure appropriate actions are taken.
- Vegetation should be cleared in the fall and/or winter months. Clearing in these seasons will help maintain the maximum seed bank in soil as well as the maximum root energy storage for future vegetation growth.

- If appropriate for restoration planning, native plants or cuttings may be salvaged from sites to create stock for post-construction restoration activities. Details for clearing planning procedures can be taken from the “Native Plant Revegetation Guidelines for Alberta” (Government of Alberta 2001).

Figure 4-18 provides a visual representation of site preparation and vegetation clearing restrictions for treed areas within the Park Area.

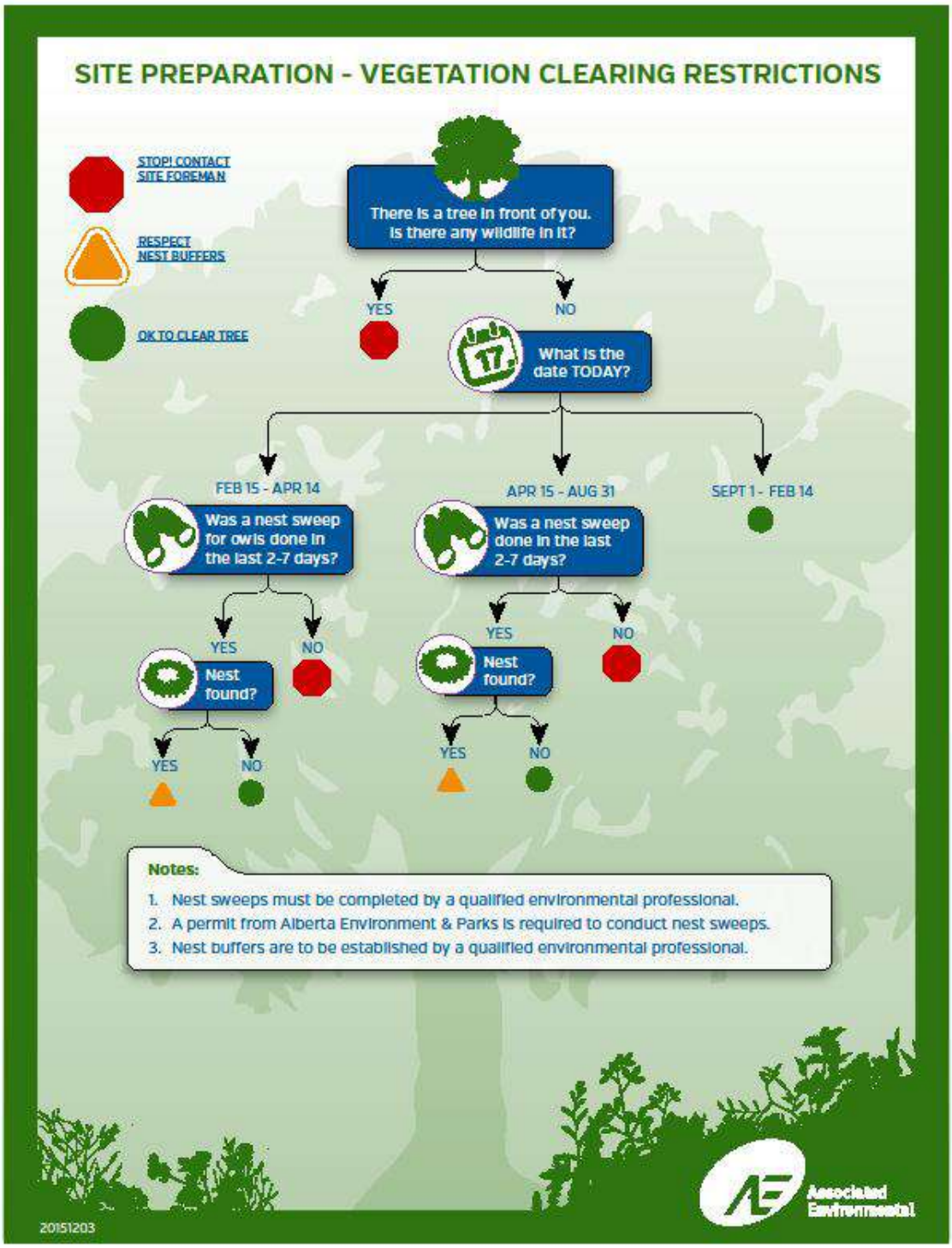


Figure 4-18
Vegetation Clearing Restrictions

4.3.3 Noxious Weed Control

All prohibited noxious weeds identified within the project areas should be destroyed. Identified noxious weeds should be controlled by inhibiting their spread or by destroying the plants. If implemented where appropriate for site objectives, the following strategies can reduce the need for chemical weed control:

- Educating workers on the importance of weed prevention and control;
- Providing construction materials (e.g., gravel, riprap, and soil) that do not contain weed plant parts or seeds and have not been stored in a weed-infested area;
- Making sure that all equipment, materials, and vehicles are free of weed seeds and plant parts prior to arriving on site (including removal of dried mud or soil from undercarriages and tires);
- Maintaining a mulch layer on disturbed soils before native forest restoration is applied;
- Re-vegetating areas as soon as possible following disturbance;
- Using native plants that establish quickly on disturbed soils; and
- Using native seed mix consisting of Certified Seed for reclamation activities.

If the prevention techniques fail, mechanical or chemical weed management should be used to control or destroy weeds. Whether mechanical or chemical controls are used depends on the growth stage, infestation size, species, and surrounding sensitivities.

4.3.4 Wildlife and Wildlife Habitat

The Park Area falls within *Bird Conservation Region B4*, with a migratory bird nesting period of **April 9 to August 31** (Government of Canada 2014b). If active nests are present, a buffer zone (size dependant on species) must be placed around the nest. Clearing activities cannot occur within this zone until the young have fledged the nest and the qualified environmental professional deems it acceptable. Vegetation clearing should avoid sensitive timing windows and should not be conducted between February 15 and August 31. If it is not possible to avoid clearing activities in this period, a bird nesting survey should be completed a few days prior by a qualified environmental professional. Additionally, conversations should be initiated with the local biologist from Alberta Environment and Parks to gain better understanding of the wildlife in the region and to undertake all necessary surveys prior to development.

The area is located within Sharp-Tailed Grouse Survey Area, and a lek survey should be conducted. Surveys should be done between March and mid-May (Government of Alberta 2013c). Leks will remain active until mid- to late June, and should be avoided to minimize disturbance. The Government of Alberta has published Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grasslands and Parkland Natural Regions of Alberta (Government of Alberta 2011). These recommendations include setback distances for leks based on the level of disturbance or type of work. Furthermore, individual birds, their eggs and active nests are protected under the Alberta Wildlife Act. Since the Park Area lies within Sensitive Raptor Ranges, particularly the range of bald eagle, set-back distances will need to be implemented if raptor nests are found. Setback distances for sensitive raptors' nests, including bald eagle, peregrine falcon (*Falco peregrinus*), golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), and ferruginous hawk (*Buteo regalis*), are 1,000 m regardless of the level of disturbance (type of work) during the period March 15 – July 15 (Government of Alberta 2011).

To protect nocturnal species, it is recommended that construction activities cease at night between dusk and dawn. Construction noise, including back up alarms, diesel generators, and engine noise may affect an animal's ability to hunt prey / evade predators. It is also suggested that construction lighting be directed only into the Park, avoid treed areas, and be shut off at night if in use.

4.3.5 Geology and Soils

The following are general measures that incorporate a number of general industry BMPs:

- The ECO Plan developed for construction activities should discuss the contamination management strategies that will be implemented based on the findings from the existing Environmental Site Assessments.
- Soils that are retained following stripping will be properly stored on a geo-fabric with a silt fence or similar measure installed around the base of each pile.
- Soil stripping should occur as close to the time of construction as possible. Soils that have been disturbed are prone to erosion, therefore, leaving grounds intact until construction mitigates against premature erosion concerns.
- If vegetation must be cleared early relative to construction activities, the root layer should be left intact until excavation.
- If topsoils are to be stockpiled within the City for re-use after reclamation, they should be seeded with a cover crop that contains a binding root mass to stabilize the piles pending construction and reclamation activities. Active vegetation will also maintain soil fertility by keeping soil biota active.
- Soil stripping should also occur in the fall, and/or winter months to maximize the seed bank and the potential for root germination. Soil should be stripped with a two- or three-lift system where all topsoil and litter layers are separated from subsoils based on specific soil conditions. Careful soil stripping and handling will minimize damage to existing roots and seed banks and maximize topsoil retention. Details for soil stripping planning procedures will be taken from the "Alberta Transportation Guide to Reclaiming Borrow Excavation" (Government of Alberta 2013).
- Prior to re-planting, subsoils should be graded to appropriate depths so the required topsoil depths will result in final grading after settling. If the subsoil is substantially compacted, it should be roughened and loosened to encourage native plant growth and discourage weed establishment. Creating a roughened surface by scooping up and placing subsoil into a series of rough peaks and valleys (about 1 m depth difference) will prevent erosion as water will absorb into the substrate instead of running off the surface, and will create moist and dry micro-habitats where native seed can be captured and grow.
- Following loosening, topsoils should be handled as little as possible. Immediately after site restoration, adequate erosion and sediment control will be installed to minimize topsoil loss due to erosion. Measures will be taken to make sure that soils do not become over-compacted before the site has become re-established.

4.3.6 Soil Contamination

Excavations in the vicinity of the train and streetcar tracks will generally assume that the soil contains creosote contamination based on results from the Phase I ESA study completed by Nichols Environmental Ltd in August 2015.

Contamination management strategies will be required during work on the track at locations where petroleum hydrocarbons were noted in the existing Phase I and II reports. Appropriate management strategies will also be required to ensure that creosote-treated rail ties are appropriately stored during construction to avoid leaching to the surrounding areas. The final contamination strategy will be defined in the project's contamination management plan, which was not yet completed at the time of this report.

Closure

This report presents our findings on the environmental baseline conditions of the City of Edmonton's Fort Edmonton Park Area projects. The expected impacts to the environment are anticipated to be offset by implementing the mitigation strategies and best management practices recommended. Re-seeding and re-vegetating the disturbed ground will be key in restoring the functional wildlife habitat features in the Park Area.

Respectfully submitted,

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Appendix A – EIA Terms of Reference

REPORT

Fort Edmonton Park Redevelopment

Terms of Reference:
Environmental Screening Review

May 2015

Table of Contents

1 Introduction

Fort Edmonton Park (FEP) is one of the City of Edmonton's (City's) cultural highlights. Situated on 64 hectares (158 acres) of parkland in Edmonton's North Saskatchewan River Valley (NSRV), the Park currently includes over 80 original and reconstructed historical structures, representing the history of Edmonton from 1846 to 1929.

Seven new infrastructure redevelopment projects are to take place as part of the FEP Master Plan. These projects will include:

- **New Entrance Building**: Located at the front gate, the new structure will function as the FEP Entrance where park visitors will purchase entrance admission and enter FEP, rather than at the currently used, modified train station.
- **Realign-Expand Midway**: New attractions in the midway could advance FEP as a premier tourist attraction. The expansion of the midway could create a permanent fair-like atmosphere.
- **Hotel Selkirk Expansion**: The existing Hotel Selkirk will be expanded by recreating the historic Windsor Block. This project could assist in attracting more overnight visitors to FEP.
- **New Commercial Block**: Located near the Blatchford Field Air Hangar, this project will further highlight business from the 1920's era.
- **Artifact Warehouse Building**: The warehouse will serve as an illustrative structure rather than storage for non-accessible material.
- **Indigenous People's Experience**: This project will include Egge's Pond and its surroundings. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.
- **Streetcar Barn Expansion**: This project will expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

Development in the NSRV is regulated by the North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188) and triggers an Environmental Screening Review (ESR) for the redevelopment of FEP. An ESR is alternately termed an Environmental Impact Assessment (EIA) by the City of Edmonton. In this Terms of Reference (TOR), the term "Environmental Screening Review (ESR)" will be used.

This TOR will define: the purpose and scope of the ESR; the planned process; and the proposed table of contents. The TOR applies to the preparation of the ESR for the FEP redevelopment upgrades and any amendments to the ESR document that may occur during the planning process. To proceed with the FEP redevelopment activities, this TOR requires approval by the City.

Note: the ESR for the FEP redevelopment will exclude the Blatchford Hangar Kitchen Expansion, which will be handled under a separate ESR, as the Blatchford Kitchen Expansion is planned to begin in July 2015. The TOR for the Blatchford Kitchen ESR has been submitted to the City's Parks and Biodiversity Department for review.

2 Environmental Screening Review Goals

2.1 ESR DEFINITION

The Environmental Screening Review will:

- describe the proposed activity and provide rationale, including alternatives considered;
- describe existing ecosystem components;
- include a Public Participation Plan;
- predict and analyze the possible effects of the activity on the environment;
- recommend mitigation measures that would reduce, eliminate or compensate for the environmental impacts of the activity; and
- describe how mitigation measures will be monitored over time to ensure effectiveness.

2.2 REGULATORY COMPLIANCE

The ESR for the Fort Edmonton redevelopment is required for approval under the North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188). Mitigation methods outlined in this ESR should serve as a guide by which the project will remain compliant under Bylaw 7188 and all applicable federal, provincial and municipal environmental legislation.

2.3 PROJECT SCOPE

The ESR will consider ecosystem sensitivities related to: vegetation; soil contamination; wildlife; surface runoff; hydrology; fisheries; and historical resources within the project site boundary and the immediately surrounding areas. The project scope also includes portions of the North Saskatchewan River and adjacent roads with public views of FEP on the south and east edges of the project boundary (i.e. Whitemud Road, Brander Drive, 66 Avenue and Whitemud Drive).

2.4 ASSOCIATED ENGINEERING

Associated Engineering will be the Prime Proponent and will assume responsibility for the project delivery. Associated Engineering is a member of the Associated Engineering Group of Companies and will contribute staff through our standard company resource sharing practices.

Legal Name: Associated Engineering Alberta Ltd.

Address of Head Office: 1000 – 10909 Jasper Avenue
Edmonton, AB T5J 5B

Key Areas of Expertise:

Engineering Services

- Water
- Infrastructure
- Transportation
- Energy
- Buildings
- Bridges
- Asset Management

Environmental Services

- Hydrology, Fluvial Geomorphology & Hydrogeology
- Ecosystems, Fish & Wildlife
- Environmental Assessment and Planning
- Environmental Policy and Management
- Environmental Information Management and GIS
- Decision Support, Facilitation & Communication

Proponent Contacts for this submission:

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With more than 900 staff across 21 offices in Canada, AE offers engineering, environmental, landscape architecture, asset management, and other technical services. Founded in Edmonton in 1948, AE is one of Canada's leading water and environmental engineering firms, with experience in all regions of Alberta. Primary areas of service include water, infrastructure, transportation, and environmental engineering. More information can be found at www.ae.ca.

AE's environmental division has provided clients with integrated environmental expertise. Our strength lies in bringing together subject specific experts to create dynamic solutions for clients, especially in environmental impact assessment, hydrology and hydraulics, hydrogeology, fisheries and aquatic ecology, wildlife and terrestrial ecology, soils, geoscience, limnology, aquatic toxicology, operational environmental management, contaminated sites management, GIS and information management, and integrated decision support.

2.5 ENVIRONMENTAL TASK MANAGER

The environmental task manager for the FEP redevelopment will be Sandra Meidinger, P. Biol., R.P. Bio. Sandra is a professional biologist and manager of AE Edmonton's environmental group. She has experience in aquatic and terrestrial ecosystem assessment, wildlife inventory, environmental impact assessment, impact mitigation planning, and environmental monitoring. She has completed projects in the transportation, oil and gas, forestry, and urban development sectors. Sandra has managed and completed multiple impact assessments including two large scale wildlife habitat assessments located in Northeastern Alberta and Coastal BC. She has experience with impact mitigation planning, water quality monitoring program design and implementation for surface and groundwater, benthic invertebrate monitoring, environmental impact assessment (aquatic and terrestrial habitats) and fish and fish habitat assessments.

3 Plan Creation Process

A collaborative process between AE project staff and City of Edmonton representatives will be essential to the success of this project. We propose an ESR creation process that will maximize efficiency and still allow the process to be cooperative between AE and the City. The ESR creation process will have four stages: pre-application, field investigation, ESR submission and ESR finalization. At this time, a pre-application stage is already underway with the completion of nine Initial Project Reviews (IPRs). The IPRs provide project descriptions, timelines and resources along with overviews of potential environmental impacts for each of the FEP upgrade components. Shortly following the submission of the IPRs, a follow-up meeting took place on May 4, 2015 between project representatives from the City of Edmonton and AE. This TOR now serves to present our project scope and the aspects of the ESR we intend to develop. The TOR will be submitted to the City of Edmonton to review.

Upon review and acceptance of the TOR, AE environmental field staff will visit the sites of all the proposed upgrades and complete a pre-disturbance analysis of each project site. All ecosystem components will be examined within the previously described project scope area. A draft ESR report will be completed based on the findings of the field visit.

In the ESR submission stage, the draft of the ESR will be developed and circulated for City representatives to review and provide feedback. AE will incorporate any necessary adjustments to the ESR, if required. Following this review process, notification to residents in communities neighbouring FEP will be notified of the upcoming construction. Once the review is complete and residents have been notified, the City will make a final decision on the approval of the components and scope of the ESR.

4 ESR Outline

The ESR report will follow the document structure outlined in this section:

EXECUTIVE SUMMARY

I. INTRODUCTION
- Purpose of report
- Purpose of the project, including rationale
- Study area and context
- Environmental Screening Review study process and method

II. PROJECT DESCRIPTION
- Project setting/site description (location, surrounding land use, etc.)
- Scope of work (design considerations, extent of alteration/ construction, duration of work)
- Alternatives considered (concept/design alternatives and location)
- Public Participation Plan

III. EXISTING ENVIRONMENT
- Vegetation (including comments on the rare plant to be completed May/June 2015)
- Geology/ geomorphology, soils, slope stability
- Wildlife habitat (including breeding birds) and movement corridors
- Fisheries and aquatic habitat
- Surface water runoff and hydrology
- Noise, odour and visual impacts
- Historical and Archaeological Resources

We may also consider (as necessary):
- The socio-economic environment
- Parks and trail development
- Traffic and parking issues
- Urban design

IV. CONSTRUCTION AND ENGINEERING
- General description (including methods of construction, duration)
- Options and alternatives
- Construction components and techniques (including site preparation, access, lighting)
- Scheduling (including timing, phasing)

V. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES
- Assessment methods (i.e. – field survey, review of existing environmental information, professional knowledge of area, analysis criteria, matrix evaluation etc.)

- Short and long term impacts of the project alongside appropriate mitigation measures for the following sensitivities:
  - Vegetation, (rare plant impacts, specifications for tree removal, site restoration and landscaping requirements)
  - Geology/ geomorphology, soils, slope stability
  - Wildlife habitat and movement corridors
  - Surface water runoff, hydrology and aquatic habitat
  - Noise, odour and visual impacts
  - Historical and Archaeological Resources
  - Potential Contamination
  - Community, socio-economic environment: land use and ownership; public utilities; parks and trail development; aesthetics; traffic and parking issues; urban design; archaeological and historic use.

- Operation and maintenance issues and environmental monitoring strategies

VI. CONCLUSION AND RECOMMENDATIONS

- Summary of significant environmental impacts and recommended mitigation measures
- Summary of outstanding issues and concerns

APPENDIX:
Technical data, Photographs, Maps

5 Amending

Should any changes to the ESR need to be made after approval of the ESR, a detailed written memo describing the change(s) will be submitted to the City for review and approval.

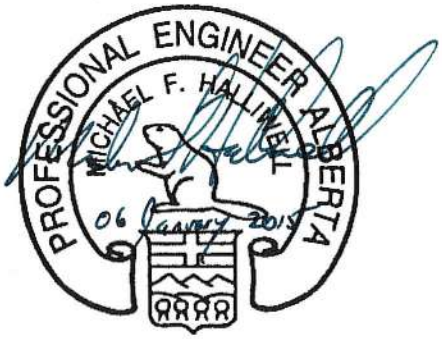
REPORT

Appendix B – Summary Table and Initial Project Reviews Reports

THURBER ENGINEERING LTD.

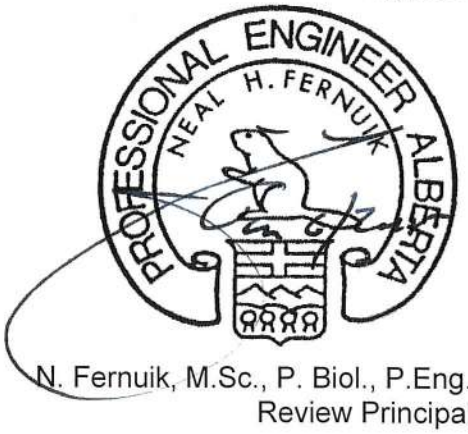
INITIAL PROJECT REVIEW
FORT EDMONTON PARK AREA
UTILITY REPLACEMENT
(BLOCK A PLAN 852 1469)
EDMONTON, ALBERTA

Report
to
Associated Engineering of Alberta Ltd.,
City of Edmonton
&
Fort Edmonton Management Company



M. Halliwell, M. Eng., EP, P.Eng.
Environmental Engineer

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
Signature _____
Date 6/Jan/2015
PERMIT NUMBER: P 5186
The Association of Professional Engineers, Geologists and Geophysicists of Alberta



Date: January 6, 2015
File: 17-123-796A

N. Fernuik, M.Sc., P. Biol., P.Eng.
Review Principal

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thurber.ca

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1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) conducted an Initial Project Review (IPR) as part of the utility replacement and future expansion plans envisaged between 2013 and 2020 in the Fort Edmonton Park Area (FEPA). The work was carried out for Associated Engineering of Alberta Ltd. (AEAL) for submittal to City of Edmonton (CoE) and Fort Edmonton Management Company (FEMCO). The IPR is a process developed by the City of Edmonton Planning and Development Department to conduct environmental reviews of projects involving public development or development of public land within the North Saskatchewan River valley and connected ravines as part of the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP, Bylaw 7188). The draft report was submitted in January 2014 with final comment received in December 2014.

FEPA is a CoE park located in the North Saskatchewan River Valley and consists of Fort Edmonton Park (FEP, a high intensity land use property with up to 83 buildings and exhibit areas), the John Jansen Nature Centre (JJNC), trails, park reserve, and associated parking. FEPA and associated venues are operated year round. FEMCO, as part of the Fort Edmonton Park Master Plan, has expressed plans to further develop the park, thus an IPR was conducted for each of seven projected infrastructure development sites within FEP and the Utility Replacement Project (throughout FEPA) prior to commencing construction activities. This IPR for the Utility Replacement Project was undertaken in 2013 summer-like spring conditions and visual observations of the site were not limited by the presence of snow.

Use of this report is subject to the Statement of Limitations and Conditions, which is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

2. PROJECT RATIONALE

According to the information provided by AEAL, the current water, storm, sanitary, gas and electrical utilities within FEPA were installed in the late 1960's, when the park was constructed. The utilities are rated for the current capacity, but are nearing end of their service life. Utilities are located in generally inaccessible areas such as under streetcar tracks, near historical buildings and in congested areas. Utility replacement is necessary to take the place of current utilities which are nearing the end of their service life and to support the CoE and FEMCO with projected infrastructure development. Utility replacements would be constructed in utility

allowances or utility corridors where maintenance activities would be minimally disruptive to park function.

In addition to the utility replacement, new infrastructure projects are in initial design for seven areas within FEP, as summarized below:

1) New Entrance Building: Located at the front gate, this building would function as a FEP entrance. The new front gate building will be a place to purchase entrance admission and enter FEP, rather than the currently used, modified train station.

2) Realign-Expand Midway: New attractions in the midway would facilitate FEP becoming a premier tourist attraction, including expansion of the midway to create a permanent fair-like atmosphere.

3) Hotel Selkirk Expansion: The existing Hotel Selkirk would be expanded by a recreation of the historic Windsor Block and would assist FEP attracting overnight visitors.

4) New Commercial Block: Located near the Blatchford Field Air Hangar, this project would further highlight business from the 1920's era.

5) Artifact Warehouse Building: This structure would serve as an illustrative warehouse, rather than archive for non accessible material.

6) Indigenous People's Experience: Project would be located near and include Egge's Pond. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.

7) Streetcar Barn Expansion: This project would expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

The approximate locations of planned utility replacement, stormwater treatment structures and new infrastructure projects in FEP are shown on Drawing 17-123-796-E1 in Appendix A.

THURBER

3. PROJECT ALTERNATIVES

Three options were considered by the CoE to address the utility replacement as follows:

1) Do nothing (null option)

   This option (Option 1) involves doing no work on the existing utility infrastructure in FEPA. With new infrastructure projects in the planning stage and the existing utilities at the end of their service life, this option was rejected for two reasons. First, the existing utilities do not have capacity to support the additional planned infrastructure, so upgrades or replacement is required. Second, with the existing utilities reaching the end of their service life, failures necessitating emergency repairs are expected to become more common. As the majority of existing utilities are located under the streetcar tracks, access is impractical during park operating hours.

2) Defer construction to a later date

   This option (Option 2) would leave the existing utilities in place and involve no immediate modifications. With projected future infrastructure development, the existing utilities would not have sufficient capacity and improvements would still be necessary for better fire protection. Additionally, as the existing utilities are reaching the end of their service life, the frequency of incidents requiring repair is anticipated to increase. Given the more inaccessible locations of the existing utilities, such repairs would likely require disruption and/or closure of FEPA features and subsequently diminish the patron's cultural heritage, natural and recreational experiences. Future planning to construct (Option 3) requires utility replacement.

3) Utility replacement

   Option 3 provides better future planning in relation to Options 1 and 2. Option 3 will construct water, sanitary sewer, storm sewer and other utilities lines concurrently in the utility allowance and utility corridors to replace the existing infrastructure and facilitate future maintenance activities. Utility replacement would also facilitate future infrastructure developments, with utility lines installed in to the future building footprint areas. The new infrastructure projects will assist FEPA in maintaining premier cultural, natural and recreational experiences.

4. PROJECT DESCRIPTION

The project work falls within the area covered by the NSRV ARP and all aspects of the project are described as part of the IPR. This IPR only addresses construction associated with utility replacement within FEPA while additional IPRs (issued under separate covers) address the new infrastructure projects planned for FEP.

The FEPA utility replacement consists of replacing existing utility lines to facilitate current and additional operating capacity. Utility trenches will be constructed in utility allowances or utility corridors and would involve several utilities including water, sanitary, storm, power, data and natural gas lines. The utility replacements are to be rated for additional capacity and a service life of approximately 50 years. Phased replacement of the utilities servicing FEPA is anticipated.

Utility replacement in FEPA includes excavation, construction and backfill of new utility lines, construction of stormwater treatment structures near the Selkirk Hotel and FEPA parking lot and abandonment and backfill of previously existing utility lines. The project scope also includes restoring the surface of the construction areas to gravel lanes or landscaping, and re-using soil from the excavation as backfill.

Other projected infrastructure developments, as shown on Drawing 17-123-796-E1 in Appendix A include the following: an Indigenous People's Experience, a new entrance building, realignment and expansion of the midway, an expansion of the Hotel Selkirk, a new commercial block, streetcar barn expansion and an artifact warehouse building.

The project laydown area for job trailers and storage of equipment and materials is unknown at the time of this IPR; however, it is anticipated to be located adjacent to road work areas. Project parking is also unknown at the time of the IPR and is anticipated to take place in the FEPA parking area east of the FEP Main Gate and on roadways adjacent to work areas.

The contractor will likely work a 10 hour shift, but may require longer shifts depending on the schedule and weather conditions. The contractor will comply with the CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

The project construction schedule has not been set; however, initial work such as clearing of trees or brush will be undertaken prior to February 15 in year of construction to avoid potential migratory bird or owl nesting areas, if present. Horizontal directional drilling, a trenchless form of excavating, could be utilized where practical to minimize vegetation loss.

The preceding descriptions for the utility replacement are construction procedures that may differ somewhat from the actual process, as construction commencement dates are not yet determined.

5. PUBLIC PARTICIPATION

It is understood from CoE that utility replacement and future infrastructure construction in FEPA have been under consideration since the spring of 2012 with the intention to carry out utility replacement in phases with completion prior to summer 2017. New infrastructure construction is planned from summer 2017 through to 2020. The envisaged time frames for utility replacement and each of the seven new infrastructure projects are summarized in Table 1 in Appendix B and range from 2017 through to 2020.

Nearby residents along the top of the River Valley and along Whitemud Road will be provided with project information and CoE contact information. Nearby residents will be able to access additional FEPA project details and/or to provide feedback through the CoE contact information.

Thurber recommends an open house or similar public participation so that stakeholders and community members may have input into the proposed changes at FEP. Information gathered at an open house may also be utilized in future Environmental Screening Reports or Environmental Impact Assessments, should the CoE require them.

6. IMPACTS AND MITIGATIVE MEASURES

6.1 Impact Identification

Proposed impacts were identified by consulting the project description and applying professional judgement. Identified potential impacts were then analyzed and classified as significant, insignificant or unknown significance, according to the following definitions:

Insignificant Impact	One that does not affect a population beyond the limits of natural perturbations or does not substantially modify a natural feature known to be significant or does not alter land use.
Significant Impact	One that affects the population beyond the limits of natural perturbations or eliminates a natural feature known to be significant, or alters the land use.

Unknown Significance	Significance could not be determined due to insufficient information regarding project description or existing conditions.

6.2 Biological Environment

The general impacts to the biological environments and the mitigative measures that have been considered by Thurber for the selected alternative include:

- *Disturbances to the natural vegetation that grows, and the wildlife that lives along the North Saskatchewan River Valley slopes*.

  Thurber anticipates that vegetation will have to be removed to install utility trenches and the stormwater treatment structures in areas shown on Drawing 17-123-796-E2 in Appendix A. Pre-existing vegetation is primarily grass areas, with some forested, aquatic and gravel areas.

  Disturbance of currently intact vegetation should be minimized to retain the ecological integrity of the park. Wildlife access to FEP is restricted by fences on the east, south and west sides, and the North Saskatchewan River to the north, otherwise the rest of FEPA has no impediment to wildlife. In forested areas, trenchless horizontal directional drilling installation techniques should be considered. Care in operating equipment on respective lay-down areas is required. Use of roadways as travel routes and laydown areas will also minimize the need to clear or damage trees, particularly prominent and aesthetically valuable trees that have been growing on non-travelled, landscaped portions of FEPA for many years. Low-ground pressure, tracked or rubber tired vehicles should be utilized where possible to minimize soil rutting.

  Disturbed ground should be reclaimed upon completion of construction activities, after which these areas should be either a) gravel or dirt surfaced for roadway use or b) reseeded and/or sodded with grass and, where appropriate, planted with woody landscape species to restore the landscaped and equipment lay-down areas to their intended uses within FEPA.

  The NSRV and Whitemud Ravine support a variety of wildlife that have adapted to life within an urban green-space. A search of the Alberta Environment & Sustainable Resource Development (ESRD) Fish and Wildlife Management Information System

(FWMIS) on-line data base[1] for FEPA identified numerous species of importance in the area. FEPA falls within the range of the Sharp-tailed Grouse (*Pedioecetes phasianellus*, which is a classified as a sensitive species in the *General Status of Alberta Wild Species)*, Short-Eared Owl (*Asio flammeus,* may be at risk species), and Peregrine Falcon (*Falco peregrines,* at risk species*).* The federal Species at Risk Act (SARA)[2] notes peregrine falcons, Yellow Rail, and Monarch butterflies are species that are either threatened or of special concern and may be present in the Edmonton area.

Fish species identified in Whitemud Creek, located approximately 700 m east of FEPA, the North Saskatchewan River approximately 50 m north of FEPA and Egge's pond, located within FEP include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), Lake Chub (*Couesius plumbeus*), Longnose Dace (*Rhinichthys cataractae*), Longnose Sucker (*Catostomus catostomus*), Northern Pike (*Esox lucius*), and White Sucker (*Catostomus commersonii*).

As the North Saskatchewan River is located approximately 40 m north of the service road, 35 m north of the proposed stormwater treatment structures and downslope of the utility replacement area, surface water runoff controls and the use of silt fencing is recommended to prevent silting of the river. Surface water runoff controls are likely not required for Whitemud Creek as surface drainage in the western portion FEPA was observed as northward toward North Saskatchewan River, and toward municipal storm system catch basins in the eastern portion of FEPA.

Given the urban location, recreational use of FEPA and the surrounding trails and majority fenced perimeter, disruption to local wildlife is anticipated to be insignificant and of short duration. Due to the potential presence of owls and migratory birds, vegetation removal prior to nesting season (February 15 – August 31 for owls, after April 15 for migratory birds) would be possible with careful planning under the proposed project timeline. CoE/FEMCO will need to have a qualified biologist or wildlife specialist assess the area of proposed vegetation removal for nests prior to clearing taking place.

The project laydown area(s) for job trailers and storage of equipment and materials is of unknown significance as the location(s) is (are) unknown at the time of IPR. The anticipated laydown areas would include road allowances adjacent to utility trench construction areas and existing open field areas. However; disruptions associated with

[1] Alberta Environment & Sustainable Resource Development Fish and Wildlife Management Information System (FWMIS). 2013. FWMIS Internet Mapping tool (Accessible at http://srd.alberta.ca/FishWildlife/FWMIS/AccessFWMISData.aspx)

[2] Government of Canada. 2003. "Species at Risk Act. Schedule 1 – List of Wildlife Species at Risk".

the project laydown area(s) is (are) anticipated to be insignificant and disturbed areas can be readily restored to previous surface – grass or gravel. Project parking is anticipated to take place in the west portion of the FEPA parking lot. The locations of the laydown and parking areas have not been finalized as of the date of this report.

- *Disturbances to fish habitat in the North Saskatchewan River and Egge's Pond.*

  Thurber anticipates that existing fish habitat in the North Saskatchewan River will be insignificant, and not be disturbed as the nearest utility related construction is adjacent to the northern FEPA boundary and approximately 35 m south of the North Saskatchewan River. Protection of natural drainage pathways in and adjacent to the work area is recommended to minimize the potential for silt or debris from the project to enter the North Saskatchewan River.

  If the stormwater treatment structure construction areas fall within the 1:100 year flood plain of the North Saskatchewan River, CoE may require additional assessment, such as an Environmental Screening Report or Environmental Impact Assessment.

  Utility installation near the proposed Indigenous People's Experience has the potential for significant impact to fish habitat. If horizontal directional drilling (recommended) is employed for utility installation, the impacts are anticipated to be insignificant. If trenching is required, there is the potential requirement for draining or partial draining of Egge's Pond. CoE / FEMCO will need to have a qualified biologist or fish specialist assess the area of proposed fish habitat disruption and alternative actions prior to trench excavation.

6.3 Physical Environment

General impacts to the physical environment and the mitigative measures that have been considered by Thurber for the chosen alternative include:

- *The detractive results of the construction activities in parkland*.

  Thurber recognizes that noise, dust and mists that may be generated will negatively impact local vegetation and wildlife during utility construction. Impacts from these sources are anticipated to be insignificant and of short duration.

- *Navigable Waters Protection Act and work scope for Egge's Pond within the Fort Edmonton Park.*

Egge's Pond, located within FEP, is less than 5 ha size, and as per Canada's Navigable Waters Protection Act (NWPA) Notification would not be required as:

- The property surrounding the pond is owned by CoE.
- Navigable waters do not enter or exit the pond.
- Public access to Egge's Pond is limited and has been since late 1960s when FEP opened.
- There are no easements that allow public access to Egge's Pond.

Minor Works and Waters Order – Section 13, exempts Egge's Pond from Section 5 applications of the NWPA.

Based on this information, the impacts to navigable waters associated with the utility replacement are anticipated to be insignificant.

- *The potential for pedestrians and cyclists to be exposed to construction hazards when using the nearby paved trail.*

  Pedestrians and cyclists may be exposed to elevated noise and dust levels; however, given the separation between the work area and existing paved and multi-use trails, the impact is anticipated to be insignificant.

- *Grade Changes.*

  Although earthworks are planned under this alternative, the intent is to complete construction activities and generally restore the surface to pre-construction status. Access to construction areas will be restricted to authorized personnel for the duration of utility replacement activities in FEPA. Grade changes are expected to be insignificant.

- *Impact on Fort Edmonton Park Area Users.*

  Impacts to guests in FEPA are of unknown significance and dependent on the construction schedule. Mitigation measures for potentially significant impacts would be to plan construction activities during seasons of reduced traffic (spring, fall or winter). If summer construction is necessary, conducting excavation and construction activities requiring machinery during park minimal use times would mitigate user impacts as well as limiting access to construction areas.

- *Historical Resources.*

  An archaeological assessment was not undertaken for FEPA. However, a review of Alberta Culture's *Listing of Historical Resources* identifies the work area as "believed to contain a historical resource" of a palaeontological nature. Consequently, impacts to historical resources are of unknown significance. Prior to construction activities in the park, a clearance from Alberta Culture will be required. If historical resources or archaeological artifacts are encountered during the work, the earthworks contractor must inform Alberta Culture and follow their direction for handling the discovery.

- *Environmental Impacts.*

  Impacts to the environment from the utility replacement are dependent on construction activities and are of unknown significance. In order to minimize potential environmental impacts (i.e. contamination or erosion) within the projected area, the contractor shall accept and incorporate CoE Environmental Policy C512, the CoE Contractor's Environmental Responsibility Package and the CoE Contractor's Release Reporting requirements into their work practices. The contractor shall also prepare an Environmental Construction Operations (ECO) Plan and implement practices consistent with the CoE *Erosion and Sedimentation Guidelines and Field Manual*.

6.4 Community Impacts

General impacts to the community and the socio-economic environment as well as the mitigative measures that have been considered by Thurber for the alternative chosen include:

- *The daily construction noise that could disturb local residents.*

  Noise impacts should be insignificant in relation to the nearby major arterial roadway within the City of Edmonton and located at the level of nearby homes. As a minimum, the project will comply with CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

- *Accessibility to the Fort Edmonton Park Area.*

  FEPA accessibility during construction is significantly dependent upon scheduling and utility replacement staging. As these aspects of the construction activities have not been finalized, the impacts are currently unknown. With care in planning the construction schedule and limiting activities which may impede park access, the

impacts to FEPA accessibility are anticipated to be insignificant. However; if the utility replacement in the parking area is carried out in its entirety without staging, the impacts to accessibility to FEPA will be significant.

- *Accessibility to the North Saskatchewan River Valley trail system.*

  It is expected that vehicular access to FEP and JJNC will be maintained for the duration of the construction activities. However, it is unclear whether utility replacement in the FEPA parking area will be staged or carried out all at once. If carried out in stages, the impacts are anticipated to be insignificant and consist of additional traffic volume and potentially extended distances between the parking area and the trail system associated with the construction activities. If the utility replacement in the FEPA parking area is not staged, but is carried out all at once, then the disruption from the construction activities will be significant.

- *Project parking and lay down area.*

  It is anticipated that an area adjacent to roadways or in open fields will be utilized as a project laydown area. Project parking is anticipated to take place in the existing FEPA parking lot unless the entire parking lot utility work is carried out at one time. The location of the laydown area, parking areas and project staging has not been finalized as of the date of this report, and is of unknown significance.

7. CONCLUSIONS AND RECOMMENDATIONS

Table 1 in Appendix B summarizes the Biological, Physical and Community impacts for each of the seven areas and the utility replacements assessed within the Fort Edmonton Park Area and Fort Edmonton Park venue. The assessment was based on insignificant impact, significant impact or unknown significance. The Utility Replacement Project has the potential for significant impacts at Egge's Pond and the FEPA parking area. Based on the information cited in this IPR, it is Thurber's opinion that project impacts will be necessary to facilitate future development. As such, additional work, such as an Environmental Screening Report (ESR) or an Environmental Impact Assessent (EIA) may be required for the Utility Replacement Project. The services of a qualified biologist or wildlife/fisheries specialist will be required to assess areas of proposed tree and shrub removal prior to clearing due to possible owl or migratory bird nesting. Similarly, CoE FEMCO will need to have a qualified biologist or fish specialist assess the area near Egge's Pond due to possible fish habitat and aquatic vegetation disruption and alternative actions prior to trench excavating (if used).

THURBER

STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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APPENDIX A

Drawings

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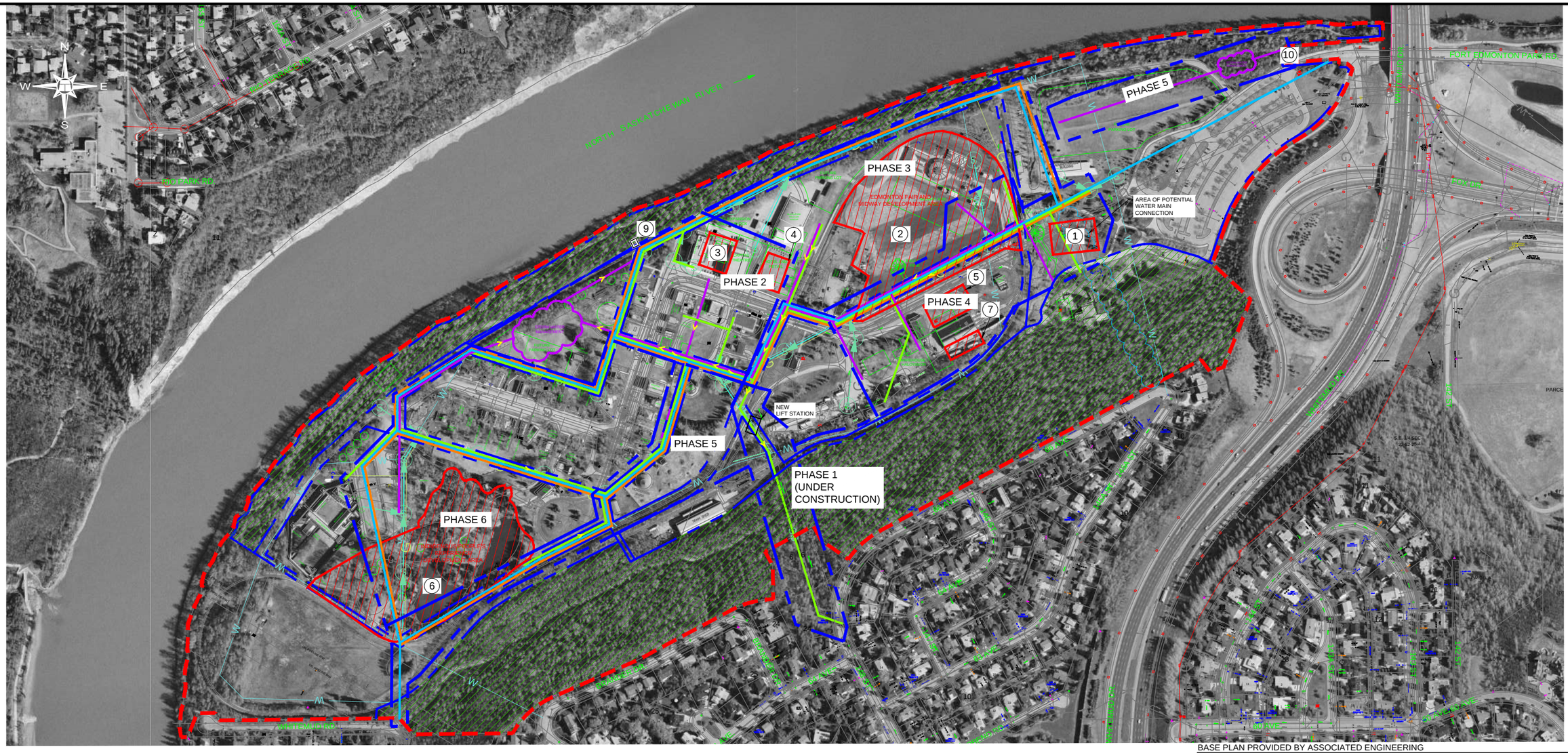

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

LEGEND:

- PROPOSED WATERMAINS
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED GAS LINE
- PHASE BOUNDARY
- PROJECT SITE BOUNDARY
- ENVIRONMENTAL RESERVE

1	NEW ENTRANCE BUILDING AT FRONT GATE	6	INDIGENOUS PEOPLE'S EXPERIENCE
2	REALIGN - EXPAND MIDWAY	7	STREETCAR BARN EXPANSION
3	HOTEL SELKIRK EXPANSION	8	UTILITY REPLACEMENT
4	NEW COMMERCIAL BLOCK	9 10	STORMWATER TREATMENT STRUCTURE
5	ARTIFACT WAREHOUSE BUILDING		

0 50 100 150 200 250 300m

SCALE 1:5000

Associated Engineering

FORT EDMONTON PARK ENVIRONMENTAL ASSESSMENT

PROPOSED DEVELOPMENTS

DWG No. 17-123-796-E1

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

THURBER ENGINEERING LTD.

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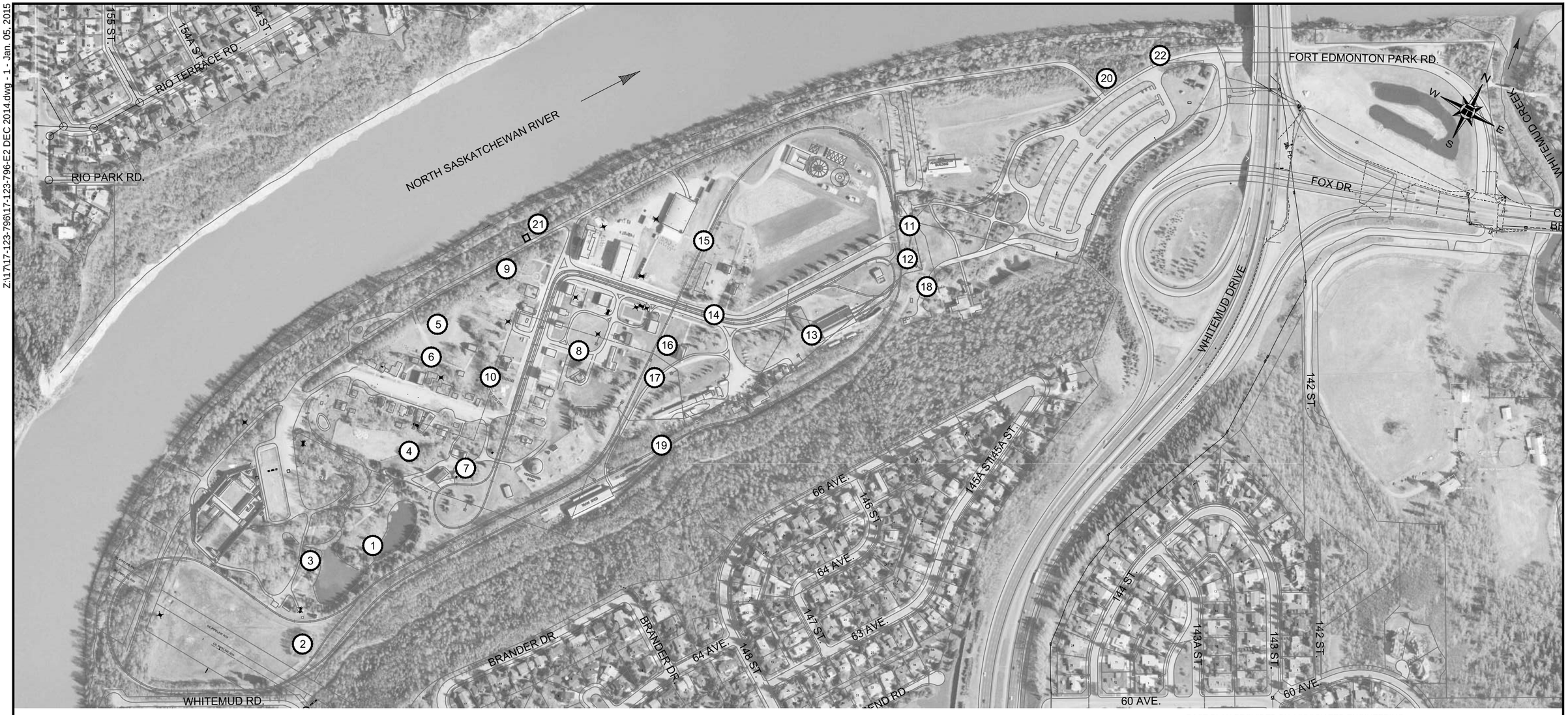

LEGEND

(1) LOCATION OF TREE REMOVAL (SEE REPORT TEXT FOR DETAILS)

0 50 100 150 200 250 300m

SCALE 1:5000

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

Associated Engineering

FORT EDMONTON PARK
ENVIRONMENTAL ASSESSMENT

SITE PLAN SHOWING AREAS OF TREE REMOVAL

DWG No. 17-123-796-E2

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

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THURBER

APPENDIX B

Table

THURBER

TABLE 1
INITIAL PROJECT REVIEW – FORT EDMONTON PARK AREA UTILITY REPLACEMENT & PROPOSED CONSTRUCTION

	BIOLOGICAL						PHYSICAL										COMMUNITY			
	VEGETATION		WILDLIFE[2]		FISH		CONSTRUCTION / GRADE CHANGES		PEDESTRIANS / CYCLISTS/TRAIL USERS		NAV WATERS			HISTORICAL[4]	ENVIRONMENTAL[5]	IMPACTS TO PARK USERS	NOISE[3]	ACCESS		PARKING /LAYDOWN
LOCATION	II	SI	II	SI	II	SI	II[3]	SI	II	SI	NA	II	SI	US	US	US	II	II	US	US
1. New Entrance Building Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
2. Realign-Expand Midway Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
3. Hotel Selkirk Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
4. New Commercial Block Time Frame - 2020	X		X		X		X		X		X			X	X	X	X	X		X
5. Artifact Warehouse Building Time Frame – 2020	X		X		X		X		X		X			X	X	X	X	X		X
6. Indigenous People's Experience Time Frame – 2017		X		X		X		X	X			X		X	X	X	X	X		X
7. Streetcar Barn Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
8. Utility Replacement Time Frame - 2017	X	X[1]	X	X[1]	X[6]	X[6]	X		X		X			X	X	X	X		X	X

Note:
1. Storm water pond
2. Need to address migratory bird act and bird nest survey for trees to be removed. Also City of Edmonton tree compensation.
3. Follow City of Edmonton noise and dust bylaws
4. Historical Resources Overview to be conducted to ascertain significance
5. Use of Environmental Construction Operations (ECO) Plan to mitigate.
6. Depending on installation method selected – Horizontal direction drilling (II) vs. trench excavation (SI)

NA Not Applicable
II Insignificant Impact
SI Significant Impact
US Unknown Significance

THURBER ENGINEERING LTD.

INITIAL PROJECT REVIEW
FORT EDMONTON PARK
NEW ENTRANCE BUILDING
(BLOCK A PLAN 852 1469)
EDMONTON, ALBERTA

Report

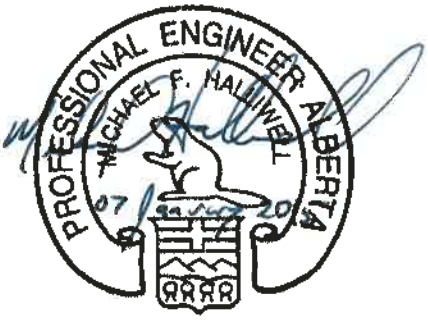
to

Associated Engineering of Alberta Ltd.

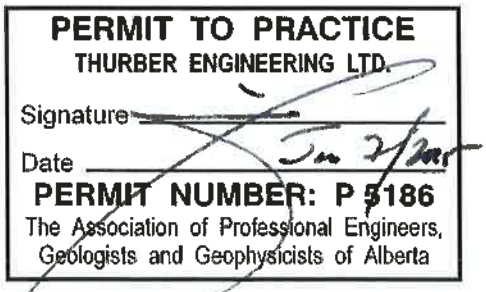
City of Edmonton

and

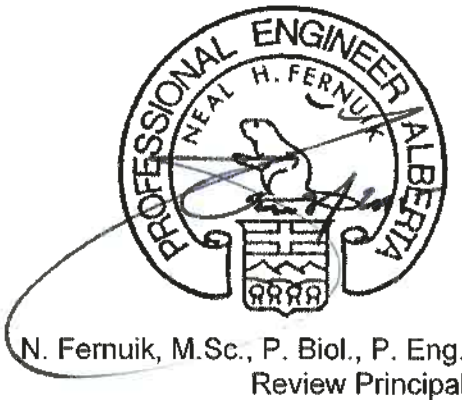
Fort Edmonton Management Company



M. Halliwell, M. Eng., EP, P. Eng.
Environmental Engineer



Date: January 7, 2015
File: 17-123-796C



N. Fernuik, M.Sc., P. Biol., P. Eng.
Review Principal

THURBER

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THURBER

1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) conducted an Initial Project Review (IPR) as part of the utility replacement and future expansion plans envisaged between 2013 and 2020 in the Fort Edmonton Park Area (FEPA). The work was carried out for Associated Engineering of Alberta Ltd. (AEAL) for submittal to City of Edmonton (CoE) and Fort Edmonton Management Company (FEMCO). The IPR is a process developed by the City of Edmonton Planning and Development Department to conduct environmental reviews of projects involving public development or development of public land within the North Saskatchewan River valley and connected ravines as part of the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP, Bylaw 7188). The draft report was submitted in January 2014 with final comment received in December 2014.

FEPA is a CoE park located in the North Saskatchewan River Valley and consists of Fort Edmonton Park (FEP, a high intensity land use property with up to 83 buildings and exhibit areas), the John Jansen Nature Centre (JJNC), trails, park reserve, and associated parking. FEPA and associated venues are operated year round. FEMCO, as part of the Fort Edmonton Park Master Plan, has expressed plans to further develop the park, thus an IPR was conducted for each of seven projected infrastructure development sites within FEP and the Utility Replacement Project (throughout FEPA) prior to commencing construction activities. This IPR, for the New Entrance Building at FEP, was undertaken in 2013 summer-like spring conditions and visual observations of the site were not limited by the presence of snow.

Use of this report is subject to the Statement of Limitations and Conditions, which is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

2. PROJECT RATIONALE

According to the information provided by AEAL, there are seven new infrastructure projects in the initial design phase, as summarized below:

1) New Entrance Building: Located at the front gate, this building would function as a FEP entrance. The new front gate building will be a place to purchase entrance admission and enter FEP, rather than the currently used, modified train station.

2) Realign-Expand Midway: New attractions in the midway would facilitate FEP becoming a premier tourist attraction, including expansion of the midway to create a permanent fair-like atmosphere.

3) Hotel Selkirk Expansion: The existing Hotel Selkirk would be expanded by a recreation of the historic Windsor Block and would assist FEP attracting overnight visitors.

4) New Commercial Block: Located near the Blatchford Field Air Hangar, this project would further highlight business from the 1920's era.

5) Artifact Warehouse Building: This structure would serve as an illustrative warehouse, rather than archive for non accessible material.

6) Indigenous People's Experience: Project would be located near and include Egge's Pond. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.

7) Streetcar Barn Expansion: This project would expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

The approximate locations of planned utility replacement and new infrastructure projects in FEP are shown on Drawing 17-123-796-E1 in Appendix A.

3. PROJECT ALTERNATIVES

Three options were considered by FEMCO to address the construction of the New Entrance Building as follows:

1) Do nothing (null option)

   This option (Option 1) involves doing no work for the New Entrance Building at FEP. Although a viable option, this option was not selected as it does not assist FEMCO in maintaining a premier cultural heritage experience. The existing entrance is also reaching its visitor capacity as FEP annual attendance continues to increase, in spite of moving many administrative offices to an adjacent building.

2) Defer construction to a later date

   This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other

planned new infrastructure projects and would increase the disruption to FEP operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist FEMCO in maintaining a premier cultural heritage experience and does nothing to relieve the issues associated with moving more and more visitors in and out of FEP.

3) New Entrance Building development in conjunction with other new infrastructure projects

Option 3 assists FEMCO in addressing the bottleneck imposed by the limited space within the existing entrance building. It will also permit additional historical displays and additional refuge from inclement weather while waiting for the steam-locomotive that provides transportation to The Fort in the far west portion of FEP. Additionally, this option permits a minimization of disruption to FEP operations and permits cost savings by coordinating the construction of the New Entrance Building with the construction of an Indigenous People's Experience, realignment and expansion of the midway, a new hotel, a new commercial block, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities.

4. PROJECT DESCRIPTION

The project work falls within the area covered by the NSRV ARP and all aspects of the project are described as part of the IPR. This IPR addresses construction associated with the New Entrance Building project within FEP while additional IPRs (issued under separate covers) address the other new infrastructure projects planned for FEP and utility replacement within FEPA.

The New Entrance Building is to be constructed south of the existing entrance building and train station. The New Entrance Building will be connected to the existing entrance building by a 15 metre circular interlocking block plaza and will include ticket booths, public washrooms, a gift shop, storage spaces, staff spaces and a lobby.

The single storey New Entrance Building will be constructed on a 740 m^2 site and have approximately 185 m^2 in new floor space. No basement is planned and the building will utilize piles and slab on grade construction. Changes to existing walkways, new walkway construction and landscaping will also be required.

Projected infrastructure developments, as shown on Drawing 17-123-796-E1 in Appendix A include the following: an Indigenous People's Experience, realigning and expanding the midway, an expansion of the Hotel Selkirk, a new commercial block near the hangar, an

artifact warehouse building near the streetcar barn, streetcar barn expansion and utility replacement throughout FEPA.

The project laydown area for job trailers and storage of equipment and materials is unknown at the time of this IPR, but is anticipated to be in parking areas located adjacent to the existing entrance. Project parking is also unknown at the time of IPR, and anticipated to take place in the FEPA parking area east of the existing FEP main gate, and on roadways in proximity to the work area.

The contractor will likely work a 10 hour shift, but may require longer shifts depending on the schedule and weather conditions. The contractor will comply with the City of Edmonton Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

The project construction schedule has not been set; however, initial work such as clearing of trees or brush (minor possible at Locations 11, 12 and 18, as shown on Drawing 17-123-796-E2) will be undertaken prior to February 15 in year of construction to avoid potential migratory bird or owl nesting areas, if present.

The preceding descriptions for the New Entrance Building are construction procedures that may differ somewhat from the actual process, as construction commencement dates are not yet determined.

5. PUBLIC PARTICIPATION

It is understood from FEMCO that future infrastructure construction, including the New Entrance Building, have been under consideration since the spring of 2012 and the intention is to carry out New Entrance Building construction in 2017. The envisaged time frames for each of the seven areas and the utility replacements are summarized in Table 1 in Appendix B and range from 2017 through to 2020.

Nearby residents along the top of the River Valley and along Whitemud Road will be provided with project information and CoE contact information. Nearby residents will be able to access additional FEPA project details and/or to provide feedback through the CoE contact information.

Thurber recommends an open house or similar public participation so that stakeholders and community members may have input into the proposed changes at FEP. Information gathered at an open house may also be utilized in future Environmental Screening Reports or Environmental Impact Assessments, should the CoE require them.

6. IMPACTS AND MITIGATIVE MEASURES

6.1 Impact Identification

Proposed impacts were identified by consulting the project description and applying professional judgement. Identified potential impacts were then analyzed and classified as significant, insignificant or unknown significance, according to the following definitions:

Insignificant Impact	One that does not affect a population beyond the limits of natural perturbations or does not substantially modify a natural feature known to be significant or does not alter land use.
Significant Impact	One that affects the population beyond the limits of natural perturbations or eliminates a natural feature known to be significant, or alters the land use.
Unknown Significance	Significance could not be determined due to insufficient information regarding project description or existing conditions.

6.2 Biological Environment

The general impacts to the biological environments and the mitigative measures that have been considered by Thurber for the selected alternative include:

- *Disturbances to the natural vegetation that grows, and the wildlife that lives along the North Saskatchewan River Valley slopes*.

  Thurber anticipates that natural vegetation will not have to be removed for New Entrance Building construction. Pre-existing vegetation is primarily grass areas, with some sparse decorative trees and shrubs. Vegetation removal is considered insignificant as these areas have been previously disturbed and landscaped.

  Disturbance of currently intact vegetation should be minimized to retain the ecological integrity of the park. Wildlife access to FEP is restricted by fences on the east, south and west sides, and the North Saskatchewan River to the north, otherwise the rest of FEPA has no impediment to wildlife. Areas immediately east of the existing entrance consist of grass covered landscaped areas and asphalt paved parking, providing minimal wildlife habitat. Care in operating equipment on respective lay-down areas is required. Use of roadways as travel routes and laydown areas will also minimize the need to clear or

damage trees, particularly prominent and aesthetically valuable trees that have been growing on non-travelled, landscaped portions of FEP for many years. Low-ground pressure, tracked or rubber tired vehicles should be utilized where possible to minimize soil rutting.

Disturbed ground should be reclaimed upon completion of construction activities, after which these areas should be reseeded and/or sodded with grass and, where appropriate, planted with woody landscape species to restore the landscape and equipment lay-down area to its previous use within FEP.

The NSRV and Whitemud Ravine support a variety of wildlife that have adapted to life within an urban green-space. A search of the Alberta Environment & Sustainable Resource Development (ESRD) Fish and Wildlife Management Information System (FWMIS) on-line data base[1] for FEPA identified numerous species of importance in the area. FEPA falls within the range of the Sharp-tailed Grouse (*Pedioecetes phasianellus*, which is a classified as a sensitive species in the *General Status of Alberta Wild Species)*, Short-Eared Owl (*Asio flammeus,* may be at risk species), and Peregrine Falcon (*Falco peregrines,* at risk species*).* The federal Species at Risk Act (SARA)[2] notes peregrine falcons, Yellow Rail, and Monarch butterflies are species that are either threatened or of special concern and may be present in the Edmonton area.

Fish species identified in Whitemud Creek, located approximately 700 m east of FEPA, the North Saskatchewan River approximately 50 m north of FEP and Egge's Pond, located within FEP include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), Lake Chub (*Couesius plumbeus*), Longnose Dace (*Rhinichthys cataractae*), Longnose Sucker (*Catostomus catostomus*), Northern Pike (*Esox lucius*), and White Sucker (*Catostomus commersonii*).

As the North Saskatchewan River is located approximately 40 m north of the service road and approximately 200 m downslope of the New Entrance Building construction area, surface water runoff controls and the use of silt fencing are recommended to prevent silting of the river. Surface water runoff controls are likely not required for Whitemud Creek as surface drainage in the western portion of FEPA was observed as north toward North Saskatchewan River, and to municipal storm system in the eastern portion of FEPA.

[1] Alberta Environment & Sustainable Resource Development Fish and Wildlife Management Information System (FWMIS). 2013. FWMIS Internet Mapping tool (Accessible at http://srd.alberta.ca/FishWildlife/FWMIS/AccessFWMISData.aspx)

[2] Government of Canada. 2003. "Species at Risk Act. Schedule 1 – List of Wildlife Species at Risk".

Given the urban location, recreational use of FEPA and the surrounding trails and majority fenced perimeter, disruption to local wildlife is anticipated to be insignificant and of short duration. Due to the potential presence of owls, tree removal prior to nesting season (February 15 – August 31 for owls, after April 15 for migratory birds) would be possible with careful planning under the proposed project timeline. CoE / FEMCO will need to have a qualified biologist or wildlife specialist assess the area of proposed tree removal for nests prior to clearing taking place.

The project laydown area for job trailers and storage of equipment and materials is of unknown significance as the location is unknown at the time of IPR. The anticipated laydown areas would include road allowances and parking areas adjacent to construction areas. However, disruptions associated with the project laydown area is anticipated to be insignificant and disturbed areas can be readily restored to previous surface – grass or gravel. Project parking is anticipated to take place in the west portion of the FEPA parking lot. The locations of the laydown and parking areas have not been finalized as of the date of this report.

- *Disturbances to fish habitat in the North Saskatchewan River and Egge's Pond.*

  Thurber anticipates impacts to existing fish habitat in the North Saskatchewan River will be insignificant and not directly disturbed as the nearest New Entrance Building construction is approximately 200 m south of the nearest approach of the river. However, protection of natural drainage pathways in and adjacent to the work area is recommended to minimize the potential for silt or debris from the project to enter the North Saskatchewan River.

  Construction of the New Entrance Building is not anticipated to have an impact on Egge's Pond, which is located approximately 700 m to the west.

6.3 Physical Environment

General impacts to the physical environment and the mitigative measures that have been considered by Thurber for the chosen alternative include:

- *The detractive results of the construction activities in parkland*.

  Thurber recognizes that noise, dust and mists that may be generated will negatively impact local vegetation and wildlife during utility construction. Impacts from these sources are anticipated to be insignificant and of short duration. Permanent infrastructure buildings will alter primarily grassed landscaped areas.

- *The potential for pedestrians and cyclists to be exposed to construction hazards when using the nearby paved trail.*

  Pedestrians and cyclists may be exposed to elevated noise and dust levels; however, given the separation between the work area and existing paved and multi-use trails, the impact is anticipated to be insignificant.

- *Grade Changes*

  Although earthworks are planned under this alternative, the intent is to complete construction activities and generally restore the surface to pre-construction status. Access to construction areas will be restricted to authorized personnel for the duration of new infrastructure construction activities in FEP. Grade changes are expected to be insignificant.

- *Impact on Fort Edmonton Park Users*

  Impacts to guests in FEP are of unknown significance and dependent on the construction schedule. Mitigation measures for potentially significant impacts would be to plan construction activities during seasons of reduced traffic (spring, fall or winter). If summer construction is necessary, conducting excavation and construction activities requiring machinery during Park minimal use times would mitigate user impacts as well as limiting access to construction areas.

- *Historical Resources*

  An archaeological assessment was not undertaken for FEP. However, a review of Alberta Culture's *Listing of Historical Resources* identifies the work area as "believed to contain a historical resource" of a palaeontological nature. Consequently, impacts to historical resources are of unknown significance. Prior to construction activities in the park, a clearance from Alberta Culture will be required. If historical resources or archaeological artifacts are encountered during the work, the earthworks contractor must inform Alberta Culture and follow their direction for handling the discovery.

- *Environmental Impacts*

  Impacts to the environment from the New Entrance Building construction are dependent on construction activities and are of unknown significance. In order to minimize potential environmental impacts (i.e. contamination or erosion) within the projected area, the contractor shall accept and incorporate CoE Environmental Policy C512, the CoE Contractor's Environmental Responsibility Package and the CoE Contractor's Release Reporting requirements into their work practices. The contractor shall also prepare an Environmental Construction Operations (ECO) Plan and implement practices consistent with the CoE *Erosion and Sedimentation Guidelines and Field Manual*.

- *Navigable Waters*

  The New Entrance Building project does not involve impacts to navigable waters.

6.4 Community Impacts

General impacts to the community and the socio-economic environment as well as the mitigative measures that have been considered by Thurber for the alternative chosen include:

- *The daily construction noise that could disturb local residents.*

  Noise impacts should be insignificant in relation to the nearby major arterial roadway within the CoE and located at the level of nearby homes. As a minimum, the project will comply with CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

- *Accessibility to Fort Edmonton Park.*

  Fort Edmonton Park visitors are dependent upon park schedule. FEP is open to the general public from the May long weekend through to Labour Day weekend in September. FEP accessibility during construction is significantly dependent upon scheduling. With care in planning the construction schedule and limiting activities which may impede park access, the impacts to FEP accessibility are anticipated to be insignificant.

- *Accessibility to the North Saskatchewan River Valley trail system.*

  It is expected that vehicular access to FEP, JJNC and the general park users parking area will be maintained for the duration of the construction activities. Other than additional traffic volume and potentially extended distances between the parking area and the trail system associated with the construction activities, additional disruption will be insignificant.

- *Project parking and lay down area.*

  It is anticipated that an existing parking area or areas adjacent to existing roadways will be utilized as a project laydown area. Project parking is anticipated to take place in the existing FEPA parking lot. The location of the laydown area has not been finalized as of the date of this report, and is of unknown significance.

7. CONCLUSIONS AND RECOMMENDATIONS

Table 1 in Appendix B summarizes the Biological, Physical and Community impacts for each of the seven areas and the utility replacements assessed within the Fort Edmonton Park Area and Fort Edmonton Park. The assessment was based on insignificant impact, significant impact or unknown significance. In general, the construction of the New Entrance Building will have insignificant impacts with the exception of parking/laydown impacts, historical impacts and certain possible environmental impacts, for which the New Entrance Building will have an unknown impact. Based on the information cited in this IPR, it is Thurber's opinion that project impacts will be necessary to facilitate future development. As such, additional work, such as an Environmental Screening Report (ESR) or an Environmental Impact Assessment (EIA) may be required for the New Entrance Building. The services of a qualified biologist or wildlife specialist will be required to assess potential tree and shrub removal prior to clearing due to possible owl or migratory bird nesting in the area.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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APPENDIX A

Drawings

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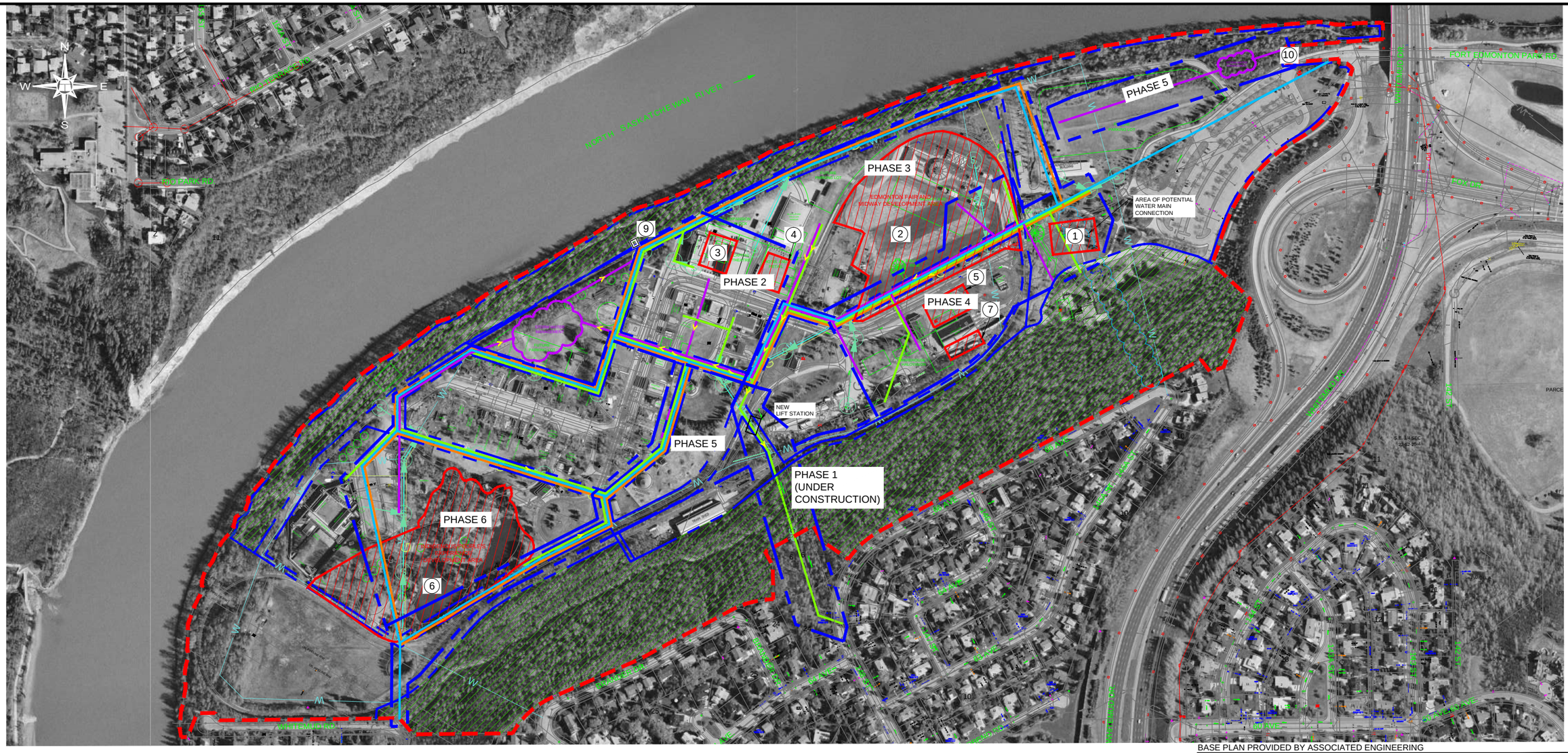

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

LEGEND:

- PROPOSED WATERMAINS
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED GAS LINE
- PHASE BOUNDARY
- PROJECT SITE BOUNDARY
- ENVIRONMENTAL RESERVE

1	NEW ENTRANCE BUILDING AT FRONT GATE	6	INDIGENOUS PEOPLE'S EXPERIENCE
2	REALIGN - EXPAND MIDWAY	7	STREETCAR BARN EXPANSION
3	HOTEL SELKIRK EXPANSION	8	UTILITY REPLACEMENT
4	NEW COMMERCIAL BLOCK	9 10	STORMWATER TREATMENT STRUCTURE
5	ARTIFACT WAREHOUSE BUILDING		

0 50 100 150 200 250 300m

SCALE 1:5000

Associated Engineering

FORT EDMONTON PARK ENVIRONMENTAL ASSESSMENT

PROPOSED DEVELOPMENTS

DWG No. 17-123-796-E1

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

THURBER ENGINEERING LTD.

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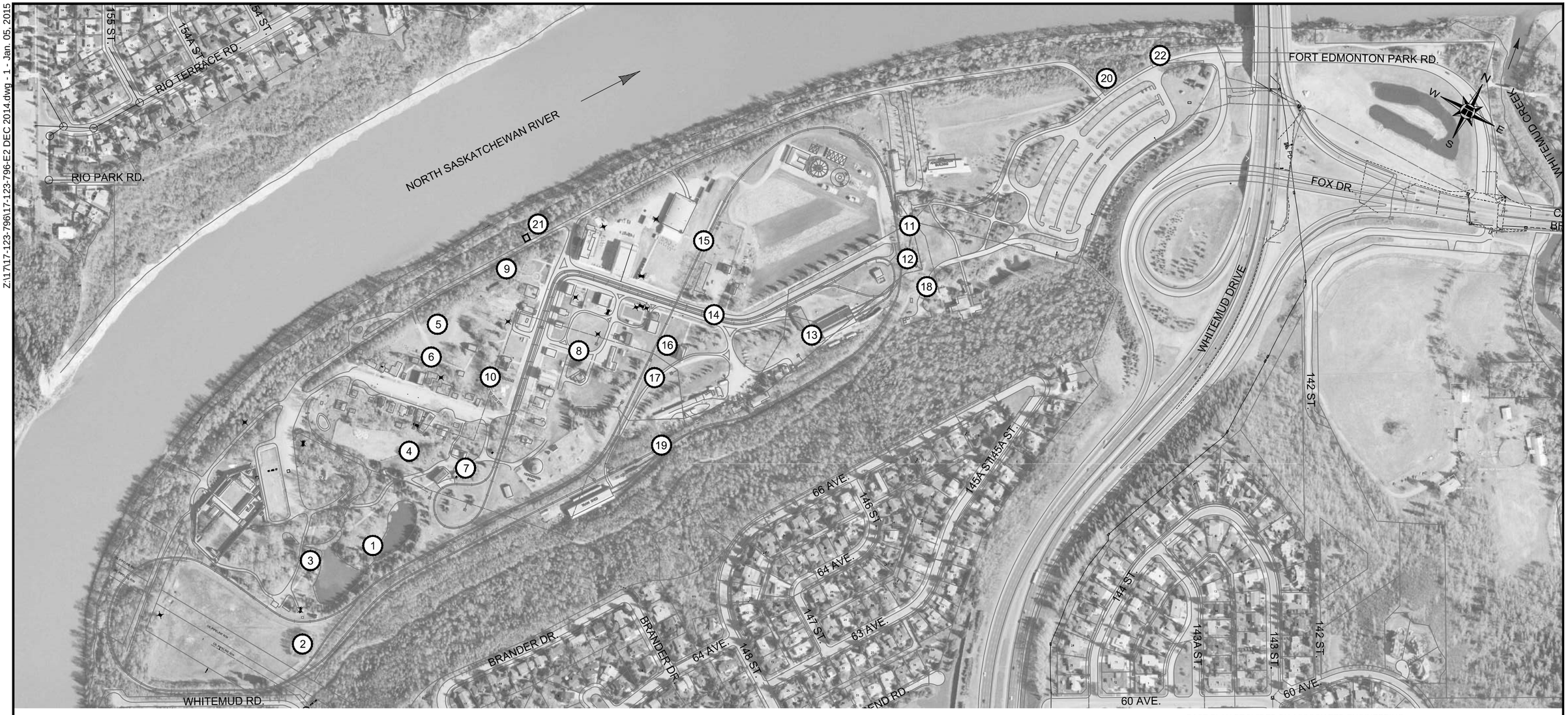

LEGEND

(1) LOCATION OF TREE REMOVAL (SEE REPORT TEXT FOR DETAILS)

0 50 100 150 200 250 300m

SCALE 1:5000

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

Associated Engineering

FORT EDMONTON PARK
ENVIRONMENTAL ASSESSMENT

SITE PLAN SHOWING AREAS OF TREE REMOVAL

DWG No. 17-123-796-E2

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

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APPENDIX B

Table

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TABLE 1
INITIAL PROJECT REVIEW – FORT EDMONTON PARK AREA UTILITY REPLACEMENT & PROPOSED CONSTRUCTION

	BIOLOGICAL						PHYSICAL										COMMUNITY			
	VEGETATION		WILDLIFE[2]		FISH		CONSTRUCTION / GRADE CHANGES		PEDESTRIANS / CYCLISTS/TRAIL USERS		NAV WATERS			HISTORICAL[4]	ENVIRONMENTAL[5]	IMPACTS TO PARK USERS	NOISE[3]	ACCESS		PARKING /LAYDOWN
LOCATION	II	SI	II	SI	II	SI	II[3]	SI	II	SI	NA	II	SI	US	US	US	II	II	US	US
1. New Entrance Building Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
2. Realign-Expand Midway Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
3. Hotel Selkirk Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
4. New Commercial Block Time Frame - 2020	X		X		X		X		X		X			X	X	X	X	X		X
5. Artifact Warehouse Building Time Frame – 2020	X		X		X		X		X		X			X	X	X	X	X		X
6. Indigenous People's Experience Time Frame – 2017		X		X		X		X	X			X		X	X	X	X	X		X
7. Streetcar Barn Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
8. Utility Replacement Time Frame - 2017	X	X[1]	X	X[1]	X[6]	X[6]	X		X		X			X	X	X	X		X	X

Note:
1. Storm water pond
2. Need to address migratory bird act and bird nest survey for trees to be removed. Also City of Edmonton tree compensation.
3. Follow City of Edmonton noise and dust bylaws
4. Historical Resources Overview to be conducted to ascertain significance
5. Use of Environmental Construction Operations (ECO) Plan to mitigate.
6. Depending on installation method selected – Horizontal direction drilling (II) vs. trench excavation (SI)

NA Not Applicable
II Insignificant Impact
SI Significant Impact
US Unknown Significance

THURBER ENGINEERING LTD.

INITIAL PROJECT REVIEW
FORT EDMONTON PARK
REALIGN-EXPAND MIDWAY
(BLOCK A PLAN 852 1469)
EDMONTON, ALBERTA

Report

to

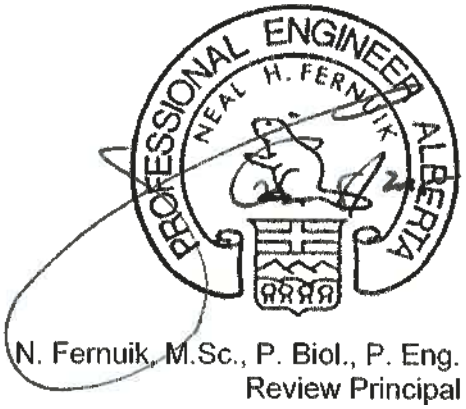
Associated Engineering of Alberta Ltd.,

City of Edmonton and

Fort Edmonton Management Company

M. Halliwell, M. Eng., EP, P. Eng.
Environmental Engineer

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
Signature _____
Date _____
PERMIT NUMBER: P 5186
The Association of Professional Engineers, Geologists and Geophysicists of Alberta



Date: January 8, 2015
File: 17-123-796D

N. Fernuik, M.Sc., P. Biol., P. Eng.
Review Principal

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thurber.ca

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1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) conducted an Initial Project Review (IPR) as part of the utility replacement and future expansion plans envisaged between 2013 and 2020 in the Fort Edmonton Park Area (FEPA). The work was carried out for Associated Engineering of Alberta Ltd. (AEAL) for submittal to City of Edmonton (CoE) and Fort Edmonton Management Company (FEMCO). The IPR is a process developed by the City of Edmonton Planning and Development Department to conduct environmental reviews of projects involving public development or development of public land within the North Saskatchewan River valley and connected ravines as part of the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP, Bylaw 7188). The draft report was submitted in January 2014 with final comment received in December 2014.

FEPA is a CoE park located in the North Saskatchewan River Valley and consists of Fort Edmonton Park (FEP, a high intensity land use property with up to 83 buildings and exhibit areas), the John Jansen Nature Centre (JJNC), trails, park reserve, and associated parking. FEPA and associated venues are operated year round. FEMCO, as part of the Fort Edmonton Park Master Plan, has expressed plans to further develop the park, thus an IPR was conducted for each of seven projected infrastructure development sites within FEP and the Utility Replacement Project (throughout FEPA) prior to commencing construction activities. This IPR, for the Realign-Expand Midway project at FEP, was undertaken in 2013 summer-like spring conditions and visual observations of the site were not limited by the presence of snow.

Use of this report is subject to the Statement of Limitations and Conditions, which is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

2. PROJECT RATIONALE

According to the information provided by AEAL, there are seven new infrastructure projects in the initial design phase, as summarized below:

1) New Entrance Building: Located at the front gate, this building would function as a park entrance. The new front gate building will be a place to purchase entrance admission and enter the park, rather than the currently used, modified train station.

2) Realign-Expand Midway: New attractions in the midway would facilitate FEP becoming a premier tourist attraction, including expansion of the midway to create a permanent fair-like atmosphere.

3) Hotel Selkirk Expansion: The existing Hotel Selkirk would be expanded by a recreation of the historic Windsor Block and would assist FEP attracting overnight visitors.

4) New Commercial Block: Located near the Blatchford Field Air Hangar, this project would further highlight business from the 1920's era.

5) Artifact Warehouse Building: This structure would serve as an illustrative warehouse, rather than archive for non accessible material.

6) Indigenous People's Experience: Project would be located near and include Egge's Pond. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.

7) Streetcar Barn Expansion: This project would expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

The approximate locations of planned utility replacement and new infrastructure projects in FEP are shown on Drawing 17-123-796-E1 in Appendix A.

3. PROJECT ALTERNATIVES

Three options were considered by FEMCO to address the Realign-Expand Midway construction as follows:

1) Do nothing (null option).

   This option (Option 1) involves doing no work for the Realign-Expand Midway project at FEP. Although a viable option, this option was not selected as it does not assist FEMCO in maintaining a premier cultural heritage experience. The existing midway is limited in scope and located off of the main visitor travel paths. In order make the midway more accessible, it requires realignment to where it is on the main travel path and accessible by the existing FEP streetcar system.

2) Defer construction to a later date.

   This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to FEP operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist FEMCO in maintaining a premier cultural heritage experience.

3) Realign-Expand Midway project in conjunction with other new infrastructure projects.

   Option 3 assists FEMCO in addressing the midway accessibility to park patrons by making access possible off of the main travel path and by FEP streetcar. Realignment would also permit expansion to better reflect the nature of the historical midway being recreated. Additionally, this option permits a minimization of disruption to FEP operations and permits cost savings by coordinating the Realign-Expand Midway project with the construction of an Indigenous People's Experience, construction of a new entrance building, a new hotel, a new commercial block, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities.

4. PROJECT DESCRIPTION

The project work falls within the area covered by the NSRV ARP and all aspects of the project are described as part of the IPR. This IPR addresses construction associated with the Realign-Expand Midway project within FEP while additional IPRs (issued under separate covers) address the other new infrastructure projects planned for FEP and utility replacement within FEPA.

The midway realignment and expansion will be constructed west of the existing midway in Mellon Field. The planned midway expansion will include a tethered helium balloon ride, a corn or hay-bale maze, the addition of period specific children's rides and a new double Ferris wheel. Additional shops, food service and opportunities for day time and evening entertainment will be constructed, as would staff spaces. Adjacent to the Midway would be an Events Field. In close proximity would be a sportsman's lodge alongside a food service venue.

Site area of the expanded midway is estimated to be 1.91 ha. Sizing of the midway expansion will be reviewed prior to construction to maximize efficiency and flow as the project proceeds. It is assumed that no basements will be constructed as part of this expansion. Buildings and attractions will be constructed using piles and slab on grade, and will vary in height. There will

be changes to the existing walkways, and new walkways will be constructed. Landscaping will also be required.

Other projected infrastructure developments, as shown on Drawing 17-123-796-E1 in Appendix A include the following: an Indigenous People's Experience, a new entrance building, an expansion of the Hotel Selkirk, a new commercial block, an artifact warehouse building near the streetcar barn, streetcar barn expansion and utility replacement throughout FEPA.

The project laydown area for job trailers and storage of equipment and materials is unknown at the time of IPR, but is anticipated to be in parking areas located adjacent to the existing entrance or within Mellon Field itself. Project parking is also unknown at the time of IPR, and anticipated to take place in the FEPA parking area east of the existing FEP main gate, and on roadways in proximity to the work area.

The contractor will likely work a 10 hour shift, but may require longer shifts depending on the schedule and weather conditions. The contractor will comply with the City of Edmonton Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

The project construction schedule has not been set; however, initial work such as clearing of trees or brush (minor possible at Location 14, as shown on Drawing 17-123-796-E2) will be undertaken prior to February 15 in year of construction to avoid potential migratory bird or owl nesting areas, if present.

The preceding descriptions for the Realign-Expand Midway project are construction procedures that may differ somewhat from the actual process, as construction commencement dates are not yet determined.

5. PUBLIC PARTICIPATION

It is understood from FEMCO that future infrastructure construction, including the Realign-Expand Midway project, have been under consideration since the spring of 2012 and the intention is to carry out the Realign-Expand Midway project construction in 2017. The envisaged time frames for each of the seven areas and the utility replacements are summarized in Table 1 in Appendix B and range from 2017 through to 2020.

Nearby residents along the top of the River Valley and along Whitemud Road will be provided with project information and CoE contact information. Nearby residents will be able to access additional FEPA project details and/or to provide feedback through the CoE contact information.

Thurber recommends an open house or similar public participation so that stakeholders and community members may have input into the proposed changes at FEP. Information gathered at an open house may also be utilized in future Environmental Screening Reports or Environmental Impact Assessments, should the CoE require them.

6. IMPACTS AND MITIGATIVE MEASURES

6.1 Impact Identification

Proposed impacts were identified by consulting the project description and applying professional judgement. Identified potential impacts were then analyzed and classified as significant, insignificant or unknown significance, according to the following definitions:

Insignificant Impact	One that does not affect a population beyond the limits of natural perturbations or does not substantially modify a natural feature known to be significant or does not alter land use.
Significant Impact	One that affects the population beyond the limits of natural perturbations or eliminates a natural feature known to be significant, or alters the land use.
Unknown Significance	Significance could not be determined due to insufficient information regarding project description or existing conditions.

6.2 Biological Environment

The general impacts to the biological environments and the mitigative measures that have been considered by Thurber for the selected alternative include:

- *Disturbances to the natural vegetation that grows, and the wildlife that lives along the North Saskatchewan River Valley slopes*.

  Thurber anticipates that natural vegetation will not have to be removed, as shown on Drawing 17-123-796-E2 in Appendix A, for Realign-Expand Midway construction. Pre-existing vegetation in Mellon Field is primarily cultivated crop (wheat), with some sparse decorative trees and shrubs around the perimeter. Vegetation removal is considered insignificant as these areas have been previously disturbed/cultivated and/or landscaped.

Disturbance of currently intact vegetation should be minimized to retain the ecological integrity of the park. Wildlife access to FEP is restricted by fences on the east, south and west sides, and the North Saskatchewan River to the north, otherwise the rest of FEPA has no impediment to wildlife. Areas immediately east of the existing entrance consist of grass covered landscaped areas and asphalt paved parking, providing minimal wildlife habitat. Care in operating equipment on respective lay-down areas is required. Use of roadways as travel routes and laydown areas will also minimize the need to clear or damage trees, particularly prominent and aesthetically valuable trees that have been growing on non-travelled, landscaped portions of FEP for many years. Low-ground pressure, tracked or rubber tired vehicles should be utilized where possible to minimize soil rutting.

Disturbed ground should be reclaimed upon completion of construction activities, after which these areas should be reseeded and/or sodded with grass and, where appropriate, planted with woody landscape species to restore the landscape and equipment lay-down area to its previous use within FEP.

The NSRV and Whitemud Ravine support a variety of wildlife that have adapted to life within an urban green-space. A search of the Alberta Environment & Sustainable Resource Development (ESRD) Fish and Wildlife Management Information System (FWMIS) on-line data base[1] for FEPA identified numerous species of importance in the area. FEPA falls within the range of the Sharp-tailed Grouse (*Pedioecetes phasianellus*, which is a classified as a sensitive species in the *General Status of Alberta Wild Species)*, Short-Eared Owl (*Asio flammeus,* may be at risk species), and Peregrine Falcon (*Falco peregrines,* at risk species*).* The federal Species at Risk Act (SARA)[2] notes peregrine falcons, Yellow Rail, and Monarch butterflies are species that are either threatened or of special concern and may be present in the Edmonton area.

Fish species identified in Whitemud Creek, located approximately 700 m east of FEP, the North Saskatchewan River approximately 50 m north of FEP and Egge's Pond, located within FEP include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), Lake Chub (*Couesius plumbeus*), Longnose Dace (*Rhinichthys cataractae*), Longnose Sucker (*Catostomus catostomus*), Northern Pike (*Esox lucius*), and White Sucker (*Catostomus commersonii*).

[1] Alberta Environment & Sustainable Resource Development Fish and Wildlife Management Information System (FWMIS). 2013. FWMIS Internet Mapping tool (Accessible at http://srd.alberta.ca/FishWildlife/FWMIS/AccessFWMISData.aspx)

[2] Government of Canada. 2003. "Species at Risk Act. Schedule 1 – List of Wildlife Species at Risk".

As the North Saskatchewan River is located approximately 40 m north of the service road, approximately 75 m downslope of the existing midway and approximately 150 m downslope of the proposed Realign-Expand Midway area, surface water runoff controls and the use of silt fencing are recommended to prevent silting of the river. Surface water runoff controls are likely not required for Whitemud Creek as surface drainage in the western portion of FEPA was observed as north toward North Saskatchewan River, and to municipal storm system in the eastern portion of FEPA.

Given the urban location, recreational use of FEPA and the surrounding trails and majority fenced perimeter, disruption to local wildlife is anticipated to be insignificant and of short duration. Due to the potential presence of owls, tree removal (Location 14 on Drawing 17-123-796-E2) prior to nesting season (February 15 – August 31) would be possible with careful planning under the proposed project timeline. CoE / FEMCO will need to have a qualified biologist or wildlife specialist assess the area of proposed tree removal for nests prior to clearing taking place.

The project laydown area for job trailers and storage of equipment and materials is of unknown significance as at the time of IPR the location is unknown but anticipated to be located on road allowances and parking areas adjacent to construction area or in Mellon Field itself. However, disruptions associated with the project laydown area is anticipated to be insignificant and disturbed areas can be readily restored to previous surface – grass, crop or gravel. Project parking is anticipated to take place in the west portion of the FEPA parking lot. The locations of the laydown and parking areas have not been finalized as of the date of this report.

- *Disturbances to fish habitat in the North Saskatchewan River and Egge's Pond.*

  Thurber anticipates impacts to existing fish habitat in the North Saskatchewan River will be insignificant and not directly disturbed as the nearest Realign-Expand Midway construction is approximately 75 m south of the nearest approach of the river. However, protection of natural drainage pathways in and adjacent to the work area is recommended to minimize the potential for silt or debris from the project to enter the North Saskatchewan River.

  Construction of the Realign-Expand Midway project is not anticipated to have an impact on Egge's Pond, which is located approximately 500 m to the west.

6.3 Physical Environment

General impacts to the physical environment and the mitigative measures that have been considered by Thurber for the chosen alternative include:

- *The detractive results of the construction activities in parkland*.

  Thurber recognizes that noise, dust and mists that may be generated will negatively impact local vegetation and wildlife during utility construction. Impacts from these sources are anticipated to be insignificant and of short duration. Permanent infrastructure buildings will alter primarily agricultural crop covered areas.

- *The potential for pedestrians and cyclists to be exposed to construction hazards when using the nearby paved trail.*

  Pedestrians and cyclists may be exposed to elevated noise and dust levels; however, given the separation between the work area and existing paved and multi-use trails, the impact is anticipated to be insignificant.

- *Grade Changes*

  Although earthworks are planned under this alternative, the intent is to complete construction activities and generally restore the surface to pre-construction status. Access to construction areas will be restricted to authorized personnel for the duration of new infrastructure construction activities in FEP. Grade changes are expected to be insignificant.

- *Impact on Fort Edmonton Park Users.*

  Impacts to guests in FEP are of unknown significance and dependent on the construction schedule. Mitigation measures for potentially significant impacts would be to plan construction activities during seasons of reduced traffic (spring, fall or winter). If summer construction is necessary, conducting excavation and construction activities requiring machinery during Park minimal use times would mitigate user impacts as would limiting access to construction areas.

- *Historical Resources*

  An archaeological assessment was not undertaken for FEP. However, a review of Alberta Culture's *Listing of Historical Resources* identifies the work area as "believed to contain a historical resource" of a palaeontological nature. Consequently, impacts to historical resources are of unknown significance. Prior to construction activities in the park, a clearance from Alberta Culture will be required. If historical resources or archaeological artifacts are encountered during the work, the earthworks contractor must inform Alberta Culture and follow their direction for handling the discovery.

- *Environmental Impacts*

  Impacts to the environment from the Realign-Expand Midway construction are dependent on construction activities and are of unknown significance. In order to minimize potential environmental impacts (i.e. contamination or erosion) within the projected area, the contractor shall accept and incorporate CoE Environmental Policy C512, the CoE Contractor's Environmental Responsibility Package and the CoE Contractor's Release Reporting requirements into their work practices. The contractor shall also prepare an Environmental Construction Operations (ECO) Plan and implement practices consistent with the CoE *Erosion and Sedimentation Guidelines and Field Manual*.

- *Navigable Waters*

  The Realign-Expand Midway project does not involve impacts to navigable waters.

6.4 Community Impacts

General impacts to the community and the socio-economic environment as well as the mitigative measures that have been considered by Thurber for the alternative chosen include:

- *The daily construction noise that could disturb local residents.*

  Noise impacts should be insignificant in relation to the nearby major arterial roadway within the CoE and located at the level of nearby homes. As a minimum, the project will comply with CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

- *Accessibility to Fort Edmonton Park.*

  Fort Edmonton Park visitors are dependent upon park schedule. The park is open to the general public from the May long weekend through to Labour Day weekend in September. FEP accessibility during construction is significantly dependent upon scheduling. With care in planning the construction schedule and limiting activities which may impede park access the impacts to FEP accessibility are anticipated to be insignificant.

- *Accessibility to the North Saskatchewan River Valley trail system.*

  It is expected that vehicular access to FEP, JJNC and the general park users parking area will be maintained for the duration of the construction activities. Other than additional traffic volume and potentially extended distances between the parking area and the trail system associated with the construction activities, additional disruption will be insignificant.

- *Project parking and lay down area.*

  It is anticipated that an existing parking area, areas adjacent to existing roadways or Mellon Field will be utilized as a project laydown area. Project parking is anticipated to take place in the existing FEPA parking lot. The location of the laydown area has not been finalized as of the date of this report, and is of unknown significance.

7. CONCLUSIONS AND RECOMMENDATIONS

Table 1 in Appendix B summarizes the Biological, Physical and Community impacts for each of the seven areas and the utility replacements assessed within the Fort Edmonton Park Area and Fort Edmonton Park. The assessment was based on insignificant impact, significant impact or unknown significance. In general, the construction of the Realign-Expand Midway project will have insignificant impacts with the exception of parking/laydown impacts, historical impacts and certain possible environmental impacts, for which the Realign-Expand project will have an unknown impact. Based on the information cited in this IPR, it is Thurber's opinion that project impacts will be necessary to improve midway accessibility and facilitate future development. As such, additional work, such as an Environmental Screening Report (ESR) or an Environmental Impact Assessment (EIA) may be required for the Realign-Expand Midway project. The services of a qualified biologist or wildlife specialist will be required to assess potential tree removal prior to clearing due to possible owl nesting in the area.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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APPENDIX A

Drawings

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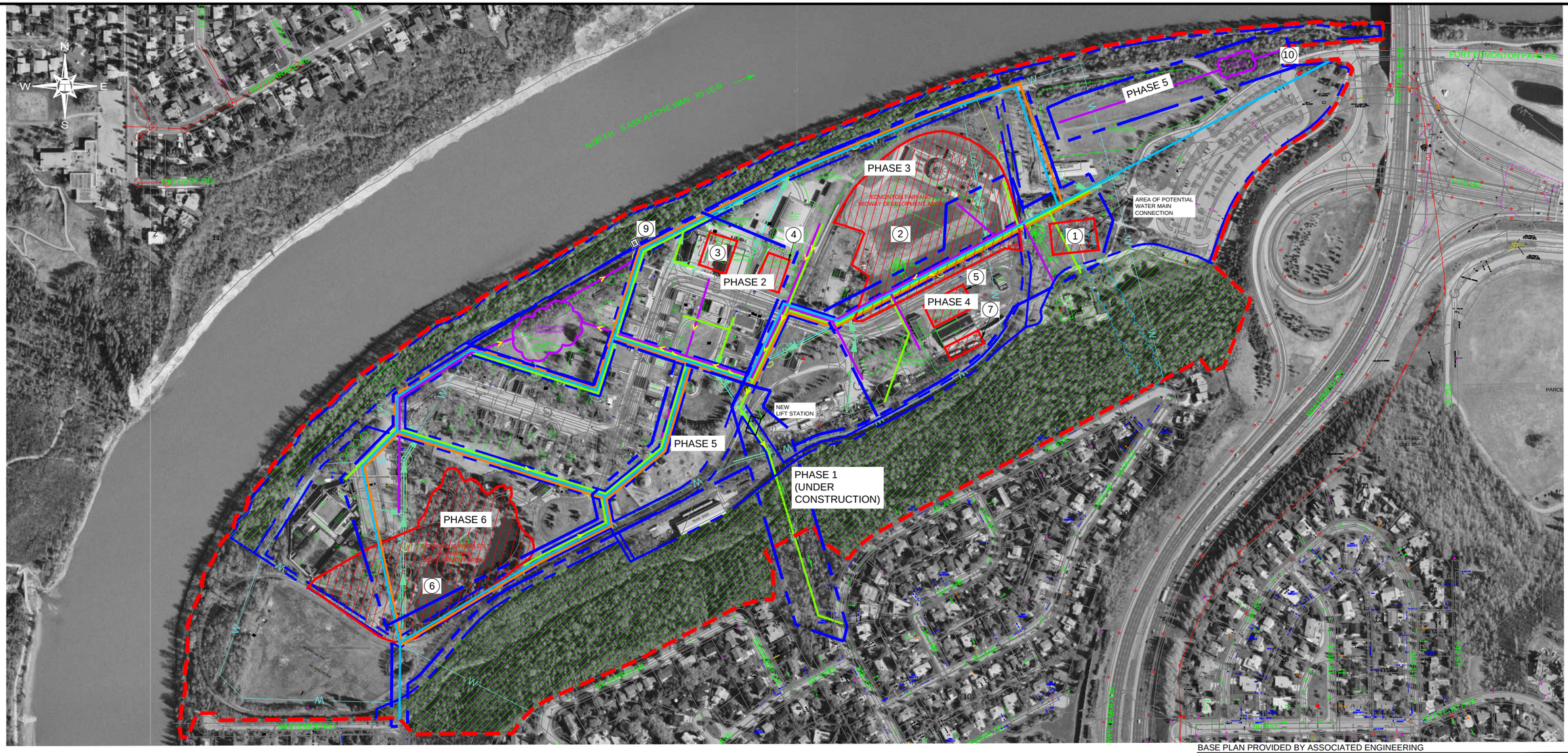

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

LEGEND:

- PROPOSED WATERMAINS
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED GAS LINE
- PHASE BOUNDARY
- PROJECT SITE BOUNDARY
- ENVIRONMENTAL RESERVE

1	NEW ENTRANCE BUILDING AT FRONT GATE	6	INDIGENOUS PEOPLE'S EXPERIENCE
2	REALIGN - EXPAND MIDWAY	7	STREETCAR BARN EXPANSION
3	HOTEL SELKIRK EXPANSION	8	UTILITY REPLACEMENT
4	NEW COMMERCIAL BLOCK	9 10	STORMWATER TREATMENT STRUCTURE
5	ARTIFACT WAREHOUSE BUILDING		

0 50 100 150 200 250 300m

SCALE 1:5000

Associated Engineering

FORT EDMONTON PARK ENVIRONMENTAL ASSESSMENT

PROPOSED DEVELOPMENTS

DWG No. 17-123-796-E1

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

THURBER ENGINEERING LTD.

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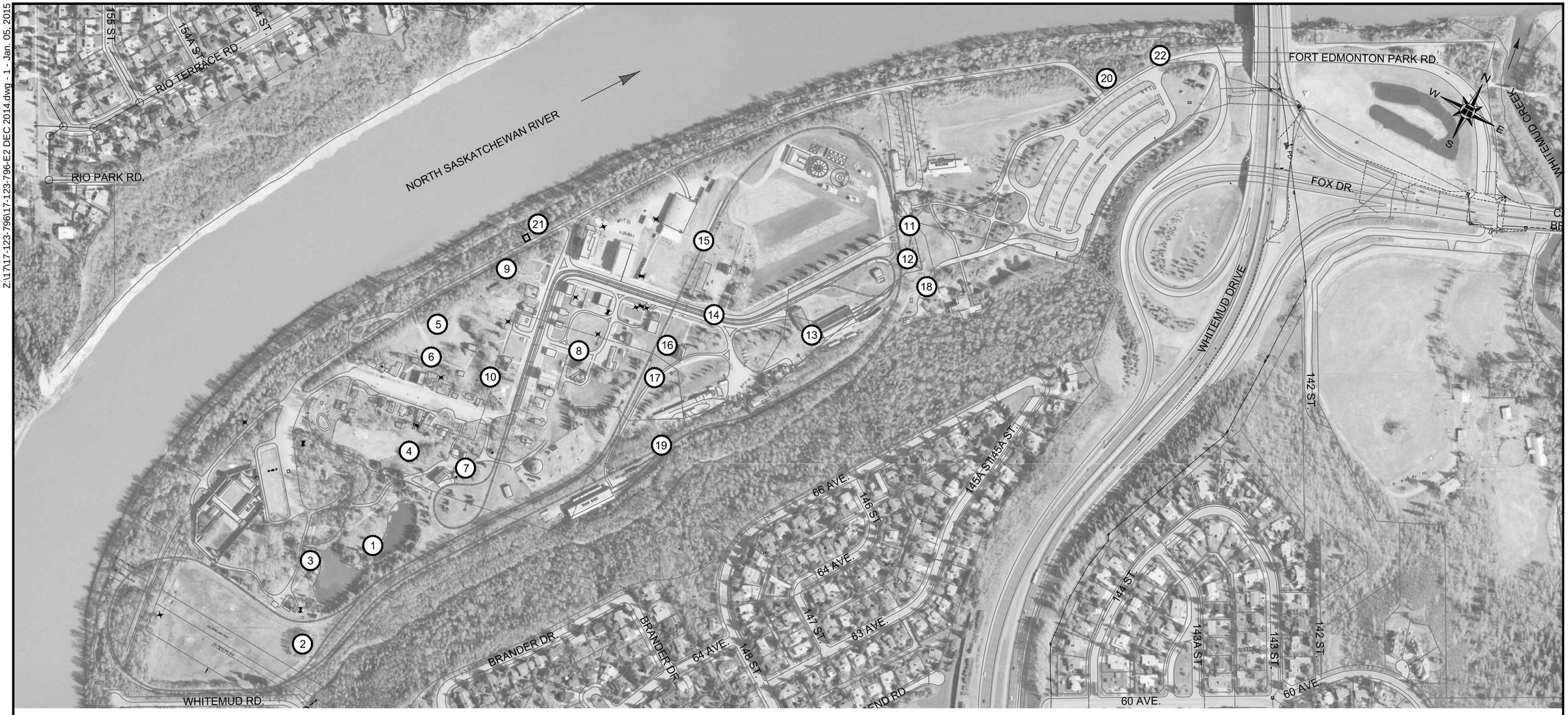

LEGEND

(1) LOCATION OF TREE REMOVAL (SEE REPORT TEXT FOR DETAILS)

0 50 100 150 200 250 300m

SCALE 1:5000

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

Associated Engineering

FORT EDMONTON PARK
ENVIRONMENTAL ASSESSMENT

SITE PLAN SHOWING AREAS OF TREE REMOVAL

DWG No. 17-123-796-E2

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

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APPENDIX B

Table

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TABLE 1
INITIAL PROJECT REVIEW – FORT EDMONTON PARK AREA UTILITY REPLACEMENT & PROPOSED CONSTRUCTION

	BIOLOGICAL						PHYSICAL										COMMUNITY			
	VEGETATION		WILDLIFE[2]		FISH		CONSTRUCTION / GRADE CHANGES		PEDESTRIANS / CYCLISTS/TRAIL USERS		NAV WATERS			HISTORICAL[4]	ENVIRONMENTAL[5]	IMPACTS TO PARK USERS	NOISE[3]	ACCESS		PARKING /LAYDOWN
LOCATION	II	SI	II	SI	II	SI	II[3]	SI	II	SI	NA	II	SI	US	US	US	II	II	US	US
1. New Entrance Building Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
2. Realign-Expand Midway Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
3. Hotel Selkirk Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
4. New Commercial Block Time Frame - 2020	X		X		X		X		X		X			X	X	X	X	X		X
5. Artifact Warehouse Building Time Frame – 2020	X		X		X		X		X		X			X	X	X	X	X		X
6. Indigenous People's Experience Time Frame – 2017		X		X		X		X	X			X		X	X	X	X	X		X
7. Streetcar Barn Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
8. Utility Replacement Time Frame - 2017	X	X[1]	X	X[1]	X[6]	X[6]	X		X		X			X	X	X	X		X	X

Note:
1. Storm water pond
2. Need to address migratory bird act and bird nest survey for trees to be removed. Also City of Edmonton tree compensation.
3. Follow City of Edmonton noise and dust bylaws
4. Historical Resources Overview to be conducted to ascertain significance
5. Use of Environmental Construction Operations (ECO) Plan to mitigate.
6. Depending on installation method selected – Horizontal direction drilling (II) vs. trench excavation (SI)

NA Not Applicable
II Insignificant Impact
SI Significant Impact
US Unknown Significance

THURBER ENGINEERING LTD.

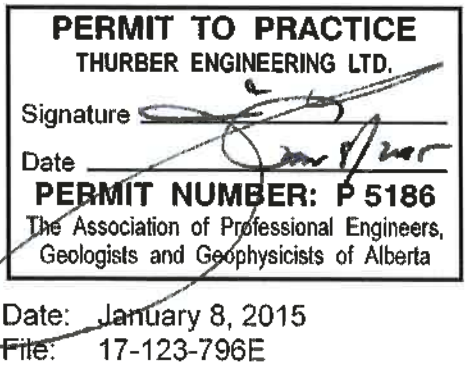
INITIAL PROJECT REVIEW
FORT EDMONTON PARK
HOTEL SELKIRK EXPANSION
(BLOCK A PLAN 852 1469)
EDMONTON, ALBERTA

Report

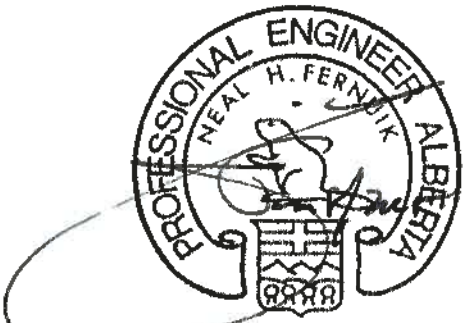
to

Associated Engineering of Alberta Ltd.,
City of Edmonton and
Fort Edmonton Management Company

M. Halliwell, M. Eng., EP, P.Eng.
Environmental Engineer



Date: January 8, 2015
File: 17-123-796E



N. Fernuik, M.Sc., P. Biol., P. Eng.
Review Principal

THURBER

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1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) conducted an Initial Project Review (IPR) as part of the utility replacement and future expansion plans envisaged between 2013 and 2020 in the Fort Edmonton Park Area (FEPA). The work was carried out for Associated Engineering of Alberta Ltd. (AEAL) for submittal to City of Edmonton (CoE) and Fort Edmonton Management Company (FEMCO). The IPR is a process developed by the City of Edmonton Planning and Development Department to conduct environmental reviews of projects involving public development or development of public land within the North Saskatchewan River valley and connected ravines as part of the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP, Bylaw 7188). The draft report was submitted in January 2014 with final comment received in December 2014.

FEPA is a CoE park located in the North Saskatchewan River Valley and consists of Fort Edmonton Park (FEP, a high intensity land use property with up to 83 buildings and exhibit areas), the John Jansen Nature Centre (JJNC), trails, park reserve, and associated parking. FEPA and associated venues are operated year round. FEMCO, as part of the Fort Edmonton Park Master Plan, has expressed plans to further develop the park, thus an IPR was conducted for each of seven projected infrastructure development sites within FEP and the Utility Replacement Project (throughout FEPA) prior to commencing construction activities. This IPR, for the New Entrance Building at FEP, was undertaken in 2013 summer-like spring conditions and visual observations of the site were not limited by the presence of snow.

Use of this report is subject to the Statement of Limitations and Conditions, which is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

2. PROJECT RATIONALE

According to the information provided by AEAL, there are seven new infrastructure projects in the initial design phase, as summarized below:

1) New Entrance Building: Located at the front gate, this building would function as a FEP entrance. The new front gate building will be a place to purchase entrance admission and enter FEP, rather than the currently used, modified train station.

2) Realign-Expand Midway: New attractions in the midway would facilitate FEP becoming a premier tourist attraction, including expansion of the midway to create a permanent fair-like atmosphere.

3) Hotel Selkirk Expansion: The existing Hotel Selkirk would be expanded by a recreation of the historic Windsor Block and would assist FEP attracting overnight visitors.

4) New Commercial Block: Located near the Blatchford Field Air Hangar, this project would further highlight business from the 1920's era.

5) Artifact Warehouse Building: This structure would serve as an illustrative warehouse, rather than archive for non accessible material.

6) Indigenous People's Experience: Project would be located near and include Egge's Pond. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.

7) Streetcar Barn Expansion: This project would expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

The approximate locations of planned utility replacement and new infrastructure projects in FEP are shown on Drawing 17-123-796-E1 in Appendix A.

3. PROJECT ALTERNATIVES

Three options were considered by FEMCO to address the construction of the Hotel Selkirk Expansion as follows:

1) Do nothing (null option)

   This option (Option 1) involves doing no work for the Hotel Selkirk Expansion at FEP. Although a viable option, this option was not selected as it does not assist FEMCO in growing the capabilities of FEP (i.e. additional banquet functions, meeting space and staff areas), expanding the representation of the 1920's and does not allow for annual attendance growth via additional overnight park visitors.

2) Defer construction to a later date

This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to FEP operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist FEMCO in growing the park's capabilities or attendance.

3) Hotel Selkirk Expansion in conjunction with other new infrastructure projects

Option 3 assists FEMCO in expanding its facilities along 1920 Street, providing additional opportunities for banquet and meeting space, adds staff space and permits increasing patron overnight attendance. Additionally, this option permits a minimization of disruption to FEP operations and permits cost savings by coordinating Hotel Selkirk Expansion with the construction of an Indigenous People's Experience, construction of a new entrance building, realignment and expansion of the midway, a new commercial block, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities.

4. PROJECT DESCRIPTION

The project work falls within the area covered by the NSRV ARP and all aspects of the project are described as part of the IPR. This IPR addresses construction associated with the Hotel Selkirk Expansion within FEP while additional IPRs (issued under separate covers) address the new infrastructure projects planned for FEP and utility replacement within FEPA.

The existing Hotel Selkirk will be expanded south and east of the existing Hotel through the re-creation of Edmonton's historic Windsor Block. The enlarged hotel would encompass a conference centre, banquet facilities, and a meeting space. Staff spaces would also be added to the expansion.

Site area of the hotel expansion is estimated to be 1925 m^2. The building is conceptually sized to be 30 metres wide and 45 metres long. The conceptual height of the building will be 3 stories, and it is assumed that a basement will be constructed. It is also assumed that the expansion will be constructed with piles and a basement. There will be changes to the existing walkways, and new walkways will be constructed. A parking lot may be added, and landscaping will be required.

Other projected infrastructure developments, as shown on Drawing 17-123-796-E1 in Appendix A include the following: an Indigenous People Experience, a new entrance building, realignment and expansion of the midway, a commercial block near the Blatchford Field Air Hangar, an artifact warehouse building near the streetcar barn, streetcar barn expansion and utility replacement throughout FEPA.

The project laydown area for job trailers and storage of equipment and materials is unknown at the time of IPR, but is anticipated to be in parking areas located adjacent to the existing service road and Blatchford Field Air Hangar. Project parking is also unknown at the time of IPR, and anticipated to take place in the FEPA parking area east of the existing FEP main gate, and on roadways in proximity to the work area.

The contractor will likely work a 10 hour shift, but may require longer shifts depending on the schedule and weather conditions. The contractor will comply with the City of Edmonton Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

The project construction schedule has not been set; however, initial work such as clearing of trees or brush (if required) will be undertaken prior to February 15 in year of construction to avoid potential migratory bird or owl nesting areas, if present.

The preceding descriptions for the Hotel Selkirk Expansion are construction procedures that may differ somewhat from the actual process, as construction commencement dates are not yet determined.

5. PUBLIC PARTICIPATION

It is understood from FEMCO that future infrastructure construction, including the Hotel Selkirk Expansion, have been under consideration since the spring of 2012 and the intention is to carry out Hotel Selkirk Expansion construction in 2017. The envisaged time frames for each of the seven areas and the utility replacements are summarized in Table 1 in Appendix B and range from 2017 through to 2020.

Nearby residents along the top of the River Valley and along Whitemud Road will be provided with project information and CoE contact information. Nearby residents will be able to access additional FEPA project details and/or to provide feedback through the CoE contact information.

Thurber recommends an open house or similar public participation so that stakeholders and community members may have input into the proposed changes at FEP. Information gathered at an open house may also be utilized in future Environmental Screening Reports or Environmental Impact Assessments, should the CoE require them.

6. IMPACTS AND MITIGATIVE MEASURES

6.1 Impact Identification

Proposed impacts were identified by consulting the project description and applying professional judgement. Identified potential impacts were then analyzed and classified as significant, insignificant or unknown significance, according to the following definitions:

Insignificant Impact	One that does not affect a population beyond the limits of natural perturbations or does not substantially modify a natural feature known to be significant or does not alter land use.
Significant Impact	One that affects the population beyond the limits of natural perturbations or eliminates a natural feature known to be significant, or alters the land use.
Unknown Significance	Significance could not be determined due to insufficient information regarding project description or existing conditions.

6.2 Biological Environment

The general impacts to the biological environments and the mitigative measures that have been considered by Thurber for the selected alternative include:

- *Disturbances to the natural vegetation that grows, and the wildlife that lives along the North Saskatchewan River Valley slopes*.

  Thurber anticipates that natural vegetation will not have to be removed, as shown on Drawing 17-123-796-E2 in Appendix A, for the Hotel Selkirk Expansion. Pre-existing vegetation in the area is primarily grassed areas. Vegetation removal is considered insignificant as these areas have been previously disturbed and/or landscaped.

  Disturbance of currently intact vegetation should be minimized to retain the ecological integrity of the park. Wildlife access to FEP is restricted by fences on the east, south and west sides, and the North Saskatchewan River to the north, otherwise the rest of FEPA

has no impediment to wildlife. Areas immediately east of the existing entrance consist of grass covered landscaped areas and asphalt paved parking, providing minimal wildlife habitat. Care in operating equipment on respective lay-down areas is required. Use of roadways as travel routes and laydown areas will also minimize the need to clear or damage trees, particularly prominent and aesthetically valuable trees that have been growing on non-travelled, landscaped portions of FEP for many years. Low-ground pressure, tracked or rubber tired vehicles should be utilized where possible to minimize soil rutting.

Disturbed ground should be reclaimed upon completion of construction activities, after which these areas should be reseeded and/or sodded with grass and, where appropriate, planted with woody landscape species to restore the landscape and equipment lay-down area to its previous use within FEP.

The NSRV and Whitemud Ravine support a variety of wildlife that have adapted to life within an urban green-space. A search of the Alberta Environment & Sustainable Resource Development (ESRD) Fish and Wildlife Management Information System (FWMIS) on-line data base[1] for FEPA identified numerous species of importance in the area. FEPA falls within the range of the Sharp-tailed Grouse (*Pedioecetes phasianellus*, which is a classified as a sensitive species in the *General Status of Alberta Wild Species)*, Short-Eared Owl (*Asio flammeus,* may be at risk species), and Peregrine Falcon (*Falco peregrines,* at risk species*).* The federal Species at Risk Act (SARA)[2] notes peregrine falcons, Yellow Rail, and Monarch butterflies are species that are either threatened or of special concern and may be present in the Edmonton area.

Fish species identified in Whitemud Creek, located approximately 700 m east of FEP, the North Saskatchewan River approximately 50 m north of FEP and Egge's Pond, located within FEP include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), Lake Chub (*Couesius plumbeus*), Longnose Dace (*Rhinichthys cataractae*), Longnose Sucker (*Catostomus catostomus*), Northern Pike (*Esox lucius*), and White Sucker (*Catostomus commersonii*).

As the North Saskatchewan River is located approximately 40 m north of the service road, approximately 100 m downslope of the existing hotel and Hotel Selkirk Expansion area, surface water runoff controls and the use of silt fencing are recommended to

[1] Alberta Environment & Sustainable Resource Development Fish and Wildlife Management Information System (FWMIS). 2013. FWMIS Internet Mapping tool (Accessible at http://srd.alberta.ca/FishWildlife/FWMIS/AccessFWMISData.aspx)

[2] Government of Canada. 2003. "Species at Risk Act. Schedule 1 – List of Wildlife Species at Risk".

prevent silting of the river. Surface water runoff controls are likely not required for Whitemud Creek as surface drainage in the western portion FEPA was observed as north toward North Saskatchewan River, and to municipal storm system in the eastern portion of FEPA.

Given the urban location, recreational use of FEPA and the surrounding trails and majority fenced perimeter, disruption to local wildlife is anticipated to be insignificant and of short duration. As tree removal is not expected for the Hotel Selkirk Expansion project, disruption of potential owl or migratory bird nesting areas is not anticipated.

The project laydown area for job trailers and storage of equipment and materials is of unknown significance as at the time of IPR the location is unknown but anticipated to be located on road allowances and parking areas adjacent to construction area. However, disruptions associated with the project laydown area are anticipated to be insignificant and disturbed areas can be readily restored to previous surface – grass or gravel. Project parking is anticipated to take place in the west portion of the FEPA parking lot. The locations of the laydown and parking areas have not been finalized as of the date of this report.

- *Disturbances to fish habitat in the North Saskatchewan River and Egge's Pond.*

  Thurber anticipates impacts to existing fish habitat in the North Saskatchewan River will be insignificant and not directly disturbed as the nearest Hotel Selkirk Expansion construction is approximately 100 m south of the nearest approach of the river. However, protection of natural drainage pathways in and adjacent to the work area is recommended to minimize the potential for silt or debris from the project to enter the North Saskatchewan River.

  Construction of the Hotel Selkirk Expansion is not anticipated to have an impact on Egge's Pond, which is located approximately 400 m to the west.

6.3 Physical Environment

General impacts to the physical environment and the mitigative measures that have been considered by Thurber for the chosen alternative include:

- *The detractive results of the construction activities in parkland*

  Thurber recognizes that noise, dust and mists that may be generated will negatively impact local vegetation and wildlife during utility construction. Impacts from these sources are anticipated to be insignificant and of short duration. Permanent infrastructure buildings will alter primarily grass covered areas.

- *The potential for pedestrians and cyclists to be exposed to construction hazards when using the nearby paved trail*

  Pedestrians and cyclists may be exposed to elevated noise and dust levels; however, given the separation between the work area and existing paved and multi-use trails, the impact is anticipated to be insignificant.

- *Grade Changes*

  Although earthworks are planned under this alternative, the intent is to complete construction activities and generally restore the surface to pre-construction status. Access to construction areas will be restricted to authorized personnel for the duration of new infrastructure construction activities in FEP. Grade changes are expected to be insignificant.

- *Impact on Fort Edmonton Park Users*

  Impacts to guests in FEP are of unknown significance and dependent on the construction schedule. Mitigation measures for potentially significant impacts would be to plan construction activities during seasons of reduced traffic (spring, fall or winter). If summer construction is necessary, conducting excavation and construction activities requiring machinery during Park minimal use times would mitigate user impacts as well as limiting access to construction areas.

- *Historical Resources*

  An archaeological assessment was not undertaken for FEP. However, a review of Alberta Culture's *Listing of Historical Resources* identifies the work area as "believed to contain a historical resource" of a palaeontological nature. Consequently, impacts to historical resources are of unknown significance. Prior to construction activities in the park, a clearance from Alberta Culture will be required. If historical resources or

archaeological artifacts are encountered during the work, the earthworks contractor must inform Alberta Culture and follow their direction for handling the discovery.

- *Environmental Impacts.*

  Impacts to the environment from the Hotel Selkirk Expansion construction are dependent on construction activities and are of unknown significance. In order to minimize potential environmental impacts (i.e. contamination or erosion) within the projected area, the contractor shall accept and incorporate CoE Environmental Policy C512, the CoE Contractor's Environmental Responsibility Package and the CoE Contractor's Release Reporting requirements into their work practices. The contractor shall also prepare an Environmental Construction Operations (ECO) Plan and implement practices consistent with the CoE *Erosion and Sedimentation Guidelines and Field Manual*.

- *Navigable Waters*

  The Hotel Selkirk Expansion does not involve impacts to navigable waters.

6.4 Community Impacts

General impacts to the community and the socio-economic environment as well as the mitigative measures that have been considered by Thurber for the alternative chosen include:

- *The daily construction noise that could disturb local residents*

  Noise impacts should be insignificant in relation to the nearby major arterial roadway within the CoE and located at the level of nearby homes. As a minimum, the project will comply with CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

- *Accessibility to Fort Edmonton Park*

  Fort Edmonton Park visitors are dependent upon park schedule. FEP is open to the general public from the May long weekend through to Labour Day weekend in September. FEP accessibility during construction is significantly dependent upon scheduling. With care in planning the construction schedule and limiting activities which may impede park access, the impacts to FEP accessibility are anticipated to be insignificant.

- *Accessibility to the North Saskatchewan River Valley trail system*

  It is expected that vehicular access to FEP, JJNC and general park users parking area will be maintained for the duration of the construction activities. Other than additional traffic volume and potentially extended distances between the parking area and the trail system associated with the construction activities, additional disruption will be insignificant.

- *Project parking and lay down area*

  It is anticipated that areas adjacent to existing roadways or the Blatchford Field Air Hangar parking will be utilized as a project laydown area. Project parking is anticipated to take place in the existing FEPA parking lot. The location of the laydown area has not been finalized as of the date of this report, and is of unknown significance.

7. CONCLUSIONS AND RECOMMENDATIONS

Table 1 in Appendix B summarizes the Biological, Physical and Community impacts for each of the seven areas and the utility replacements assessed within the Fort Edmonton Park Area and Fort Edmonton Park. The assessment was based on insignificant impact, significant impact or unknown significance. In general, the construction of the Hotel Selkirk Expansion will have insignificant impacts with the exception of parking/laydown impacts, historical impacts and certain possible environmental impacts, for which the Hotel Selkirk Expansion will have an unknown impact. Based on the information cited in this IPR, it is Thurber's opinion that project impacts will be necessary to improve the facilities along 1920 Street and permit expanded use and attendance at the park. As such, additional work, such as an Environmental Screening Report (ESR) or an Environmental Impact Assessment (EIA) may be required for the Hotel Selkirk Expansion.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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APPENDIX A

Drawings

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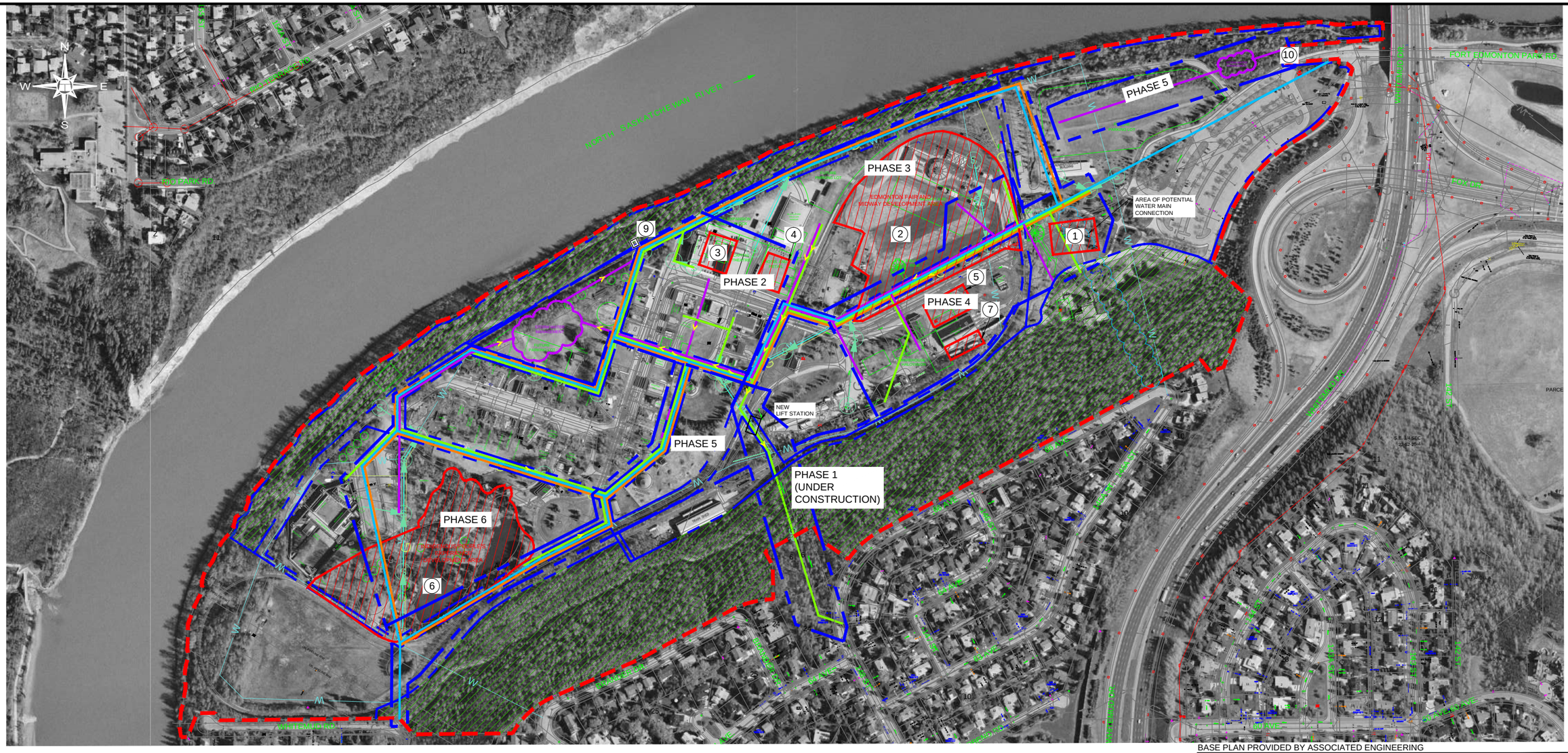

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

LEGEND:

- PROPOSED WATERMAINS
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED GAS LINE
- PHASE BOUNDARY
- PROJECT SITE BOUNDARY
- ENVIRONMENTAL RESERVE

1	NEW ENTRANCE BUILDING AT FRONT GATE	6	INDIGENOUS PEOPLE'S EXPERIENCE
2	REALIGN - EXPAND MIDWAY	7	STREETCAR BARN EXPANSION
3	HOTEL SELKIRK EXPANSION	8	UTILITY REPLACEMENT
4	NEW COMMERCIAL BLOCK	9 10	STORMWATER TREATMENT STRUCTURE
5	ARTIFACT WAREHOUSE BUILDING		

0 50 100 150 200 250 300m

SCALE 1:5000

Associated Engineering

FORT EDMONTON PARK ENVIRONMENTAL ASSESSMENT

PROPOSED DEVELOPMENTS

DWG No. 17-123-796-E1

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

THURBER ENGINEERING LTD.

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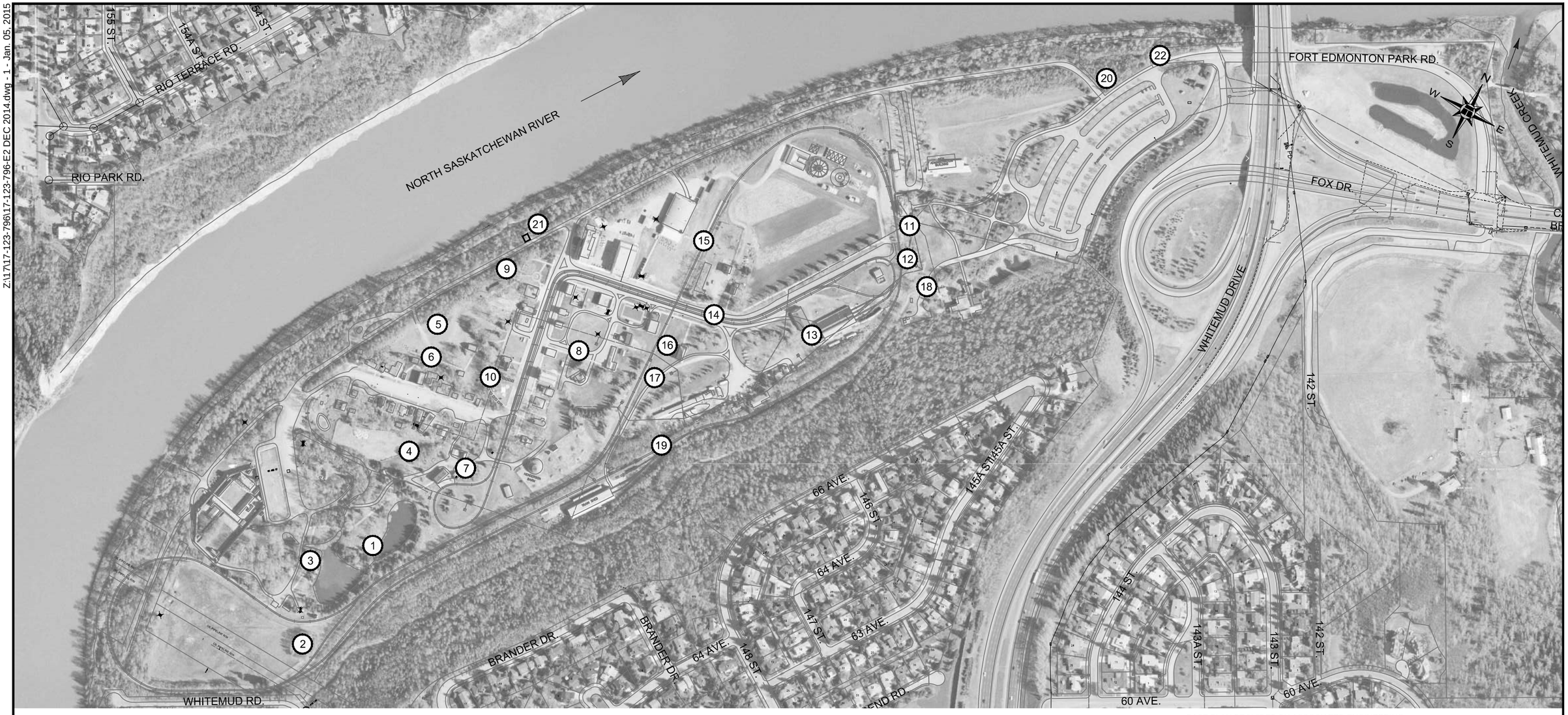

LEGEND

(1) LOCATION OF TREE REMOVAL (SEE REPORT TEXT FOR DETAILS)

0 50 100 150 200 250 300m

SCALE 1:5000

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

Associated Engineering

FORT EDMONTON PARK
ENVIRONMENTAL ASSESSMENT

SITE PLAN SHOWING AREAS OF TREE REMOVAL

DWG No. 17-123-796-E2

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

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APPENDIX B

Table

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TABLE 1
INITIAL PROJECT REVIEW – FORT EDMONTON PARK AREA UTILITY REPLACEMENT & PROPOSED CONSTRUCTION

	BIOLOGICAL						PHYSICAL										COMMUNITY			
	VEGETATION		WILDLIFE[2]		FISH		CONSTRUCTION / GRADE CHANGES		PEDESTRIANS / CYCLISTS/TRAIL USERS		NAV WATERS			HISTORICAL[4]	ENVIRONMENTAL[5]	IMPACTS TO PARK USERS	NOISE[3]	ACCESS		PARKING /LAYDOWN
LOCATION	II	SI	II	SI	II	SI	II[3]	SI	II	SI	NA	II	SI	US	US	US	II	II	US	US
1. New Entrance Building Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
2. Realign-Expand Midway Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
3. Hotel Selkirk Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
4. New Commercial Block Time Frame - 2020	X		X		X		X		X		X			X	X	X	X	X		X
5. Artifact Warehouse Building Time Frame – 2020	X		X		X		X		X		X			X	X	X	X	X		X
6. Indigenous People's Experience Time Frame – 2017		X		X		X		X	X			X		X	X	X	X	X		X
7. Streetcar Barn Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
8. Utility Replacement Time Frame - 2017	X	X[1]	X	X[1]	X[6]	X[6]	X		X		X			X	X	X	X		X	X

Note:
1. Storm water pond
2. Need to address migratory bird act and bird nest survey for trees to be removed. Also City of Edmonton tree compensation.
3. Follow City of Edmonton noise and dust bylaws
4. Historical Resources Overview to be conducted to ascertain significance
5. Use of Environmental Construction Operations (ECO) Plan to mitigate.
6. Depending on installation method selected – Horizontal direction drilling (II) vs. trench excavation (SI)

NA Not Applicable
II Insignificant Impact
SI Significant Impact
US Unknown Significance

THURBER ENGINEERING LTD.

INITIAL PROJECT REVIEW
FORT EDMONTON PARK
NEW COMMERCIAL BLOCK
(BLOCK A PLAN 852 1469)
EDMONTON, ALBERTA

Report

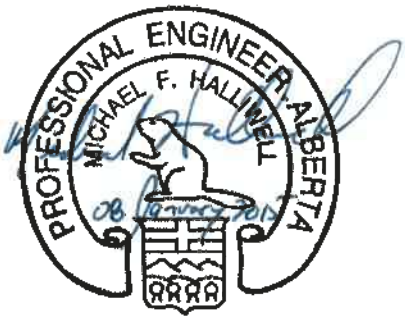
to

Associated Engineering of Alberta Ltd.,

City of Edmonton

and

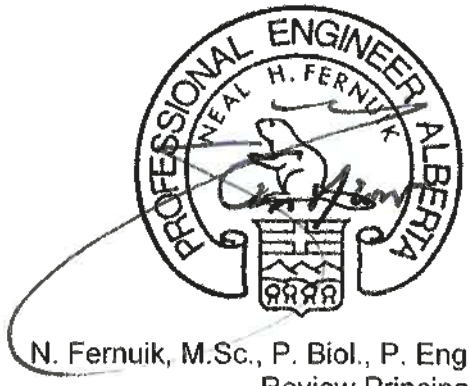
Fort Edmonton Management Company



M. Halliwell, M. Eng., EP, P.Eng.
Environmental Engineer

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
Signature
Date
PERMIT NUMBER: P 5186
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

Date: January 8, 2015
File: 17-123-796F



N. Fernuik, M.Sc., P. Biol., P. Eng.
Review Principal

THURBER

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1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) conducted an Initial Project Review (IPR) as part of the utility replacement and future expansion plans envisaged between 2013 and 2020 in the Fort Edmonton Park Area (FEPA). The work was carried out for Associated Engineering of Alberta Ltd. (AEAL) for submittal to City of Edmonton (CoE) and Fort Edmonton Management Company (FEMCO). The IPR is a process developed by the City of Edmonton Planning and Development Department to conduct environmental reviews of projects involving public development or development of public land within the North Saskatchewan River valley and connected ravines as part of the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP, Bylaw 7188). The draft report was submitted in January 2014 with final comment received in December 2014.

FEPA is a CoE park located in the North Saskatchewan River Valley and consists of Fort Edmonton Park (FEP, a high intensity land use property with up to 83 buildings and exhibit areas), the John Jansen Nature Centre (JJNC), trails, park reserve, and associated parking. FEPA and associated venues are operated year round. FEMCO, as part of the Fort Edmonton Park Master Plan, has expressed plans to further develop the park, thus an IPR was conducted for each of seven projected infrastructure development sites within FEP and the Utility Replacement Project (throughout FEPA) prior to commencing construction activities. This IPR, for a New Commercial Block at FEP, was undertaken in 2013 summer-like spring conditions and visual observations of the site were not limited by the presence of snow.

Use of this report is subject to the Statement of Limitations and Conditions, which is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

2. PROJECT RATIONALE

According to the information provided by AEAL, there are seven new infrastructure projects in the initial design phase, as summarized below:

1) New Entrance Building: Located at the front gate, this building would function as a FEP entrance. The new front gate building will be a place to purchase entrance admission and enter the park, rather than the currently used, modified train station.

2) Realign-Expand Midway: New attractions in the midway would facilitate FEP becoming a premier tourist attraction, including expansion of the midway to create a permanent fair-like atmosphere.

3) Hotel Selkirk Expansion: The existing Hotel Selkirk would be expanded by a recreation of the historic Windsor Block and would assist FEP attracting overnight visitors.

4) New Commercial Block: Located near the Blatchford Field Air Hangar, this project would further highlight business from the 1920's era.

5) Artifact Warehouse Building: This structure would serve as an illustrative warehouse, rather than archive for non accessible material.

6) Indigenous People's Experience: Project would be located near and include Egge's Pond. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.

7) Streetcar Barn Expansion: This project would expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

The approximate locations of planned utility replacement and new infrastructure projects in FEP are shown on Drawing 17-123-796-E1 in Appendix A.

3. PROJECT ALTERNATIVES

Three options were considered by FEMCO to address the construction of the New Commercial Block as follows:

1) Do nothing (null option)

   This option (Option 1) involves doing no work for the New Commercial Block at FEP. Although a viable option, this option was not selected as it does not assist FEMCO growing the capabilities of the park (i.e. additional retail, restaurants and art and theatre venues), expanding the representation of the 1920's and does not allow for needed additional staff space.

2) Defer construction to a later date

This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to FEP operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist FEMCO in growing the park's capabilities and representation of the 1920's or meeting the need for additional staff space.

3) New Commercial Block construction in conjunction with other new infrastructure projects

Option 3 assists FEMCO in expanding its facilities along 1920 Street, providing additional opportunities for food and cultural space and adds staff space. Additionally, this option permits a minimization of disruption to FEP operations and permits cost savings by coordinating the construction of the New Commercial Block with the development of an Indigenous People's Experience, construction of a new entrance building, realignment and expansion of the midway, the Hotel Selkirk expansion, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities.

4. PROJECT DESCRIPTION

The project work falls within the area covered by the NSRV ARP and all aspects of the project are described as part of the IPR. This IPR addresses construction associated with the New Commercial Block within FEP while additional IPRs (issued under separate covers) address other new infrastructure projects planned for FEP and utility replacement in FEPA.

The New Commercial Block will be located in the area south of Blatchford Field Air Hangar. This area will feature retail and restaurant venues including a café, restaurant, art house, and theatre. Staff spaces will also be added.

Site area of the new commercial block will be approximately 3,100 m^2, and will consist of two buildings, each 76 m long by 15 m wide. The buildings will be located from the boardwalk on 1920 Street to the Hangar. Each building would be subdivided to look like up to five individual buildings using facades. Each unit would be a single story in height on a concrete floor. The expansion will be constructed using piles and slab on grade. Walkways and roadways will be required, as will landscaping.

Other projected infrastructure developments, as shown on Drawing 17-123-796-E1 in Appendix A include the following: an Indigenous People's Experience, a new FEP entrance building, realignment and expansion of the midway, an expansion of the Hotel Selkirk, an artifact warehouse building near the streetcar barn, streetcar barn expansion and utility replacement throughout FEPA.

The project laydown area for job trailers and storage of equipment and materials is unknown at the time of the IPR, but is anticipated to be in parking areas located adjacent to the existing service road and Blatchford Field Air Hangar. Project parking is also unknown at the time of IPR, and anticipated to take place in the FEPA parking area east of the existing FEP main gate, and on roadways in proximity to the work area.

The contractor will likely work a 10 hour shift, but may require longer shifts depending on the schedule and weather conditions. The contractor will comply with the City of Edmonton Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

The project construction schedule has not been set; however, initial work such as clearing of trees or brush (if required) will be undertaken prior to February 15 in year of construction to avoid potential migratory bird or owl nesting areas, if present.

The preceding descriptions for the New Commercial Block are construction procedures that may differ somewhat from the actual process, as construction commencement dates are not yet determined.

5. PUBLIC PARTICIPATION

It is understood from FEMCO that future infrastructure construction, including the New Commercial Block, have been under consideration since the spring of 2012 and the intention is to carry out New Commercial Block construction in 2020. The envisaged time frames for each of the seven areas and the utility replacements are summarized in Table 1 in Appendix B and range from 2017 through to 2020.

Nearby residents along the top of the River Valley and along Whitemud Road will be provided with project information and CoE contact information. Nearby residents will be able to access additional FEPA project details and/or to provide feedback through the CoE contact information.

Thurber recommends an open house or similar public participation so that stakeholders and community members may have input into the proposed changes at FEP. Information gathered

at an open house may also be utilized in future Environmental Screening Reports or Environmental Impact Assessments, should the CoE require them.

6. IMPACTS AND MITIGATIVE MEASURES

6.1 Impact Identification

Proposed impacts were identified by consulting the project description and applying professional judgement. Identified potential impacts were then analyzed and classified as significant, insignificant or unknown significance, according to the following definitions:

Insignificant Impact	One that does not affect a population beyond the limits of natural perturbations or does not substantially modify a natural feature known to be significant or does not alter land use.
Significant Impact	One that affects the population beyond the limits of natural perturbations or eliminates a natural feature known to be significant, or alters the land use.
Unknown Significance	Significance could not be determined due to insufficient information regarding project description or existing conditions.

6.2 Biological Environment

The general impacts to the biological environments and the mitigative measures that have been considered by Thurber for the selected alternative include:

- *Disturbances to the natural vegetation that grows, and the wildlife that lives along the North Saskatchewan River Valley slopes*.

  Thurber anticipates that natural vegetation will not have to be removed, as shown on Drawing 17-123-796-E2 in Appendix A, for the New Commercial Block. Pre-existing vegetation in the area is primarily grassed areas. Vegetation removal is considered insignificant as these areas have been previously disturbed and/or landscaped. Location 15 is the nearest area of tree removal; however, that location is associated with utility replacement and not the New Commercial Block construction.

  Disturbance of currently intact vegetation should be minimized to retain the ecological integrity of the park. Wildlife access to FEP is restricted by fences on the east, south and west sides, and the North Saskatchewan River to the north, otherwise the rest of FEPA

has no impediment to wildlife. Areas immediately east of the existing entrance consist of grass covered landscaped areas and asphalt paved parking, providing minimal wildlife habitat. Care in operating equipment on respective lay-down areas is required. Use of roadways as travel routes and laydown areas will also minimize the need to clear or damage trees, particularly prominent and aesthetically valuable trees that have been growing on non-travelled, landscaped portions of FEP for many years. Low-ground pressure, tracked or rubber tired vehicles should be utilized where possible to minimize soil rutting.

Disturbed ground should be reclaimed upon completion of construction activities, after which these areas should be reseeded and/or sodded with grass and, where appropriate, planted with woody landscape species to restore the landscape and equipment lay-down area to its previous use within FEP.

The NSRV and Whitemud Ravine support a variety of wildlife that have adapted to life within an urban green-space. A search of the Alberta Environment & Sustainable Resource Development (ESRD) Fish and Wildlife Management Information System (FWMIS) on-line data base[1] for FEPA identified numerous species of importance in the area. FEPA area falls within the range of the Sharp-tailed Grouse (*Pedioecetes phasianellus*, which is a classified as a sensitive species in the *General Status of Alberta Wild Species)*, Short-Eared Owl (*Asio flammeus,* may be at risk species), and Peregrine Falcon (*Falco peregrines,* at risk species*).* The federal Species at Risk Act (SARA)[2] notes peregrine falcons, Yellow Rail, and Monarch butterflies are species that are either threatened or of special concern and may be present in the Edmonton area.

Fish species identified in Whitemud Creek, located approximately 700 m east of FEP, the North Saskatchewan River approximately 50 m north of FEP and Egge's pond, located within FEP include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), Lake Chub (*Couesius plumbeus*), Longnose Dace (*Rhinichthys cataractae*), Longnose Sucker (*Catostomus catostomus*), Northern Pike (*Esox lucius*), and White Sucker (*Catostomus commersonii*).

As the North Saskatchewan River is located approximately 40 m north of the service road, approximately 120 m downslope of the New Commercial Block construction area, surface water runoff controls and the use of silt fencing are recommended to prevent

[1] Alberta Environment & Sustainable Resource Development Fish and Wildlife Management Information System (FWMIS). 2013. FWMIS Internet Mapping tool (Accessible at http://srd.alberta.ca/FishWildlife/FWMIS/AccessFWMISData.aspx)

[2] Government of Canada. 2003. "Species at Risk Act. Schedule 1 – List of Wildlife Species at Risk".

silting of the river. Surface water runoff controls are likely not required for Whitemud Creek as surface drainage in the western portion FEPA was observed as north toward the North Saskatchewan River, and to municipal storm system in the eastern portion of FEPA.

Given the urban location, recreational use of FEPA and the surrounding trails and majority fenced perimeter, disruption to local wildlife is anticipated to be insignificant and of short duration. As tree removal is not expected for the New Commercial Building project, disruption of potential owl or migratory bird nesting areas is not anticipated.

The project laydown area for job trailers and storage of equipment and materials is of unknown significance as the location is unknown at the time of IPR. The anticipated laydown areas would be located on road allowances and parking areas adjacent to construction area, including the existing parking area near the Blatchford Field Air Hanger. However, disruptions associated with the project laydown area is anticipated to be insignificant and disturbed areas can be readily restored to previous surface – grass or gravel. Project parking is anticipated to take place in the west portion of the FEPA parking lot. The locations of the laydown and parking areas have not been finalized as of the date of this report.

- *Disturbances to fish habitat in the North Saskatchewan River and Egge's Pond*

  Thurber anticipates existing fish habitat in the North Saskatchewan River will not be directly disturbed (insignificant impact) as the nearest area disturbed by the New Commercial Block construction is approximately 120 m south of the nearest approach of the river. However, protection of natural drainage pathways in and adjacent to the work area is recommended to minimize the potential for silt or debris from the project to enter the North Saskatchewan River.

  Construction of the New Construction Block is not anticipated to have an impact on Egge's Pond, which is located approximately 400 m to the west.

6.3 Physical Environment

General impacts to the physical environment and the mitigative measures that have been considered by Thurber for the chosen alternative include:

- *The detractive results of the construction activities in parkland*

  Thurber recognizes that noise, dust and mists that may be generated will negatively impact local vegetation and wildlife during utility construction. Impacts from these sources are anticipated to be insignificant and of short duration. Permanent infrastructure buildings will alter primarily grass covered areas.

- *The potential for pedestrians and cyclists to be exposed to construction hazards when using the nearby paved trail*

  Pedestrians and cyclists may be exposed to elevated noise and dust levels; however, given the separation between the work area and existing paved and multi-use trails, the impact is anticipated to be insignificant.

- *Grade Changes*

  Although earthworks are planned under this alternative, the intent is to complete construction activities and generally restore the surface to pre-construction status. Access to construction areas will be restricted to authorized personnel for the duration of new infrastructure construction activities in FEP. Grade changes are expected to be insignificant.

- *Impact on Fort Edmonton Park Users*

  Impacts to guests in FEP are of unknown significance and dependent on the construction schedule. Mitigation measures for potentially significant impacts would be to plan construction activities during seasons of reduced traffic (spring, fall or winter). If summer construction is necessary, conducting excavation and construction activities requiring machinery during Park minimal use times would mitigate user impacts as well as limiting access to construction areas.

- *Historical Resources*

  An archaeological assessment was not undertaken for FEP. However, a review of Alberta Culture's *Listing of Historical Resources* identifies the work area as "believed to contain a historical resource" of a palaeontological nature. Consequently, impacts to historical resources are of unknown significance. Prior to construction activities in the park, a clearance from Alberta Culture will be required. If historical resources or

archaeological artifacts are encountered during the work, the earthworks contractor must inform Alberta Culture and follow their direction for handling the discovery.

- *Environmental Impacts*

  Impacts to the environment from the New Commercial Block construction are dependent on construction activities and are of unknown significance. In order to minimize potential environmental impacts (i.e. contamination or erosion) within the project area, the contractor shall accept and incorporate CoE Environmental Policy C512, the CoE Contractor's Environmental Responsibility Package and the CoE Contractor's Release Reporting requirements into their work practices. The contractor shall also prepare an Environmental Construction Operations (ECO) Plan and implement practices consistent with the CoE *Erosion and Sedimentation Guidelines and Field Manual*.

- *Navigable Waters*

  The New Commercial Block does not involve impacts to navigable waters.

6.4 Community Impacts

General impacts to the community and the socio-economic environment as well as the mitigative measures that have been considered by Thurber for the alternative chosen include:

- *The daily construction noise that could disturb local residents*

  Noise impacts should be insignificant in relation to the nearby major arterial roadway within the CoE and located at the level of nearby homes. As a minimum, the project will comply with CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

- *Accessibility to Fort Edmonton Park*

  Fort Edmonton Park visitors are dependent upon park schedule. FEP is open to the general public from the May long weekend through to Labour Day weekend in September. FEP accessibility during construction is significantly dependent upon scheduling. With care in planning the construction schedule and limiting activities which may impede park access the impacts to FEP accessibility are anticipated to be insignificant.

- *Accessibility to the North Saskatchewan River Valley trail system*

  It is expected that vehicular access to FEP, JJNC and the general park users parking area will be maintained for the duration of the construction activities. Other than additional traffic volume and potentially extended distances between the parking area and the trail system associated with the construction activities, additional disruption will be insignificant.

- *Project parking and lay down area*

  It is anticipated that areas adjacent to existing roadways or the Blatchford Field Air Hangar parking will be utilized as a project laydown area. Project parking is anticipated to take place in the existing FEPA parking lot. The location of the laydown area has not been finalized as of the date of this report, and is of unknown significance.

7. CONCLUSIONS AND RECOMMENDATIONS

Table 1 in Appendix B summarizes the Biological, Physical and Community impacts for each of the seven areas and the utility replacements assessed within the Fort Edmonton Park Area and Fort Edmonton Park. The assessment was based on insignificant impact, significant impact or unknown significance. In general, the construction of the New Commercial Block will have insignificant impacts with the exception of parking/laydown impacts, historical impacts and certain possible environmental impacts, for which the New Commercial Block will have an unknown impact. Based on the information cited in this IPR, it is Thurber's opinion that project impacts will be necessary to improve the facilities along 1920 Street and permit expanded use and staff space at the park. As such, additional work, such as an Environmental Screening Report (ESR) or an Environmental Impact Assessment (EIA), may be required for the New Commercial Block.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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APPENDIX A

Drawings

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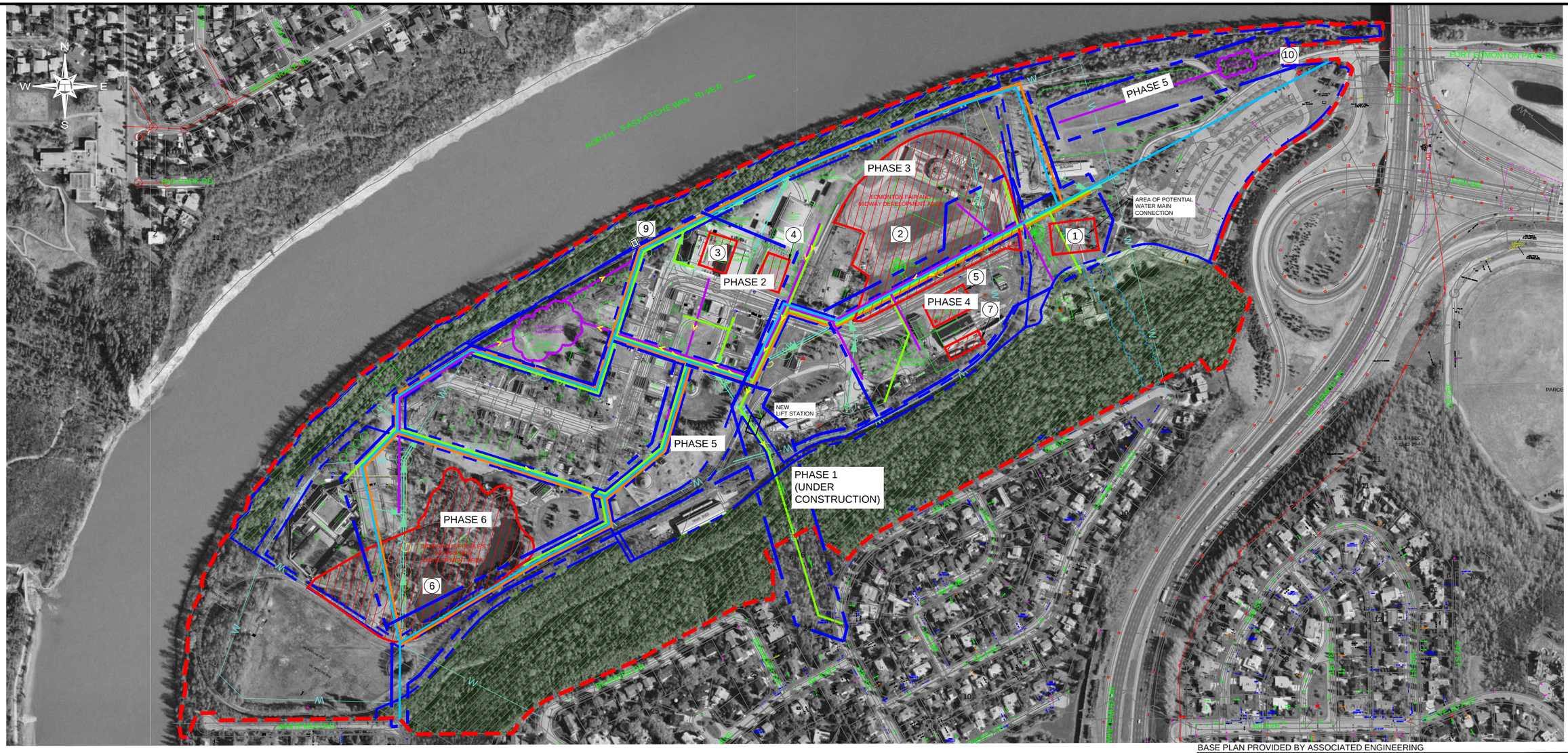

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

LEGEND:

- PROPOSED WATERMAINS
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED GAS LINE
- PHASE BOUNDARY
- PROJECT SITE BOUNDARY
- ENVIRONMENTAL RESERVE

1	NEW ENTRANCE BUILDING AT FRONT GATE	6	INDIGENOUS PEOPLE'S EXPERIENCE
2	REALIGN - EXPAND MIDWAY	7	STREETCAR BARN EXPANSION
3	HOTEL SELKIRK EXPANSION	8	UTILITY REPLACEMENT
4	NEW COMMERCIAL BLOCK	9 10	STORMWATER TREATMENT STRUCTURE
5	ARTIFACT WAREHOUSE BUILDING		

0 50 100 150 200 250 300m

SCALE 1:5000

Associated Engineering

FORT EDMONTON PARK ENVIRONMENTAL ASSESSMENT

PROPOSED DEVELOPMENTS

DWG No. 17-123-796-E1

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

THURBER ENGINEERING LTD.

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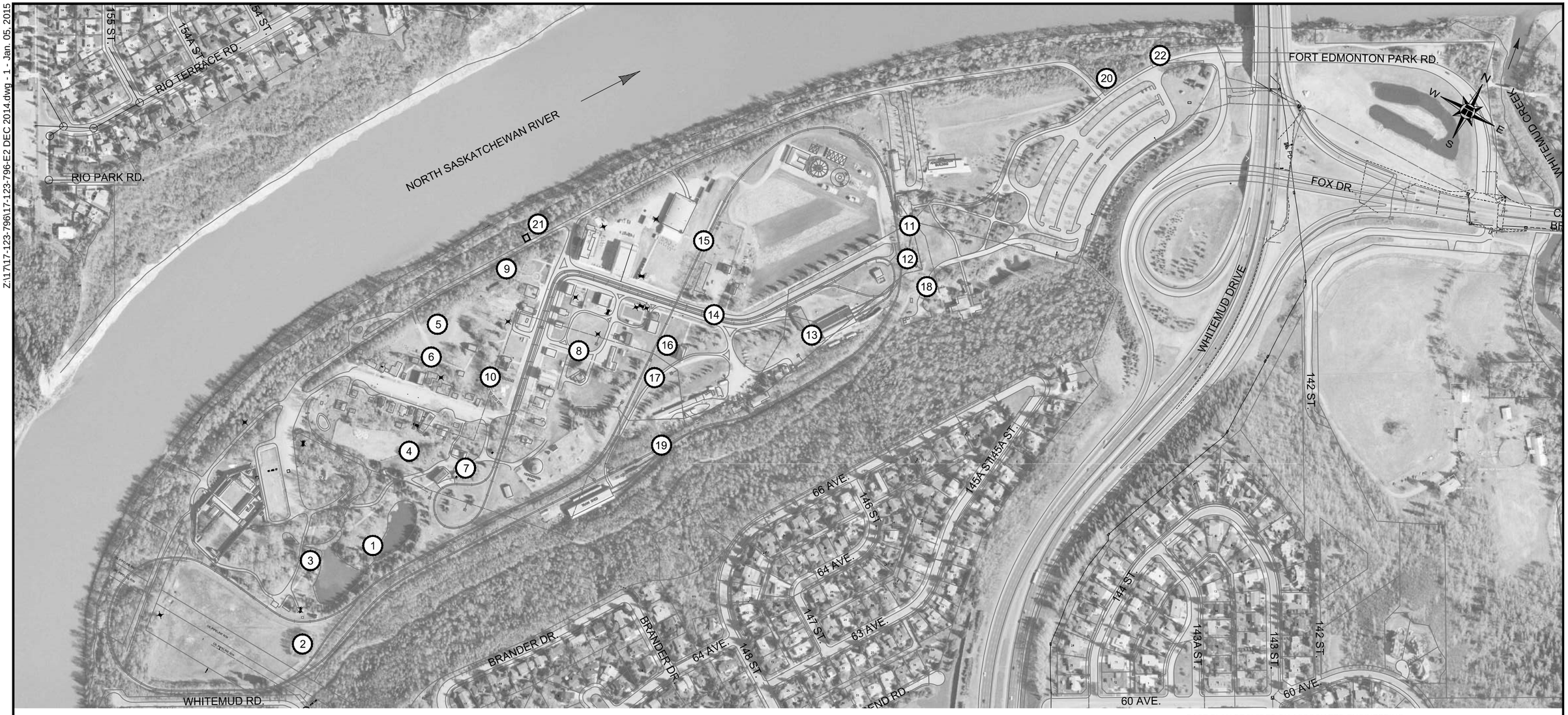

LEGEND

(1) LOCATION OF TREE REMOVAL (SEE REPORT TEXT FOR DETAILS)

0 50 100 150 200 250 300m

SCALE 1:5000

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

Associated Engineering

FORT EDMONTON PARK
ENVIRONMENTAL ASSESSMENT

SITE PLAN SHOWING AREAS OF TREE REMOVAL

DWG No. 17-123-796-E2

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

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APPENDIX B

Table

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TABLE 1
INITIAL PROJECT REVIEW – FORT EDMONTON PARK AREA UTILITY REPLACEMENT & PROPOSED CONSTRUCTION

	BIOLOGICAL						PHYSICAL										COMMUNITY			
	VEGETATION		WILDLIFE[2]		FISH		CONSTRUCTION / GRADE CHANGES		PEDESTRIANS / CYCLISTS/TRAIL USERS		NAV WATERS			HISTORICAL[4]	ENVIRONMENTAL[5]	IMPACTS TO PARK USERS	NOISE[3]	ACCESS		PARKING /LAYDOWN
LOCATION	II	SI	II	SI	II	SI	II[3]	SI	II	SI	NA	II	SI	US	US	US	II	II	US	US
1. New Entrance Building Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
2. Realign-Expand Midway Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
3. Hotel Selkirk Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
4. New Commercial Block Time Frame - 2020	X		X		X		X		X		X			X	X	X	X	X		X
5. Artifact Warehouse Building Time Frame – 2020	X		X		X		X		X		X			X	X	X	X	X		X
6. Indigenous People's Experience Time Frame – 2017		X		X		X		X	X			X		X	X	X	X	X		X
7. Streetcar Barn Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
8. Utility Replacement Time Frame - 2017	X	X[1]	X	X[1]	X[6]	X[6]	X		X		X			X	X	X	X		X	X

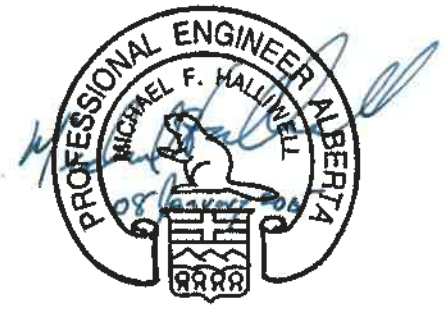
Note:
1. Storm water pond
2. Need to address migratory bird act and bird nest survey for trees to be removed. Also City of Edmonton tree compensation.
3. Follow City of Edmonton noise and dust bylaws
4. Historical Resources Overview to be conducted to ascertain significance
5. Use of Environmental Construction Operations (ECO) Plan to mitigate.
6. Depending on installation method selected – Horizontal direction drilling (II) vs. trench excavation (SI)

NA Not Applicable
II Insignificant Impact
SI Significant Impact
US Unknown Significance

THURBER ENGINEERING LTD.

INITIAL PROJECT REVIEW
FORT EDMONTON PARK
ARTIFACT WAREHOUSE BUILDING
(BLOCK A PLAN 852 1469)
EDMONTON, ALBERTA

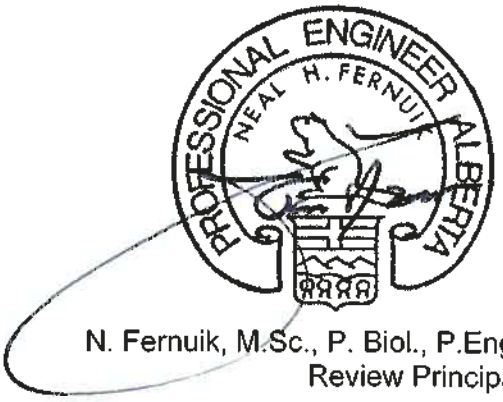
Report
to
Associated Engineering of Alberta Ltd.,
City of Edmonton
and
Fort Edmonton Management Company



M. Halliwell, M. Eng., EP, P.Eng.
Environmental Engineer

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
Signature
Date
PERMIT NUMBER: P 5186
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

Date: January 8, 2015
File: 17-123-796G



N. Fernuik, M.Sc., P. Biol., P.Eng.
Review Principal

THURBER

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1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) conducted an Initial Project Review (IPR) as part of the utility replacement and future expansion plans envisaged between 2013 and 2020 in the Fort Edmonton Park Area (FEPA). The work was carried out for Associated Engineering of Alberta Ltd. (AEAL) for submittal to City of Edmonton (CoE) and Fort Edmonton Management Company (FEMCO). The IPR is a process developed by the City of Edmonton Planning and Development Department to conduct environmental reviews of projects involving public development or development of public land within the North Saskatchewan River valley and connected ravines as part of the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP, Bylaw 7188). The draft report was submitted in January 2014 with final comment received in December 2014.

FEPA is a CoE park located in the North Saskatchewan River Valley and consists of Fort Edmonton Park (FEP, a high intensity land use property with up to 83 buildings and exhibit areas), the John Jansen Nature Centre (JJNC), trails, park reserve, and associated parking. FEPA and associated venues are operated year round. FEMCO, as part of the Fort Edmonton Park Master Plan, has expressed plans to further develop the park, thus an IPR was conducted for each of seven projected infrastructure development sites within FEP and the Utility Replacement Project (throughout FEPA) prior to commencing construction activities. This IPR, for the Artifact Warehouse Building at FEP, was undertaken in 2013 summer-like spring conditions and visual observations of the site were not limited by the presence of snow.

Use of this report is subject to the Statement of Limitations and Conditions, which is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

2. PROJECT RATIONALE

According to the information provided by AEAL, there are seven new infrastructure projects in the initial design phase, as summarized below:

1) New Entrance Building: Located at the front gate, this building would function as a FEP entrance. The new front gate building will be a place to purchase entrance admission and enter the park, rather than the currently used, modified train station.

2) Realign-Expand Midway: New attractions in the midway would facilitate FEP becoming a premier tourist attraction, including expansion of the midway to create a permanent fair-like atmosphere.

3) Hotel Selkirk Expansion: The existing Hotel Selkirk would be expanded by a recreation of the historic Windsor Block and would assist FEP attracting overnight visitors.

4) New Commercial Block: Located near the Blatchford Field Air Hangar, this project would further highlight business from the 1920's era.

5) Artifact Warehouse Building: This structure would serve as an illustrative warehouse, rather than archive for non accessible material.

6) Indigenous People's Experience: Project would be located near and include Egge's Pond. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.

7) Streetcar Barn Expansion: This project would expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

The approximate locations of planned utility replacement and new infrastructure projects in FEP are shown on Drawing 17-123-796-E1 in Appendix A.

3. PROJECT ALTERNATIVES

Three options were considered by CoE to address the construction of the Artifact Warehouse Building as follows:

1) Do nothing (null option)

   This option (Option 1) involves doing no work for the Artifact Warehouse Building at FEP. Although a viable option, this option was not selected as it does not assist FEMCO in maintaining a premier cultural heritage experience, presenting historical artifacts to the public, storing additional artifacts or having adequate staff spaces to support FEP.

2) Defer construction to a later date

   This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other

planned new infrastructure projects and would increase the disruption to FEP operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist FEMCO in preserving and presenting artifacts to the public or augmenting staff space in a timely manner.

3) Artifact Warehouse Building construction in conjunction with other new infrastructure projects

   Option 3 assists FEMCO in expanding its ability to present and preserve artifacts related to Edmonton's history, makes the artifacts available for public display to park patrons and adds staff space. Additionally, this option permits a minimization of disruption to FEP operations and permits cost savings by coordinating the construction of the Artifact Warehouse Building with the development of an Indigenous People's Experience, construction of a new entrance building, realignment and expansion of the midway, the Hotel Selkirk expansion, a new commercial block, the streetcar barn expansion and needed utility replacement activities.

4. PROJECT DESCRIPTION

The project work falls within the area covered by the NSRV ARP and all aspects of the project are described as part of the IPR. This IPR addresses construction associated with the Artifact Warehouse Building within FEP while additional IPRs (issued under separate covers) address the other new infrastructure projects planned for FEP and utility replacement within FEPA.

The Artifact Warehouse Building will be located immediately west of the existing Motordrome (publically accessible historical automobile storage and maintenance facility). The building will primarily be a warehouse with a viewing/display area. It will also include staff spaces, storage spaces and staff washrooms.

The site size will be approximately 700 m^2. The conceptual footprint of the artifact warehouse building is approximately 600 m^2. The warehouse will be a single story in height, and will be constructed using piles and slab on grade. There will be changes to existing walkways and new walkways will be required. Landscaping will also be required.

Other projected infrastructure developments, as shown on Drawing 17-123-796-E1 in Appendix A include the following: an Indigenous People's Experience, a new FEP entrance

building, realignment and expansion of the midway, an expansion of the Hotel Selkirk, a new commercial block, streetcar barn expansion and utility replacement throughout FEPA.

The project laydown area for job trailers and storage of equipment and materials is unknown at the time of IPR, but is anticipated to be in parking areas located adjacent to the existing streetcar barn and Motordrome or on nearby grassed areas. Project parking is also unknown at the time of IPR, and anticipated to take place in the FEPA parking area east of the existing FEP entrance, and on roadways in proximity to the work area.

The contractor will likely work a 10 hour shift, but may require longer shifts depending on the schedule and weather conditions. The contractor will comply with the City of Edmonton Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

The project construction schedule has not been set; however, initial work such as clearing of trees or brush (if required) will be undertaken prior to February 15 in year of construction to avoid potential migratory bird or owl nesting areas, if present.

The preceding descriptions for the Artifact Warehouse Building are construction procedures that may differ somewhat from the actual process, as construction commencement dates are not yet determined.

5. PUBLIC PARTICIPATION

It is understood from FEMCO that future infrastructure construction, including the Artifact Warehouse Building, have been under consideration since the spring of 2012 and the intention is to carry out Artifact Warehouse Building construction in 2020. The envisaged time frames for each of the seven areas and the utility replacements are summarized in Table 1 in Appendix B and range from 2017 through to 2020.

Nearby residents along the top of the River Valley and along Whitemud Road will be provided with project information and CoE contact information. Nearby residents will be able to access additional FEPA project details and/or to provide feedback through the CoE contact information.

Thurber recommends an open house or similar public participation so that stakeholders and community members may have input into the proposed changes at FEP. Information gathered at an open house may also be utilized in future Environmental Screening Reports or Environmental Impact Assessments, should the CoE require them.

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6. IMPACTS AND MITIGATIVE MEASURES

6.1 Impact Identification

Proposed impacts were identified by consulting the project description and applying professional judgement. Identified potential impacts were then analyzed and classified as significant, insignificant or unknown significance, according to the following definitions:

Insignificant Impact	One that does not affect a population beyond the limits of natural perturbations or does not substantially modify a natural feature known to be significant or does not alter land use.
Significant Impact	One that affects the population beyond the limits of natural perturbations or eliminates a natural feature known to be significant, or alters the land use.
Unknown Significance	Significance could not be determined due to insufficient information regarding project description or existing conditions.

6.2 Biological Environment

The general impacts to the biological environments and the mitigative measures that have been considered by Thurber for the selected alternative include:

- *Disturbances to the natural vegetation that grows, and the wildlife that lives along the North Saskatchewan River Valley slopes*

  Thurber anticipates that natural vegetation will not have to be removed, as shown on Drawing 17-123-796-E2 in Appendix A, for the Artifact Warehouse Building. Vegetation at location 13 is anticipated to be removed as part of the Streetcar Barn Expansion project, which will precede the Artifact Warehouse Building project. Pre-existing vegetation in the area is primarily grassed areas. Vegetation removal is considered insignificant as these areas have been previously disturbed and/or landscaped.

  Disturbance of currently intact vegetation should be minimized to retain the ecological integrity of the park. Wildlife access to FEP is restricted by fences on the east, south and west sides, and the North Saskatchewan River to the north, otherwise the rest of FEPA has no impediment to wildlife. Areas immediately east of the existing entrance consist of grass covered landscaped areas and asphalt paved parking, providing minimal wildlife

habitat. Care in operating equipment on respective lay-down areas is required. Use of roadways as travel routes and laydown areas will also minimize the need to clear or damage trees, particularly prominent and aesthetically valuable trees that have been growing on non-travelled, landscaped portions of FEP for many years. Low-ground pressure, tracked or rubber tired vehicles should be utilized where possible to minimize soil rutting.

Disturbed ground should be reclaimed upon completion of construction activities, after which these areas should be reseeded and/or sodded with grass and, where appropriate, planted with woody landscape species to restore the landscape and equipment lay-down area to its previous use within FEP.

The NSRV and Whitemud Ravine support a variety of wildlife that have adapted to life within an urban green-space. A search of the Alberta Environment & Sustainable Resource Development (ESRD) Fish and Wildlife Management Information System (FWMIS) on-line data base[1] for FEPA identified numerous species of importance in the area. FEPA area falls within the range of the Sharp-tailed Grouse (*Pedioecetes phasianellus*, which is a classified as a sensitive species in the *General Status of Alberta Wild Species)*, Short-Eared Owl (*Asio flammeus,* may be at risk species), and Peregrine Falcon (*Falco peregrines,* at risk species*).* The federal Species at Risk Act (SARA)[2] notes peregrine falcons, Yellow Rail, and Monarch butterflies are species that are either threatened or of special concern and may be present in the Edmonton area.

Fish species identified in Whitemud Creek, located approximately 700 m east of FEP, the North Saskatchewan River approximately 50 m north of FEP and Egge's Pond, located within FEP include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), Lake Chub (*Couesius plumbeus*), Longnose Dace (*Rhinichthys cataractae*), Longnose Sucker (*Catostomus catostomus*), Northern Pike (*Esox lucius*), and White Sucker (*Catostomus commersonii*).

As the North Saskatchewan River is located approximately 40 m north of the service road, approximately 250 m downslope of the Artifact Warehouse Building area, surface water runoff controls and the use of silt fencing are recommended to prevent silting of the river. Surface water runoff controls are likely not required for Whitemud Creek as

[1] Alberta Environment & Sustainable Resource Development Fish and Wildlife Management Information System (FWMIS). 2013. FWMIS Internet Mapping tool (Accessible at http://srd.alberta.ca/FishWildlife/FWMIS/AccessFWMISData.aspx)

[2] Government of Canada. 2003. "Species at Risk Act. Schedule 1 – List of Wildlife Species at Risk".

surface drainage in the western portion FEP was observed as north toward North Saskatchewan River, and to municipal storm system in the eastern portion of FEPA.

Given the urban location, recreational use of FEPA and the surrounding trails and majority fenced perimeter, disruption to local wildlife is anticipated to be insignificant and of short duration. Due to the potential presence of owls, tree removal (if required for location 13 on Drawing 17-123-796-E2) prior to nesting season (February 15 – August 31) would be possible with careful planning under the proposed project timeline. CoE / FEMCO will need to have a qualified biologist or wildlife specialist assess the area of proposed tree removal for nests prior to clearing taking place.

The project laydown area for job trailers and storage of equipment and materials is of unknown significance as the location is unknown at the time of IPR. The anticipated laydown areas would include road allowances and parking areas adjacent to construction areas, including the existing parking area near the Motordrome and streetcar barn. However, disruptions associated with the project laydown area are anticipated to be insignificant and disturbed areas can be readily restored to previous surface – grass or gravel. Project parking is anticipated to take place in the west portion of the FEPA parking lot. The locations of the laydown and parking areas have not been finalized as of the date of this report.

- *Disturbances to fish habitat in the North Saskatchewan River and Egge's Pond*

  Thurber anticipates existing fish habitat in the North Saskatchewan River will not be directly disturbed (insignificant impact) as the nearest area disturbed by the Artifact Warehouse Building construction is approximately 250 m south of the nearest approach of the river. However, protection of natural drainage pathways in and adjacent to the work area is recommended to minimize the potential for silt or debris from the project to enter the North Saskatchewan River.

  Construction of the Artifact Warehouse Building is not anticipated to have an impact on Egge's Pond, which is located approximately 500 m to the west.

6.3 Physical Environment

General impacts to the physical environment and the mitigative measures that have been considered by Thurber for the chosen alternative include:

- *The detractive results of the construction activities in parkland*

  Thurber recognizes that noise, dust and mists that may be generated will negatively impact local vegetation and wildlife during utility construction. Impacts from these sources are anticipated to be insignificant and of short duration. Permanent infrastructure buildings will alter primarily grassed landscaped areas.

- *The potential for pedestrians and cyclists to be exposed to construction hazards when using the nearby paved trail*

  Pedestrians and cyclists may be exposed to elevated noise and dust levels; however, given the separation between the work area and existing paved and multi-use trails, the impact is anticipated to be insignificant.

- *Grade Changes*

  Although earthworks are planned under this alternative, the intent is to complete construction activities and generally restore the surface to pre-construction status. Access to construction areas will be restricted to authorized personnel for the duration of new infrastructure construction activities in FEP. Grade changes are expected to be insignificant.

- *Impact on Fort Edmonton Park Users*

  Impacts to guests in FEP are of unknown significance and dependent on the construction schedule. Mitigation measures for potentially significant impacts would be to plan construction activities during seasons of reduced traffic (spring, fall or winter). If summer construction is necessary, conducting excavation and construction activities requiring machinery during Park minimal use times would mitigate user impacts as would limiting access to construction areas.

- *Historical Resources*

  An archaeological assessment was not undertaken for FEP. However, a review of Alberta Culture's *Listing of Historical Resources* identifies the work area as "believed to contain a historical resource" of a palaeontological nature. Consequently, impacts to historical resources are of unknown significance. Prior to construction activities in the park, a clearance from Alberta Culture will be required. If historical resources

or archaeological artifacts are encountered during the work, the earthworks contractor must inform Alberta Culture and follow their direction for handling the discovery.

- *Environmental Impacts*

  Impacts to the environment from the Artifact Warehouse Building construction are dependent on construction activities and are of unknown significance. In order to minimize potential environmental impacts (i.e. contamination or erosion) within the projected area, the contractor shall accept and incorporate CoE Environmental Policy C512, the CoE Contractor's Environmental Responsibility Package and the CoE Contractor's Release Reporting requirements into their work practices. The contractor shall also prepare an Environmental Construction Operations (ECO) Plan and implement practices consistent with the CoE *Erosion and Sedimentation Guidelines and Field Manual*.

- *Navigable Waters*

  The Artifact Warehouse Building does not involve impacts to navigable waters.

6.4 Community Impacts

General impacts to the community and the socio-economic environment as well as the mitigative measures that have been considered by Thurber for the alternative chosen include:

- *The daily construction noise that could disturb local residents*

  Noise impacts should be insignificant in relation to the nearby major arterial roadway within the CoE and located at the level of nearby homes. As a minimum, the project will comply with CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

- *Accessibility to Fort Edmonton Park*

  Fort Edmonton Park visitors are dependent upon park schedule. FEP is open to the general public from the May long weekend through to Labour Day weekend in September. FEP accessibility during construction is significantly dependent upon scheduling. With care in planning the construction schedule and limiting activities which may impede park access the impacts to FEP accessibility are anticipated to be insignificant.

- *Accessibility to the North Saskatchewan River Valley trail system*

  It is expected that vehicular access to FEP, JJNC and the general park users parking area will be maintained for the duration of the construction activities. Other than additional traffic volume and potentially extended distances between the parking area and the trail system associated with the construction activities, additional disruption will be insignificant.

- *Project parking and lay down area*

  It is anticipated that areas adjacent to existing roadways, parking at the Motordrome and streetcar barns or nearby grassed areas will be utilized as a project laydown area. Project parking is anticipated to take place in the existing FEPA parking lot. The location of the laydown area has not been finalized as of the date of this report, and is of unknown significance.

7. CONCLUSIONS AND RECOMMENDATIONS

Table 1 in Appendix B summarizes the Biological, Physical and Community impacts for each of the seven areas and the utility replacements assessed within Fort Edmonton Park Area and Fort Edmonton Park. The assessment was based on insignificant impact, significant impact or unknown significance. In general, the construction of the Artifact Warehouse Building will have insignificant impacts with the exception of parking/laydown impacts, historical impacts and certain possible environmental impacts, for which the Artifact Warehouse Building will have an unknown impact. Based on the information cited in this IPR, it is Thurber's opinion that project impacts will be necessary to improve the preservation and presentation of historical artifacts and provide additional staff space at the park. As such, additional work, such as an Environmental Screening Report (ESR) or an Environmental Impact Assessment (EIA) may be required for the Artefact Warehouse Building. The services of a qualified biologist or wildlife specialist will be required to assess any potential tree removal prior to clearing due to possible owl or migratory bird nesting in the area.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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APPENDIX A

Drawings

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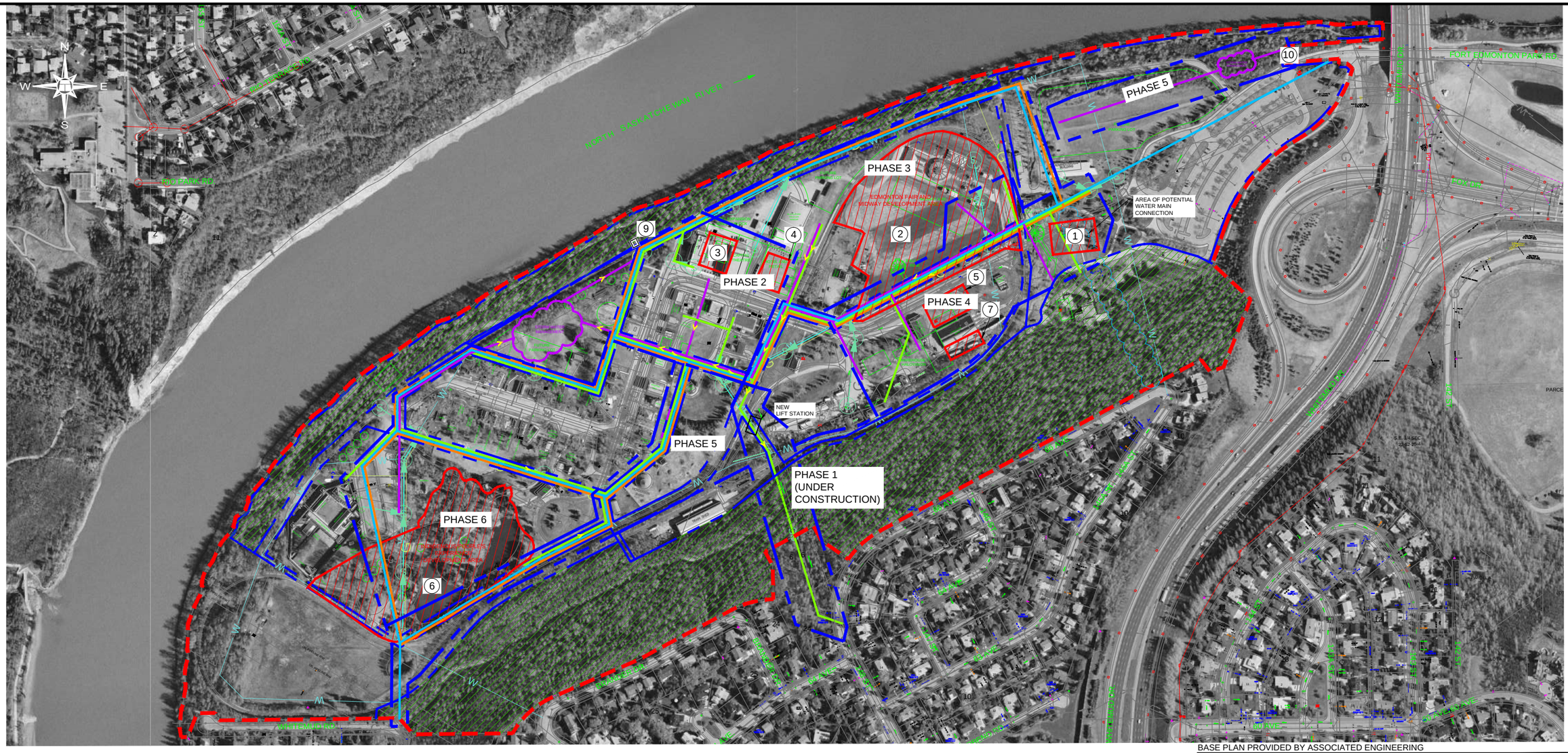

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

LEGEND:

- PROPOSED WATERMAINS
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED GAS LINE
- PHASE BOUNDARY
- PROJECT SITE BOUNDARY
- ENVIRONMENTAL RESERVE

1	NEW ENTRANCE BUILDING AT FRONT GATE	6	INDIGENOUS PEOPLE'S EXPERIENCE
2	REALIGN - EXPAND MIDWAY	7	STREETCAR BARN EXPANSION
3	HOTEL SELKIRK EXPANSION	8	UTILITY REPLACEMENT
4	NEW COMMERCIAL BLOCK	9 10	STORMWATER TREATMENT STRUCTURE
5	ARTIFACT WAREHOUSE BUILDING		

0 50 100 150 200 250 300m

SCALE 1:5000

Associated Engineering

FORT EDMONTON PARK ENVIRONMENTAL ASSESSMENT

PROPOSED DEVELOPMENTS

DWG No. 17-123-796-E1

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

THURBER ENGINEERING LTD.

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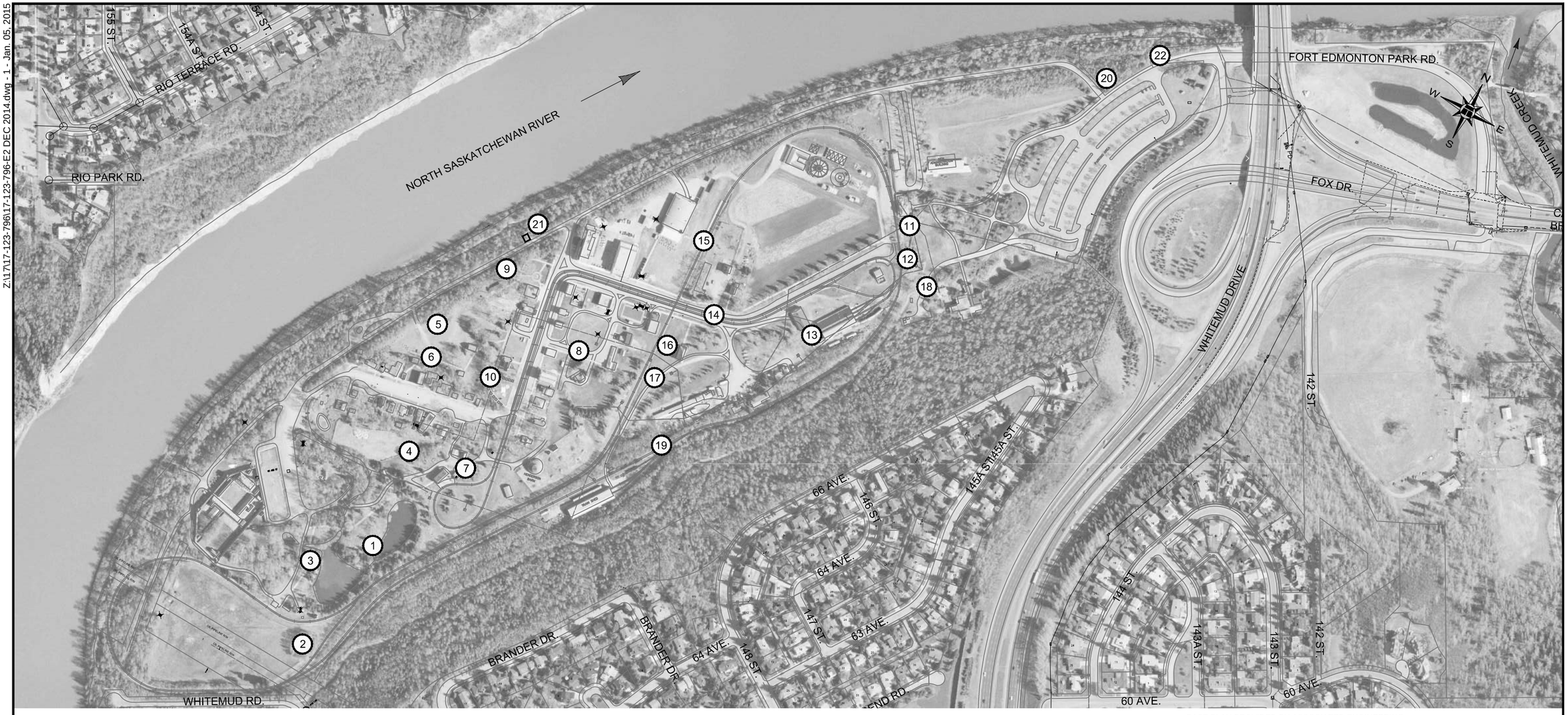

LEGEND

(1) LOCATION OF TREE REMOVAL (SEE REPORT TEXT FOR DETAILS)

0 50 100 150 200 250 300m

SCALE 1:5000

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

Associated Engineering

FORT EDMONTON PARK
ENVIRONMENTAL ASSESSMENT

SITE PLAN SHOWING AREAS OF TREE REMOVAL

DWG No. 17-123-796-E2

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

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APPENDIX B

Table

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TABLE 1
INITIAL PROJECT REVIEW – FORT EDMONTON PARK AREA UTILITY REPLACEMENT & PROPOSED CONSTRUCTION

	BIOLOGICAL						PHYSICAL										COMMUNITY			
	VEGETATION		WILDLIFE[2]		FISH		CONSTRUCTION / GRADE CHANGES		PEDESTRIANS / CYCLISTS/TRAIL USERS		NAV WATERS			HISTORICAL[4]	ENVIRONMENTAL[5]	IMPACTS TO PARK USERS	NOISE[3]	ACCESS		PARKING /LAYDOWN
LOCATION	II	SI	II	SI	II	SI	II[3]	SI	II	SI	NA	II	SI	US	US	US	II	II	US	US
1. New Entrance Building Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
2. Realign-Expand Midway Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
3. Hotel Selkirk Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
4. New Commercial Block Time Frame - 2020	X		X		X		X		X		X			X	X	X	X	X		X
5. Artifact Warehouse Building Time Frame – 2020	X		X		X		X		X		X			X	X	X	X	X		X
6. Indigenous People's Experience Time Frame – 2017		X		X		X		X	X			X		X	X	X	X	X		X
7. Streetcar Barn Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
8. Utility Replacement Time Frame - 2017	X	X[1]	X	X[1]	X[6]	X[6]	X		X		X			X	X	X	X		X	X

Note:
1. Storm water pond
2. Need to address migratory bird act and bird nest survey for trees to be removed. Also City of Edmonton tree compensation.
3. Follow City of Edmonton noise and dust bylaws
4. Historical Resources Overview to be conducted to ascertain significance
5. Use of Environmental Construction Operations (ECO) Plan to mitigate.
6. Depending on installation method selected – Horizontal direction drilling (II) vs. trench excavation (SI)

NA Not Applicable
II Insignificant Impact
SI Significant Impact
US Unknown Significance

THURBER ENGINEERING LTD.

INITIAL PROJECT REVIEW
FORT EDMONTON PARK
STREETCAR BARN EXPANSION
(BLOCK A PLAN 852 1469)
EDMONTON, ALBERTA

Report

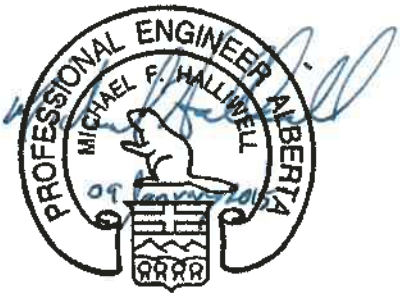
to

Associated Engineering of Alberta Ltd.,

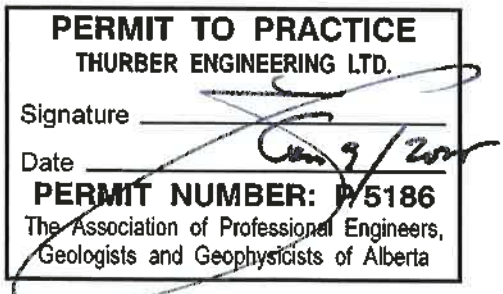
City of Edmonton

and

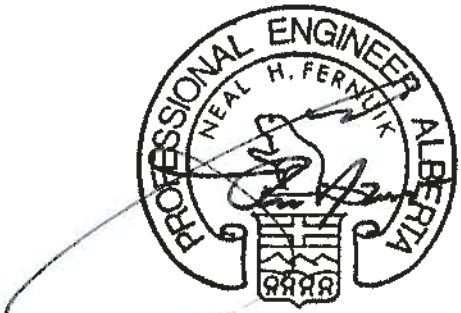
Fort Edmonton Management Company



M. Halliwell, M. Eng., EP, P.Eng.
Environmental Engineer



Date: January 9, 2015
File: 17-123-796H



N. Fernuik, M.Sc., P. Biol., P.Eng.
Review Principal

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TABLE OF CONTENTS

1. INTRODUCTION

Thurber Engineering Ltd. (Thurber) conducted an Initial Project Review (IPR) as part of the utility replacement and future expansion plans envisaged between 2013 and 2020 in the Fort Edmonton Park Area (FEPA). The work was carried out for Associated Engineering of Alberta Ltd. (AEAL) for submittal to City of Edmonton (CoE) and Fort Edmonton Management Company (FEMCO). The IPR is a process developed by the City of Edmonton Planning and Development Department to conduct environmental reviews of projects involving public development or development of public land within the North Saskatchewan River valley and connected ravines as part of the North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP, Bylaw 7188). The draft report was submitted in January 2014 with final comment received in December 2014.

FEPA is a CoE park located in the North Saskatchewan River Valley and consists of Fort Edmonton Park (FEP, a high intensity land use property with up to 83 buildings and exhibit areas), the John Jansen Nature Centre (JJNC), trails, park reserve, and associated parking. FEPA and associated venues are operated year round. FEMCO, as part of the Fort Edmonton Park Master Plan, has expressed plans to further develop the park, thus an IPR was conducted for each of seven projected infrastructure development sites within FEP and the Utility Replacement Project (throughout FEPA) prior to commencing construction activities. This IPR, for the Streetcar Barn Expansion at FEP, was undertaken in 2013 summer-like spring conditions and visual observations of the site were not limited by the presence of snow.

Use of this report is subject to the Statement of Limitations and Conditions, which is included at the end of the text of this report. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

2. PROJECT RATIONALE

According to the information provided by AEAL, there are seven new infrastructure projects in the initial design phase, as summarized below:

1) New Entrance Building: Located at the front gate, this building would function as a FEP entrance. The new front gate building will be a place to purchase entrance admission and enter the park, rather than the currently used, modified train station.

2) Realign-Expand Midway: New attractions in the midway would facilitate FEP becoming a premier tourist attraction, including expansion of the midway to create a permanent fair-like atmosphere.

3) Hotel Selkirk Expansion: The existing Hotel Selkirk would be expanded by a recreation of the historic Windsor Block and would assist FEP attracting overnight visitors.

4) New Commercial Block: Located near the Blatchford Field Air Hangar, this project would further highlight business from the 1920's era.

5) Artifact Warehouse Building: This structure would serve as an illustrative warehouse, rather than archive for non accessible material.

6) Indigenous People's Experience: Project would be located near and include Egge's Pond. Highlighting Edmonton and area from the native perspective, pre-fur trader influence, the Indigenous People's Experience will involve expanding Egge's Pond to two distinct ponds and a water feature.

7) Streetcar Barn Expansion: This project would expand the existing streetcar facilities and is located just south of the proposed Artifact Warehouse Building.

The approximate locations of planned utility replacement and new infrastructure projects in FEP are shown on Drawing 17-123-796-E1 in Appendix A.

3. PROJECT ALTERNATIVES

Three options were considered by CoE to address the construction of the Streetcar Barn Expansion as follows:

1) Do nothing (null option)

   This option (Option 1) involves doing no work for the Streetcar Barn Expansion at FEP. Although a viable option, this option was not selected as it does not assist FEMCO or the Edmonton Radial Railway Society (ERRS, operators of the streetcars at FEP) in preserving, restoring or operating historical artifacts at the park.

2) Defer construction to a later date

   This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other

planned new infrastructure projects, would increase the disruption to FEP operations and the patron's experiences and would permit additional weathering of unrestored streetcars. Similarly to Option 1, this option was not selected as it does not assist FEMCO and ERRS in preserving, presenting and operating artifacts (streetcars) at FEP.

3) Streetcar Barn Expansion construction in conjunction with other new infrastructure projects

   Option 3 assists FEMCO and the ERRS in expanding their ability to present and preserve artifacts (streetcars) related to Edmonton's history, makes restored and unrestored streetcars available for public display to park patrons, adds potential workspace and provides additional staff space. As well, this option permits a minimization of disruption to FEP operations and permits cost savings by coordinating the construction of the Streetcar Barn Expansion with the development of an Indigenous People's Experience, construction of a new FEP entrance building, realignment and expansion of the midway, the Hotel Selkirk expansion, a new commercial block, the construction of a new artifact warehouse and needed utility replacement activities.

4. PROJECT DESCRIPTION

The project work falls within the area covered by the NSRV ARP and all aspects of the project are described as part of the IPR. This IPR addresses construction associated with the Streetcar Barn Expansion within FEP while additional IPRs (issued under separate covers) address the new infrastructure projects planned for FEP and utility replacement in FEPA.

The Streetcar Barn Expansion will take place on the north side of the existing Streetcar Barn building. The building will mostly be used for storage and display of the unrestored streetcar collection of the ERRS. The building will also include staff spaces and washrooms. Restored cars may be stored in the new building in the future as more streetcars are restored. The building will be unheated and will require lighting. In the future, one or more tracks may be electrified for moving streetcars.

The building will be approximately 13 metres wide and 45 to 58 metres long. Depending on the design, the building height will be approximately 5 metres. The building will be constructed using piles and slab on grade. There will be changes to the existing walkways, and new walkways will be constructed. Landscaping will also be required.

Other projected infrastructure developments, as shown on Drawing 17-123-796-E1 in Appendix A include the following: an Indigenous People's Experience, a new FEP entrance building, realignment and expansion of the midway, an expansion of the Hotel Selkirk, a new commercial block, a new artifact warehouse and utility replacement throughout FEPA.

The project laydown area for job trailers and storage of equipment and materials is unknown at the time of IPR, but is anticipated to be in parking areas located adjacent to the existing streetcar barn and Motordrome or on nearby grassed areas. Project parking is also unknown at the time of IPR, and anticipated to take place in the FEPA parking area east of the existing FEP main gate, and on roadways in proximity to the work area.

The contractor will likely work a 10 hour shift, but may require longer shifts depending on the schedule and weather conditions. The contractor will comply with the City of Edmonton Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

The project construction schedule has not been set; however, initial work such as clearing of trees or brush (if required) will be undertaken prior to February 15 in year of construction to avoid potential migratory bird or owl nesting areas, if present.

The preceding descriptions for the Streetcar Barn Expansion are construction procedures that may differ somewhat from the actual process, as construction commencement dates are not yet determined.

5. PUBLIC PARTICIPATION

It is understood from FEMCO that future infrastructure construction, including the Streetcar Barn Expansion, have been under consideration since the spring of 2012 and the intention is to carry out Streetcar Barn Expansion construction in 2017. The envisaged time frames for each of the seven areas and the utility replacements are summarized in Table 1 in Appendix B and range from 2017 through to 2020.

Nearby residents along the top of the River Valley and along Whitemud Road will be provided with project information and CoE contact information. Nearby residents will be able to access additional FEPA project details and/or to provide feedback through the CoE contact information.

Thurber recommends an open house or similar public participation so that stakeholders and community members may have input into the proposed changes at FEP. Information gathered at an open house may also be utilized in future Environmental Screening Reports or Environmental Impact Assessments, should the CoE require them.

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6. IMPACTS AND MITIGATIVE MEASURES

6.1 Impact Identification

Proposed impacts were identified by consulting the project description and applying professional judgement. Identified potential impacts were then analyzed and classified as significant, insignificant or unknown significance, according to the following definitions:

Insignificant Impact	One that does not affect a population beyond the limits of natural perturbations or does not substantially modify a natural feature known to be significant or does not alter land use.
Significant Impact	One that affects the population beyond the limits of natural perturbations or eliminates a natural feature known to be significant, or alters the land use.
Unknown Significance	Significance could not be determined due to insufficient information regarding project description or existing conditions.

6.2 Biological Environment

The general impacts to the biological environments and the mitigative measures that have been considered by Thurber for the selected alternative include:

- *Disturbances to the natural vegetation that grows, and the wildlife that lives along the North Saskatchewan River Valley slopes*.

  Thurber anticipates that a small amount of vegetation will have to be removed, as shown at location 13 on Drawing 17-123-796-E2 in Appendix A, for the Streetcar Barn Expansion. Pre-existing vegetation in the area is primarily grassed areas. Vegetation removal is considered insignificant as these areas have been previously disturbed and/or landscaped.

  Disturbance of currently intact vegetation should be minimized to retain the ecological integrity of the park. Wildlife access to FEP is restricted by fences on the east, south and west sides, and the North Saskatchewan River to the north, otherwise the rest of FEPA has no impediment to wildlife. Areas immediately east of the existing entrance consist of grass covered landscaped areas and asphalt paved parking, providing minimal wildlife habitat. Care in operating equipment on respective lay-down areas is required. Use of

roadways as travel routes and laydown areas will also minimize the need to clear or damage trees, particularly prominent and aesthetically valuable trees that have been growing on non-travelled, landscaped portions of FEP for many years. Low-ground pressure, tracked or rubber tired vehicles should be utilized where possible to minimize soil rutting.

Disturbed ground should be reclaimed upon completion of construction activities, after which these areas should be reseeded and/or sodded with grass and, where appropriate, planted with woody landscape species to restore the landscape and equipment lay-down area to its previous use within FEP.

The NSRV and Whitemud Ravine support a variety of wildlife that have adapted to life within an urban green-space. A search of the Alberta Environment & Sustainable Resource Development (ESRD) Fish and Wildlife Management Information System (FWMIS) on-line data base[1] for FEPA identified numerous species of importance in the area. FEPA falls within the range of the Sharp-tailed Grouse (*Pedioecetes phasianellus*, which is a classified as a sensitive species in the *General Status of Alberta Wild Species)*, Short-Eared Owl (*Asio flammeus,* may be at risk species), and Peregrine Falcon (*Falco peregrines,* at risk species*).* The federal Species at Risk Act (SARA)[2] notes peregrine falcons, Yellow Rail, and Monarch butterflies are species that are either threatened or of special concern and may be present in the Edmonton area.

Fish species identified in Whitemud Creek, located approximately 700 m east of FEP, the North Saskatchewan River approximately 50 m north of FEP and Egge's Pond, located within FEP include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), Lake Chub (*Couesius plumbeus*), Longnose Dace (*Rhinichthys cataractae*), Longnose Sucker (*Catostomus catostomus*), Northern Pike (*Esox lucius*), and White Sucker (*Catostomus commersonii*).

As the North Saskatchewan River is located approximately 40 m north of the service road, approximately 250 m downslope of the Streetcar Barn Expansion area, surface water runoff controls and the use of silt fencing are recommended to prevent silting of the river. Surface water runoff controls are likely not required for Whitemud Creek as surface drainage in the western portion FEP was observed as

[1] Alberta Environment & Sustainable Resource Development Fish and Wildlife Management Information System (FWMIS). 2013. FWMIS Internet Mapping tool (Accessible at http://srd.alberta.ca/FishWildlife/FWMIS/AccessFWMISData.aspx)

[2] Government of Canada. 2003. "Species at Risk Act. Schedule 1 – List of Wildlife Species at Risk".

north toward North Saskatchewan River, and to municipal storm system in the eastern portion of FEPA.

Given the urban location, recreational use of FEPA and the surrounding trails and majority fenced perimeter, disruption to local wildlife is anticipated to be insignificant and of short duration. Due to the potential presence of owls, tree removal (if required at location 13 on Drawing 17-123-796-E2) prior to nesting season (February 15 – August 31) would be possible with careful planning under the proposed project timeline. CoE/FEMCO will need to have a qualified biologist or wildlife specialist assess the area of proposed tree removal for nests prior to clearing taking place.

The project laydown area for job trailers and storage of equipment and materials is of unknown significance as the location is unknown at the time of IPR. The anticipated laydown areas would include road allowances and parking areas adjacent to construction area, including the existing parking area near the Motordrome and existing streetcar barn. However, disruptions associated with the project laydown area is anticipated to be insignificant and disturbed areas can be readily restored to previous surface – grass or gravel. Project parking is anticipated to take place in the west portion of the FEPA parking lot. The locations of the laydown and parking areas have not been finalized as of the date of this report.

- *Disturbances to fish habitat in the North Saskatchewan River and Egge's Pond*

  Thurber anticipates existing fish habitat in the North Saskatchewan River will not be directly disturbed (insignificant impact) as the nearest area disturbed by the Streetcar Barn Expansion construction is approximately 250 m south of the nearest approach of the river. However, protection of natural drainage pathways in and adjacent to the work area is recommended to minimize the potential for silt or debris from the project to enter the North Saskatchewan River.

  Construction of the Streetcar Barn Expansion is not anticipated to have an impact on Egge's Pond, which is located approximately 500 m to the west.

6.3 Physical Environment

General impacts to the physical environment and the mitigative measures that have been considered by Thurber for the chosen alternative include:

- *The detractive results of the construction activities in parkland*

  Thurber recognizes that noise, dust and mists that may be generated will negatively impact local vegetation and wildlife during utility construction. Impacts from these sources are anticipated to be insignificant and of short duration. Permanent infrastructure buildings will alter primarily grass covered areas.

- *The potential for pedestrians and cyclists to be exposed to construction hazards when using the nearby paved trail*

  Pedestrians and cyclists may be exposed to elevated noise and dust levels; however, given the separation between the work area and existing paved and multi-use trails, the impact is anticipated to be insignificant.

- *Grade Changes*

  Although earthworks are planned under this alternative, the intent is to complete construction activities and generally restore the surface to pre-construction status. Access to construction areas will be restricted to authorized personnel for the duration of new infrastructure construction activities in FEP. Grade changes are expected to be insignificant.

- *Impact on Fort Edmonton Park Users*

  Impacts to guests in FEP are of unknown significance and dependent on the construction schedule. Mitigation measures for potentially significant impacts would be to plan construction activities during seasons of reduced traffic (spring, fall or winter). If summer construction is necessary, conducting excavation and construction activities requiring machinery during Park minimal use times would mitigate user impacts as well as limiting access to construction areas.

- *Historical Resources*

  An archaeological assessment was not undertaken for FEP. However, a review of Alberta Culture's *Listing of Historical Resources* identifies the work area as "believed to contain a historical resource" of a palaeontological nature. Consequently, impacts to historical resources are of unknown significance. Prior to construction activities in the park, a clearance from Alberta Culture will be required. If historical resources or

archaeological artifacts are encountered during the work, the earthworks contractor must inform Alberta Culture and follow their direction for handling the discovery.

- *Environmental Impacts*

  Impacts to the environment from the Streetcar Barn Expansion construction are dependent on construction activities and are of unknown significance. In order to minimize potential environmental impacts (i.e. contamination or erosion) within the projected area, the contractor shall accept and incorporate CoE Environmental Policy C512, the CoE Contractor's Environmental Responsibility Package and the CoE Contractor's Release Reporting requirements into their work practices. The contractor shall also prepare an Environmental Construction Operations (ECO) Plan and implement practices consistent with the CoE *Erosion and Sedimentation Guidelines and Field Manual*.

- *Navigable Waters*

  The Streetcar Barn Expansion does not involve impacts to navigable waters.

6.4 Community Impacts

General impacts to the community and the socio-economic environment as well as the mitigative measures that have been considered by Thurber for the alternative chosen include:

- *The daily construction noise that could disturb local residents*

  Noise impacts are anticipated to be insignificant in relation to the nearby major arterial roadway within the CoE and located at the level of nearby homes. As a minimum, the project will comply with CoE Bylaw 14600 (Community Standards Bylaw) that pertains to noise during construction activities.

- *Accessibility to Fort Edmonton Park*

  Fort Edmonton Park visitors are dependent upon park schedule. FEP is open to the general public from the May long weekend through to Labour Day weekend in September. FEP accessibility during construction is significantly dependent upon scheduling. With care in planning the construction schedule and limiting activities which may impede park access, the impacts to FEP accessibility are anticipated to be insignificant.

- *Accessibility to the North Saskatchewan River Valley trail system*

  It is expected that vehicular access to FEP, JJNC and the general park users parking area will be maintained for the duration of the construction activities. Other than additional traffic volume and potentially extended distances between the parking area and the trail system associated with the construction activities, additional disruption will be insignificant.

- *Project parking and lay down area*

  It is anticipated that areas adjacent to existing roadways, parking at the Motordrome and existing streetcar barns or nearby grassed areas will be utilized as a project laydown area. Project parking is anticipated to take place in the existing FEPA parking lot. The location of the laydown area has not been finalized as of the date of this report, and is of unknown significance.

7. CONCLUSIONS AND RECOMMENDATIONS

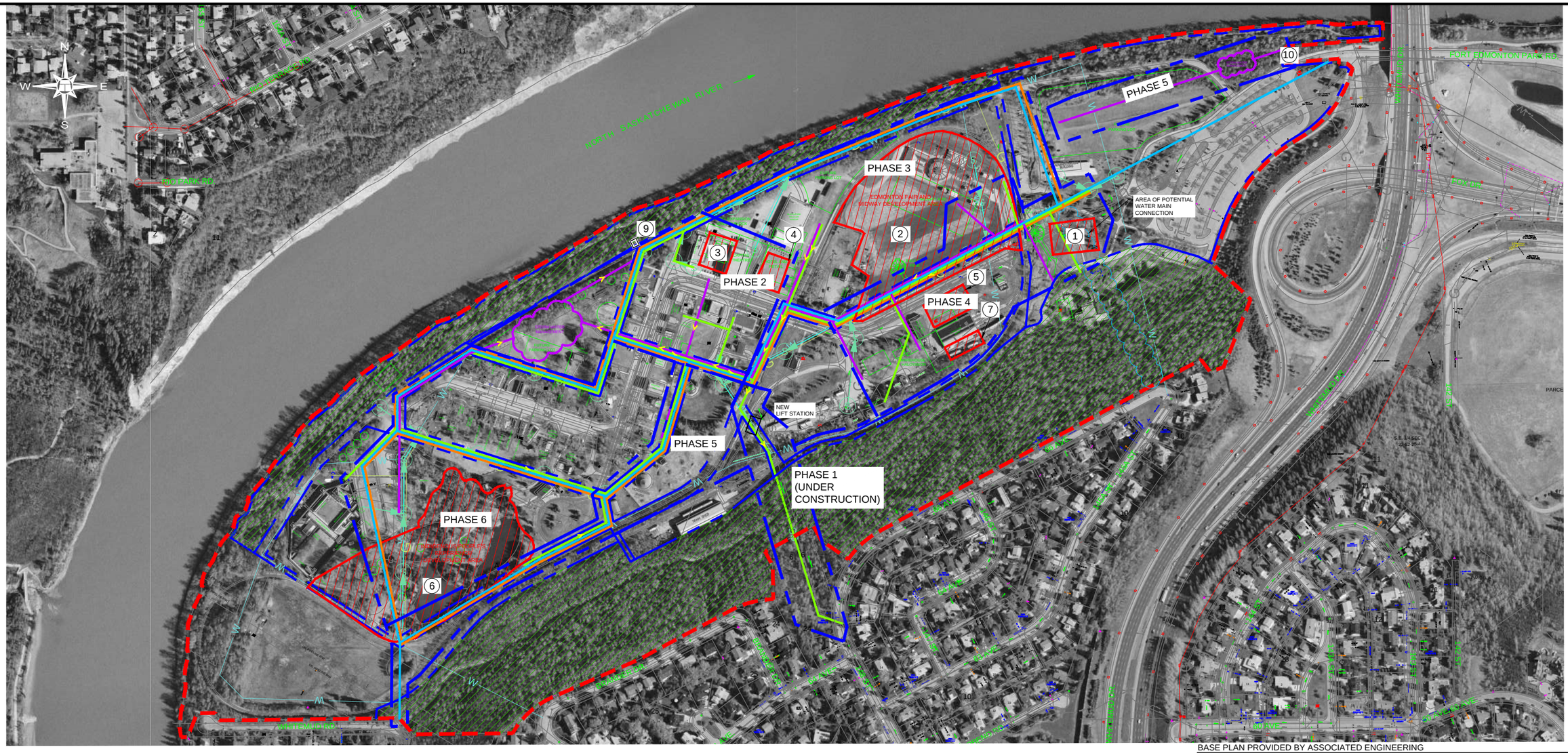
Table 1 in Appendix B summarizes the Biological, Physical and Community impacts for each of the seven areas and the utility replacements assessed within Fort Edmonton Park Area and Fort Edmonton Park. The assessment was based on insignificant impact, significant impact or unknown significance. In general, the construction of the Streetcar Barn Expansion will have insignificant impacts with the exception of parking/laydown impacts, historical impacts and certain possible environmental impacts, for which the Streetcar Barn Expansion will have an unknown impact. Based on the information cited in this IPR, it is Thurber's opinion that project impacts will be necessary to assist FEMCO and the ERRS in expanding their ability to present and preserve artifacts (streetcars) related to Edmonton's history, make restored and unrestored streetcars available for public display to park patrons, add potential workspace and provide additional staff space. As such, additional work, such as an Environmental Screening Report (ESR) or an Environmental Impact Assessment (EIA) may be required for the New Entrance Building. The services of a qualified biologist or wildlife specialist will be required to assess potential tree removal prior to clearing due to possible owl nesting in the area.

THURBER

APPENDIX A

Drawings

Z:\17\17-123-796\17-123-796-E1 DEC 2014.dwg - 1 - Jan. 05, 2015



BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

LEGEND:

- PROPOSED WATERMAINS
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED GAS LINE
- PHASE BOUNDARY
- PROJECT SITE BOUNDARY
- ENVIRONMENTAL RESERVE

1	NEW ENTRANCE BUILDING AT FRONT GATE	6	INDIGENOUS PEOPLE'S EXPERIENCE
2	REALIGN - EXPAND MIDWAY	7	STREETCAR BARN EXPANSION
3	HOTEL SELKIRK EXPANSION	8	UTILITY REPLACEMENT
4	NEW COMMERCIAL BLOCK	9 10	STORMWATER TREATMENT STRUCTURE
5	ARTIFACT WAREHOUSE BUILDING		

0 50 100 150 200 250 300m

SCALE 1:5000

Associated Engineering

FORT EDMONTON PARK ENVIRONMENTAL ASSESSMENT

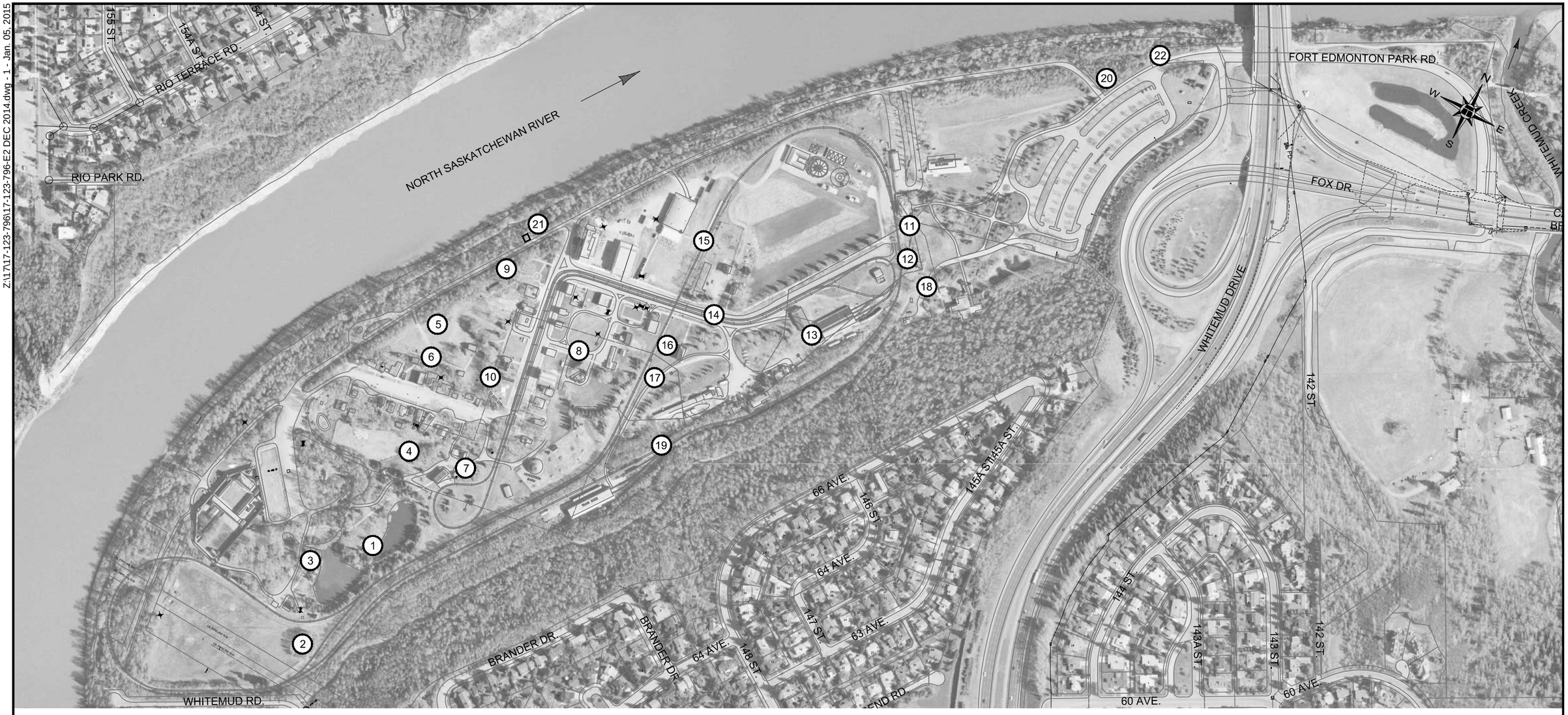
PROPOSED DEVELOPMENTS

DWG No. 17-123-796-E1

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

THURBER ENGINEERING LTD.

Z:\17\17-123-796\17-123-796-E2 DEC 2014.dwg - 1 - Jan. 05, 2015



LEGEND

(1) LOCATION OF TREE REMOVAL (SEE REPORT TEXT FOR DETAILS)

0 50 100 150 200 250 300m

SCALE 1:5000

BASE PLAN PROVIDED BY ASSOCIATED ENGINEERING

Associated Engineering

FORT EDMONTON PARK
ENVIRONMENTAL ASSESSMENT

SITE PLAN SHOWING AREAS OF TREE REMOVAL

DWG No. 17-123-796-E2

DRAWN BY	ML
DESIGNED BY	MKK
APPROVED BY	NHF
SCALE	1:5000
DATE	JANUARY 2015
FILE No.	17-123-796

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THURBER

APPENDIX B

Table

THURBER

TABLE 1
INITIAL PROJECT REVIEW – FORT EDMONTON PARK AREA UTILITY REPLACEMENT & PROPOSED CONSTRUCTION

	BIOLOGICAL						PHYSICAL										COMMUNITY			
	VEGETATION		WILDLIFE[2]		FISH		CONSTRUCTION / GRADE CHANGES		PEDESTRIANS / CYCLISTS/TRAIL USERS		NAV WATERS			HISTORICAL[4]	ENVIRONMENTAL[5]	IMPACTS TO PARK USERS	NOISE[3]	ACCESS		PARKING /LAYDOWN
LOCATION	II	SI	II	SI	II	SI	II[3]	SI	II	SI	NA	II	SI	US	US	US	II	II	US	US
1. New Entrance Building Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
2. Realign-Expand Midway Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
3. Hotel Selkirk Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
4. New Commercial Block Time Frame - 2020	X		X		X		X		X		X			X	X	X	X	X		X
5. Artifact Warehouse Building Time Frame – 2020	X		X		X		X		X		X			X	X	X	X	X		X
6. Indigenous People's Experience Time Frame – 2017		X		X		X		X	X			X		X	X	X	X	X		X
7. Streetcar Barn Expansion Time Frame – 2017	X		X		X		X		X		X			X	X	X	X	X		X
8. Utility Replacement Time Frame - 2017	X	X[1]	X	X[1]	X[6]	X[6]	X		X		X			X	X	X	X		X	X

Note:
1. Storm water pond
2. Need to address migratory bird act and bird nest survey for trees to be removed. Also City of Edmonton tree compensation.
3. Follow City of Edmonton noise and dust bylaws
4. Historical Resources Overview to be conducted to ascertain significance
5. Use of Environmental Construction Operations (ECO) Plan to mitigate.
6. Depending on installation method selected – Horizontal direction drilling (II) vs. trench excavation (SI)

NA Not Applicable
II Insignificant Impact
SI Significant Impact
US Unknown Significance

Project	Footprint size	Project outline	Laydown location	Options/Alternatives		
				Do nothing (null option)	Defer construction to a later date	Carry out Project
Projects described in the FEP Park 2010 Master Plan Update.						
Utilities Upgrade The current water, storm, sanitary, gas and electrical utilities within the Park Area are outdated, having been installed in the late 1960's, and will therefore be replaced. This undertaking will involve replacing and realigning watermains, gas lines, sanitary and storms sewers as well as constructing two stormwater treatment structures near the river.	Corridors throughout the park. Anticipated to cover 19.6 ha or about 30.7% of the Park Area See **Figure 1-2** for specific project footprint areas.	soil excavation; construct stormwater treatment structures near the Selkirk Hotel and parking lot abandon and backfill existing utility lines; restore site, and reuse excavated soils for backfill.	Adjacent to road work areas.	This option (Option 1) involves doing no work on the existing utility infrastructure in Fort Edmonton Park Area. With new infrastructure projects in the planning stage and the existing utilities at the end of their service life, this option was rejected for two reasons. First, the existing utilities do not have capacity to support the additional planned infrastructure, so upgrades or replacement is required. Second, with the existing utilities reaching the end of their service life, failures necessitating emergency repairs are expected to become more common. As the majority of existing utilities are located under the streetcar tracks, access is impractical during park operating hours.	This option (Option 2) would leave the existing utilities in place and involve no immediate modifications. With projected future infrastructure development, the existing utilities would not have sufficient capacity and improvements would still be necessary for better fire protection. Additionally, as the existing utilities are reaching the end of their service life, the frequency of incidents requiring repair is anticipated to increase. Given the more inaccessible locations of the existing utilities, such repairs would likely require disruption and/or closure of Fort Edmonton Park Area features and subsequently diminish the patron's cultural heritage, natural and recreational experiences.	Option 3 provides better future planning in relation to Options 1 and 2. Option 3 will construct water, sanitary sewer, storm sewer and other utilities lines concurrently in the utility allowance and utility corridors to replace the existing infrastructure and facilitate future maintenance activities. Utility replacement would also facilitate future infrastructure developments, with utility lines installed in to the future building footprint areas. The new infrastructure projects will assist Fort Edmonton Park Area in maintaining premier cultural, natural and recreational experiences.
New Entrance Building The new entrance building will be located south and east of the existing entrance building. It will function as the Fort Edmonton Park entrance where park visitors will purchase entrance admission rather than at the currently used, modified train station. The New entrance building will be connected to the existing entrance building by a 15 metre circular interlocking block plaza and will include ticket booths, public washrooms, a gift shop, storage spaces, staff spaces and a lobby.	The construction footprint for the new entrance building is anticipated to cover 726 m2 or about 0.1% of the Park Area.	construction of a single storey structure with no basement; changes to existing walkways; construction of a new walkway; and landscape.	Adjacent to the existing entrance.	This option (Option 1) involves doing no work for the new entrance building. Although a viable option, this option was not selected as it does not assist Fort Edmonton Park Area in maintaining a premier cultural heritage experience. The existing entrance is also reaching its visitor capacity as Fort Edmonton Park annual attendance continues to increase, in spite of moving many administrative offices to an adjacent building.	This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to Fort Edmonton Park Area operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist the Fort Edmonton Management Company in maintaining a premier cultural heritage experience and does nothing to relieve the issues associated with moving more and more visitors in and out of the Park.	Option 3 assists Fort Edmonton Management Company in addressing the bottleneck imposed by the limited space within the existing entrance building. It will also permit additional historical displays and additional refuge from inclement weather while waiting for the steam-locomotive that provides transportation to the Fort in the far west portion of the Park Area. Additionally, this option permits a minimization of disruption to Fort Edmonton Park Area operations and permits cost savings by coordinating the construction of the New Entrance Building with the realignment and expansion of the midway, a new hotel, a new commercial block, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities

Project	Footprint size	Project outline	Laydown location	Options/Alternatives		
				Do nothing (null option)	**Defer construction to a later date**	**Carry out Project**
Midway Realignment and Expansion The midway realignment and expansion will be constructed west of the existing Midway in Mellon Field. The planned midway expansion will include a tethered helium balloon ride, a corn or hay-bale maze, the addition of period appropriate children's rides and a new double ferris wheel. Shops, food service kiosks and opportunities for day and evening entertainment will be constructed, along with added staff spaces.	The construction footprint for the expanded midway is anticipated to cover 1.93 ha or about 3.0 % of the Park Area.	Construct structures that vary in height; change existing walkways, construct new walkways; and landscape.	Adjacent to the existing entrance or within Mellon Farm itself.	This option (Option 1) involves doing no work for the Realign-Expand Midway project at Fort Edmonton Park Area. Although a viable option, this option was not selected as it does not assist Fort Edmonton Management Company in maintaining a premier cultural heritage experience. The existing midway is limited in scope and located off of the main visitor travel paths. In order make the midway more accessible, it requires realignment to where it is on the main travel path and accessible by the existing FEP streetcar system.	This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to Fort Edmonton Park Area operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist Fort Edmonton Management Company in maintaining a premier cultural heritage experience.	Option 3 assists Fort Edmonton Management Company in addressing the midway accessibility to park patrons by making access possible off of the main travel path and by Fort Edmonton Park streetcar. Realignment would also permit expansion to better reflect the nature of the historical midway being recreated. Additionally, this option permits a minimization of disruption to Fort Edmonton Park Areay operations and permits cost savings by coordinating the Realign-Expand Midway project with the construction of a new entrance building, a new hotel, a new commercial block, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities
Hotel Selkirk Expansion The existing Hotel Selkirk accommodation services will be expanded by recreating the historic Windsor Block as a second hotel in the currently empty lot southeast of the Hotel Selkirk. This project could assist in attracting more overnight visitors to Fort Edmonton Park. The enlarged hotel would encompass a conference centre, banquet facilities, and a meeting space. Staff spaces would also be added to the expansion.	The construction footprint for the new hotel is anticipated to be 1,875 m2 or about 0.3% of the Park Area.	construct a hotel structure (30 m wide, 45 m long, 3 stories high with a basement); change existing walkways; construct new walkways; and landscape.	Nearby parking areas located adjacent to the existing service road and Blatchford Field Air Hangar.	This option (Option 1) involves doing no work for the Hotel Selkirk Expansion at Fort Edmonton Park Area. Although a viable option, this option was not selected as it does not assist Fort Edmonton Management Company in growing the capabilities of Fort Edmonton Park Area (i.e. additional banquet functions, meeting space and staff areas), expanding the representation of the 1920's and does not allow for annual attendance growth via additional overnight park visitors.	This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to Fort Edmonton Park Area operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist Fort Edmonton Management Company in growing the park's capabilities or attendance.	Option 3 assists Fort Edmonton Management Company in expanding its facilities along 1920 Street, providing additional opportunities for banquet and meeting space, adds staff space and permits increasing patron overnight attendance. Additionally, this option permits a minimization of disruption to Fort Edmonton Park Area operations and permits cost savings by coordinating Hotel Selkirk Expansion with the construction of a new entrance building, realignment and expansion of the midway, a new commercial block, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities.

Project	Footprint size	Project outline	Laydown location	Options/Alternatives		
				Do nothing (null option)	Defer construction to a later date	Carry out Project
New Artifact Warehouse Building The warehouse will serve as an illustrative structure rather than storage for non-accessible material. The Artifact Warehouse Building will be built immediately west of the existing Motordrome, publically accessible historical automobile storage and maintenance facility. The building will primarily be a warehouse with a viewing/display area. It will also include staff spaces, storage spaces and staff washrooms.	The construction footprint for the new artifact warehouse is anticipated to be about 602 m2 or about 0.1 % of the Park Area.	construct a single story building; change existing walkways; construct new walkways; and landscape.	Adjacent to the existing streetcar barn and motordome or on nearby grassed areas.	This option (Option 1) involves doing no work for the Artifact Warehouse Building at Fort Edmonton Park Area. Although a viable option, this option was not selected as it does not assist V in maintaining a premier cultural heritage experience, presenting historical artifacts to the public, storing additional artifacts or having adequate staff spaces to support Fort Edmonton Park Area.	This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to Fort Edmonton Park Area operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist Fort Edmonton Management Company in preserving and presenting artifacts to the public or augmenting staff space in a timely manner.	Option 3 assists Fort Edmonton Management Company in expanding its ability to present and preserve artifacts related to Edmonton's history, makes the artifacts available for public display to park patrons and adds staff space. Additionally, this option permits a minimization of disruption to Fort Edmonton Park Area operations and permits cost savings by coordinating the construction of the Artifact Warehouse Building with the construction of a new entrance building, realignment and expansion of the midway, the Hotel Selkirk expansion, a new commercial block, the streetcar barn expansion and needed utility replacement activities.
New Commercial Block The new commercial block will be built in the green space south of Blatchford air hangar. This area will feature replicas of businesses from the era such as the Capitol Barber Shop and Beauty Parlour, including a café, restaurant, and art house. Staff spaces will also be added.	The construction footprint for the new commercial block is anticipated to be about 3,120 m2 or about 0.5 % of the Park Area.	construct two buildings (each 76 m long by 15 m wide) located from the boardwalk on 1920 Street to the Hangar. Each building will be subdivided to look like up to five individual buildings using facades. Each unit would be a single story in height on a concrete floor; construct walkways, roadways; and landscape.	Adjacent to the existing service road and Blatchford Air Hangar.	This option (Option 1) involves doing no work for the New Commercial Block at Fort Edmonton Park Area. Although a viable option, this option was not selected as it does not assist Fort Edmonton Management Company growing the capabilities of the park (i.e. additional retail, restaurants and art and theatre venues), expanding the representation of the 1920's and does not allow for needed additional staff space.	This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects and would increase the disruption to Fort Edmonton Park Area operations and the patron's experiences. Similarly to Option 1, this option was not selected as it does not assist Fort Edmonton Management Company in growing the park's capabilities and representation of the 1920's or meeting the need for additional staff space.	Option 3 assists Fort Edmonton Management Company in expanding its facilities along 1920 Street, providing additional opportunities for food and cultural space and adds staff space. Additionally, this option permits a minimization of disruption to Fort Edmonton Park Area operations and permits cost savings by coordinating the construction of the New Commercial Block with the construction of a new entrance building, realignment and expansion of the midway, the Hotel Selkirk expansion, a new artifact warehouse, the streetcar barn expansion and needed utility replacement activities.

Project	Footprint size	Project outline	Laydown location	Options/Alternatives		
Projects subject of a Site Location Study to comply with Bylaw 7188 because they were not included in the FEP Park 2010 Master Plan Update.						
Streetcar Barn Expansion This project will involve building a duplicate streetcar barn next to the existing barn which is located just south of the Midway Grounds. The Streetcar Barn Expansion will take place on the north side of the existing Streetcar Barn building. The building will mostly be used for storage and display of an unrestored streetcar collection. The building will also include staff spaces and washrooms. Restored cars may be stored in the new building in the future as more streetcars are restored. The building will be unheated and will require lighting. In the future, one or more tracks may be electrified for moving streetcars.	The construction footprint for the streetcar barn expansion is anticipated to be about 592 m2 or about 0.1% of the Park Area.	construct a streetcar barn structure; change existing walkways; construct new walkways; and landscape.	In parking areas located adjacent to the existing streetcar barn and motordome or on nearby grassed areas.	This option (Option 1) involves doing no work for the Streetcar Barn Expansion at Fort Edmonton Park Area. Although a viable option, this option was not selected as it does not assist Fort Edmonton Management Company or the Edmonton Radial Railway Society (ERRS, operators of the streetcars at Fort Edmonton Park Area in preserving, restoring or operating historical artifacts at the park.	This option (Option 2) is also a viable option. However, it would prevent capitalization on cost saving that can be realized by carrying out construction at the same time as other planned new infrastructure projects, would increase the disruption to Fort Edmonton Park Area operations and the patron's experiences and would permit additional weathering of unrestored streetcars. Similarly to Option 1, this option was not selected as it does not assist Fort Edmonton Management Company and ERRS in preserving, presenting and operating artifacts (streetcars) at Fort Edmonton Park Area.	Option 3 assists Fort Edmonton Management Company and the ERRS in expanding their ability to present and preserve artifacts (streetcars) related to Edmonton's history, makes restored and unrestored streetcars available for public display to park patrons, adds potential workspace and provides additional staff space. As well, this option permits a minimization of disruption to Fort Edmonton Park Area operations and permits cost savings by coordinating the construction of the Streetcar Barn Expansion with the construction of a new Fort Edmonton Park Area entrance building, realignment and expansion of the midway, the Hotel Selkirk expansion, a new commercial block, the construction of a new artifact warehouse and needed utility replacement activities.
Freight Shed Expansion This is an expansion of an existing structure. The displays in the expanded freight shed would complete the "story" of the early railway construction in Edmonton's river valley. This story would be told by using both historical artifacts and a working scale display.	The construction footprint for the freight shed expansion is anticipated to be about 120 m2 or about 0.1% of the Park Area.	build a 40-foot extension to the existing structure; change existing walkways; construct new walkways; and landscape.		This option (Option 1) involves doing no work for the Streetcar Barn Expansion at Fort Edmonton Park Area. Although a viable option, this option was not selected as it does not assist Fort Edmonton Management Company or the Edmonton Radial Railway Society (ERRS, operators of the streetcars at Fort Edmonton Park Area) in preserving, restoring or operating historical artifacts at the park.		
Maintenance Projects						
Streetcar track realignment Maintenance work to improve performance	Realign a short portion of the street car track to improve functionality.					
Steam train track realignment Maintenance work to improve performance	Realign a short portion of the street car track to improve public safety and functionality.					
Old Fort train station relocation Maintenance work to improve performance	Relocate the structure to accommodate new track alignment.					

Appendix C – Database and Field Data Inventories

Fish Species of the North Saskatchewan River

A search of the FWMIS database for fish documented in the regional study area revealed the following:

Common Name	Scientific Name	Provincial Status			Federal Status	
		General Status of Alberta Wild Species[a]	Alberta's Endangered Species Conservation Committee[b]	*Wildlife Regulation*, Schedule 6[c]	COSEWIC[d]	*Species At Risk Act*, Schedule 1[e]
Found within a 2Km radius						
brook stickleback	*Culaea inconstans*	Secure	N/A	N/A	N/A	N/A
fathead minnow	*Pimephales promelas*	Secure	N/A	N/A	N/A	N/A
lake chub	*Couesius plumbeus*	Secure	N/A	N/A	N/A	N/A
lake sturgeon	*Acipenser fulvescens*	Undetermined	Threatened	Endangered	Endangered	No Schedule
longnose dace	*Rhinichthys cataractae*	Secure	N/A	N/A	N/A	N/A
longnose sucker	*Catostomus catostomus*	Secure	N/A	N/A	N/A	N/A
Northern Crayfish	*Orconectes virilis*	Not Assessed	N/A	N/A	N/A	N/A
pearl dace	*Margariscus margarita*	Undetermined	N/A	N/A	N/A	N/A
rainbow trout*	*Oncorhynchus mykiss*	At Risk	Threatened	Endangered	Endangered	No Schedule
river shiner	*Notropis blennius*	Undetermined	N/A	N/A	N/A	N/A
spottail shiner	*Notropis hudsonius*	Secure	N/A	N/A	N/A	N/A
trout-perch	*Percopsis omiscomaycus*	Secure	N/A	N/A	N/A	N/A
white sucker	*Catostomus commersoni*	Secure	N/A	N/A	N/A	N/A

Common Name	Scientific Name	Provincial Status			Federal Status	
		General Status of Alberta Wild Species[a]	Alberta's Endangered Species Conservation Committee[b]	*Wildlife Regulation*, Schedule 6[c]	COSEWIC[d]	*Species At Risk Act*, Schedule 1[e]
Within a 5Km radius						
burbot	*Lota lota*	Secure	N/A	N/A	N/A	N/A
emerald Shiner	*Notropis atherinoides*	Secure	N/A	N/A	N/A	N/A
goldeye	*Hiodon alosoides*	Secure	N/A	N/A	N/A	N/A
mooneye	*Hiodon tergisus*	Secure	N/A	N/A	N/A	N/A
mountain Whitefish	*Prosopium williamsoni*	Secure	N/A	N/A	N/A	N/A
northern pike	*Esox Lucius*	Secure	N/A	N/A	N/A	N/A
shorthead redhorse	*Moxostoma macrolepidotum*	Secure	N/A	N/A	N/A	N/A
walleye	Stizostedion vitreum	Secure	N/A	N/A	N/A	N/A

*Previously recorded in the Egge's Pond", presumed to be stocked

[a] Government of Alberta. 2015. Wild Species Status Search. http://esrd.alberta.ca/fish-wildlife/species-at-risk/wild-species-status-search.aspx (accessed June 25, 2015).

[b] Government of Alberta. 2014. Species Assessed by Alberta's Endangered Species Conservation Committee. http://esrd.alberta.ca/fish-wildlife/species-at-risk/documents/SpeciesAssessed-Endangered-Jul18-2014.pdf(accessed July 22, 2015).

[b] Government of Alberta. 2015. Wildlife Regulation, Wildlife Act. http://www.qp.alberta.ca/documents/Regs/1997_143.pdf (accessed July 3, 2015).

[c] Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2015. Wildlife Species Search. http://www.cosewic.gc.ca/eng/sct1/index_e.cfm (accessed July 3, 2015).

[d] Government of Canada. 2015. Species at Risk Public Registry. *A to Z Species Index*. http://www.sararegistry.gc.ca/sar/index/default_e.cfm (accessed June 25, 2015).

Provincial and Federal Wildlife Status Listings

A search of the FWMIS database for species at risk documented in the regional study area revealed the following:

Common Name	Scientific Name	Provincial Status			Federal Status	
		General Status of Alberta Wild Species[a]	Alberta's Endangered Species Conservation Committee[b]	*Wildlife Regulation*, Schedule 6[c]	COSEWIC[d]	*Species At Risk Act*, Schedule 1[e]
Found within a 2Km radius						
Birds						
barred owl	*Strix varia*	Sensitive	Special Concern	Not scheduled	Not Assessed	Not scheduled
peregrine falcon	*Falco peregrinus*	At Risk	Threatened	Threatened	Special Concern	Not scheduled
short-eared owl	*Asio flammeus*	May Be At Risk	N/A	Not scheduled	Special Concern	Not scheduled
Amphibians						
Canadian toad	*Anaxyrus hemiophrys*	May Be At Risk	Data Deficient	Not scheduled	Not at Risk	Not scheduled
Within a 5Km radius						
Birds						
Baltimore oriole	*Icterus galbula*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled
barn swallow	*Hirundo rustica*	Sensitive	N/A	Not scheduled	Threatened	Not scheduled
bay-breasted warbler	*Dendroica castanea*	Sensitive	Special Concern	Not scheduled	Not Assessed	Not scheduled
Cape May warbler	*Dendroica tigrina*	Sensitive	Special Concern	Not scheduled	Not Assessed	Not scheduled
least flycatcher	*Empidonax minimus*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled

Common Name	Scientific Name	Provincial Status			Federal Status	
		General Status of Alberta Wild Species[a]	Alberta's Endangered Species Conservation Committee[b]	*Wildlife Regulation*, Schedule 6[c]	COSEWIC[d]	*Species At Risk Act*, Schedule 1[e]
lesser scaup	*Aythya affinis*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled
osprey	*Pandion haliaetus*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled
pileated woodpecker	*Dryocopus pileatus*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled
sharp-tailed grouse	*Tympanuchus phasianellus*	Sensitive	N/A	Not scheduled	Not assessed	Not scheduled
Short-eared owl	Asio flammeus	May Be At Risk	Not Listed	Not Scheduled	Not Listed	Not Scheduled
sora	*Porzana carolina*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled
Swainson's hawk	*Buteo swainsoni*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled
Western tanager	*Piranga ludoviciana*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled
Amphibians						
Northern leopard frog	*Lithobates pipiens*	At Risk	Threatened	Threatened	Special Concern	Not scheduled
Mammals						
cougar	*Puma concolor*	Secure	N/A	Not scheduled	Data deficient	Not scheduled
Northern long-eared bat	*Myotis septentrionalis*	May Be At Risk	N/A	Not scheduled	Not Assessed	Not scheduled
hoary bat	*Lasiurus cinereus*	Sensitive	N/A	Not scheduled	Not Assessed	Not scheduled

[a] Government of Alberta. 2015. Wild Species Status Search. http://esrd.alberta.ca/fish-wildlife/species-at-risk/wild-species-status-search.aspx (accessed June 25, 2015).

[b] Government of Alberta. 2014. Species Assessed by Alberta's Endangered Species Conservation Committee. http://esrd.alberta.ca/fish-wildlife/species-at-risk/documents/SpeciesAssessed-Endangered-Jul18-2014.pdf(accessed July 22, 2015).
[b] Government of Alberta. 2015. Wildlife Regulation, Wildlife Act. http://www.qp.alberta.ca/documents/Regs/1997_143.pdf (accessed July 3, 2015).
[c] Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2015. Wildlife Species Search. http://www.cosewic.gc.ca/eng/sct1/index_e.cfm (accessed July 3, 2015).
[d] Government of Canada. 2015. Species at Risk Public Registry. *A to Z Species Index*. http://www.sararegistry.gc.ca/sar/index/default_e.cfm (accessed June 25, 2015).

Vegetation Species in Areas Throughout the Park Area

Location	Species
1) Disturbed areas with bare ground dominated by weeds	· alsike clover (*Trifolium hybridum*)*** · common dandelion (*Taraxacum officinale*)** · oat (*Avena sativa*)** · shepherd's-purse (*Capsella bursa-pastoris*)** · canola (*Brassica rapa*) · scentless chamomile (*Matricaria perforata*)* · strawberry blite (*Chenopodium capitatum*) · common plantain (*Plantago major*)*** · foxtail barley (*Hordeum jubatum*)*** · Canada thistle (*Cirsium arvense*)* · stinkweed (*Thlaspi arvense*)** · geranium (*Geranium spp*.) · timothy grass (*Phleum pratense*) · willow (*Salix spp*.) · caragana (*Caragana spp*.)
2) Forested areas in natural state with high potential for migratory birds	· Saskatoon (*Amelanchier alnifolia*) · high bush cranberry (*Viburnum opulus*) · prickly rose (*Rosa acicularis*); · trembling aspen (*Populus tremuloides*); · balsam poplar (*Populus balsamifera*); · choke cherry (*Prunus virginiana*) · alder (*Alnus spp*.) · pin cherry (*Prunus pensylvanica*) · common horsetail (*Equisetum arvense*) · wild lily-of-the-valley (*Maianthemum canadense*;) · American vetch (*Vicia americana*) · Canada thistle (*Cirsium arvense*) · caragana (*Caragana spp*.) · red-osier dogwood (*Cornus stolonifera*) · perennial sow thistle (*Sonchus arvensis*) · showy aster (*Aster conspicuous*) · Manitoba maple (*Acer negundo*) · western mountain ash (*Sorbus scopulina*). · common snowberry (*Symphoricarpos albus*)
3) Field/ Pasture Areas	· Canada thistle (*Cirsium arvense*) · common dandelion (*Taraxacum officinale*) · scentless chamomile (*Matricaria perforata*) · shepherd's-purse (*Capsella bursa-pastoris*) · canola (*Brassica rapa)* · strawberry blite (*Chenopodium capitatum*)

Location	Species
	· oat (*Avena sativa*) · wheat (*Triticum spp.*) · common plantain (*Plantago major*) · foxtail barley (*Hordeum jubatum*) · white cockle (*Silene latifolia*) · American vetch (*Vicia americana*) · goldenrod (*Solidago spp.*)
4) Roadways (these areas have little vegetation to preserve).	· common dandelion (*Taraxacum officinale*) · common plantain (*Plantago major*) · alsike clover (*Trifolium hybridum*) · Kentucky bluegrass (*Poa pratensis*) · scentless chamomile (*Matricaria perforata*)
5) Disturbed Sod Areas	· Kentucky bluegrass (*Poa pratensis*) · alsike clover (*Trifolium hybridum*) · common plantain (*Plantago major*) · pineappleweed (*Matricaria matricarioides*)
6) Upland areas towards the Southeast side of the park, adjacent to river valley up-slopes	· trembling aspen (*Populus tremuloides*); · balsam poplar (*Populus balsamifera*); · white spruce (*Picea glauca*); · prickly rose (*Rosa acicularis*); · wild lily-of-the-valley (*Maianthemum canadense*;) · western mountain ash (*Sorbus scopulina*).

* weed species of Schedule 1 or 2 of the *Weed Control Act*
** common weed classified by Alberta Agriculture and Forestry (http://www.agric.gov.ab.ca/app107/pestselector?type=Weed)
*** undesirable disturbance species as classified by the Cows and Fish Program

Alberta Environment and Sustainable Resource Development

Fish and Wildlife Internet Mapping Tool (FWIMT)

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

Species Summary Report

Report Created: 1-Jun-2015 15:34

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Aquatic Inventory	Stocked Inventory
BROOK STICKLEBACK	BARRED OWL	No records found.	No records found.
FATHEAD MINNOW	CANADIAN TOAD		
LAKE CHUB	PEREGRINE FALCON		
LAKE STURGEON	SHORT-EARED OWL		
LONGNOSE DACE			
LONGNOSE SUCKER			
NORTHERN CRAYFISH			
NORTHERN PIKE			
PEARL DACE			
RAINBOW TROUT			
RIVER SHINER			
SPOTTAIL SHINER			
TROUT-PERCH			
WHITE SUCKER			

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
594289, 5926035	10-TM AEP Forest	NE 14 52 25 4	2 kilometers

Wildlife Contact Information

Primary Contact

Name:	Phone:	Email:	Town:
Delaney Anderson	780-415-1328	Delaney.Anderson@gov.ab.ca	

Alternative

Name:	Phone:	Email:	Town:

Fisheries Contact Information

Primary Contact

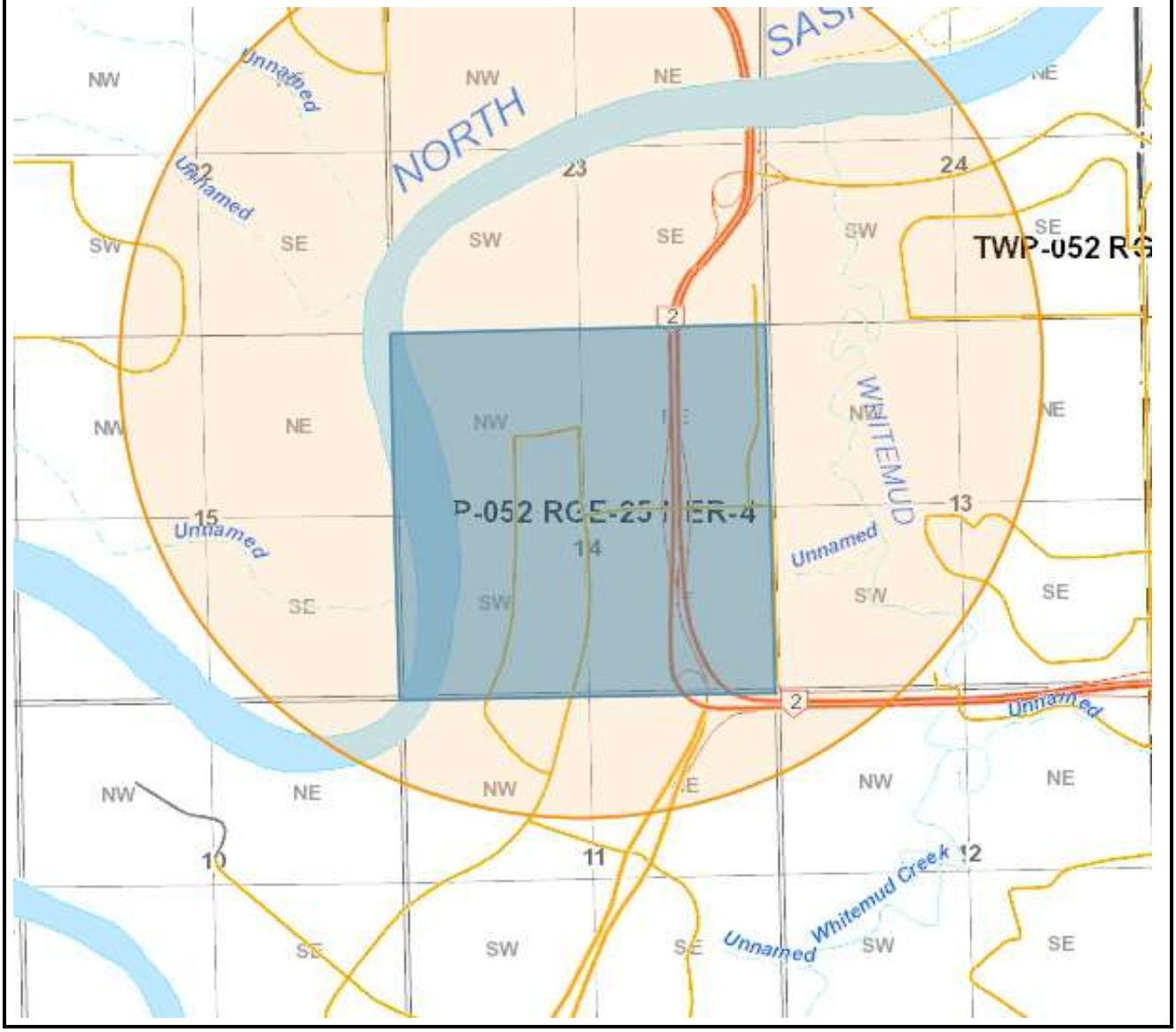
Name:	Phone:	Email:	Town:
FRLs:Denyse Gullion	780-675-8205	Denyse.Gullion@gov.ab.ca	Athabasca

Alternative

Name:	Phone:	Email:	Town:
			Athabasca

1-Jun-2015 15:34

Map Results



Alberta Environment and Sustainable Resource Development

Fish and Wildlife Internet Mapping Tool (FWIMT)

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

Species Summary Report

Report Created: 1-Jun-2015 15:37

Species present within the current extent :

Fish Inventory	Wildlife Inventory	Aquatic Inventory	Stocked Inventory
BROOK STICKLEBACK	BALTIMORE ORIOLE	No records found.	No records found.
BURBOT	BARN SWALLOW		
EMERALD SHINER	BARRED OWL		
FATHEAD MINNOW	BAY-BREASTED WARBLE		
GOLDEYE	CANADIAN TOAD		
LAKE CHUB	CAPE MAY WARBLER		
LAKE STURGEON	COUGAR		
LONGNOSE DACE	HOARY BAT		
LONGNOSE SUCKER	LEAST FLYCATCHER		
MOONEYE	LESSER SCAUP		
MOUNTAIN WHITEFISH	NORTHERN LEOPARD FF		
NORTHERN CRAYFISH	NORTHERN LONG-EARE		
NORTHERN PIKE	OSPREY		
PEARL DACE	PEREGRINE FALCON		
RIVER SHINER	PILEATED WOODPECKER		
SHORTHEAD REDHORSE	SHARP-TAILED GROUSE		
SPOTTAIL SHINER	SHORT-EARED OWL		
TROUT-PERCH	SORA		
WALLEYE	SWAINSON'S HAWK		
WHITE SUCKER	WESTERN TANAGER		

Buffer Extent

Centroid (X,Y):	Projection	Centroid: (Qtr Sec Twp Rng Mer)	Buffer Radius:
594173, 5926282	10-TM AEP Forest	SW 23 52 25 4	5 kilometers

Wildlife Contact Information

Primary Contact

Name: Delaney Anderson **Phone:** 780-415-1328 **Email:** Delaney.Anderson@gov.ab.ca **Town:**

Alternative

Name: **Phone:** **Email:** **Town:**

Fisheries Contact Information

Primary Contact

Name: FRLs:Denyse Gullion **Phone:** 780-675-8205 **Email:** Denyse.Gullion@gov.ab.ca **Town:** Athabasca

Alternative

Name: **Phone:** **Email:** **Town:** Athabasca

1-Jun-2015 15:37

Map Results

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Acer negundo	Manitoba maple	X	X	X	X	X			X
Achillea millefolia	Common yarrow		X			X			
Actaea rubra	Baneberry			X	X	X			
Agrimonia striata	Agrimony			X				X	
Agropyron pectiniforme	Crested wheatgrass		X				X		
Agropyron repens	Couch grass		X				X		
Agropyron trachycaulum var. trachycaulum	Slender wheat grass		X	X		X			
Alisma plantago-aquatica	Broad-leaved water plantain					X		X	
Alnus crispa	Green alder			X				X	
Alnus tenuifolia	River alder			X	X	X		X	
Amaranthus retroflexus	Reflexed pigweed		X						
Amelanchier alnifolia	Saskatoon	X	X	X		X			X
Anemone cylindrica	Long-fruited anemone			X		X			
Apocynum androsaemifolium	Spreading dogbane	X	X	X					
Aquilegia brevistyla	Blue columbine			X		X			
Aralia nudicaulis	Wild sarsaparilla	X	X	X	X				
Arctium minus	Common burdock		X				X		
Arenaria lateriflora	Blunt-leaved sandwort		X	X					
Aster ciliolatus	Fringed aster			X	X	X			
Aster conspicuus	Showy aster		X	X					X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Aster hesperius	Western willow aster					X			
Aster laevis	Smooth aster		X	X		X			
Aster puniceus	Purple-stemmed aster	X				X	X		
Astragalus canadensis	Canadian milk-vetch			X			X		
Aulacomium palustre	Tufted moss					X	X		
Avena sativa	Common oats	X	X					X	X
Betula papyrifera	White birch			X		X			
Bidens cernua	Nodding beggar-ticks					X		X	
Brachythecium rivulare	Waterside feather moss				X	X		X	
Brassica rapa	Canola	X	X						X
Bromus inermis	Smooth brome	X	X	X	X	X			
Bryum argenteum	Silver bryum		X	X	X	X			
Calamagrostis canadensis	Marsh reed grass	X	X	X	X	X			
Calamagrostis inexpansa	Northern reed grass					X		X	
Campanula rotundifolia	Common harebell					X		X	
Capsella bursa-pastoris	Shepherd's purse	X	X						X
Caragana arborescens	Common caragana	X		X		X			X
Carex aquatilis	Water sedge					X			

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Carex atherodes	Awned sedge					X	X		
Carex bebbii	Bebb's sedge					X		X	
Carex concinna	Beautiful sedge			X				X	
Carex concinnoides	Northwestern sedge			X			X		
Carex crawfordii	Crawford's sedge				X	X			
Carex deweyana	Dewey's sedge			X					
Carex disperma	Two-seeded sedge				X	X		X	
Carex praticola	Meadow sedge			X		X	X		
Carex retrorsa	Turned sedge				X	X			
Carex utriculata	Beaked sedge			X		X	X		
Carex viridula	Green sedge				X	X		X	
Ceratodon purpureus	Fire moss			X		X			
Ceratophyllum demersum	Hornwort					X			
Chenopodium album	Lamb's quarters		X						
Chenopodium capitatum	Strawberry blite	X	X						X
Cirsium arvense	Canada thistle	X	X	X		X			X
Clematis integrifolia	Bush clematis		X					X	
Corallorhiza maculata	Spotted coralroot			X			X		
Cornus canadensis	Bunchberry			X	X				
Cornus stolonifera	Red osier dogwood	X	X	X	X	X			X
Corylus cornuta	Beaked hazelnut	X	X	X	X	X			
Cotoneaster lucidus	Cotoneaster		X	X					
Dactylis glomerata	Orchard grass		X	X				X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Disporum trachycaulum	Fairybells	X		X					
Draba nemorosa	Annual whitlow-grass		X						
Descurainia sophia	Flixweed		X				X		
Drepanocladus aduncus	Common hook moss		X	X		X			
Echinochloa crusgalli	Barnyard grass		X						
Echium vulgare	Blueweed		X				X		
Elaeagnus angustifolia	Russian olive	X					X		
Elaeagnus commutata	Wolf willow			X				X	
Eleocharis palustris	Creeping spike-rush					X			
Epilobium angustifolium	Fireweed		X	X	X				
Epilobium palustre	Marsh willowherb				X	X			
Equisetum arvense	Common horsetail			X	X	X			X
Equisetum scirpoides	Dwarf scouring-rush			X			X		
Fagopyrum tataricum	Common knotweed		X						
Festuca rubra	Creeping red fescue		X	X		X			
Fragaria virginiana	Strawberry		X	X	X	X			
Fraxinus pennsylvanica	Green ash	X					X		
Galeopsis tetrahit	Hemp nettle			X	X			X	
Galium aparine	Cleavers		X					X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Galium boreale	Northern bedstraw	X		X	X	X			
Galium trifidum	Small bedstraw					X		X	
Galium triflorum	Sweet-scented bedstraw			X		X			
Geranium spp.	Geranium species	X							X
Geum aleppicum	Yellow avens				X	X	X		
Glyceria grandis	Tall manna grass					X		X	
Helodium blandowii	Blandow's feather moss					X		X	
Heracleum lanatum	Cow-parsnip			X			X		
Hieracium umbellatum	Narrow-leaved hawkweed		X					X	
Hippuris vulgaris	Common mare's-tail					X		X	
Hordeum jubatum	Foxtail barley	X	X						X
Hordeum vulgare	Barley		X						
Hylocomium splendens	Stair step moss		X	X	X				
Hypnum lindbergii	Clay pigtail moss					X			
Impatiens capensis	Spotted forget-me-not					X		X	
Juniperus communis	Common juniper			X				X	
Lathyrus ochroleucus	Creamy peavine		X	X		X			
Lathyrus venosus	Purple peavine		X	X	X				
Lemna minor	Common duckweed				X	X			
Leptobryum pyriforme	Long-necked bryum		X					X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Leymus innovatus	Hairy wild rye			X			X		
Linnaea borealis	Twinflower			X			X		
Linum vulgare	Toadflax		X			X			
Lonicera dioica	Twining honeysuckle	X		X					
Lonicera involucrata	Bracted honeysuckle			X	X			X	
Lysimachia thrysiflora	Tufted loosestrife					X		X	
Maianthemum canadense	Wild lily-of-the-valley	X	X	X	X	X			X
Malva neglecta	Common mallow		X					X	
Matricaria matricarioides	Pineappleweed	X	X						X
Matricaria perforata	Scentless chamomile	X	X						X
Medicago lupulina	Black medic	X	X						
Medicago sativa	Alfalfa	X	X	X					
Melilotus albus	White sweet clover		X						
Melilotus officinalis	Yellow sweet clover		X					X	
Mertensia paniculata	Tall lungwort			X			X		
Myriophyllum exalbescens	Spiked water-milfoil					X		X	
Najas flexilis	Slender naiad					X			
Oryzopsis asperifolia	Rough-leaved rice grass			X			X		
Peltigera canina	Dog pelt lichen		X	X					
Petasites palmatus	Palmate colt's-foot			X					

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Petasites sagittatus	Arrow-leaved colt's-foot				X	X		X	
Phalaris arundinacea	Canary reed grass					X		X	
Phleum pratense	Timothy	X	X					X	X
Picea glauca	White spruce	X	X	X	X	X			X
Picea pungens	Blue spruce	X					X		X
Pinus banksiana	Jack pine		X			X		X	X
Plagiomnium ellipticum	Marsh magnificent moss				X	X			
Plantago major	Common plantain	X	X			X			X
Platanthera hyperborea	Northern green bog orchid					X		X	
Pleurozium schreberi	Red stem moss		X	X	X				
Poa palustris	Fowl bluegrass		X		X	X			
Poa pratensis	Kentucky bluegrass	X	X	X		X			
Polygonum amphibium	Water smartweed				X		X		X
Populus balsamifera	Balsam poplar	X	X	X	X	X			X
Populus tremuloides	Trembling aspen	X	X	X	X	X			X
Potamogeton friesii	Fries' pondweed					X			
Potamogeton richardsonii	Richardson's pondweed					X		X	
Potentilla anserina	Silverweed		X					X	
Potentilla fruticosa	Common potentilla		X				X		
Potentilla palustris	Marsh cinquefoil					X		X	
Prunus pensylvanica	Pin cherry	X	X	X					X
Prunus virginiana	Chokecherry	X	X	X	X	X			X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Ptilium crista-castrensis	Knight's plume			X			X		
Pylaisella polyantha	Stocking moss			X		X			
Pyrola asarifolia	Common wintergreen			X	X	X	X		
Pyrola minor	Lesser wintergreen					X		X	
Pyrola secunda	One-sided wintergreen			X			X		
Pyrola virens	Green wintergreen				X		X		
Ranunculus acris	Tall buttercup			X				X	
Ranunculus sceleratus	Celery-leaved buttercup					X	X		
Ribes lacustre	Black gooseberry			X					
Ribes oxyacanthoides	Northern gooseberry		X	X	X				
Ribes triste	Wild red currant			X				X	
Rorippa islandica	Marsh yellow cress					X		X	
Rosa acicularis	Prickly rose	X	X	X	X	X			X
Rosa woodsii	Common wild rose			X				X	
Rubus idaeus	Raspberry			X	X				
Rubus pubescens	Dewberry			X	X				
Salix arbusculoides	Shrubby willow			X			X		
Salix bebbiana	Bebb's willow			X	X	X			
Salix discolor	Pussy willow					X		X	
Salix exigua	Sandbar willow					X			
Salix lasiandra	Western shining willow					X	X		

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Salix lucida	Shining willow			X	X	X			
Salix lutea	Yellow willow					X		X	
Salix pentandra	Laurel-leaved willow		X					X	
Salix petiolaris	Basket willow					X		X	
Salix planifolia	Plane-leaved willow			X	X	X			
Salix pyrifolia	Balsam willow			X		X	X		
Sambucus racemosa	Elderberry			X				X	
Sanicula marilandica	Snakeroot			X			X		
Schizachne purpurascens	Purple oat grass			X					
Scirpus microcarpus	Small-fruited bulrush					X			
Scirpus validus	Common great bulrush					X		X	
Senecio pauperculus	Balsam groundsel		X	X				X	
Shepherdia canadensis	Canada buffalo-berry			X	X	X			
Silene latifolia	White cockle		X						X
Smilacina stellata	Star-flowered false Solomon's-seal	X		X	X	X			
Solidago canadensis	Canada goldenrod		X	X	X	X		X	X
Sonchus arvensis	Perennial sow-thistle	X	X	X	X	X			X
Sorbus scopulina	Mountain ash		X	X	X	X			X
Sparganium angustifolium	Narrow-leaved bur-reed					X		X	
Spirodella polyrhiza	Larger duckweed					X		X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015
Stellaria longifolia	Long-leaved chickweed					X	X		
Stellaria media	Common chickweed					X		X	
Symphoricarpos albus	Common snowberry		X	X	X	X			X
Symphoricarpus occidentalis	Western snowberry	X		X	X				
Tanacetum vulgare	Common tansy			X		X			X
Taraxacum officinale	Common dandelion	X	X	X	X	X			X
Thalictrum venulosum	Veiny meadowrue			X	X				
Thlaspi arvense	Stinkweed	X	X				X		X
Trifolium hybridum	Alsike clover	X	X	X	X	X			X
Trifolium repens	Red clover			X			X		
Triticum spp.	Wheat species		X						
Typha latifolia	Common cattail					X			
Urtica dioica	Stinging-nettle			X	X			X	
Viburnum edule	Low-bush cranberry		X	X	X	X			
Viburnum opulus	High-bush cranberry	X		X	X	X			X
Vicia americana	American vetch	X	X	X	X	X			X
Viola canadensis	Canada violet	X		X	X				
Viola renifolia	Kidney-leaved violet			X				X	
Zygadenus elegans	White death-camas					X		X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Wetland	Aug. 2014	June 2015	Sept. 2015

Appendix D – Rare Plants Study

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

Associated Engineering Alberta Ltd.
1000 Associated Engineering Plaza
10909 Jasper Avenue
Edmonton, Alberta, Canada, T5J 5B9

TEL: 780.451.7666
FAX: 780.454.7698
www.ae.ca

July 29, 2015
File: 2012-3701

Debbie Cashion-Kalinowski
Project Coordinator
Park and Facility Development
City of Edmonton
P.O. Box 2359
12th Floor CN Tower
Edmonton, AB T5J 2R7

Re: FORT EDMONTON PARK RARE PLANT SURVEY REPORT

Dear Ms. Cashion-Kalinowski:

Associated Engineering is pleased to provide this rare plant survey report for the Fort Edmonton Park (subject area) utility replacement project. The survey involved a desktop assessment to identify focus areas and key habitats, and an early- and late-flowering survey to identify the presence and potential for rare species within the park boundary. Invasive species were also documented during the spring survey.

The following report was written by Jamie-Lynn Greter, B.Sc., P.Biol. of Nadurra Ecological Consulting Ltd. and is based on the findings of her August 2014 and June 2015 field assessments. Melanie Piorecky, P.Ag., a Senior Environmental Scientist with Associated Engineering, provided a peer review of the report and findings.

Should you have any comments or questions regarding this report, please contact the undersigned at any time.

Yours truly,

Sandra Meidinger. P.Biol., R.P.Bio.
Senior Environmental Scientist

SM

1 INTRODUCTION

The City of Edmonton requested that a rare plant survey be completed in Fort Edmonton Park (the study area), with the intent to use the results in environmental screening reports or impact assessments for future developments. To this end, Associated Engineering retained Nadurra Ecological Consulting Ltd. (Nadurra) to complete a rare plant survey in August 2014. An additional rare plant survey was completed by Nadurra and Associated Engineering in June 2015 to capture early-flowering species that might have been missed in the August 2014 survey. This report summarizes existing data from the desktop assessment and documents observations of rare plant species and/or rare plant communities in the study area from the two field surveys.

2 METHODS

2.1 DESKTOP ASSESSMENT

A review of background information was used as a planning tool for developing the field survey, in addition to the experience of the surveyor from completing rare plant surveys in the Edmonton river valley in the past. The methods for the desktop assessment were as follows, with additional details provided below:

- Stratify the study area into habitat types using satellite imagery and an ArcGIS platform.
- Conduct a search of available rare plant information for the study area using the Alberta Conservation Information Management System (ACIMS) rare plant database and other applicable background information.
- Create a list of rare plant species and rare plant communities likely to be encountered based on the habitat types identified in the study area.
- Rank the different habitat types based on the potential for the identified rare plants and rare plant to occur.
- Plan a field survey to focus on areas with moderate and high potential for rare plants and rare plant communities based on the background information collected.

When stratifying the landscape by habitat type, boundaries of landscape features, such as roads, and change in vegetation communities were used to delineate and create polygons of the various habitat types.

For available rare plant information, an ACIMS database search of all element occurrence data was completed prior to both field surveys to determine whether there were any past observations of plant species or communities of special concern in the study area (Government of Alberta 2015). The search was updated for the second field survey to verify whether any new species had been added or found in the area since the late-summer survey was completed, in August 2014. Table 1 outlines the element

occurrences on a global, national, and subnational scale of 1 to 5. These rankings are then used to determine the rarity of a species or community, and those elements that current data suggest may be rare are placed on a tracking or watch list (usually S3 or lower). A database search and/or query was conducted for a specific legal location to determine whether any species/communities on the tracking and watch list have been recorded within the study area.

The study area lies within 52-25-W4M, which was used as the target area search in the database for previously observed/documented species and communities. The targeted area searched in the database was larger than the study area to capture all possible rare element occurrences in adjacent habitat types (i.e. elements that might also be present within the study area). In this way, a comprehensive list was created of rare species with potential to be encountered in the study area. In addition to a targeted area search, a list of all rare element occurrences (rare vascular plants, bryophytes, lichens, and communities) found in the Central Parkland natural subregion (in which the study area is located) was generated to create a comprehensive list of all possible rare element occurrences. This was then pared down by comparing the habitat type in which they occurred with the habitat types that were determined to be within the study area. Key identification features, habitats, phenology, and illustrations of the species likely to be encountered were reviewed so that the botanist was familiar with this information prior to the field survey. While this list was generated to prepare the botanist for the most likely rare species to be encountered, the field survey was in no way limited to searching only for the list of 21 species; all plant species were surveyed for and identified. The botanist also drew on personal experience from other rare plant surveys conducted in the area (specifically the Edmonton river valley area) to prepare for the field survey.

Results from the ACIMS query were also used to determine which habitat types should be focused on during the field survey (i.e. which habitat types have moderate to high rare plant potential). Because of the large size and nature of the study area, a plot-based survey approach was used. Most of the plot points were selected in the forested and man-made wetland habitat types, as opposed to areas of anthropogenic disturbance (e.g. urban infrastructure) and fields/pasture. Plot points were identified on the study area map using ArcView GIS and imagery and from this GPS waypoints for each plot location were generated.

Note that the ACIMS database contains information on locations of rare plants and rare plant communities recorded and reported on within the province; it does not provide detailed information on the likelihood of occurrences in an area. Thus, a field survey was required to capture and record any new element occurrences of rare species.

Table 1
ACMIS rankings system

Rank	Definition
SX/GX	• Taxon is believed to be extirpated from the province • Not located despite intensive searches of historical sites and other appropriate habitat • Virtually no likelihood that it will be rediscovered
SH/GH	• Known from only historical records but still some hope of rediscovery • Evidence that the taxon may no longer be present but not enough to state this with certainty
S1/G1	• Known from five or fewer occurrences or especially vulnerable to extirpation because of other factor(s)
S2/G2	• Known from 20 or fewer occurrences or vulnerable to extirpation because of other factors
S3/G3	• Known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes, or other factors
S4/G4	• Apparently secure • Taxon is uncommon but not rare • Potentially some cause for long-term concern due to declines or other factors
S5/G5	• Secure - taxon is common, widespread, and abundant
SNR/GNR	• Element not yet ranked
SU/GU	• Currently “unrankable” due to lack of information or substantially conflicting information about status or trends
SNA/GNA	• Not applicable • A conservation status rank is not applicable because the community is not a suitable target for conservation activities
S#S#/G#G#	• Ranks can be combined to indicate a range. Example - S2S3 = may be between 6 and 80 occurrences throughout Alberta but the exact status is uncertain • Ranges cannot skip more than one rank (e.g. SU is used rather than S1S4) • Combined ranks indicate a larger margin of error than ranks assigned a "?" qualifier (see below)
S#?/G#?	• Inexact numeric rank • Applied when a specific rank is most likely appropriate but for which some conflicting information or unresolved questions remain. Example - S2? believed to be 6 - 20 occurrences but some uncertainty

2.2 FIELD SURVEY

The field survey methods were as follows:

- Refine the boundaries of the habitat types within the study area.
- Document the presence of any rare plants previously unknown within the study area.
- Compile a list of all plant species within the study area.
- Recommend mitigation measures for future projects and construction, if rare plants are found.

The rare plant survey followed the Alberta Native Plant Council (ANPC) Guidelines for Rare Vascular Plant Surveys (2012). Two field surveys were completed: one in late summer (August 2014) and one in early summer (June 2015), to capture early- and late-flowering species at their respective flowering times (phenology). Flowering and/or seeding can be important diagnostic features used to separate rare species from more common ones (ANPC 2012).

Plots selected during the pre-stratification of the study area were investigated using a floristic survey method with meander searches. A meander search is performed by starting at plot centre and walking in a spiral pattern to cover a greater area more thoroughly. The surveyor searches until no new species are found or until an entirely different plant community is entered. Unique or special landscape features, such as microhabitats, ephemeral habitats, wet areas, or transition zones, are given special attention. These areas tend to be important habitats for rare plants (Kershaw et al. 2001), as rare plants and rare plant communities are usually closely linked with soil moisture, nutrient levels, and substrate type. Effectively, a combination of a meander and transect survey was performed to increase the chances of capturing any rare plant species within the study area (ANPC 2012). Rare plant communities were also surveyed for while performing the meander searches at each plot, and while travelling between plots.

Data collection protocols to determine each plot's habitat type followed those outlined in the Ecological Land Survey Site Description Manual (Alberta Environmental Protection 1994). The plot location was recorded at plot centre using a GPS unit, and representative photographs of the site were taken. General site characteristics, such as slope, surface expression, and slope position, were recorded.

If it was not possible to identify a plant in the field a sample (voucher) was collected if there were greater than 20 specimens present, or else a photo was taken, in accordance with the Plant Collection Guidelines (ANPC 2006). Plant samples were then identified using a hand lens and appropriate taxonomic keys (Moss et al. 1983, Johnson et al. 1995 and Kershaw et al. 2001). Plant material of rare species was pressed, and prepared for submission to a local herbarium. Locations of rare plant species were then mapped using GPS coordinates and ArcGIS.

2.3 QUALITY ASSURANCE / QUALITY CONTROL

Quality assurance and control methods used in the collection of rare plant data included:

- reviewing potential rare plant species, their taxonomic characteristics, and habitat, and reviewing potential rare communities' habitats before field surveys;
- use of accepted protocols when a rare plant was encountered (ANPC 2006);
- reviewing data sheets to make certain they were complete, legible, and accurate; and,
- reviewing plant specimens collected to ensure proper labelling and to verify identification using detailed taxonomic keys.

3 RESULTS

3.1 DESKTOP ASSESSMENT

3.1.1 Landscape Stratification

Four different habitat types (field/pasture, forest, man-made wetland, and anthropogenic) were delineated within the study area using ArcView GIS. A fifth habitat type, riparian, was discovered during the late-summer field survey. Habitat type boundaries were refined after both field surveys were completed.

General descriptions of each of the habitat types within the study area are as follows:

- Field/Pasture – agricultural fields/pasture used for grazing of livestock and/or open field areas adjacent to the forest habitat type; typical plant species include agronomic grass species such as timothy (*Phleum pratense*) and smooth brome (*Bromus inermis*). This community type occurs in patches mostly adjacent to the anthropogenic areas in the study area.
- Forest – a natural deciduous treed area consisting of trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*) in the overstory. White spruce (*Picea glauca*) occurs in the understory along the south, north, and west sides of the study area. This area appears to be consistent with a d1/e1 ecosite phase (aspen/low-bush cranberry [*Viburnum edule*] and/or balsam poplar/red osier dogwood [*Cornus stolonifera*]) following the Ecosite Classification Guide for Northern Alberta (Beckingham and Archibald 1996).
- Wetland (man-made) – in five areas within the study area, the water table is at or near the surface for most of the year and aquatic or hydrophytic vegetation is present, which identifies these sites as wetlands (National Wetlands Working Group 1988). The wetlands appear to be concentrated in the west end of the study area, with one wetland on the east end of the park. These wetlands are all created or man-made wetlands.

- Anthropogenic – the main area of the park consists of various streets, buildings, and a parking lot on the east end of the study area. This area is classified as anthropogenic because of the human activity occurring and the lack of natural vegetation remaining. All plants noted within this area were planted species, including manicured lawn and weedy species such as scentless chamomile (*Matricaria maritima*).
- Riparian – an ephemeral drainage flows northwest from two man-made wetlands at the west end of the study area, and eventually drains into the North Saskatchewan River at the north end of the park. The vegetation in the riparian area is a combination of species found within the forest and wetland habitat types.

Refer to Figure 1 for a map depicting the spatial locations of each habitat type within the study area. Photographs of each habitat type are included in Appendix A.

3.1.2 ACIMS Query and Results

In total the ACIMS query produced 48 element occurrences of 18 species were found (i.e. seven vascular species, eight bryophyte species, and three lichen species). No rare plant community element occurrences were found within the query boundaries (Appendix B). As well, none of the element occurrences identified in the query are actually located within the study area boundaries. The search was updated prior to the second field visit and did not return any additional element occurrences. The database query of the Central Parkland natural subregion returned 145 element occurrences, 61 vascular plant species, 48 bryophyte species, 16 lichen species, and 20 rare plant communities (Appendix C). Once contrasted to the habitat types within the study area, the resultant was a list of 21 probable rare plant species (Appendix D).

3.2 FIELD SURVEY

3.2.1 Species by Habitat Type

In total, 39 rare plant plots were completed in the study area, capturing the five habitat types. In the late-summer survey conducted on August 23 and 24, 2014, 20 plots were completed. In the early-summer visit conducted on June 9 and 10, 2015, 19 plots were completed. For the late-season survey (August), 3 plots were completed in the open field/pasture habitat type, 12 were completed in the forest habitat type, 4 were completed in the man-made wetland habitat type, and one was completed in the riparian habitat type (Figure 1). For the June survey, one plot was completed in the open field/pasture habitat type, 11 in the forest habitat type, one in the man-made wetland habitat type, one in the riparian habitat type, and 5 in the anthropogenic habitat type (Figure 1).

In total, 197 species were identified between the two surveys. Seventy-eight species were recorded within the field/pasture habitat type, 112 species within the forest habitat type, 109 species within the man-made

wetland habitat type, 61 species within the riparian habitat type, and 33 species within the anthropogenic habitat type (Appendix E).

3.2.2 Rare Species

Of all of the species encountered within the study area, two vascular plant species were determined to be rare and tracked on the Alberta List of Tracked and Watched Elements (Government of Alberta 2015b). Table 2 lists the species and their provincial and global rankings. Photographs of the two rare plants are provided in Appendix A. No rare communities were observed during field surveys.

Table 2
Rare plant species found within the study area

Scientific Name	Common Name	Habitat Type Where Found	Alberta Rank*	Global Rank*	Status
Carex retrorsa	Turned sedge	Riparian	S3	G5	Somewhat vulnerable; globally secure
Najas flexilis	Slender naiad	Man-Made Wetland	S2	G5	Vulnerable; globally secure

*For definitions of Alberta (S) and global (G) rankings, refer to Table 1 of Section 2.1.

These two species were first discovered during the late-summer (August 2014) survey and were revisited during the early-summer (June 2015) survey to confirm species presence and to assess the status of the population. There are three populations, two of slender naiad and one of turned sedge (Figure 2). Upon revisiting the three populations during the early-season survey, it was determined that all three still existed.

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE

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DATE: 2015-07-30, Stephanie Tik

Associated Engineering

FORT EDMONTON PARK

AE PROJECT No.	2015-3701.300.300
SCALE	1:5,000
APPROVED	
DATE	2015JUL30
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE No. 1

FORT EDMONTON PARK
UTILITY REPLACEMENT

RARE PLANT PLOT LOCATIONS
& HABITAT TYPES

Observation and population details for each rare plant are provided on the ACIMS Rare Native Plant and Lichen Survey forms (Appendix F). These forms can be forwarded digitally to ACIMS for updating element occurrence lists (pending client approval). Since the original populations were found to be intact at the time of the second visit, the same observation and population details applied (i.e. no changes from those previously recorded on the ACIMS forms). As a result, no new ACIMS forms were completed; however, the presence of these species was documented on the June vegetation plot survey forms as a means of capturing these data (Appendix G).

Below is a description of each of the rare plant species encountered:

***Carex retrorsa* Schwein– Turned sedge**

Turned sedge was found at one location within the study area along the shallow, slower-flowing portion of the ephemeral drainage at the west end of the study area (Figure 2). This plant is similar in taxonomy and habitat to two common sedges, beaked sedge (*Carex utriculata*) and awned sedge (*Carex atherodes*), with the main differences being the closely packed female spikes and crowded perigynia that bend downwards (see photographs in Appendix A). Turned sedge is usually found in marshes and slower-flowing streams within the Parkland and Boreal Forest regions of Alberta (Johnson et al. 1995, Kershaw et al. 2001).

***Najas flexilis* Willd.– Slender naiad**

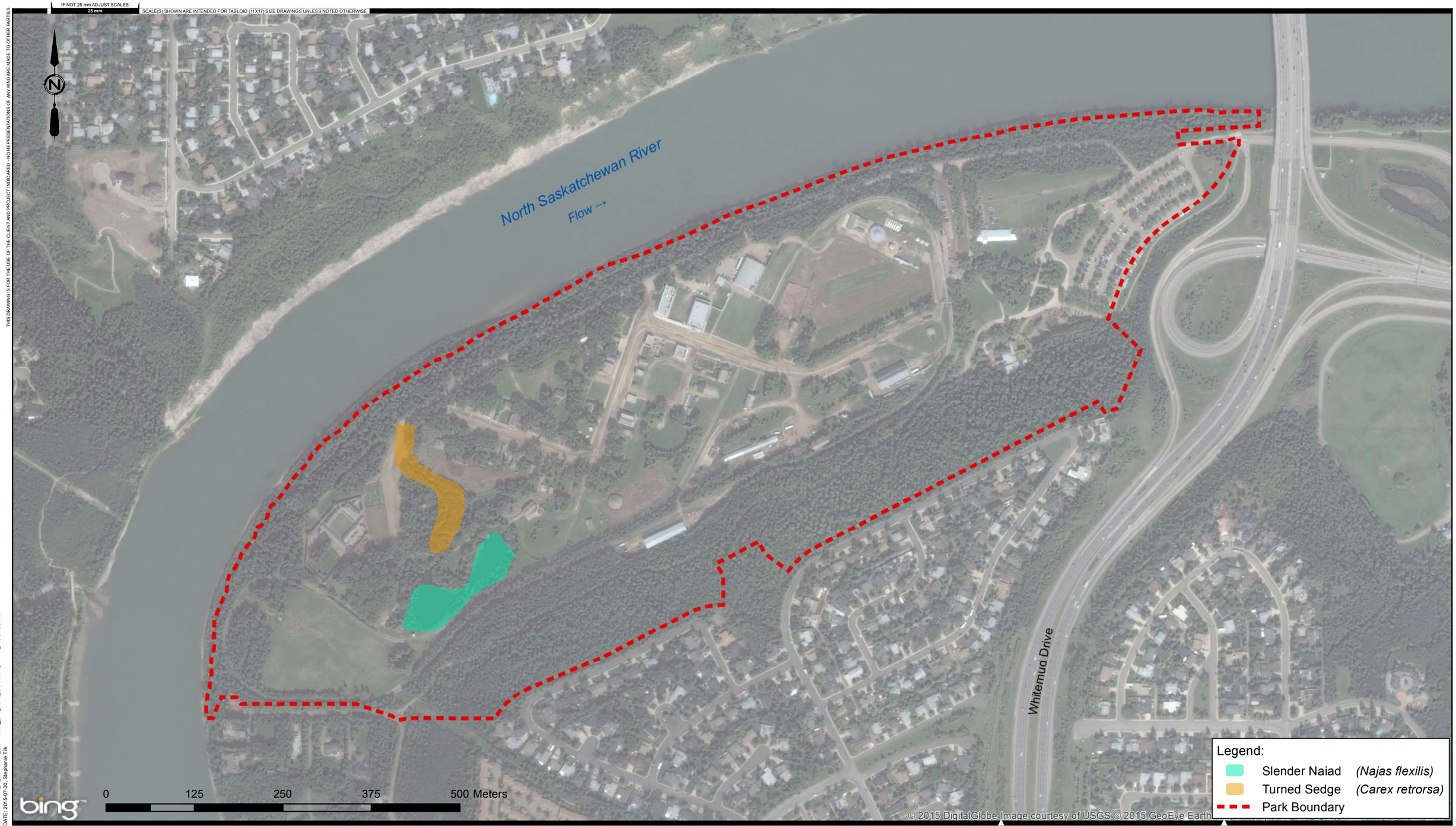
Slender naiad was found at two different man-made wetlands within the study area (Figure 2). Slender naiad is a pale green, submerged aquatic annual that is 30-60 cm long, has 1 mm thick stems, and has alternate branches that give the plant a tufted appearance (see photographs in Appendix A). The flowers are tiny and appear in the axils of the lower pair of leaves from April-June or July-August. Slender naiad grows in quiet ponds and streams in the Central Parkland and southern Boreal Forest regions of Alberta (Kershaw et al. 2001).

No additional rare plant species were discovered during the early-summer (June 2015) survey. Further, no rare plant communities were found within the study area.

The habitat types provide specific conditions for these species to grow. It is therefore plausible that the species could be found throughout the habitat types they were observed within. It is assumed that the rare plant species exist throughout the entire habitat type and not just within the location where they were observed (Figure 2).

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



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DATE: 2015-07-30, Stephanie Tik

Associated Engineering

FORT EDMONTON PARK

AE PROJECT No.	2015-3701.300.300
SCALE	1:5,000
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DATE	2015JUL30
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DESCRIPTION	ISSUED FOR REPORT

FIGURE No. 2

FORT EDMONTON PARK
UTILITY REPLACEMENT

RARE PLANT POPULATION LOCATIONS

3.2.3 Invasive Species

Although an extensive weed survey was not conducted as part of this study, the presence of any non-native or invasive species encountered was documented on the vegetation plot forms. In general, non-native and invasive species were discovered in the anthropogenic and field/pasture habitat types, although some species (such as common dandelion [*Taraxacum officinale*]) were encountered in all five habitat types. One species of noxious weed (scentless chamomile [*Matricaria maritime*]) was noted within the anthropogenic habitat type.

4 MITIGATION, RECOMMENDATIONS AND DISCUSSION

Mitigation measures are recommended in order to (1) minimize disturbance of existing native vegetative communities (forest, man-made wetland, and riparian habitat types), which are areas with potential to harbour rare plants; and (2) protect and preserve the rare species found within the study area. Construction in these habitat types should be avoided or minimized. Alternate routes that circumvent/avoid native vegetation communities or that minimize disturbance to them should also be considered.

Fort Edmonton Park has several redevelopment projects tentatively scheduled between 2015 and 2019. The first project is the expansion of the Blatchford hangar kitchen, which is scheduled for early fall 2015. Subsequent projects include utility replacements and additional building and railway track expansions. All redevelopment projects will be subject to a review by the Parks and Biodiversity department of the City of Edmonton (ie. Initial Project Reviews, and Environmental Impact Assessments).

Every effort should be made to protect the three rare plant populations that were observed by avoiding the areas where they exist (as well as adjacent habitat) during project planning and construction. If this is not possible, as a last resort, plants can be carefully dug up and transplanted into an adjacent area of similar habitat that will not be disturbed in the near future. In this case, ongoing monitoring of the transplant success of the population should be undertaken to ensure the species is thriving in the new environment.

All City staff and site personnel should be made aware of the rare plants observed within the park boundary. Any future observations of any rare species, particularly during construction, should be reported immediately to the Parks and Biodiversity office.

The spread of any non-native invasive species should be limited or controlled in order to comply with the *Weed Control Act* (Government of Alberta 2011) as a mitigation measure to preserve and minimize disturbance to native vegetation and the three rare plant populations identified within the study area. If any prohibited noxious weeds are observed on site, they must be removed immediately to comply with the Act (Government of Alberta 2011, Government of Alberta 2012). Noxious weeds should be removed but do not require immediate removal (Government of Alberta 2012). The occurrence of scentless chamomile, a

noxious weed was noted within the anthropogenic habitat type and should be removed. Taking precautionary measures during construction or any future disturbance within the study area (e.g. washing construction equipment to ensure weed seeds do not get passed from one area to another) will ensure that these weedy species do not spread to other parts of the study area.

Of special interest regarding invasive species is the recent discovery of an umbelliferous weed from Eurasia, burnet-saxifrage (*Pimpinella saxifraga*), found on lands adjacent to the study area within the Edmonton river valley. This weed is uncommon in the Edmonton area and in Canada as a whole, and was not observed in the study area but was discovered in a hayfield and along forested trails in the Oleskiw lands in the summer of 2014. Special emphasis should be placed on limiting the spread of this weed species to prevent its range to expand within the Edmonton river valley.

5 CLOSURE

The Nadurra field botanist and author certifies that she approves of the data and recommendations in this report, and acknowledges that all relevant information is included. In addition, she accepts responsibility for the accuracy of the report.

Yours truly,
Nadurra Ecological Consulting Ltd.

Jamie-Lynn Greter, B.Sc., P.Biol.
Principal Ecologist
Environmental Scientist

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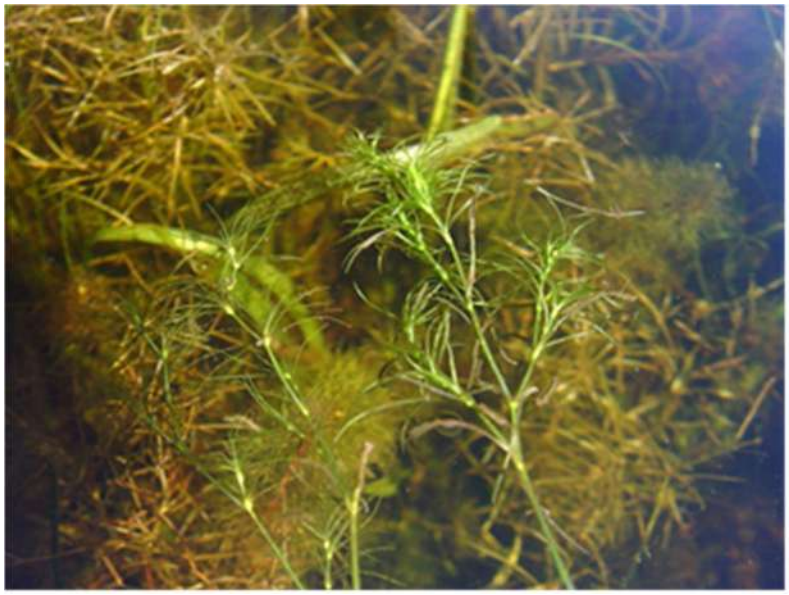
APPENDIX A – PHOTOGRAPHS

Photograph 1. Turned sedge (*Carex retrorsa*) in a wetted ditch within a clearing.

Photograph 2. Turned sedge (*Carex retrorsa*) spikes.



Photograph 3. Slender naiad (*Najas flexilis*).

Photograph 4. Riparian habitat in Fort Edmonton Park.

Photograph 5. Man-made wetland habitat in Fort Edmonton Park.

Photograph 6. Field habitat in Fort Edmonton Park.

Photograph 7. Aspen parkland forest in Fort Edmonton Park.

Photograph 8. Example of anthropogenic feature in Fort Edmonton Park.

Photograph 9. Dry mixedwood forest surrounding Fort Edmonton Park.

APPENDIX B – ACIMS QUERY RESULTS FOR 52-25-W4M

Legal Location	Element Occurrence ID	Element Code	Subnational Rank*	Scientific Name**	Common Name	Last Observed Date	Sensitivity Code
4-25-052-13	3072	NBMUS1A030	S2	*Bryum algovicum*	moss	7/20/1955	Non-Sensitive
4-25-052-24	3072	NBMUS1A030	S2	*Bryum algovicum*	moss	7/20/1955	Non-Sensitive
4-25-052-36	3054	NBMUS1A030	S2	*Bryum algovicum*	moss	9/14/1976	Non-Sensitive
4-25-052-13	3099	NBMUS1A0X0	S2	*Bryum pallens*	moss	6/25/1958	Non-Sensitive
4-25-052-24	3099	NBMUS1A0X0	S2	*Bryum pallens*	moss	6/25/1958	Non-Sensitive
4-25-052-24	3157	NBMUS1A1B0	S2	*Bryum uliginosum*	moss	1/15/1961	Non-Sensitive
4-25-052-16	12320	PMCYP03EN0	S2	*Carex vulpinoidea*	fox sedge	1998-06-XX	Non-Sensitive
4-25-052-24	3315	NBMUS1U010	S2	*Conardia compacta*	moss	6/25/1958	Non-Sensitive
4-25-052-24	3563	NBMUS2C070	S1S2	*Didymodon tophaceus*	blunt-leaved hair moss	7/24/1960	Non-Sensitive
4-25-052-09	7604	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	8/17/1999	Non-Sensitive
4-25-052-09	21518	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	7/12/2007	Non-Sensitive
4-25-052-09	18827	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	7/12/2007	Non-Sensitive

Legal Location	Element Occurrence ID	Element Code	Subnational Rank*	Scientific Name**	Common Name	Last Observed Date	Sensitivity Code
4-25-052-10	7605	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	8/29/2012	Non-Sensitive
4-25-052-10	18826	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	7/11/2007	Non-Sensitive
4-25-052-10	7604	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	8/17/1999	Non-Sensitive
4-25-052-10	21518	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	7/12/2007	Non-Sensitive
4-25-052-12	7601	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	1996-08-XX	Non-Sensitive
4-25-052-15	7604	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	8/17/1999	Non-Sensitive
4-25-052-15	21518	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	7/12/2007	Non-Sensitive
4-25-052-15	7606	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	8/17/1999	Non-Sensitive
4-25-052-30	7613	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	8/1/1927	Non-Sensitive
4-25-052-31	7613	PDASTEH022	S2	*Doellingeria umbellata var. pubens*	flat-topped white aster	8/1/1927	Non-Sensitive
4-25-052-	3676	NBMUS2N100	S1	*Entodon*	Schleicher's	12/1/2002	Non-

Legal Location	Element Occurrence ID	Element Code	Subnational Rank*	Scientific Name**	Common Name	Last Observed Date	Sensitivity Code
13				*schleicheri*	silk moss		Sensitive
4-25-052-18	16430	PDSCR0R070	S2	*Gratiola neglecta*	clammy hedge-hyssop	7/26/2003	Non-Sensitive
4-25-052-13	5541	NLT0018380	S1	*Micarea melaena*	dot lichen	4/29/1961	Non-Sensitive
4-25-052-10	16507	PMPOA481D0	S2	*Muhlenbergia racemosa*	marsh muhly	8/18/2002	Non-Sensitive
4-25-052-12	13547	PMPOA481D0	S2	*Muhlenbergia racemosa*	marsh muhly	10/26/2003	Non-Sensitive
4-25-052-12	21650	PMPOA481D0	S2	*Muhlenbergia racemosa*	marsh muhly	10/26/2003	Non-Sensitive
4-25-052-13	16508	PMPOA481D0	S2	*Muhlenbergia racemosa*	marsh muhly	7/20/2003	Non-Sensitive
4-25-052-13	13547	PMPOA481D0	S2	*Muhlenbergia racemosa*	marsh muhly	10/26/2003	Non-Sensitive
4-25-052-13	21650	PMPOA481D0	S2	*Muhlenbergia racemosa*	marsh muhly	10/26/2003	Non-Sensitive
4-25-052-36	13540	PMPOA481D0	S2	*Muhlenbergia racemosa*	marsh muhly	9/3/1968	Non-Sensitive
4-25-052-09	18966	PMNAJ01020	S2	*Najas flexilis*	slender naiad	7/12/2007	Non-Sensitive
4-25-052-09	18967	PMNAJ01020	S2	*Najas flexilis*	slender naiad	7/12/2007	Non-Sensitive
4-25-052-16	18966	PMNAJ01020	S2	*Najas flexilis*	slender naiad	7/12/2007	Non-Sensitive
4-25-052-10	18825	PDAPI1K060	S2	*Osmorhiza longistylis*	smooth sweet cicely	7/11/2007	Non-Sensitive
4-25-052-	16510	PDAPI1K060	S2	*Osmorhiza*	smooth	6/29/2004	Non-

Legal Location	Element Occurrence ID	Element Code	Subnational Rank*	Scientific Name**	Common Name	Last Observed Date	Sensitivity Code
12				*longistylis*	sweet cicely		Sensitive
4-25-052-36	6731	PDAPI1K060	S2	*Osmorhiza longistylis*	smooth sweet cicely	1974-06-XX	Non-Sensitive
4-25-052-36	6725	PDAPI1K060	S2	*Osmorhiza longistylis*	smooth sweet cicely	6/26/2013	Non-Sensitive
4-25-052-12	5985	NLTEST5080	S2S3	*Peltigera horizontalis*	flat fruited pelt lichen	6/9/2011	Non-Sensitive
4-25-052-13	5985	NLTEST5080	S2S3	*Peltigera horizontalis*	flat fruited pelt lichen	6/9/2011	Non-Sensitive
4-25-052-13	5642	NLT0023840	S1	*Pseudevernia consocians*	lichen	5/21/1963	Non-Sensitive
4-25-052-12	4457	NBMUS6F020	S2	*Rhodobryum ontariense*	moss	7/25/1996	Non-Sensitive
4-25-052-24	4454	NBMUS6F020	S2	*Rhodobryum ontariense*	moss	5/8/1973	Non-Sensitive
4-25-052-13	10263	PDROS1K900	S1	*Rubus x paracaulis*	hybrid dwarf raspberry	6/15/1940	Non-Sensitive
4-25-052-24	10263	PDROS1K900	S1	*Rubus x paracaulis*	hybrid dwarf raspberry	6/15/1940	Non-Sensitive
4-25-052-03	4536	NBMUS6W010	S2	*Scouleria aquatica*	moss	6/11/1979	Non-Sensitive
4-25-052-04	4536	NBMUS6W010	S2	*Scouleria aquatica*	moss	6/11/1979	Non-Sensitive

*Note: For definitions of subnational rankings, refer to Table 1 in Section 2.0.

**Note: Latin founder names have not been included, but can be provided upon request.

APPENDIX C – ACIMS QUERY: POTENTIAL RARE PLANTS AND RARE PLANT COMMUNITIES WITHIN THE CENTRAL PARKLAND NATURAL SUBREGION

Potential Rare Plants

Scientific Name*	Common Name	Subnational Rank**	National Rank**	Global Rank**
Almutaster pauciflorus	few-flowered aster	S2S3	NNR	G4
Aloina rigida	aloe-like rigid screw moss	S2	N4	G4G5
Amblyodon dealbatus	moss	S2	N3N4	G3G5
Aongstroemia longipes	spring moss	S2	N4	G4G5
Bolboschoenus fluviatilis	river bulrush	S1	N5	G5
Botrychium campestre	field grape fern	S1	N2	G3G4
Botrychium pinnatum	northwestern grape fern	S3	N4	G4?
Botrychium simplex	dwarf grape fern	S2	N4	G5
Botrychium spathulatum	spatulate grape fern	S2	N2N3	G3
Brachythecium acutum	moss	SU	NNR	GNRQ
Brachythecium hylotapetum	moss	S3	NNR	GU
Brachythecium plumosum	moss	S2	N5	G5
Brachythecium rutabulum	moss	S2?	NNR	G5
Bromus latiglumis	Canada brome	S1	NNR	G5

Scientific Name*	Common Name	Subnational Rank**	National Rank**	Global Rank**
Bryohaplocladium virginianum	moss	S1	NNR	G5
Bryum algovicum	moss	S2	NNR	G4G5
Bryum pallens	moss	S2	NNR	G4G5
Bryum turbinatum	moss	S2	NNR	G5
Bryum uliginosum	moss	S2	NNR	G3G5
Callicladium haldanianum	moss	S1	N5	G5
Calylophus serrulatus	shrubby evening-primrose	S2	N5	G5
Calypogeia muelleriana	liverwort	S2	NNR	G5
Campylium radicale	campylium moss	S2	NNR	G3G5
Carex crawei	Crawe's sedge	S2	NNR	G5
Carex heleonastes	Hudson Bay sedge	S2	N3	G4
Carex hystericina	porcupine sedge	S1	N5	G5
Carex incurviformis var. incurviformis	seaside sedge	S2	NNR	G4G5T4T5Q
Carex lacustris	lakeshore sedge	S2	N5	G5
Carex retrorsa	turned sedge	S3	N5	G5
Carex umbellata	umbellate sedge	S2	N5	G5
Cetraria arenaria	sand-loving Iceland lichen	S1	NNR	G4
Chenopodium atrovirens	goosefoot	S1	N1N2	G5
Chrysosplenium iowense	golden saxifrage	S3?	N3	G3?
Conardia compacta	moss	S2	NNR	G3G5
Conocephalum	liverwort	S2	N5	G5

Scientific Name*	Common Name	Subnational Rank**	National Rank**	Global Rank**
salebrosum				
Cryptantha kelseyana	Kelsey's cat's eye	S1	N2	G4
Cynoglossum virginianum var. boreale	wild comfrey	S1	N4	G5T4T5
Cyperus schweinitzii	sand nut-grass	S2	NNR	G5
Cyphelium notarisii	soot lichen	S2	NNR	GNR
Danthonia spicata	poverty oat grass	S2	N5	G5
Desmatodon cernuus	narrow-leafed chain-teeth moss	S1	NNR	G3G5
Desmatodon heimii	long-stalked beardless moss	S2	NNR	G5
Desmatodon randii	moss	S1	NNR	G3?
Dicranum ontariense	cushion moss	S1	NNR	G4G5
Dicranum tauricum	broken-leaf moss	S1S2	NNR	G4
Didymodon fallax	fallacious screw moss	S2	NNR	G5
Didymodon tophaceus	blunt-leaved hair moss	S1S2	N3N4	G5
Doellingeria umbellata var. pubens	flat-topped white aster	S2	N5	G5T5
Drepanocladus crassicostatus	brown moss	S2	NNR	G3G5
Eleocharis elliptica	slender spikerush	S2?	N5	G5
Ellisia nyctelea	waterpod	S2	N4	G5
Entodon concinnus	moss	S2	NNR	G4G5
Entodon schleicheri	Schleicher's silk	S1	N1N2	G3G5

Scientific Name*	Common Name	Subnational Rank**	National Rank**	Global Rank**
	moss			
Eupatorium maculatum	spotted Joe-pye weed	S1S2	N5	G5
Gentiana fremontii	marsh gentian	S2	N2N3	G4
Gratiola neglecta	clammy hedge-hyssop	S2	NNR	G5
Hedyotis longifolia	long-leaved bluets	S2	NNR	G4G5
Hypericum majus	large Canada St. John's-wort	S2	NNR	G5
Hypnum pallescens	moss	S2	NNR	G5
Juncus nevadensis	Nevada rush	S1	NNR	G5
Lactuca biennis	tall blue lettuce	S2	N5	G5
Lecania dubitans	bean-spored rim-lichen	S2S4	NNR	G4?
Lecanora caesiorubella ssp. saximontana	frosted rim-lichen	S1	NNR	G4G5TNR
Lecanora hybocarpa	bumpy rim-lichen	S2	NNR	G5
Leskea gracilescens	moss	S1	NNR	G5
Leskea obscura	moss	S1	N2N3	G5
Leskea polycarpa	moss	S1	NNR	G4G5
Limprichtia cossonii	moss	SU	NNR	GU
Lomatogonium rotatum	marsh felwort	S2S3	N5?	G5
Lysimachia hybrida	lance-leaved loosestrife	S2	NNR	G5
Malaxis paludosa	bog adder's-mouth	S1	N3	G4
Mannia fragrans	liverwort	S1	N3N4	G5
Mannia pilosa	liverwort	S1	N2N3	G4?

Scientific Name*	Common Name	Subnational Rank**	National Rank**	Global Rank**
Marsilea vestita	hairy pepperwort	S2	N2N3	G5
Micarea melaena	dot lichen	S1	NNR	G4G5
Mimulus glabratus	smooth monkeyflower	S1	N2	G5
Muhlenbergia racemosa	marsh muhly	S2	N4N5	G5
Munroa squarrosa	false buffalo grass	S2	N2	G5
Myxobilimbia sabuletorum	dot lichen	S2	NNR	G4G5
Najas flexilis	slender naiad	S2	N5	G5
Oryzopsis canadensis	Canadian rice grass	S1	N4N5	G5
Osmorhiza longistylis	smooth sweet cicely	S2	N5	G5
Panicum leibergii	Leiberg's millet	S1	NNR	G5
Panicum wilcoxianum	Wilcox's panicgrass	S1	N2	G5
Peltigera horizontalis	flat fruited pelt lichen	S2S3	N4N5	G5
Phaeophyscia cernohorskyi	shadow lichen	S1	NU	G4G5
Phascum cuspidatum	cuspidate earth moss	S2	N4	G5
Physcia dimidiata	rosette lichen	S1S2	NNR	G5?
Physcomitrium hookeri	bladder-cap moss	S1	NNR	G2G4
Physconia isidiigera	frost lichen	S2	NNR	G3G4
Pohlia atropurpurea	moss	S1	NNR	G4G5
Polanisia dodecandra	clammyweed	S2	NNR	G5
Potamogeton	leafy pondweed	S2	N5	G5

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Scientific Name*	Common Name	Subnational Rank**	National Rank**	Global Rank**
foliosus				
Potamogeton strictifolius	linear-leaved pondweed	S2	N4	G5
Potentilla finitima	sandhills cinquefoil	S1	N2N4	G2G4Q
Potentilla plattensis	low cinquefoil	S1S2	N2	G4
Pseudevernia consocians	lichen	S1	NNR	G3G5
Pterygoneurum subsessile	moss	S2	N3N4	G4?
Puccinellia cusickii	Cusick's salt-meadow grass	SU	NNR	G3G4Q
Quercus macrocarpa	burr oak	SU	NNR	G5
Ramalina farinacea	dotted ramalina	S3	NNR	G3G5
Rhodobryum ontariense	moss	S2	NNR	G5
Rhynchospora capillacea	slender beak-rush	S1	NNR	G4
Riccardia latifrons	liverwort	S2	NNR	G4G5
Riccardia multifida	liverwort	S2S3	NNR	G5
Riccia fluitans	liverwort	S2	NNR	G5
Ricciocarpos natans	liverwort	S2	N5	G5
Rorippa curvipes	yellow cress	SU	NNR	G5
Rubus x paracaulis	hybrid dwarf raspberry	S1	NNA	GNA
Ruppia cirrhosa	widgeon-grass	S1	N4	G5
Scouleria aquatica	moss	S2	NNR	G4
Shinnersoseris rostrata	annual skeletonweed	S2	N2N3	G5?
Sisyrinchium	pale blue-eyed grass	S3	N3N4	G3G4

Scientific Name*	Common Name	Subnational Rank**	National Rank**	Global Rank**
septentrionale				
Spergularia salina	salt-marsh sand spurry	S2S3	N5?	G5
Sphagnum contortum	twisted bog moss	S2	NNR	G5
Sphenopholis obtusata	prairie wedge grass	S2	NNR	G5
Splachnum ampullaceum	flagon-fruited splachnum moss	S2	NNR	G5
Thuidium philibertii	moss	S1S2	NNR	G5
Townsendia exscapa	low townsendia	S2	N4N5	G5
Trapeliopsis flexuosa	mottled-disk lichen	S1S3	N4N5	G5
Viola pedatifida	crowfoot violet	S2	N4	G5
Weissia controversa	green-cushioned weissia moss	S2	NNR	G5
Wolffia columbiana	watermeal	S2	NNR	G5
Xanthomendoza montana	sunburst lichen	SU	NU	GNR
Xylographa parallela	black woodscript lichen	S2S4	N4	G5

*Note: Latin founder names have not been included, but can be provided upon request.

**Note: For definitions of subnational (S), national (N), and global (G) rankings, refer to Table 1 in Section 2.0.

Potential Rare Plant Communities

Scientific Name*	Common Name	S Rank**	N Rank**	G Rank**
Betula neoalaskana - Picea glauca / Salix discolor / Equisetum arvense swamp forest community	Alaska birch - white spruce / pussy willow / common horsetail swamp forest community	S1S2	NNR	GNR
Calamovilfa longifolia - Sporobolus cryptandrus	sand grass - sand dropseed	S2S3	NNR	GNR
Calamovilfa longifolia - Stipa comata grassland	sand grass - needle-and-thread grassland	S3	NNR	G3
Distichlis stricta - Pascopyrum smithii	salt grass - western wheat grass	S2	NNR	GNR
Festuca hallii - Calamovilfa longifolia	plains rough fescue - sand grass	S1	NNR	GNR
Festuca hallii - Koeleria macrantha / Juniperus horizontalis / forbs	plains rough fescue - June grass / juniper / forbs	S2	NNR	GNR
Festuca hallii - Stipa curtiseta grassland	plains rough fescue - western porcupine grass grassland	S2S3	NNR	GNR
Festuca hallii grassland	plains rough fescue grassland	S1	NNR	GNR
Juniperus horizontalis / (Koeleria macrantha) / Cladina mitis	creeping juniper / (June grass) / green reindeer lichen	S1S2	NNR	GNR
Larix laricina - Picea mariana / Cornus stolonifera - Rubus	tamarack - black spruce / red-osier dogwood - wild red	S1S2	NNR	GNR

Scientific Name*	Common Name	S Rank**	N Rank**	G Rank**
idaeus	raspberry			
Picea mariana / Cornus stolonifera / feathermoss	black spruce / red-osier dogwood / feathermoss	S1S2	NNR	GNR
Populus balsamifera / Viburnum opulus / Matteuccia struthiopteris	balsam poplar / high-bush cranberry / ostrich fern	S1S2	NNR	GNR
Populus tremuloides / Juniperus horizontalis / Carex siccata woodland	aspen / creeping juniper / hay sedge woodland	S2S3	NNR	GNR
Puccinellia nuttalliana community	Nuttall's salt-meadow grass community	S3?	NNR	G3?
Salicornia rubra emergent marsh	samphire emergent marsh	S2	NNR	G2G3
Schizachyrium scoparium - Calamovilfa longifolia	little bluestem - sand grass	S2	NNR	GNR
Scirpus nevadensis - (Triglochin maritima)	Nevada bulrush - (seaside arrow-grass)	S2S3	NNR	GNR
Spartina gracilis - (Pascopyrum smithii)	alkali cord grass - (western wheat grass)	S2S3	NNR	GNR
Sporobolus cryptandrus semi-active dune	sand dropseed semi-active dune	S2	NNR	GNR
Triglochin maritima emergent marsh	seaside arrow-grass emergent marsh	S2?	NNR	GNR

*Note: Latin founder names have not been included, but can be provided upon request.
**Note: For definitions of subnational (S), national (N), and global (G) rankings, refer to Table 1 in Section 2.0.

APPENDIX D – PROBABLE RARE PLANT SPECIES WITHIN THE STUDY AREA

Scientific Name*	Common Name	S Rank**	N Rank**	G Rank**
Bolboschoenus fluviatilis	river bulrush	S1	N5	G5
Bromus latiglumis	Canada brome	S1	NNR	G5
Carex vulpinoidea	fox sedge	S2	N5	G5
Chrysosplenium iowense	golden saxifrage	S3?	N3	G3?
Cynoglossum virginianum var. boreale	wild comfrey	S1	N4	G5T4T5
Cyperus schweinitzii	sand nut-grass	S2	NNR	G5
Doellingeria umbellata var. pubens	flat-topped white aster	S2	N5	G5T5
Eleocharis elliptica	slender spikerush	S2?	N5	G5
Ellisia nyctelea	waterpod	S2	N4	G5
Eupatorium maculatum	spotted Joe-pye weed	S1S2	N5	G5
Gentiana fremontii	marsh gentian	S2	N2N3	G4
Gratiola neglecta	clammy hedge-hyssop	S2	NNR	G5
Juncus nevadensis	Nevada rush	S1	NNR	G5
Lactuca biennis	tall blue lettuce	S2	N5	G5
Lomatogonium rotatum	marsh felwort	S2S3	N5?	G5
Lysimachia hybrida	lance-leaved loosestrife	S2	NNR	G5
Mimulus glabratus	smooth monkeyflower	S1	N2	G5
Muhlenbergia	marsh muhly	S2	N4N5	G5

Scientific Name*	Common Name	S Rank**	N Rank**	G Rank**
racemosa				
Najas flexilis	slender naiad	S2	N5	G5
Osmorhiza longistylis	smooth sweet cicely	S2	N5	G5
Rorippa curvipes	yellow cress	SU	NNR	G5

*Note: Latin founder names have not been included, but can be provided upon request.

**Note: For definitions of subnational (S), national (N), and global (G) rankings, refer to Table 1 in Section 2.0.

APPENDIX E – SPECIES OBSERVED BY HABITAT TYPE AND SURVEY DATE

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Acer negundo	Manitoba maple	X	X	X	X	X			X
Achillea millefolia	Common yarrow		X			X			X
Actaea rubra	Baneberry			X	X	X			X
Agrimonia striata	Agrimony			X				X	
Agropyron pectiniforme	Crested wheatgrass		X				X		
Agropyron repens	Couch grass		X				X		
Agropyron trachycaulum var. trachycaulum	Slender wheat grass		X	X		X			X
Alisma plantago-aquatica	Broad-leaved water plantain					X		X	
Alnus crispa	Green alder			X					X
Alnus tenuifolia	River alder			X	X	X			X
Amaranthus retroflexus	Reflexed pigweed		X						X
Amelanchier alnifolia	Saskatoon	X	X	X		X			X
Anemone cylindrica	Long-fruited anemone			X		X			X
Apocynum androsaemifolium	Spreading dogbane	X	X	X					X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Aquilegia brevistyla	Blue columbine			X		X			X
Aralia nudicaulis	Wild sarsaparilla	X	X	X	X				X
Arctium minus	Common burdock		X				X		
Arenaria lateriflora	Blunt-leaved sandwort		X	X					X
Aster ciliolatus	Fringed aster			X	X	X			X
Aster conspicuus	Showy aster		X	X					X
Aster hesperius	Western willow aster					X			X
Aster laevis	Smooth aster		X	X		X			X
Aster puniceus	Purple-stemmed aster	X				X	X		
Astragalus canadensis	Canadian milk-vetch			X			X		
Aulacomium palustre	Tufted moss					X	X		
Avena sativa	Common oats		X					X	
Betula papyrifera	White birch			X		X			X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Bidens cernua	Nodding beggar-ticks					X		X	
Brachythecium rivulare	Waterside feather moss				X	X		X	
Brassica rapa	Canola	X	X						X
Bromus inermis	Smooth brome	X	X	X	X	X			X
Bryum argenteum	Silver bryum		X	X	X	X			X
Calamagrostis canadensis	Marsh reed grass	X	X	X	X	X			X
Calamagrostis inexpansa	Northern reed grass					X		X	
Campanula rotundifolia	Common harebell					X		X	
Capsella bursa-pastoris	Shepherd's purse		X						X
Caragana arborescens	Common caragana			X		X			X
Carex aquatilis	Water sedge					X			X
Carex atherodes	Awned sedge					X	X		
Carex bebbii	Bebb's sedge					X		X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Carex concinna	Beautiful sedge			X				X	
Carex concinnoides	Northwestern sedge			X			X		
Carex crawfordii	Crawford's sedge				X	X			X
Carex deweyana	Dewey's sedge			X					X
Carex disperma	Two-seeded sedge				X	X		X	
Carex praticola	Meadow sedge			X		X	X		
Carex retrorsa	Turned sedge				X	X			X
Carex utriculata	Beaked sedge			X		X	X		
Carex viridula	Green sedge				X	X		X	
Ceratodon purpureus	Fire moss			X		X			X
Ceratophyllum demersum	Hornwort					X			X
Chenopodium album	Lamb's quarters		X						X
Cirsium arvense	Canada thistle		X	X		X			X
Clematis integrifolia	Bush clematis		X					X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Corallorhiza maculata	Spotted coralroot			X			X		
Cornus canadensis	Bunchberry			X	X				X
Cornus stolonifera	Red osier dogwood	X	X	X	X	X			X
Corylus cornuta	Beaked hazelnut	X	X	X	X	X			X
Cotoneaster lucidus	Cotoneaster		X	X					X
Dactylis glomerata	Orchard grass		X	X				X	
Disporum trachycaulum	Fairybells	X		X					X
Draba nemorosa	Annual whitlow-grass		X						X
Descurainia sophia	Flixweed		X				X		
Drepanocladus aduncus	Common hook moss		X	X		X			X
Echinochloa crusgalli	Barnyard grass		X						X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Echium vulgare	Blueweed		X				X		
Elaeagnus angustifolia	Russian olive	X					X		
Elaeagnus commutata	Wolf willow			X				X	
Eleocharis palustris	Creeping spike-rush					X			X
Epilobium angustifolium	Fireweed		X	X	X				X
Epilobium palustre	Marsh willowherb				X	X			X
Equisetum arvense	Common horsetail			X	X	X			X
Equisetum scirpoides	Dwarf scouring-rush			X			X		X
Fagopyrum tataricum	Common knotweed		X						X
Festuca rubra	Creeping red fescue		X	X		X			X
Fragaria virginiana	Strawberry		X	X	X	X			X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Fraxinus pennsylvanica	Green ash	X					X		
Galeopsis tetrahit	Hemp nettle			X	X			X	
Galium aparine	Cleavers		X					X	
Galium boreale	Northern bedstraw	X		X	X	X			X
Galium trifidum	Small bedstraw					X		X	
Galium triflorum	Sweet-scented bedstraw			X		X			X
Geum aleppicum	Yellow avens				X	X	X		
Glyceria grandis	Tall manna grass					X		X	
Helodium blandowii	Blandow's feather moss					X		X	
Heracleum lanatum	Cow-parsnip			X			X		
Hieracium umbellatum	Narrow-leaved hawkweed		X					X	
Hippuris vulgaris	Common mare's-tail					X		X	
Hordeum vulgare	Barley		X						X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Hylocomium splendens	Stair step moss		X	X	X				X
Hypnum lindbergii	Clay pigtail moss					X			X
Impatiens capensis	Spotted forget-me-not					X		X	
Juniperus communis	Common juniper			X				X	
Lathyrus ochroleucus	Creamy peavine		X	X		X			X
Lathyrus venosus	Purple peavine		X	X	X				X
Lemna minor	Common duckweed				X	X			X
Leptobryum pyriforme	Long-necked bryum		X					X	
Leymus innovatus	Hairy wild rye			X			X		
Linnaea borealis	Twinflower			X			X		
Linum vulgare	Toadflax		X			X			X
Lonicera dioica	Twining honeysuckle	X		X					X
Lonicera involucrata	Bracted honeysuckle			X	X			X	

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Lysimachia thrysiflora	Tufted loosestrife					X		X	
Maianthemum canadense	Wild lily-of-the-valley	X	X	X	X	X			X
Malva neglecta	Common mallow		X					X	
Matricaria matricarioides	Pineappleweed		X						X
Matricaria perforata	Scentless chamomile		X						X
Medicago lupulina	Black medic	X	X						X
Medicago sativa	Alfalfa	X	X	X					X
Melilotus albus	White sweet clover		X						X
Melilotus officinalis	Yellow sweet clover		X					X	
Mertensia paniculata	Tall lungwort			X			X		
Myriophyllum exalbescens	Spiked water-milfoil					X		X	
Najas flexilis	Slender naiad					X			X
Oryzopsis	Rough-leaved			X			X		

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Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
asperifolia	rice grass								
Peltigera canina	Dog pelt lichen		X	X					X
Petasites palmatus	Palmate colt's-foot			X					X
Petasites sagittatus	Arrow-leaved colt's-foot				X	X		X	
Phalaris arundinacea	Canary reed grass					X		X	
Phleum pratense	Timothy		X					X	
Picea glauca	White spruce	X	X	X	X	X			X
Picea pungens	Blue spruce	X					X		
Pinus banksiana	Jack pine		X			X		X	
Plagiomnium ellipticum	Marsh magnificent moss				X	X			X
Plantago major	Common plantain		X			X			X
Platanthera hyperborea	Northern green bog orchid					X		X	
Pleurozium schreberi	Red stem moss		X	X	X				X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Poa palustris	Fowl bluegrass		X		X	X			X
Poa pratensis	Kentucky bluegrass	X	X	X		X			X
Polygonum amphibium	Water smartweed				X		X		
Populus balsamifera	Balsam poplar	X	X	X	X	X			X
Populus tremuloides	Trembling aspen	X	X	X	X	X			X
Potamogeton friesii	Fries' pondweed					X			X
Potamogeton richardsonii	Richardson's pondweed					X		X	
Potentilla anserina	Silverweed		X					X	
Potentilla fruticosa	Common potentilla		X				X		
Potentilla palustris	Marsh cinquefoil					X		X	
Prunus pensylvanica	Pin cherry	X	X	X					X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Prunus virginiana	Chokecherry	X	X	X	X	X			X
Ptilium crista-castrensis	Knight's plume			X			X		
Pylaisella polyantha	Stocking moss			X		X			X
Pyrola asarifolia	Common wintergreen			X	X	X	X		
Pyrola minor	Lesser wintergreen					X		X	
Pyrola secunda	One-sided wintergreen			X			X		
Pyrola virens	Green wintergreen				X		X		
Ranunculus acris	Tall buttercup			X				X	
Ranunculus sceleratus	Celery-leaved buttercup					X	X		
Ribes lacustre	Black gooseberry			X					X
Ribes oxyacanthoides	Northern gooseberry		X	X	X				X
Ribes triste	Wild red currant			X				X	
Rorippa islandica	Marsh yellow					X		X	

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Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
	cress								
Rosa acicularis	Prickly rose	X	X	X	X	X			X
Rosa woodsii	Common wild rose			X				X	
Rubus idaeus	Raspberry			X	X				X
Rubus pubescens	Dewberry			X	X				X
Salix arbusculoides	Shrubby willow			X			X		
Salix bebbiana	Bebb's willow			X	X	X			X
Salix discolor	Pussy willow					X		X	
Salix exigua	Sandbar willow					X			X
Salix lasiandra	Western shining willow					X	X		
Salix lucida	Shining willow			X	X	X			X
Salix lutea	Yellow willow					X		X	
Salix pentandra	Laurel-leaved willow		X					X	
Salix petiolaris	Basket willow					X		X	
Salix planifolia	Plane-leaved willow			X	X	X			X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Salix pyrifolia	Balsam willow			X		X	X		
Sambucus racemosa	Elderberry			X				X	
Sanicula marilandica	Snakeroot			X			X		
Schizachne purpurascens	Purple oat grass			X					X
Scirpus microcarpus	Small-fruited bulrush					X			X
Scirpus validus	Common great bulrush					X		X	
Senecio pauperculus	Balsam groundsel		X	X				X	
Shepherdia canadensis	Canada buffalo-berry			X	X	X			X
Smilacina stellata	Star-flowered false Solomon's-seal	X		X	X	X			X
Solidago canadensis	Canada goldenrod		X	X	X	X		X	
Sonchus arvensis	Perennial sow-	X	X	X	X	X			X

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
	thistle								
Sorbus scopulina	Mountain ash		X	X	X	X			X
Sparganium angustifolium	Narrow-leaved bur-reed					X		X	
Spirodella polyrhiza	Larger duckweed					X		X	
Stellaria longifolia	Long-leaved chickweed					X	X		
Stellaria media	Common chickweed					X		X	
Symphoricarpos albus	Common snowberry		X	X	X	X			X
Symphoricarpus occidentalis	Western snowberry	X		X	X				X
Tanacetum vulgare	Common tansy			X		X			X
Taraxacum officinale	Common dandelion	X	X	X	X	X			X
Thalictrum venulosum	Veiny meadowrue			X	X				X
Thlaspi arvense	Stinkweed		X				X		

Scientific Name	Common Name	Habitat Type Observed					Survey Observed		
		Anthropogenic	Field/ Pasture	Forest	Riparian	Man-made Wetland	August 2014	June 2015	Both
Trifolium hybridum	Alsike clover		X	X	X	X			X
Trifolium repens	Red clover			X			X		
Typha latifolia	Common cattail					X			X
Urtica dioica	Stinging-nettle			X	X			X	
Viburnum edule	Low-bush cranberry		X	X	X	X			X
Viburnum opulus	High-bush cranberry	X		X	X	X			X
Vicia americana	American vetch	X	X	X	X	X			X
Viola canadensis	Canada violet	X		X	X				X
Viola renifolia	Kidney-leaved violet			X				X	
Zygadenus elegans	White death-camas					X		X	

APPENDIX F – ACIMS FORMS

Rare Native Plant and Lichen Survey Form

Header Information

Project ID	Year	Month	Day
Fort Edmonton Park	2014	August	24
Plot Type	**Plot Label**	**Surveyor**	**GPS Name**
Rare	N/A - refer to figure for location	JG	—
UTM Zone	**Easting**	**Northing**	**Photos**
12U	328512	5931067	Yes

Rare Species Information

Rare Species	Collected
Carex retrorsa	Yes

Key Characteristics

Crowded female spikes, perigynia bent downwards

Reference Used

Flora of Alberta, Rare Vascular Plants of Alberta

Population Size (#)	Count or Estimate	Population Extent (m)	Measured or Estimate
~ 60 plants			

Percent of Population in Each Phenological Stage (Seed = Spore for Bryophytes and Lichens)

Seedling	Vegetative	In Bud	In Flower	Immature Seed	Mature Seed	Dispersing Seed
	25				75	

Rare Species Habitat Information

Ecosite Guide	NSR	Ecosite	Phase	Com
(N) WC SW	BM	e	1	1

Wetland Guide	Wetland Type	Nutrient Regime	Elevation
N/A	Stream/marsh	A B C (D) E	—

Slope (%)	Aspect (°)	Surface Shape	Slope Position
0	N/A	CV (CC) ST	CR UP MD LW TO (DP) LV

Surface Expression	Structural Stage	Successional Stage
Depression	1a 1b 2a (2b) 2c 2d 3a 3b 4 5 6 7	PS YS MS OS (YEC) MEC YCC MCC DC NV

Moisture	Light	Substrate
VX X SX SM M SHG HG (SHD) HD	(Open) Partial Filtered Shade	Wet mud

Organic Thickness (cm)	Surface Soil Texture	Soil Type	Drainage
0	Clay loam	SW-wet	VR R W MW I P (VP)

Plants Growing in Association with Rare Species

Epilobium palustre, Calamagrostis canadensis, Phalaris arundinacea, Rubex orbiculatus, Plantago major

Comments (Describe Microsite)

Population is at head of stream, in slower moving / standing water (more of a drainage ditch); see attached figure for spatial reference

Rare Native Plant and Lichen Survey Form

Header Information

Project ID	Year	Month	Day
Fort Edmonton Park	2014	August	24
Plot Type	**Plot Label**	**Surveyor**	**GPS Name**
Rare	FEP04 and FEP12	JG	FEP04 / FEP12
UTM Zone	**Easting**	**Northing**	**Photos**
12U	328616 / 328554	5930920 / 5930931	Yes

Rare Species Information

Rare Species	Collected
Najas flexilis	Yes

Key Characteristics

Submerged aquatic, leaves crowded at stem tips in sub-opposite pairs, giving tufted appearance, enlarged clasping bases on leaves

Reference Used

Flora of Alberta, Rare Vascular Plants of Alberta

Population Size (#)		Population Extent (m)	
>100 (each population)	Count or (Estimate)	5 m^2 (each population)	Measured or (Estimate)

Percent of Population in Each Phenological Stage (Seed = Spore for Bryophytes and Lichens)

Seedling	Vegetative	In Bud	In Flower	Immature Seed	Mature Seed	Dispersing Seed
	100					

Rare Species Habitat Information

Ecosite Guide	NSR	Ecosite	Phase	Com
(N) WC SW	BM	L	1	1

Wetland Guide	Wetland Type	Nutrient Regime	Elevation
Stewart and Kantrud	class V (permanent)	A B C (D) E	—

Slope (%)	Aspect (°)	Surface Shape	Slope Position
0	N/A	CV (CC) ST	CR UP MD LW TO (DP) LV

Surface Expression	Structural Stage	Successional Stage
Depression	1a 1b 2a (2b) 2c 2d 3a 3b 4 5 6 7	PS YS MS OS YEC (MEC) YCC MCC DC NV

Moisture	Light	Substrate
VX X SX SM M SHG HG SHD (HD)	(Open) Partial Filtered Shade	Water / mud

Organic Thickness (cm)	Surface Soil Texture	Soil Type	Drainage
0	Loam	SW - wet	VR R W MW I P (VP)

Plants Growing in Association with Rare Species

Lemna minor, Hippuris vulgaris, Potamogeton friesii, Potamogeton richardsonii, Carex aquatilis, Myriophyllum exalbescens

Comments (Describe Microsite)

Two populations, one at each interconnecting wetland, floating in the shallows and along margins of shore; see attached figure for spatial reference

APPENDIX G – FIELD SURVEY DATA SHEETS

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	12	08	24				R	FEP	11

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
628 m	FEP11	67-72	JG	wetland

UTM Zone	Easting	Northing
12V	328511	5930831
UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over	B	16	Pb 10					SC SO	8
Under								BR	
								HG HF	2

Stand Structure	C H M	Number of Layers	2	Height each Layer	16/7 m

Successional Stage

Successional Stage	PS YS MS OS YEC MEC YCC MCC DC NV			

Site Characteristics

Slope (%)		Moisture Regime	1 2 3 4 5 6 7 8 9
Aspect (degrees)			VX X SX SM M SHG HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 5 6 7	Nutrient Regime	A B C D E
Surface Exp.	depression		
Surface Shape	convex / concave / straight		
Slope position	1 2 3 4 5 6 7		
	CR UP MD LW TO DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC N	BM	L	1	
Ecosite fit		Good Fair Poor		

Shrubby + Wetland Class V

Percent Surface Substrate

Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
2	0	0	2	91	5	

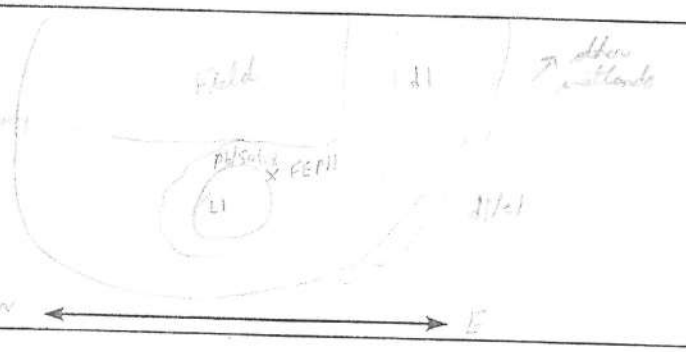
Alberta Wetland Classification

Wetland Class	M	Vegetation Modifier	0	Complex Landform	N	Local Landform	G

WOWP

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	W ⟷ E
PM & surf. exp.	



Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP11

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	% Cover	E	L	Type
1	Ph					6	Bromine				
	Acerneg						Poapal				
							Festrub				
							Scirmic				
							Poapra				
2	NNN						Typlat				
							Carcera				
							Carevir				
							Calacan				
	~~Rhus~~										
3	Salix hookeriana					7					
	Salpla										
	Salpet										
4	Slopcan										
	Cornsto										
	Corcer										
	Amelain										
	Sorbsco										
	Picsitc										
	Prunvir										
	Symalb										
	Vibedu										
	Sali hair ba										
5	Equarv										
	Victame										
	Plathyp										
	Sancan										
	Tricha										
	Achmil										
	Stilcan										
	Anelan										
	Potaur (vic)										
	Pota fri										

Cover classes: +: <1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	12	08	24				R	FEP	12

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
629	FEP12	Yes	JG	wetland

UTM Zone	Easting	Northing
12U	328554	5933951

UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over								SC SO	9
								BR	
Under								HG HF	1

Stand Structure	(C) H M	Number of Layers	2	Height each Layer	10/4 m (shrubs)

Successional Stage

Successional Stage	PS YS MS OS YEC (MEC) YCC MCC DC NV			

Site Characteristics

Slope (%)	0	Moisture Regime	1 2 3 4 5 6 7 (8) 9
Aspect (degrees)	N/A		VX X SX SM M SHG HG (SHD) HD
Structural Stage	1a 1b 2a (2b) 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B C (D) E
Surface Exp.	D		
Surface Shape	convex (concave) straight		
Slope position	1 2 3 4 5 (6) 7		
	CR UP MD LW TO (DP) LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	BM	2	1	
Ecosite fit		Good (Fair) Poor		

Stewart + Kantrud Class V

Percent Surface Substrate

Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
2	0	0	0	78	20	

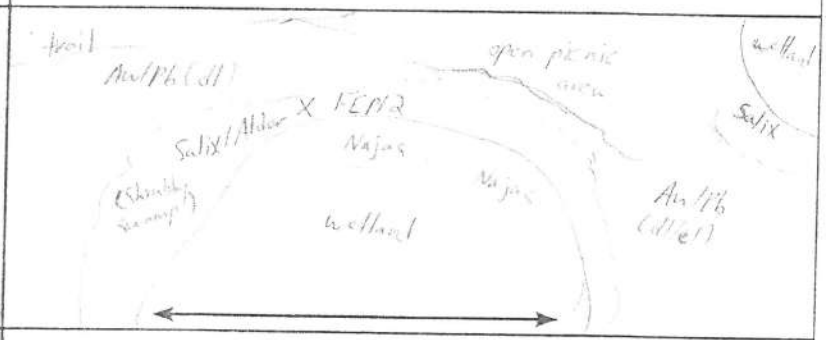
Alberta Wetland Classification

Wetland Class	M	Vegetation Modifier	0	Complex Landform	N	Local Landform	G

deciduous woody

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	
PM & surf. exp.	



Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP12

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	% Cover	E	L	Type
1	Aw					6	Poapal				
	Ph						Careagr				
							Poapra				
							Brohine				
2	Sw						Carcutr				
	~~Alnuhw~~ Acerneg						Typlat				
							Caredis				
							Phalaw				
3	Salipla						Festrub				
	Alnuten										
	Salilut										
						7	Phauro				
							Dicpol				
							Brarip				
4	Corsto										
	Salilu										
	Rosaci										

5	Equiarv				
	Epilpal				
	Astcil				
	Potfru				
	Potpic				
	Sancan				
	Cirsan				
	Najfle				
	Planhaj				
	Urtdio				
	Cepdem				
	Lemmin				
	Hippul				
	Trifhyb				
	Myrlep				

Cover classes: +: <1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	14	08	24				R	FEP	13

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
624	FEP13	8-08	TG	d/e1

UTM Zone	Easting	Northing
12U	328592	5931005
UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over	C	14	Aw 7	Pl 3				SC (SO)	8
Under								BR	
								(HG) HF	2

Stand Structure	(C) H M	Number of Layers	4	Height each Layer	14/9/5/2 m

Successional Stage

Successional Stage	PS (YS) MS OS YEC MEC YCC MCC DC NV			

Site Characteristics

Slope (%)	0	Moisture Regime	1 2 3 4 5 6 7 (8) 9
Aspect (degrees)	N/A		VX X SX SM M SHG HG (SHD) HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B C (D) E
Surface Exp.	D		
Surface Shape	convex (concave) straight		
Slope position	1 2 3 4 5 (6) 7		
	CR UP MD LW TO (DP) LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	BM	d/e	1	
Ecosite fit		Good (Fair) Poor		

Percent Surface Substrate

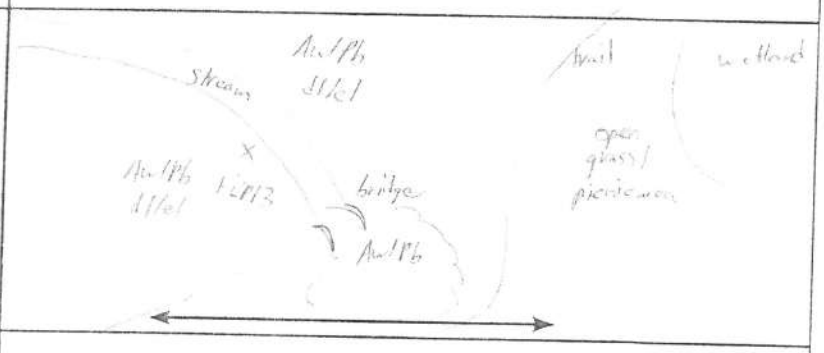
Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
5	0	0	10	65	20	

Alberta Wetland Classification

Wetland Class		Vegetation Modifier		Complex Landform		Local Landform	

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	
PM & surf. exp.	



Parts are d/e more riparian than anything else

Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP13

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	% Cover	E	L	Type
1	Aw					6	Bromine				
	Rh						Calacan				
							Carexdis				
							Carevir				
							Poapal				
2	Accmag						Careros?				
3	Almten										
	Picgla					7	Brachv				
	Salbeb						Bryuny				
							Hylspl				
							Plausch				
4	Cornsto						Plagell				
	Corcor										
	Lonvil										
	Ribcyn										
	Prunvir										
	Rubuida										
	Rosacic										
	Sympalb										
	Vibedu										
5	Actarub										
	Ayalnud										
	Carncan										
	Epilang										
	Astecil										
	Epileal										
	Fragvir										
	Equiarv										
	Galibor										
	Galetet										
	Potasug										
	Solcan										
	Rubpub										
	Thalven										
	Urtdio										
	Violcan										

Cover classes: +: <1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Forest

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label
FEP	14	08	24				R	FEP 14

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
	FEP14	Yes	JG	Wet

UTM Zone	Easting	Northing
12U	329516	5931241

UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over	C	16	Bw 7	Aw 3				SC SO	
Under	A	10	Aw 10					BR	
								HG HF	

Stand Structure	(C) H M	Number of Layers	4	Height each Layer	16/10/4/2 m

Successional Stage

Successional Stage	PS (YS) MS OS YEC MEC YCC MCC DC NV			

Site Characteristics

Slope (%)	6	Moisture Regime	1 2 3 4 (5) 6 7 8 9
Aspect (degrees)	320		VX X SX SM (M) SHG HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B (C) D E
Surface Exp.	NW I		
Surface Shape	convex concave (straight)		
Slope position	1 2 (3) 4 5 6 7		
	CR UP (MD) LW TO DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	BM	d	1	
Ecosite fit		Good (Fair) Poor		

Birch instead of aspen

Percent Surface Substrate

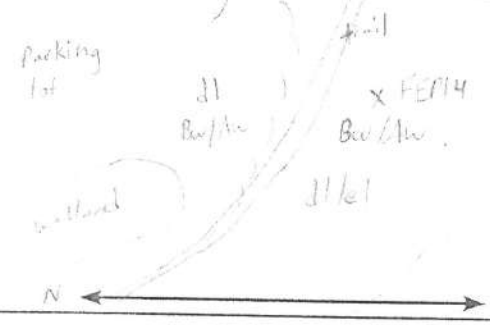
Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
5	0	0	10	85	0	

Alberta Wetland Classification

Wetland Class		Vegetation Modifier		Complex Landform		Local Landform	

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	N ⟷ S
PM & surf. exp.	



Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP14

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	% Cover	E	L	Type
1	Aw										
	Bw										
3	Salibe b										
4	Alnuri										
	Ribvla c										
	Vibuedu										
	Rosaaci										
	Abiela tn										
5	Galibor										
	Asteril										
	Violven										
	Carhcan										
	Aralnud										
	Ruhapub										
	Solican										
6	Calacan										
	Brohine										
	Caredew										
7	Plowsh										
	Hylosp										

Cover classes: +:<1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Wetland

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	14	08	24				R	FEP	15

Elevation	GPS file name	35-mm pt	Surveyor	Mapped As
629	FEP15	Yes	JG	wetland

UTM Zone	Easting	Northing
12V	329436	5931262
UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for	
Over								SC SO	
Under								BR	
								HG HF	10

Static Structure: C H M | Number of Layers: | Height each Layer:

Successional Stage

Successional Stage: PS YS MS OS YEC MEC YCC MCC DC NV

Site Characteristics

Slope (%)	0	Moisture Regime	1 2 3 4 5 6 7 8 9
Aspect (degrees)	N/A		VX X SX SM M SHG HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 3a 3b 4 5 6 7	Nutrient Regime	A B C D E
Surface Exp	D		
Surface Shape	convex (concave) straight		
Slope position	1 2 3 4 5 6 7		
	CR UP MD LW TC/DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	BM	L	1	1

Ecosite fit: (Good) Fair Poor

Skunk Cabbage wetland

Percent Surface Substrate

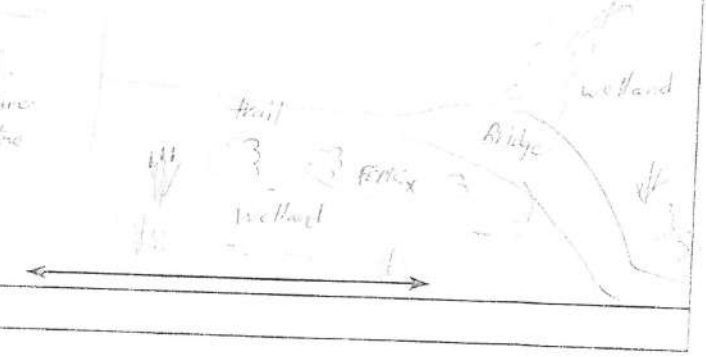
Decaying wood	Bedrock	Cobbles Stone	Mineral Soil	Organic Matter	Water	
0	0	0	30	50	20	

Alberta Wetland Classification

Wetland class	M	Vegetation Modifier	O	Complex Landform	N	Local Landform	G

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	
PM & surf. exp	



Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	EEM5

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	% Cover	E	L	Type
4	Salibeb										
	Saliexi										
	Rhaaci										
	Cornsto										
5	Hippvul										
	Potepal										
	Alispla										
	Spareur										
	Myriexa										
	Eletepal										
	Spirpal										
	Poltafri										
	Potarie										
	Lemnmin										
	Lemtri										
	Epilano										
	Sancdry										
6	Carexan										
	Scirval										
	Typhlat										
	Poapal										
	Poagrat										
	Bromine										
7	Dropadu										

Cover classes: +: <1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Forest

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	14	08	24				R	FEP	16

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
648	FEP16	Yes	JG	d1

UTM Zone	Easting	Northing
12U	329300	5931154

UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over	C	15	Aw 9	Pa 1				SC SO	
Under								BR	
								HG HF	

Stand Structure	(C) H M	Number of Layers	3	Height each Layer	15/5/2 m

Successional Stage

Successional Stage	PS (YS) MS OS YEC MEC YCC MCC DC NV			

Site Characteristics

Slope (%)	6	Moisture Regime	1 2 3 4 (5) 6 7 8 9
Aspect (degrees)	310		VX X SX SM (M) SHG HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B (C) D E
Surface Exp.	NW 1		
Surface Shape	convex concave (straight)		
Slope position	1 2 3 (4) 5 6 7		
	CR UP MD LW TO DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	B/M	3	1	

Ecosite fit: (Good) Fair Poor

Percent Surface Substrate

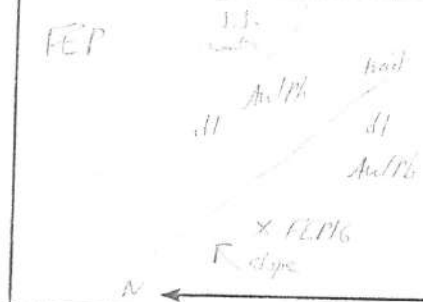
Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
5	0	0	5	90	0	

Alberta Wetland Classification

Wetland Class		Vegetation Modifier		Complex Landform		Local Landform	

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	N ⟷ S
PM & surf. exp.	



Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP16

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	%Cover	E	L	Type
1	Aw					7	Hylusp1				
	Pb						Ryguarg				
2	Bw										
3	Saliboh										
	Acerrug										
	Sorhscd										
4	Ribeacy										
	Alnucri										
	Vibopu										
	Prunvir										
	Amelalp										
	Rosanct										
	Corspar										
5	Vicriam										
	Aralanl										
	Galtheo										
	Astecon										
	Smilste										
	Rubupub										
	Epilang										
6	Calaspe										
	Carcden										
	Schipur										

Cover classes: +: <1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50 75% G: >75%

Forest

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	14	08	24				R	FEP	17

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
644	FEP17	Yes	TG	d1

UTM Zone	Easting	Northing
12U	329052	5931049
UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over	C	16	Aw 8	Pb 2				SC SO	
Under								BR	
								HG HF	

Stand Structure	(C) H M	Number of Layers	3	Height each Layer	16/5/2 m

Successional Stage

Successional Stage	PS (YS) MS OS YEC MEC YCC MCC DC NV			

Site Characteristics

Slope (%)	4	Moisture Regime	1 2 3 4 5 (6) 7 8 9
Aspect (degrees)	302		VX X SX SM M (SHG) HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B (C) D E
Surface Exp.	NW I		
Surface Shape	convex concave (straight)		
Slope position	1 2 3 (4) 5 6 7		
	CR UP MD LW (TO) DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	B/M	d	1	
Ecosite fit	Good (Fair) Poor			

Borderline d1

Percent Surface Substrate

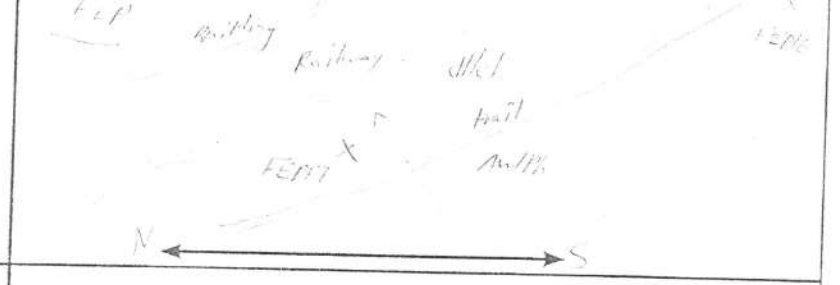
Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
3	0	0	0	97	0	

Alberta Wetland Classification

Wetland Class		Vegetation Modifier		Complex Landform		Local Landform	

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	N ⟷ S
PM & surf. exp.	



Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP17

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	% Cover	E	L	Type
1	Ac										
	Ph										
2	Sw										
3	Acomeg										
	Sorbsco										
	Salitch										
4	Cornsto										
	Rosaci										
	Vibedu										
	Ribsan										
	Piceri										
	Prunvir										
	Corcor										
5	Arulnud										
	Galtri										
	Rubpub										
	Corcan										
	Vicsep										
	Hogvir										
	Shilste										
6	Calcan										
	Agrstolo										

Cover classes: +:<1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Forest

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	14	08	24				R	FEP	18

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
648	FEP18	Yes	JG	d/c/

UTM Zone	Easting	Northing
12U	328595	5930800
UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over.	C	15	Aw 9	Pl 1				SC SO	
Under.								BR	
								HG HF	

Stand Structure	(C) H M	Number of Layers	3	Height each Layer	15/10/4 m

Successional Stage

Successional Stage: PS (YS) MS OS YEC MEC YCC MCC DC NV

Site Characteristics

Slope (%)	6	Moisture Regime	1 2 3 4 (5) 6 7 8 9
Aspect (degrees)	300		VX X SX SM (M) SHG HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B (C) D E
Surface Exp.	I		
Surface Shape	convex concave (straight)		
Slope position	1 2 (3) 4 5 6 7		
	CR UP (MD) LW TO DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	RM	d	1	

Ecosite fit: (Good) Fair Poor

Percent Surface Substrate

Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
3	0	0	2	95	0	

Alberta Wetland Classification

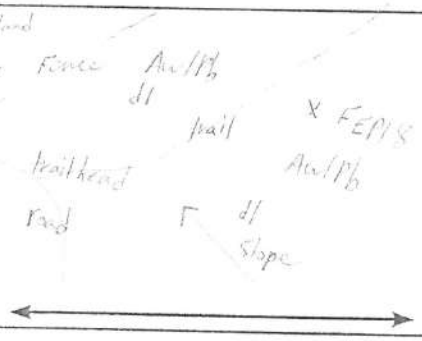
Wetland Class		Vegetation Modifier		Complex Landform		Local Landform	

Landscape Profile Diagram

Ecosites

Relief (m)

Slope (%)



Direction

PM & surf. exp.

Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP18

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	%Cover	E	L	Type
1	Aw										
	Pb										
2&3	Salsch										
	Alnucri										
10%											
4	Rosnut										
	Vibopu										
	Salsit										
	Amelaln										
	Symphoc										
	Corsto										
5	Vidcan										
	Carcan										
	Rubpub										
	Frasit										
	Vicsat										
	Astrap										
	Smista										
	Astcil										
	Solcan										
	Sancan										
	Taroff										
	Epilan										
	Maiacan										
	Lathoch										
6	Bromin										
	Calcan										
7	Bryspp										
	Ptlusch										

Cover classes: +:<1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Forest

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	14	08	24				R	FEP	19

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
647	FEP19	Yes	TG	d/ef

UTM Zone	Easting	Northing
12U	328721	5930891
UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over	C	14	Aw 9	Pb 1				SC SO	
Under								BR	
								HG HF	

Stand Structure	(C) H M	Number of Layers	2	Height each Layer	14/4 m

Successional Stage

Successional Stage	PS (YS) MS OS YEC MEC YCC MCC DC NV			

Site Characteristics

Slope (%)	4	Moisture Regime	1 2 3 4 (5) 6 7 8 9
Aspect (degrees)	306		VX X SX SM (M) SHG HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B (C) D E
Surface Exp.	I		
Surface Shape	convex concave (straight)		
Slope position	1 2 3 (4) 5 6 7		
	CR UP MD (LW) TO DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	BM	d	1	
Ecosite fit		Good (Fair) Poor		

Percent Surface Substrate

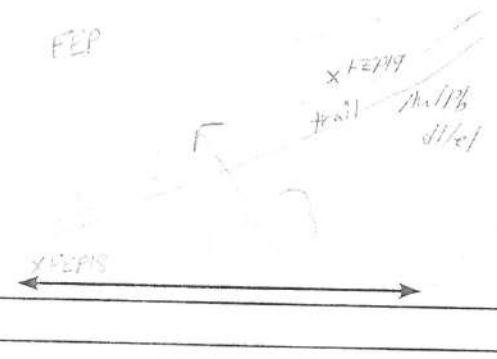
Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
5	0	0	0	95	0	

Alberta Wetland Classification

Wetland Class		Vegetation Modifier		Complex Landform		Local Landform	

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	
PM & surf. exp.	



Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	FEP19

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	%Cover	E	L	Type
1	Pb					6	Calacan				
	Aw										
2	Sw					7	Hylosp/				
							Pylapol				
3	Sorbsco										
	Salibeb					8	Pelt sp.				
4	Vibrcam										
	Rosnut										
	Corsor										
	Symalb										
	Cofsto										
	Prunvir										
	Ribcay										
5	Solcan										
	Avalnud										
	Disstra										
	Astcil										
	Astcan										
	Smilste										
	Vicamer										
	Agrsto										
	Calcan										
	Fragvir										
	Rubpub										
	Astlaxb										
	Epilang										
	Viosem										

Cover classes: +:<1% A: 1-5% B: 5-10% C: 10-25% D: 25-33% E: 33-50% F: 50-75% G: >75%

Forest

Ecological Assessment Form (Detailed)

Header Information

Project ID	YY	MM	DD	YY2	MM2	DD2	Plot type	Plot Label	
FEP	14	08	24				R	FEP	20

Elevation	GPS filename	35-mm ph.	Surveyor	Mapped As
653	FEP20	Yes	JG	d/ld

UTM Zone	Easting	Northing
12U	328911	5930940
UTM Zone2	Easting2	Northing2

Field AVI Type

	Dens	Ht	Sp1	Sp2	Sp3	Sp4	Sp5	Non-for.	
Over.	C	15	Aw 7	Pb 3				SC SO	
Under.								BR	
								HG HF	

Stand Structure: (C) H M | Number of Layers: 1 2 (3) | Height each Layer: 15/10/3 m

Successional Stage

Successional Stage: PS (YS) MS OS YEC MEC YCC MCC DC NV

Site Characteristics

Slope (%)	5	Moisture Regime	1 2 3 4 5 (6) 7 8 9
Aspect (degrees)	302		VX X SX SM M SHG HG SHD HD
Structural Stage	1a 1b 2a 2b 2c 2d 3a 3b 4 (5) 6 7	Nutrient Regime	A B (C) D E
Surface Exp.	I		
Surface Shape	convex concave (straight)		
Slope position	1 2 (3) 4 5 6 7		
	CR UP (MD) LW TO DP LV		

Ecological Classification

Guide	NSR	Ecosite	Phase	Com
WC (N)	B4	d	1	
Ecosite fit		Good (Fair) Poor		

Bordering on c1

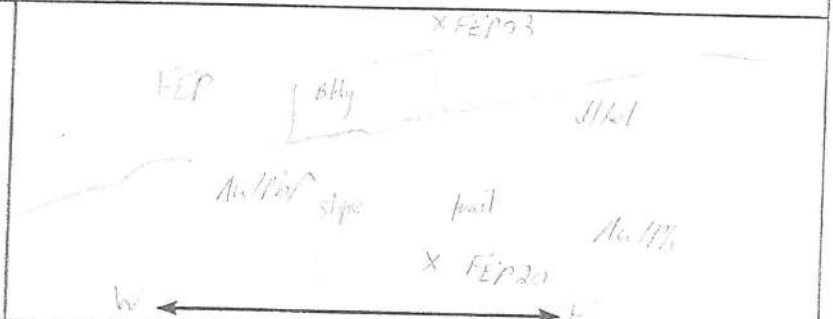
Percent Surface Substrate

Decaying wood	Bedrock	Cobbles/Stone	Mineral Soil	Organic Matter	Water	
5	0	0	2	93	0	

Alberta Wetland Classification

Wetland Class		Vegetation Modifier		Complex Landform		Local Landform	

Landscape Profile Diagram

Ecosites	
Relief (m)	
Slope (%)	
Direction	
PM & surf. exp.	

Additional Header Information

Project ID	YY	MM	DD	Plot Type	Plot no
				R	ELP20

Vegetation

Strata	Name	% Cover	E	L	Type	Strata	Name	%Cover	E	L	Type
1	Aw					6	calamus				
	Ph						schipus				
							Rubiine				
2	Sw										
3	Viburnum					7	Pleurich				
	Nemii						Hibapl				
	Sorbsca						Rubapl				
4	Amelan										
	Rosaci										
	Vibrede										
	Ribcyn										
	Corsto										
	Symposa										
5	Calthar										
	Carcan										
	Gralitz										
	Atalmyl										
	Rubpedi										
	Violcan										
	Vioten										
	Lupsti										
	Epilang										
	Thalfe										
	Artarb										
	Glysmi										
	Equarv										

Cover classes: +:<1% **A:** 1-5% **B:** 5-10% **C:** 10-25% **D:** 25-33% **E:** 33-50% **F:** 50-75% **G:** >75%

Appendix E – Phase I Environmental Site Assessment

Phase I Environmental Site Assessment
Fort Edmonton Park
7000 - 143rd Street NW
Block A; Plan 852 1469
Edmonton, Alberta

Prepared for:

The City of Edmonton
Edmonton, Alberta

Prepared by:

Nichols Environmental (Canada) Ltd.
Edmonton, Alberta

Nichols File: 15-305-CFE

Date Issued: August 11, 2015

Nichols Environmental
(Canada) Ltd.

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The City of Edmonton
Phase I ESA: Fort Edmonton Park
7000 - 143rd Street NW
Block A; Plan 852 1469
Edmonton, Alberta

EXECUTIVE SUMMARY

Nichols Environmental (Canada) Ltd. has completed a Phase I Environmental Site Assessment (ESA) of Fort Edmonton Park, municipally described as 7000 - 143rd Street NW in Edmonton, Alberta and legally described as Block A; Plan 852 1469 (the "Property"). Nichols Environmental is of the understanding that the Phase I ESA is required in order to provide a general overview of potential environmental concerns for the Property. As such, not all buildings on the Property were accessed during the site inspection.

The Property has been under the ownership of The City of Edmonton since May 1959 but appears to have begun development in 1967. The Property currently consists of more than 80 original and reconstructed historical structures dating from 1846 to 1929, situated on approximately 64 hectares of parkland. Given the range of ages of buildings on the Property, the potential for hazardous building materials exists. Documentation has confirmed the presence of asbestos-containing building materials (ACBMs) in the fire hall, Al Rashid Mosque, former administration building, and John Janzen Nature Centre. Mould growth has also previously been documented within the former administration building.

Previous geotechnical investigations have identified the presence of fill material throughout the Property and the 1982 aerial photograph also identified the stockpiling of materials within the area of the Blatchford Hangar. The only analytical testing identified (from 2010) confirmed the presence of elevated boron concentrations in the soil near the present-day Capitol Theatre. However, the concentrations were believed to be naturally occurring. Fill material for the boardwalk from Mellon Farm to 1905 Street was also identified to be from road sweeping material.

Decommissioning of a former fuel aboveground storage tank (AST) for the train, formerly located to the north of the Train Shed, identified the potential for petroleum hydrocarbon (PHC) impacts to be present extending north toward the rail line. A piezometer was identified within this general area during the site inspection. However, documentation of the origin of the piezometer or further investigative work in this area has not been identified to date.

Operation of the rail line has also resulted in staining and impacts to the ballast materials, as documented by previous environmental investigations. Remediation of select areas of the rail line was conducted in 2013, and impacts are documented to remain at approximately 0.91 metres below grade (mbg) at the locations of the main Train Station and Fort Station. As part of a risk management plan (RMP) developed for operation of the train, absorbent track matting has been placed at locations where the train idles. It was also identified that a portion of the rail line had been excavated by the Train Shed, though documentation of any testing has not been identified. Operation of the rail may continue to pose a level of environmental risk to the Property, including the use of presumably creosote-treated rail ties.

Staining was noted at a number of locations along the rail and street car lines on the Property at the time of inspection, as well as on rail ties being stored in the vicinity of the Streetcar Barn and Train Shed. This staining is likely associated with leakage from years of use of the train on the Property. Otherwise, minor staining was noted within select buildings, but the use of spill absorbent and pads was apparent. Chemical storage on the Property was observed to be associated primarily with vehicle/equipment maintenance. Chemicals were stored in an orderly fashion and the use of secondary containment was evident.

Surrounding land use has predominantly been residential in nature. Construction of Whitemud Drive NW Was noted to have been completed by the 1973 aerial photograph and construction of a pipeline right-of-way (ROW), currently licenced to Terasen Inc., was noted in the 1962 aerial photograph. This ROW intersects the southwest portion of the Property, and may pose a level of environmental risk to the Property.

Based on the findings of the Phase I ESA to date, Nichols Environmental is of the opinion that the operation of the rail line on the Property as well as the use of fill materials may pose a level of environmental risk. However, due to the likely continued operation of the rail line as well as the apparent widespread nature of the fill materials, these risks may be managed through an appropriate risk assessment/RMP. The RMP should also address management of the storage of rail ties on the Property, including the designation of specific storage areas that are equipped with a means of containment so as to mitigate the leaching of preservative chemicals from the rail ties to the surrounding ground surface.

The former fuel AST area at the Train Shed may also pose a level of environmental risk, as impacts do not appear to have been delineated to the north of this area. Further testing would be required in this area in order to assess the current status of the soil and groundwater in relation to PHCs, and testing of polycyclic aromatic hydrocarbons (PAHs) and metals would also be recommended.

The statements made in this Executive Summary are subject to the same limitations included in Section 9.2, and are to be read in conjunction with the remainder of this report.

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FIGURES

APPENDICES

1.0 INTRODUCTION

Nichols Environmental was retained by The City of Edmonton to conduct a Phase I ESA on Fort Edmonton Park municipally located at 7000 - 143rd Street NW in Edmonton, Alberta (herein referred to as "the Property"). The Property is legally described as Block A; Plan 852 1469. The location of the Property relative to the surrounding area is presented on Figure 1.

Nichols Environmental is of the understanding that the Phase I ESA is required in order to provide a general overview of potential environmental concerns for the Property. As such, it should be noted that not all buildings on the Property were accessed during the site inspection.

Where possible, the Fort Edmonton Park building identifier number (i.e., FOR205) has been provided in the report for ease of reference with Fort Edmonton Park records.

The purpose of a Phase I ESA is to identify actual and potential site contamination. This involves the evaluation and reporting of existing information collected through a Records Review, a Site Visit and Interviews. The Phase I ESA may assist in reducing uncertainty about potential liabilities and may be a basis for further investigation of the Property. Phase I ESAs may be used to make informed decisions about property transactions, identify certain baseline environmental conditions, assist in meeting regulatory requirements, and as an initial step in site remediation (Canadian Standards Association Z768-01, Phase I Environmental Site Assessment).

1.1 Background

A number of previous environmental investigations have been completed for the Property, which were provided to Nichols Environmental for review. A complete list of the available documents is provided in Appendix A. A summary of relevant information from the review is provided below:

Environmental Site Assessments

In 2000, Shelby Engineering Ltd. (Shelby) was retained to complete a Phase II ESA for the former train refuelling station located at the Train Shed (FOR205) on the Property. The investigation included the advancement of 15 test holes, which were advanced to a maximum depth of approximately 2.3 mbg. Of these, 13 were advanced in close proximity to the former refuelling station, while two were advanced within the train tracks north of the station. Based on the results of the assessment, an estimated 100 m^3 of oil/grease-impacted soils were recommended for removal to an approximate depth of 0.75 mbg.

In 2001, construction activities were initiated to decommission, remove, and replace the former refuelling station which consisted of an approximate 58,000-Litre (L) rail car tanker and associated piping. In total, 364.8 tonnes (t) of impacted soils were removed during these activities, including

an estimated 100 m^3 of impacted soils from the location for the fuel AST that was noted on the Property during this current Phase I ESA. The impacted soils were hauled to the Leduc Landfill for disposal, and soil samples were collected from the extent of the new AST excavation (for the concrete base) and former AST location. All of the submitted soil closure samples from both excavations indicated that hydrocarbon concentrations were below the then applicable Level I Remediation Guidelines for Petroleum Storage Tank Sites (1994 Draft Guidelines). Impacts were excavated to a maximum depth of 2.4 mbg. However, during excavation work for the new AST, it was noted that clay fill material along the north wall of the excavation showed evidence of impacts up to 0.9 mbg. There was also visual evidence of staining on the north side of the fence under the railway tracks in the vicinity of the former AST, which was situated south of the current fuelling AST at this location. Documentation also indicated that two ASTs had been decommissioned and removed from the Property in 2000, but further details were not provided.

CRIMSON Environmental Limited (CRIMSON) completed a Phase I ESA of the Property in 2009 (2009 CRIMSON Phase I ESA) in order to provide a general overview of the environmental condition of the Property. Based on the results of the investigation, CRIMSON recommended that a delineation assessment be undertaken within the area of the refuelling station in order to re-evaluate and ensure that all potential contaminants of concern were addressed. It was also identified that none of the on-site ASTs were registered with the Petroleum Tank Management Association of Alberta (PTMAA). The Phase I ESA also noted that there were PHC impacts present at several locations along the on-site rail line, which were reportedly from leaking of the train engine. However, several small-scale remediations had taken place over the years to address these areas and it was recommended that these impacts be assessed, remediated and a management plan put in place to prevent future impacts.

CRIMSON identified a pipeline ROW operated by Kinder Morgan Inc., on the southwestern portion of the Property. It was recommended that an assessment be conducted in the vicinity of the pipeline, as no information regarding the status of the pipeline had been identified. The Phase I ESA also noted that road salt was used and stored on-site, for which a management plan was recommended. Road sand collected from city streets was also identified as a fill for several of the on-site roads during the 1980s. The quality of the fill was unknown, and as such, it was recommended that the roads be assessed for fill materials.

CRIMSON also noted that an unknown volume of water is diverted from and returned to the North Saskatchewan River for on-site operations, for which there was no permit at the time. Nichols Environmental confirmed with site representatives that a Water Licence is now in place.

CRIMSON completed a Limited Phase II ESA for the Property in 2011 (2011 CRIMSON Phase II ESA), which was conducted in order to determine the presence or absence of impacts along the rail ROW. The assessment included analysis of PHC, PAHs, trace metals, and polychlorinated biphenyls (PCBs). The results of the investigation identified the presence of PHC Fractions 2, 3

and 4 as well as several PAHs, boron, copper, lead, and zinc along the rail line, with increased impacts noted near the passenger loading areas and Train Shed. The impacts were also noted to extend beyond the maximum completion depth of several boreholes. CRIMSON was retained in 2012 to complete a second Phase II ESA to further characterize the identified impacts. Based on the results of the assessment, it was CRIMSON's opinion that the impacts identified in the sand and gravel fill materials were likely from waste oil spills along the rail line and that those impacts identified within the underlying clay may have been from the presence of coal. Based on the results, CRIMSON recommended remediation of the impacted sand/gravel.

In the fall of 2013, The City of Edmonton completed excavations to remove impacted soils from the rail line in the vicinity of the main Train Station (FOR207) and Fort Station. The areas were excavated to a maximum depth of approximately 0.91 mbg and confirmatory samples were collected and submitted for analysis of metals, PHCs, and PAHs. Results indicated that PHCs remained present at the main Train Station at approximately 0.91 mbg and PAHs remained present at both locations. In light of the results, a risk assessment/risk management plan was recommended to be conducted to address the concerns associated with the ongoing operation of the train on the Property.

An Initial Project Review (IPR) prepared in 2013 Hatch Mott MacDonald for the proposed replacement/upgrades of the rail line on the Property also identified a third location that was believed to be impacted from the operation of the train. This location was identified by the Train Shed and was also recommended for remediation during upgrades. Documentation regarding this remediation has not been identified. However, conversations with site representatives indicate that this area had been excavated.

An Environmental Investigation was also conducted in 2010 by Thurber Engineering Ltd. (Thurber) for the proposed Capitol Theatre (FOR227) in conjunction with a geotechnical program. The investigation consisted of analysing soil samples from four separate locations at approximately 0.75 mbg for metals and PHCs, the results for which only identified boron concentrations above the then current 2009 Alberta Tier 1 Guidelines for Residential/Parkland Land Use for fine-grained soils. Thurber concluded that the boron concentrations were likely naturally occurring (ranging from 3 to 7 mg/kg). Notable fill material was only encountered to approximately 1.3 mbg in one of the four boreholes, to the southwest of the Capitol Theatre.

Risk Management Plan

An RMP was developed in 2012 by The City of Edmonton for the operation and maintenance of the train that operates on the Property. The RMP outlines the use of a barrier absorbent installed in areas of high risk for ballast contamination from the train. These areas were predominantly identified to be where the train would sit for loading/unloading at the main stations. Replacements were also made to the fuel tender tank and fuel burner on the train.

Asbestos Testing

A number of buildings have had selective testing completed for ACBMs. The discussion presented is likely not an exhaustive list of the testing that has been completed, but represents a review of the records that were made available.

An asbestos survey appears to have been completed of select buildings on the Property by AGRA Earth & Environmental (AGRA) in 1996. The results of the survey identified the presence of 40-50% chrysotile in sheet vinyl flooring from the kitchen in the historical foundation house, in pipe elbow insulation from the water heater in the mechanical room and in fire protection board on the storage room door in the fire hall, and >70% chrysotile asbestos in materials from heaters in a store room and steam pipework textile wrap in what is believed to be the steam locomotive shop. The exact locations of the samples were not provided. More recently, a sample described as "white plaster on green decorative" was also collected in 2015 from the Al Rashid Mosque (FOR186) which identified 2% chrysotile asbestos.

Results were also provided that indicated that drywall joint compound tested at three locations in the Ukrainian Bookstore (FOR174), one location in the Masonic Hall (FOR165), and two locations in the Ernest Brown Studio (FOR176) did not contain asbestos.

PHH ARC Environmental Ltd. (PHH) has also conducted a Hazardous Materials Assessment of the former administration building (FOR200) in December 2006. This building was originally a school house moved onsite in 1972 and the assessment identified asbestos-containing vinyl floor tiles and plaster wall material. The potential for asbestos-containing drywall joint compound and potential vermiculite in the attic space was also noted. An area of mould growth approximately 200 square feet was also identified within the building.

Cascade Environmental Consulting Ltd. (Cascade) was retained in March 2015 to conduct pre-contamination inspections, site supervision, and air monitoring services during the abatement of asbestos-containing drywall jointing compound from a section of the ceiling in the basement kitchen of Jasper House (FOR131). The scope required the removal of ACBMs with the abatement work being conducted between March 11 & 13, 2015, and included removal of all the identified ACBMs from the area described.

2.0 SCOPE OF WORK

The following scope of work for the Phase I ESA was presented in a proposal to The City of Edmonton on April 2, 2015:

- Complete a review of any previous environmental reports completed for the Property;

- Obtain and review all records of land ownership and land use from the appropriate land title authority;

- Obtain and review all pertinent aerial photographs of the Property in question and adjacent properties. The purpose of this is to determine the historical sequence of events that have transpired on the Property since its use as agricultural or naturally vegetated land. The photographs will also be used to gain further information concerning land use, construction activity, pipeline installations, and to determine if there is any visual evidence of waste disposal pits, open excavations, spills, vegetation stress, tank installations or other factors of environmental significance;

- Obtain and review information from municipal, provincial and federal regulatory agencies regarding any environmental issues on record pertinent to the Property, including a historical review of municipal directories and the following agencies:

  Municipal
  - Infrastructure Services - The City of Edmonton;
  - Current Planning Branch - The City of Edmonton Sustainable Development;
  - Fire Rescue Services - The City of Edmonton;
  - Transportation Services - The City of Edmonton;
  - Waste Management Services - The City of Edmonton;

  Provincial
  - Alberta Energy Regulator (AER);
  - Alberta Health Services;
  - Environmental Law Centre - Enforcement Search;
  - Environmental Site Assessment Repository - Alberta Environment and Parks (AEP);
  - Freedom of Information Protection of Privacy Act (FOIPP) - AEP;
  - FOIPP, Records & Information Management (FRIM) Branch - AEP;
  - Petroleum Tank Management Association of Alberta (PTMAA);

  Federal
  - National Pollutant Release Inventory (NPRI) - Environment Canada;

- Complete an inspection of the Property in question and adjacent lands;

- Have discussions with current and former land owners/tenants (where possible) to resolve questions and uncertainties which may arise from the above investigative steps; and

- Prepare a final report documenting the findings of the Phase I ESA.

Authorization to proceed with the Phase I ESA was provided by The City of Edmonton on June 9, 2015.

3.0 PROPERTY DESCRIPTION

3.1 Location and Development Details

Location of Site:	7000 - 143rd Street NW, Edmonton, Alberta
Legal Description:	Block A; Plan 852 1469, LSD 23-52-25-W4M
Current Owner:	The City of Edmonton
Year Developed:	Based on the historical review, Fort Edmonton Park appears to have begun development in 1967 and was opened to the public in 1974. The John Janzen Nature Centre was constructed in 1976 on the Property.
Water Supply:	EPCOR
Sewer Service:	The City of Edmonton

3.2 Physical Description

Fort Edmonton Park is situated on approximately 64 hectares of parkland within the North Saskatchewan River Valley and includes more than 80 original and reconstructed historical structures dating from 1846 to 1929. The Property is located in the River Valley Fort Edmonton Neighbourhood of Edmonton, Alberta and is currently zoned as a River Valley Active Node Zone (AN).

The east portion of the Property was occupied by an asphalt-paved parking lot which was accessed from Fort Edmonton Park Road NW off of Whitemud Drive NW/Fox Drive NW to the east. To the south of the access point for Fort Edmonton Park was the John Janzen Nature Centre and to the north was the park's Administration Building (FOR219). At the park entrance was the main Train Station, followed by the 1920s Midway & Exhibition, 1920 Street, 1905 Street, 1885 Street, and Fort Edmonton. Service buildings were present along the south portion of the Property, including the Streetcar Barn (FOR206), Motordrome (FOR196), the maintenance yard, and the Train Shed.

The majority of the Property was surfaced with grassy vegetation and trees, with the exception of a planted crop at Mellon Farm adjacent the midway. Roads throughout the Property were surfaced with gravel. A rail line was present along the east/west and south boundary of the Property, and a street car line was also present along 1920 Street and 1905 Street.

The Property was bordered by the North Saskatchewan River to the north and a treed area followed by residential homes to the south. Details showing the location of buildings discussed in this report are provided on Figure 2.

3.3 Geology, Topography and Drainage

The surficial geology of Edmonton primarily consists of glaciolacustrine deposits of bedded silt and clay with minor sand. The southeastern portion of Edmonton consists of glacial till composed of clay, silt and sand, with pebbles, and boulders. Modern alluvial gravel, sand and silt can be found along the North Saskatchewan River and smaller creeks. The area surrounding Edmonton is primarily glacial till with a large glaciolacustrine region to the north, southwest, and west. A large aeolian dune region of medium- to fine-grained sand can also be found to the southwest, and glaciofluvial deposits of fine- to medium-grained sand are situated directly south of Edmonton.

Underlying the surficial sediments in the Edmonton area is the Horseshoe Canyon Formation of the Edmonton Group. This formation is Upper Cretaceous in age and consists of non-marine to marine fine-grained sandstone, siltstone, and mudstone with laterally continuous coal seams.

The North Saskatchewan River provides drainage for the Edmonton area and is more or less coincident with buried valleys containing sand and gravel deposits in the region. Groundwater flow has a downward component in most of the area. Infiltration of groundwater is greatly influenced by the lithology, soil type and topographic position of the area.

The local topography was primarily flat with a slope to the north toward the North Saskatchewan River. This slope was more pronounced on the south portion of the Property, which was elevated in comparison to the remainder of the Property. Surface drainage on the Property is anticipated to be primarily via infiltration or overland flow toward catch basins. Two ponds were identified on the southwest portion of the Property at the time of inspection, and a third was identified east adjacent the John Janzen Nature Centre.

4.0 SITE VISIT FINDINGS

4.1 General Site Conditions

Nichols Environmental inspected the Property on June 25, 2015 and August 4, 2015. The inspection consisted of a walk throughout the Property, as well as an observation of the adjacent lots. Ms. Tami Dolen, of The City of Edmonton, accompanied Nichols Environmental through the site inspection of Fort Edmonton Park. Mr. Robin Benbow, Assistant Train Engineer for Fort Edmonton Park, Mr. Neil Payne, Operations Site Supervisor for Fort Edmonton Park, and Ms. Debbie Cashion-Kalinowski, Project Coordinator for Park and Facility Development with The City of Edmonton were also available for answering questions and Ms. Cashion-Kalinowski accompanied Nichols Environmental on August 4, 2015 during the inspection of the John Janzen Nature Centre. Selected photographs of the Property are provided in Appendix B.

The purpose of the site visit was to observe the current uses of the Property, including the possible uses, treatment, storage, disposal, or generation of hazardous materials, landfilling, or the storage of wastewater in impoundments.

4.2 Storage Tanks (Non-Petroleum)

A number of 20-lb petroleum tanks were present within a caged storage unit within the maintenance yard. Discussions with Mr. Payne indicated that the propane tanks are used for the barbeques on-site during catering functions. Tanks containing compressed welding gases were also present within the Streetcar Barn and Train Shed at the time of inspection.

A storage container for used cooking oil was also present to the north of the Hotel Selkirk (FOR216), the contents of which are collected by Northern Alberta Processing Co.

4.3 Underground Storage Tanks (USTs) - Petroleum or Hydrocarbon Contents

No evidence of USTs was observed on the Property at the time of inspection.

4.4 Aboveground Storage Tanks (ASTs) - Petroleum or Hydrocarbon Contents

A 25,469-L double-walled heavy fuel oil AST was present at the west boundary of the Train Shed yard on the south-central portion of the Property. The AST appeared to be in good shape with no signs of staining on or surrounding the unit, and was contained within a concrete berm. A stickup piezometer was also noted to the east of this location at the time of inspection.

Two 455-L double-walled gasoline and diesel ASTs were present within the maintenance yard on the south portion of the Property. Both ASTs appeared to be in good shape with no signs of

damage, though some staining was noted on the diesel AST. Both ASTs were contained within a concrete bermed and covered shed, which was also used for the storage of a number of smaller jerry cans of fuel products.

4.5 Polychlorinated Biphenyls (PCBs)

PCBs were historically used in cooling and insulating fluids for electrical equipment such as transformers, capacitors, hydraulics, voltage regulators, and lamp ballasts as they do not readily burn or conduct electricity. A number of health concerns were found to be associated with the chemicals. As a result of these findings, their use in electrical equipment was prohibited in the early 1980s. PCBs may still be found in equipment manufactured prior to this time.

Lighting

Lighting within the inspected buildings was provided via a mix of overhead fluorescent ballasts, metal halides, and incandescent lighting. Considering the range of ages of the buildings, the potential for PCB-containing ballasts exists.

Contractors should be made aware of this potential prior to any renovation or demolition of the buildings, so that proper handling and disposal measures can be taken.

Transformers

Two pole-mounted transformers were located to the north of the Streetcar Barn and a number of pad-mounted transformers were located throughout the Property, including one to the west of the John Janzen Nature Centre. Those that were identified appeared to be in good condition at the time of inspection, with no evidence of staining on or surrounding the units.

4.6 Asbestos-Containing Building Materials (ACBMs)

Asbestos is a naturally occurring fibrous mineral primarily used in building materials for its flame retardant and insulation properties. The material is often mixed with cement or woven into fabrics or mats. Asbestos fibres are most commonly found in boiler rooms and piping insulation, cement products, floor coverings, and ceiling tiles.

ACBMs contain microscopic asbestos fibres that may become airborne when damaged. The inhalation of asbestos fibres has been known to cause significant health problems. Until the early 1980s asbestos-containing insulation was used in office buildings, public buildings, and schools.

ACBMs have been identified in select buildings on the Property as per the summary provided in Section 1.1. Of note, warnings for asbestos-containing pipe wrap were noted in the mechanical

room in the basement of the John Janzen Nature Centre. The ceiling in the offices of this building were also identified as containing asbestos, as per the identified warnings. Considering the range of ages of the buildings, the potential for ACBMs exists.

Contractors should be made aware of this potential prior to any renovation or demolition of the buildings, so that proper handling and disposal measures can be taken.

It should be noted that a hazardous building materials assessment was beyond the scope of work.

4.7 Waste Management and Chemicals Handling

Waste and recycling bins, managed by The City of Edmonton, were present north adjacent the Blatchford Hangar (FOR211) within a parking lot, as well as behind the Hotel Selkirk and to the west of the John Janzen Nature Centre. A large bin managed through GFL was also present in the maintenance yard. A scrap metal recycling bin was also present to the west of the Streetcar Barn. No notable staining was observed surrounding these bins.

Chemicals observed on the Property included those associated with vehicle/equipment maintenance, or were janitorial in nature or related to building mechanical maintenance. Flammable materials cabinets containing an assortment of paint, adhesives, cleaners, and/or automotive products were observed within the shop adjacent the former administration building on the south portion of the Property, the Streetcar Barn, the Motordrome, and the Train Shed. Of these, a spill kit was noted in the immediate vicinity of the cabinet within the Motordrome. Automotive batteries were also stored within the Motordrome and a locked secondary containment unit labelled for waste oil was present to the south of this building. Within the Train Shed, 220-L barrels containing oil were stored within secondary containment units or on trays. Plastic totes containing bags of sodium sulphate and sodium nitrate were also stored within the Train Shed. These products are added directly to the water tower for conditioning of the water used in the train.

As noted in Section 4.4, a number of jerry cans containing fuel were stored within an outdoor structure in the maintenance yard.

Chemicals were generally stored in an orderly fashion and were noted to be contained within secondary containment and the accessibility and use of spill absorbent was apparent.

General storage of what appeared to be rail line components was observed adjacent the Streetcar Barn. This included 220-L barrels containing metal components and rail ties, as well as other scrap metal. Rail ties were also noted to be stored within the yard of the Train Shed.

4.8 Liquid Waste Generation, Storage and Disposal

No other evidence of liquid waste generation, storage, or disposal, other than that discussed in Section 4.7, was observed on the Property at the time of inspection.

4.9 Hazardous Waste Generation, Storage and Disposal

No other hazardous wastes, other than those discussed in Section 4.7, were observed on the Property at the time of inspection.

4.10 Radon Gas

Radon is a colourless, odourless, tasteless gas produced by the natural breakdown of uranium found in concrete, brick, stone and soil. Radon gas can enter buildings through floor cracks, sumps, and joints and accumulate in poorly ventilated areas, such as basements and crawlspaces. Exposure to high levels of radon can be hazardous to human health.

The Edmonton area has low naturally occurring radon levels as shown in a study conducted by The City of Edmonton in 2007. As such, elevated radon levels are not expected on the Property.

Radon gases were not further investigated on the Property as it would be considered beyond the scope of work.

4.11 Methane Gas

Methane is a colourless, odourless gas formed by the decay and decomposition of organic materials under anaerobic (oxygen-poor) conditions. Methane is commonly found in or near swamps, wetland areas, peat deposits, and landfills.

Methane is nontoxic; however, potential risks include explosion hazards in confined areas, and suffocation due to decreased oxygen concentrations. Building on or adjacent to a methane-generating site is dangerous due to the ability of methane to migrate beneath or into structures.

At the time of inspection, there was no evidence to suggest a potential for methane gas accumulation on the Property. Consequently, the potential for methane gas accumulation on the Property would be considered low.

Methane gases were not further investigated on the Property as it would be considered beyond the scope of work.

4.12 Gas and Oil Wells

No gas or oil wells were observed on the Property at the time of inspection.

4.13 Lead-Based Paint and Lead in Drinking Water

Exposure to lead, a highly toxic substance, can lead to a wide range of adverse health effects in adults and most commonly in children.

Drinking Water

Drinking water may become contaminated through leaching of lead from lead distribution lines and lead soldering in piping joints. Lead distribution lines are particularly common in buildings constructed prior to 1950.

Lead was not tested for in the drinking water at the time of inspection as it would be considered beyond the scope of work. Considering the age of some of the buildings on the Property, the potential for lead-distribution lines exists.

Lead-Based Paint

Until 1976, lead was commonly used in industrial paints due to its ability to resist corrosion. Lead-based paints are considered a significant risk to humans, especially children, due to the possibility of ingestion of peeling or flaking lead-based paint. Lead-based paints may also be a risk to humans through inhalation if the paint becomes airborne via sanding or grinding.

The Hazardous Products Act limited the amount of lead in paint to 0.5 percent in 1976. The addition of lead in paint was eliminated in 1990 by the Canadian Paint and Coating Association. Lead-based paint may still be present beneath newer layers of paint on buildings constructed prior to 1990.

Lead-based paint was not tested for at the time of inspection as it would be considered beyond the scope of work. Considering the range of ages of the buildings on the Property, there is a possibility that lead-based paint may be present beneath the existing paint layers.

Contractors should be made aware of this potential prior to any renovation or demolition of the buildings, so that proper handling and disposal measures can be taken.

4.14 Mercury

Mercury is a metal that is a liquid at room temperature. Mercury is known to evaporate, or volatilize, easily. In the environment, mercury has the ability to migrate through all media, and is known to bio-accumulate. These characteristics may pose environmental and human health issues, including a number of adverse neurological health effects. Mercury is commonly found in thermostats, electrical switches, and fluorescent light bulbs in buildings.

Fluorescent light tubes and mercury-containing thermostats were identified in buildings on the Property at the time of inspection. Contractors should be made aware of this prior to any renovation or demolition of the buildings so that proper handling and disposal measures can be taken.

4.15 Ozone Depleting Substances (ODSs)

Ozone-depleting substances (ODSs) contain combinations of any substances capable of destroying the ozone in the atmosphere, specifically chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs), and halon. ODSs are used as foam-blowing agents, solvents, fire extinguishing agents, and refrigerants for air conditioning and refrigeration applications.

HCFCs are used extensively for refrigeration and coolant purposes, the most common of which being HCFC-22 (R-22).

Site representatives indicated that commercial refrigerators were present within the Hotel Selkirk, Blatchford Hangar, and Jasper House. HVAC units were also indicated to be present at the Administration Building and at the John Janzen Nature Centre. The units are maintained and serviced through The City of Edmonton or approved contractors and typically only pose a potential risk in the event of any leaks.

4.16 Pesticides and Herbicides

No pesticide or herbicide storage was observed on the Property during the inspection. Spraying is conducted on the Property as needed by The City of Edmonton or contractors.

4.17 Soil Fill and Land Reclamation

Evidence of new ballast material was identified at the main Train Station, the Fort Station and at the Train Shed. This material is believed to coincide with the remediation work that was completed for the rail line, as discussed in Section 1.1.

As discussed in Section 1.1, the 2009 CRIMSON Phase I ESA identified the use of road salt storage on the Property as well as the use of road sand from city streets used for fill on several of the on-site roads during the 1980s. Nichols Environmental followed up on these items with the site representatives and storage of a few yards of pickled sand was identified beneath a covered structure within the maintenance area. The sand was placed on a tarp and was covered, and was noted to be of a low salt content so as to not deteriorate the boardwalks it was used on. With regards to the fill material, it was identified that fill for the parking lots and roads was all new material and that fill for the boardwalk from the Mellon Farm to 1905 Street was from road sweeping material.

4.18 Urea-Formaldehyde Foam Insulation (UFFI)

UFFI is a type of insulation composed of urea-formaldehyde resin, a foaming agent, and compressed air. The mixture was injected into walls and used as an insulating agent in Canada during the 1970s to improve energy efficiency. Excess formaldehyde was often added to ensure complete curing with the urea to produce the urea-formaldehyde foam. This excess formaldehyde was released to the environment during curing. Present exposure to UFFI is limited as the majority of the excess formaldehyde was released during curing. However, UFFI may break down and release potentially hazardous chemicals when in contact with water or moisture.

No sources of UFFI were observed within the inspected buildings on the Property at the time of inspection. However, considering the range of ages of the buildings the potential for UFFI exists.

Contractors should be made aware of this potential prior to renovation or demolition of the buildings so that proper handling and disposal measures can be taken.

4.19 Air Emissions

No dangerous air emissions were observed on or near the Property at the time of inspection. To the best of our knowledge, Nichols Environmental is not aware of any licensed air discharges or processes on the Property at the time of inspection.

4.20 Microbial Contamination (Mould)

Moulds are fungi that grow in damp or humid environments. Mould can develop from poor ventilation, flooding, or building leaks. It can grow in damp basements, on bathroom surfaces, against outside walls, or on window frames. Mould spores contain allergens and irritants that can cause humans to have allergic reactions or respiratory disease.

No obvious potential mould growth was observed in the inspected buildings on the Property at the time of inspection. However, previous investigations noted that mould was identified in the former

administration building on the south portion of the Property. Signage to this effect was also noted on this building at the time of the site inspection.

Contractors should be made aware of the potential for mould growth prior to any renovation or demolition of the buildings so that proper handling and disposal measures can be taken.

4.21 Electromagnetic (EM) Frequencies

No high EM frequency emitters were observed on or within the vicinity of the Property at the time of inspection. Standard-voltage power lines were present throughout the Property.

4.22 Radioactive Materials and Equipment

No radioactive material or equipment was observed on the Property at the time of inspection.

4.23 Spills and Soil Staining

Minor staining was noted on the gravel floor within the west portion of the Train Shed. Staining was also noted on the concrete floor in the Streetcar Barn, Train Shed, Motordrome, and within the pump house associated with the train AST in the Train Shed yard. These stains are not anticipated to pose a significant environmental risk, as the use of spill absorbent and pads was apparent.

Staining was noted at a number of locations along the rail and street car lines on the Property, and was more prominent along the rail line. A number of stained rail ties were also noted to be stored within the area by the Streetcar Barn. This staining is likely associated with leakage from years of use of the train on the Property. Absorbent track matting has also been placed along the rail line at locations where the train idles in order to mitigate migration of any leaks to the ballast below.

4.24 Unidentified Substances

No unidentified substances were observed on the Property at the time of inspection.

4.25 Storage Containers

Intermodal containers were kept south and west of the Streetcar Barn and within the maintenance yard. The containers were used for dry storage of props and parts.

4.26 Hydraulics

No underground hydraulic units were identified on the Property at the time of inspection.

4.27 Stressed Vegetation

No obviously stressed vegetation was observed on or immediately adjacent to the Property at the time of inspection.

4.28 Sumps

A two-stage separator sump was present within the Motordrome building. The floor surrounding the sump appeared to be in good condition. However, the sump was full of liquid at the time of inspection so the interior could not be inspected for integrity.

5.0 ADJACENT LAND USE

The following adjacent land uses were observed surrounding the Property (Figure 1):

- Northwest, north, and northeast of the Property was the North Saskatchewan River followed by residential land;
- East of the Property was Fort Edmonton Park Road NW and the interchange of Whitemud Drive NW and Fox Drive NW;
- South of the Property was a residential area followed by Whitemud Drive NW; and
- Southwest and west of the Property was the North Saskatchewan River followed by parkland.

Based on observations of the surrounding land uses made at the time of inspection, none would be anticipated to pose a significant environmental risk to the Property.

6.0 SITE HISTORY AND RECORDS REVIEW

6.1 Prior Ownership and Usage

Land title documents for the Property dating back to 1916 were obtained from the 2009 CRIMSON Phase I ESA. A copy of the original land titles is provided in Appendix C.

The Property legally described as Block A; Plan 852 1469 has been owned by The City of Edmonton since May 2, 1969. Prior to this time, the Property was owned by a variety of private individuals and/or one of three corporations, namely Great-West Life Assurance Company, the North-West Trust Company Limited, and the National Trust Company Limited.

Based on a historical review of the land titles, none of the previous land owners would be anticipated to pose a significant environmental risk to the Property.

It should be noted that land titles do not indicate the lessee, tenants, or the nature of the business carried out on the Property.

6.2 Aerial Photography Review

Aerial photographs were reviewed for the following years: 1949, 1952, 1962, 1967, 1973, 1977, 1982, 1987, 1992, 1997, 2003, 2007, and 2015. The aerial photographs were obtained from AEP Air Photo Services, The City of Edmonton Archives (COE Archives), and Google Earth and are included in Appendix D, Plates 1 through 13. Aerial photographs were not available for the Property prior to 1949 or between 1952 and 1962.

Year: 1949 Source: AEP Reference: Plate 1
Roll: AS0135 Photo No.: 043
Description:

- The Property appears to be utilized as agricultural land, lined by trees along the north and south boundaries. An access road is also apparent along the north and south boundaries of the Property;
- There appear to be two stockpiles of light-coloured material on the Property;
- The North Saskatchewan River is apparent to the north of the Property; and
- Possible farmsteads are apparent to the east, southeast and south of the Property.

Year: 1952 Source: AEP Reference: Plate 2
Roll: AS0004 Photo No.: 052

Description:

- There appears to be a possible low-lying area on the east-central portion of the Property; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1962 Source: AEP Reference: Plate 3
Roll: AS0818 Photo No.: 080
Description:

- The stockpiles and low-lying area are no longer apparent on the Property and what may be a pipeline ROW is present on the southwest corner of the Property, extending further west across the North Saskatchewan River;
- Residential development has begun to the north of the Property across the North Saskatchewan River;
- A possible farmstead has been developed to the southeast of the Property;
- At least four buildings have been constructed to the south of the west portion of the Property; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1967 Source: AEP Reference: Plate 4
Roll: AS0979 Photo No.: 115
Description:

- Development is apparent on the east and west portions of the Property, including two cleared areas, roadways, and what may be building materials or temporary structures on the east portion;
- Residential development continues to the north of the Property;
- Most of the farmstead to the east of the Property has been cleared, as well as the land. Further clearing of the land and stockpiling of materials is apparent to the southeast of the Property; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1973 Source: AEP Reference: Plate 5
Roll: AS1248 Photo No.: 299
Description:

- The Fort Edmonton structure appears to have been constructed on the west boundary of the Property and there appears to be one or two other buildings present on the Property. The previous activity on the east portion of the Property appears to have been removed;
- Residential development continues to the north of the Property;

- Present-day Quesnell Bridge has been constructed to the northeast of the Property and the Whitemud Drive NW/Fox Drive NW interchange has been constructed to the east along with the continuation of Whitemud Drive NW to the south/southeast and Fort Edmonton Park Road NW to the east;
- Residential development is apparent to the southeast and south of the Property; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1977 Source: AEP Reference: Plate 6
Roll: AS1592 Photo No.: 095
Description:

- Roadways have been constructed on the Property and a number of buildings are also present, the majority of which are placed along present-day 1885 Street near Fort Edmonton. The John Janzen Nature Centre building is present on the east portion of the Property and buildings are also apparent within the present-day maintenance yard. A building is also present on the southwest-central portion of the yard;
- Development continues to the north, southeast and south of the Property; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1982 Source: AEP Reference: Plate 7
Roll: AS2568 Photo No.: 172
Description:

- Additional buildings have been moved onto the Property including the main Train Station, Streetcar Barn, Mellon Farm, and select buildings along present-day 1905 Street. Two ponds and a parking lot have also been constructed on the Property, in addition to the main rail line. What appear to be stockpiles of material are also present on the northeast portion of the Property;
- Minimal development is apparent to the north and south of the Property; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1987 Source: AEP Reference: Plate 8
Roll: AS3590 Photo No.: 170
Description:

- The street car line appears to have been constructed on the Property and the stockpiles of material are no longer present. Additional buildings have also been constructed along 1905 Street and the Train Shed has been constructed; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1992 Source: COE Archives Reference: Plate 9
Roll: ED9205 Photo No.: 105 & 107
Description:

- The present-day Al Rashid Mosque and Blatchford Hangar are apparent on the Property as well as buildings along 1920 Street and within the maintenance yard. An area of ponded water is also apparent east of the present-day John Janzen Nature Centre; and
- No other significant changes are noted for the Property or surrounding area.

Year: 1997 Source: COE Archives Reference: Plate 10
Roll: ED9706 Photo No.: 104 & 106
Description:

- Additional buildings are apparent along 1920 Street and the present-day Motordrome building is apparent to the northeast of the Streetcar Barn; and
- No other significant changes are noted for the Property or surrounding area.

Year: 2003 Source: AEP Reference: Plate 11
Roll: G0305055 Photo No.: 106
Description:

- Present-day Blatchford Hangar appears to have undergone an expansion and present-day Hotel Selkirk is also now apparent on 1920 Street. An addition is also apparent on a building within the maintenance yard; and
- No other significant changes are noted for the Property or surrounding area.

Year: 2007 Source: AEP Reference: Plate 12
Roll: ED2007-01 Photo No.: 141
Description:

- The 1920s Midway & Exhibition has been constructed on the east portion of the Property along with a smaller building further east; and
- No other significant changes are noted for the Property or surrounding area.

Year: 2015 Source: Google Earth Reference: Plate 13
Description:

- What appears to be an addition has been constructed at the present-day Administration Building;
- A bridge has been constructed across the North Saskatchewan River to the south of the Property; and
- No other significant changes are noted for the Property or surrounding area.

Based on the aerial photograph review, the Property appears to have largely been utilized as agricultural land up until the 1967 aerial photograph in which construction activity was noted. Since this time, buildings have been added to the Property, starting with Fort Edmonton. Of particular note is the construction of the rail line by the 1982 aerial photograph, and the Train Shed and street car line by the 1987 aerial photograph. The pipeline ROW on the Property can also be seen in the 1962 aerial photograph. Information regarding this ROW is further discussed in Section 6.5.

Development of the surrounding area has been residential. Construction of Whitemud Drive NW was noted to have been completed by the 1973 aerial photograph, and it is possible a portion of the Property was utilized as a lay-down for this construction in the 1967 aerial photograph.

It should be noted that the scale and resolution of some of the aerial photographs made it difficult to determine land use.

6.3 Fire Insurance Maps

No fire insurance maps were available for the Property.

6.4 Municipal Directories

The City of Edmonton Criss Cross and Henderson Directories were consulted to determine past occupants of the Property and surrounding lots. The Henderson Directories were reviewed at five-year intervals, starting in 1999 and resuming from 1987 dating back to 1967 when the surrounding area began development.

No listings were identified for the Property under 7000 - 143rd Street NW, and surrounding land use was identified to be predominantly residential.

6.5 Regulatory Review

Correspondence with federal, provincial and municipal regulatory agencies is presented in Appendix E, and is summarized below.

6.5.1 Federal

A search was conducted using Environment Canada's National Pollutant Release Inventory (NPRI) to determine whether there have been any significant releases in the vicinity of the Property, or whether there are any facilities which may pose an environmental risk to the Property. No facilities were identified within a 1.0-km radius of the Property.

6.5.2 Provincial

An inquiry was made to the PTMAA to determine whether any petroleum/storage tanks are presently or have historically been located on the Property. The PMTAA provided records regarding installation of a 25,469-L steel AST in 2001. The AST is listed to contain used oil and was confirmed on-site to contain the fuel for the train. Records were also provided documenting the removal of one 58,000-L steel fuel oil AST from the train refuelling station on the Property in May 2001. Records indicate that Shelby Engineering was retained to conduct an investigation and that remediation had taken place to remove surface spills and shallow soil contamination. An estimated 365 m^3 of soil is reported to have been disposed of at the Leduc Landfill. No further information was provided.

A request was made to the Alberta Energy Regulator (AER) to determine whether there have been any environmental incidents or gas/oil wells on the Property. The AER did not identify any wells or incidents within the quarter sections on which the Property is situated.

A search was completed of the GeoDiscover Alberta website for abandoned wellsites within the vicinity of the Property. One abandoned wellsite was identified approximately 260 m to the east of the parking lot at the interchange of Whitemud Drive NW and Fox Drive NW. Information for this well, obtained through Abacus Datagraphics (AbaData), identified that it was drilled to a depth of 153 metres as a test hole in January 1951, and was subsequently abandoned. AbaData was also searched for information pertaining to the pipeline ROW on the Property, which identified that it was licenced to Terasen Inc. and carries crude oil.

A request was made to the AEP Freedom of Information and Protection of Privacy (FOIPP) Office, under the FOIPP Act, for any information related to any contamination associated with the Property. AEP did not have any records pertaining to the Property.

A request was made to the Environmental Law Centre for records of enforcement actions issued to The City of Edmonton pertaining to the *Alberta Environmental Protection and Enhancement Act* and its predecessor legislation, the *Hazardous Chemicals Act*, *Agricultural Chemicals Act*, *Clean Water Act* and *Clean Air Act* to 1971, and/or pursuant to the Water Action from 1999 onwards. As of June 1, 2015, a number of warning letters, water quality control orders, administrative penalties and prosecutions have been issued against The City of Edmonton, none of which appear to pertain specifically to the Property.

A search was completed of the AEP Environmental Site Assessment Repository (ESAR) for scientific and technical information pertaining to the Property and/or assessed sites within the vicinity of the Property. The ESAR search identified records pertaining only to the Property. Those of relevance have been summarized in Section 1.1 and due to the volume of correspondence and reports

identified and the fact that they are freely available at www.esar.alberta.ca, copies are not included.

6.5.3 Local

An inquiry was made to Alberta Health Services to determine if there are or have been any landfills, waste sites, or contamination present on the Property. Alberta Health Services did not have any records of outstanding orders, landfills, waste sites or environmental concerns related to the Property.

An inquiry was made to The City of Edmonton Waste Management Services to determine whether there was any information with respect to landfills or dump sites on or near the Property. Waste Management Services did not identify any former landfills or dump sites within a 500-m radius of the Property.

An inquiry was made to The City of Edmonton Sustainable Development Current Planning to determine whether there was any information with respect to infractions, complaints or investigations on the Property. Correspondence received from Current Planning indicated that a warning was issued in September 2014 with regards to Section 15 of the *Weed Control Act*, for which voluntary compliance was achieved.

An inquiry was made to The City of Edmonton Drainage Services with respect to compliance with Edmonton's Sewer Use Bylaw No. 9675 and Sewers Bylaw No. 9425. Correspondence received from Infrastructure Services indicated that the Property was inspected on September 26, 2008, a violation was found, and a notice to comply was issued. Notices to comply to clean and maintain the grease interceptors were issued for the Hotel Selkirk, Blatchford Hangar, Jasper House, and Masonic Hall. It was specifically noted that a new interceptor in the Jasper House needed to be installed.

An inquiry was submitted to The City of Edmonton Fire Rescue Services for any relevant information with respect to the Property. Fire Rescue Services identified that a 25,469-L AST for heavy industrial fuel oil was present at the Train Shed on the Property, a 200-L gas tidy tank was present in the maintenance yard, and two 455-L ASTs for diesel and gas were present at the maintenance administration building. Records also indicated that there was formerly a 45-gallon used-oil container at the Motordrome and a 200-gallon gas container at the Maintenance Yard, and that flammable liquid storage cabinet was present at the rear of the workshop in the Motordrome building. Oxygen and acetylene cylinders were also noted to be present in the Motordrome building and Streetcar Barn. Records also noted that paints and thinners were stored in the Exhibit Building.

An inquiry was made to Transportation Services of The City of Edmonton's Streets Engineering Branch for any information/incidents on file pertaining to the Property. Streets Engineering identified a number of reports pertaining to the Property and surrounding area, the majority of which have been summarized in Section 1.1. However, a number of geotechnical reports were also available and a summary is provided below with relation to the occurrence of fill materials:

> Previous geotechnical-related investigations on the Property identified the presence of clay fill material to a depth of approximately 0.4 mbg near the Train Shed, 1.1 mbg near the maintenance area (lift station), 1.2 mbg near the mosque, and from approximately 1.2 to 1.6 mbg near the J.B. Little Brickyard (FOR168). Investigations conducted in 1980 prior to the placement of Fire Hall #1 (FOR175) also identified the presence of approximately 2.5 metres of fill material, which was speculated to have been from a filled-in house basement. Geotechnical investigations conducted in 2006 near the location of the Administration Building identified surficial organic and clay fill ranging in thickness from 0.5 to 1.2 mbg.
>
> No debris was identified in any of the fill descriptions from the various geotechnical investigations.

7.0 PHASE I ESA CONCLUSIONS AND RECOMMENDATIONS

Nichols Environmental has completed a Phase I ESA of Fort Edmonton Park, municipally described as 7000 - 143rd Street NW in Edmonton, Alberta and legally described as Block A; Plan 852 1469. The Property has been under the ownership of The City of Edmonton since May 2, 1969.

Based on the results of the Phase I ESA to date, Nichols Environmental makes the following conclusions regarding the Property:

- The Property appears to have begun development in 1967 and was opened to the public in 1974. Development began with Fort Edmonton, and major milestones include the construction of the John Janzen Nature Centre in 1976, a rail line by the 1982 aerial photograph, and the Train Shed and street car line by the 1987 aerial photograph. The Property currently consists of more than 80 original and reconstructed historical structures dating from 1846 to 1929, situated on approximately 64 hectares of parkland;

- Given the range of ages of buildings on the Property, the potential for hazardous building materials exists. Specifically, ACBMs have been confirmed to be present in the fire hall, Al Rashid Mosque, former administration building, and the John Janzen Nature Centre. Other locations were also confirmed to have ACBMs, but documentation provided was not clear as to the exact buildings. Contractors should be made aware of this potential prior to renovation or demolition of the buildings so that proper handling and disposal measures can be taken. Mould growth has also been previously documented within the former administration building, and signage to this effect was noted on the building at the time of inspection;

- Previous geotechnical investigations on the Property have identified the presence of fill material on the Property and the 1982 aerial photograph also identified the stockpiling of materials within the area of the Blatchford Hangar. The most recent investigation completed in 2010 for the Capitol Theatre construction included laboratory analysis of the soil and fill material, which identified elevated boron which was believed to be naturally occurring. Of the known investigations that were reviewed, the only debris noted was wood debris in the fill material identified during the Capitol Theatre investigation. Fill material for the boardwalk from Mellon Farm to 1905 Street has also been identified to be from road sweeping material;

- A number of environmental assessments have also been completed for the Property. Of note, decommissioning and replacement of the fuel AST for the train, formerly located to the north of the Train Shed, took place in 2001, which identified the potential for impacted soils to be present north of the excavation area. An estimated 365 t of PHC-impacted material was removed from this area during decommissioning. However, further testing

of PAHs or metals, or testing of groundwater, was not completed. A piezometer was identified within the general area of the former AST during the site inspection. However, the origin of the piezometer or documentation of further investigative work in this area has not been identified to date. The current fuel AST for the train appeared to be in good condition at the time of inspection;

- Environmental assessments have also been completed with regards to the operation of the rail line on the Property. In 2011 and 2012, Phase II ESAs were completed which identified the presence of PHC, PAH and metals-impacted ballast materials on the main rail line near the main Train Station as well as the Fort Station. Remediation of these areas was completed in 2013, to a maximum depth of approximately 0.91 mbg. However, confirmatory results indicated that PHCs remained present at the main Train Station and PAHs remained present at both locations. In light of the results, it was recommended that a risk assessment/RMP be developed to address the concerns with ongoing operation of the train on the Property. It was also identified that a portion of the rail line had been excavated by the Train Shed, though documentation of any testing has not been identified. Operation of the rail may continue to pose a level of environmental risk to the Property, including the use of presumably creosote-treated rail ties;

- Staining was noted at a number of locations along the rail and street car lines on the Property at the time of inspection, as well as on rail ties being stored in the vicinity of the Streetcar Barn and Train Shed. This staining is likely associated with leakage from years of use of the train on the Property. Absorbent track matting was observed to be placed along the rail line at locations where the train idles in order to mitigate migration of any leaks to the ballast below, as per the RMP that was developed for operating the train on the Property;

- Chemicals observed on the Property included those primarily associated with vehicle/equipment maintenance and were stored primarily within flammable cabinets or secondary containment within the Streetcar Barn, the Motordrome, the Train Shed, and the maintenance yard. Two 455-L double-walled gasoline and diesel ASTs were present within the maintenance yard and both appeared to be in good shape, though staining was noted on the diesel AST. Minor staining was noted on the gravel floor within the west portion of the Train Shed as well as concrete floors in the Streetcar Barn, Train Shed, Motordrome, and within the pump house associated with the train AST in the Train Shed yard. These stains are not anticipated to pose a significant environmental risk, as the use of spill absorbent and pads was apparent;

- Surrounding land use has predominantly been residential in nature. Construction of Whitemud Drive NW Was noted to have been completed by the 1973 aerial photograph and construction of a pipeline ROW (currently licenced to Terasen Inc.) was noted in the 1962

aerial photograph, intersecting the southwest portion of the Property. This ROW may pose a level of environmental risk to the Property; and

- Regulatory correspondence received to date has not identified any other environmental concerns pertaining to the Property or surrounding area.

Based on the findings of the Phase I ESA to date, Nichols Environmental is of the opinion that the operation of the rail line on the Property as well as the use of fill materials may pose a level of environmental risk. However, due to the likely continued operation of the rail line as well as the apparent widespread nature of the fill materials, these risks may be managed through an appropriate risk assessment/RMP. The RMP should also include management for the storage of rail ties on the Property, including the designation of specific storage areas that are equipped with a means of containment to mitigate the leaching of preservatives from the rail ties to the surrounding ground surface.

The former fuel AST area at the Train Shed may also pose a level of environmental risk, as impacts do not appear to have been delineated to the north of this area. Further testing would be required in this area in order to assess the current status of the soil and groundwater with relation to PHCs, and testing of PAHs and metals would also be recommended.

8.0 REFERENCES

Throughout this project, the following resources were used:

- Abacus Datagraphics Ltd. (AbaData): http://www.abacusdatagraphics.com/;
- Alberta Energy Regulator (AER);
- Alberta Environment and Parks (AEP);
  - Aerial photographs;
  - Environmental Site Assessment Repository (ESAR): http://www.environment.alberta.ca/01520.html; and
  - Freedom of Information and Protection of Privacy (FOIPP);
- Alberta Government. GeoDiscover Alberta: http://geodiscover.alberta.ca/viewer;
- Alberta Health Services;
- Bayrock, L. A. and Hughes, G. M. 1962. Surficial Geology of the Edmonton District, Alberta, Alberta Research Council Report 62-6, 40 pages;
- Carlson, V. A. 1966. Bedrock Topography and Surficial Aquifers of the Edmonton District, Alberta, Alberta Research Council Report 66-3, 21 pages;
- Environment Canada, National Pollutant Release Inventory (NPRI): http://www.ec.gc.ca/inrp-npri/;
- Environmental Law Centre;
- Fenton, M. M., Water, E. J., Pawley, S. M., Atkinson, N., Utting, D. J. and Mckay, K. 2013. Surficial Geology of Alberta, Alberta Energy Regulator, AER/AGS Map 601, 1:1 000 000 scale;
- Google Earth;
- Government of Alberta, Spatial Information System (Spin 2): https://alta.registries.gov.ab.ca/spinii/logon.aspx;
- LPP Services Ltd. (land titles);

- Petroleum Tank Management Association of Alberta (PTMAA);

- Prior, G. J., Hathway, B., Glombick, P. M., Pană, D. I., Banks, C. J., Hay, D. C., Schneider, C. L., Grobe, M., Elgr, R. and Weiss, J. A. 2013. Bedrock Geology of Alberta, Alberta Energy Regulator, AER/AGS Map 600, 1:1 000 000 scale; and

- The City of Edmonton;
  - Archives;
  - Drainage Services;
  - Fire Rescue Services;
  - Maps, Zoning Detail: http://maps.edmonton.ca/;
  - Streets Engineering Branch - Transportation Services;
  - Sustainable Development - Current Planning; and
  - Waste Management Services; and

- The City of Edmonton Engineering Services. 2007. City of Edmonton Residential Radon Study, Radon Fact Sheet.

9.0 QUALIFICATIONS AND LIMITATIONS

9.1 Qualifications

Mrs. Tawnya Anderson, B.Sc., EP, coordinated all aspects of the project, including completion of the final report. Mrs. Anderson has a B.Sc. in Environmental Science from the University of Alberta, Augustana Faculty.

Mr. Rob Dickie, P.Geol., R.E.T., EP, provided the senior project management and peer review of the entire project. Mr. Dickie has more than 25 years of consulting and industry experience.

9.2 Limitations

In conducting the Phase I ESA of the Property and in rendering our conclusions on the potential presence or level of contamination, Nichols Environmental gives the benefit of its best judgment based on its experience and in accordance with generally accepted professional standards for this type of investigation. Our conclusions are limited by the following:

- Nichols Environmental spent only a limited amount of time on the Property. Thus, any activities conducted on the Property following the site inspection that Nichols Environmental is not aware of may have an impact on the conclusions and recommendations presented;

- Nichols Environmental has assumed the genuineness of the documents and that the information provided in documents or statements is true and accurate;

- A hazardous building materials survey was not completed as it was beyond the scope of work; and

- The study area was limited to the areas indicated in Section 3.0.

This report is intended to provide information to reduce, but not necessarily eliminate, uncertainty regarding the potential for contamination of a property. This report has been prepared for the exclusive use of The City of Edmonton for the purpose of assessing the current environmental conditions that may be present at the location identified in Section 3.0. Any uses which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. Nichols Environmental (Canada) Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

10.0 CLOSURE

We trust this meets with your current requirements. Should you have any questions or concerns, please contact the undersigned at your convenience.

Yours truly,
NICHOLS ENVIRONMENTAL (CANADA) LTD.
APEGA PERMIT TO PRACTICE NO. P6730

Tawnya Anderson, B.Sc., EP
Senior Project Manager

Reviewed by:

PROFESSIONAL GEOLOGIST ALBERTA
ROBERT W. DICKIE

8/11/15

R.W. (Rob) Dickie, P.Geol., R.E.T., EP
President

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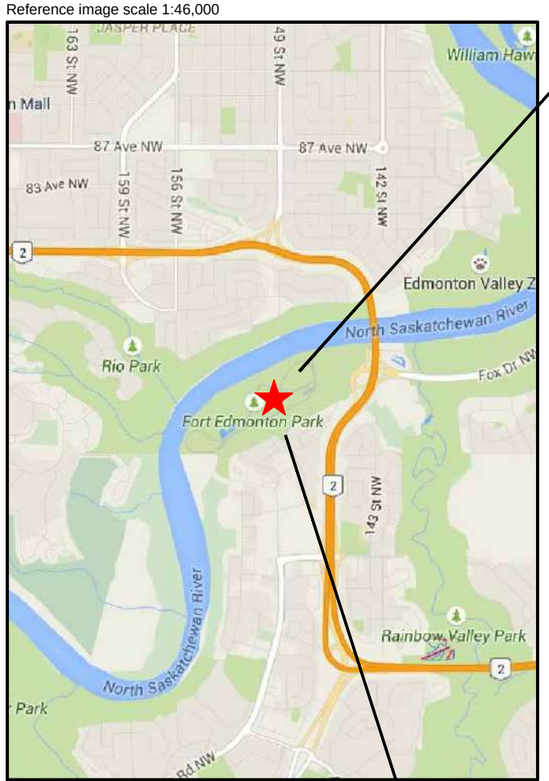
FIGURES

Reference image scale 1:46,000



Legend:

Approximate Property Boundary

2015 Air Photo Source: Google Earth

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-80 0 80 160 240m

CLIENT
The City of Edmonton

PROJECT
Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE
Site Location and Surrounding Land Use

BASE/SITE PLAN PROVIDED BY
Nichols Environmental (Canada) Ltd.

REVISION DATE
August 2015

SCALE	APPROVED
1:8,600	TA/KK

PROJECT NO.
15-305-CFE

DRAWING NO.
Figure 1

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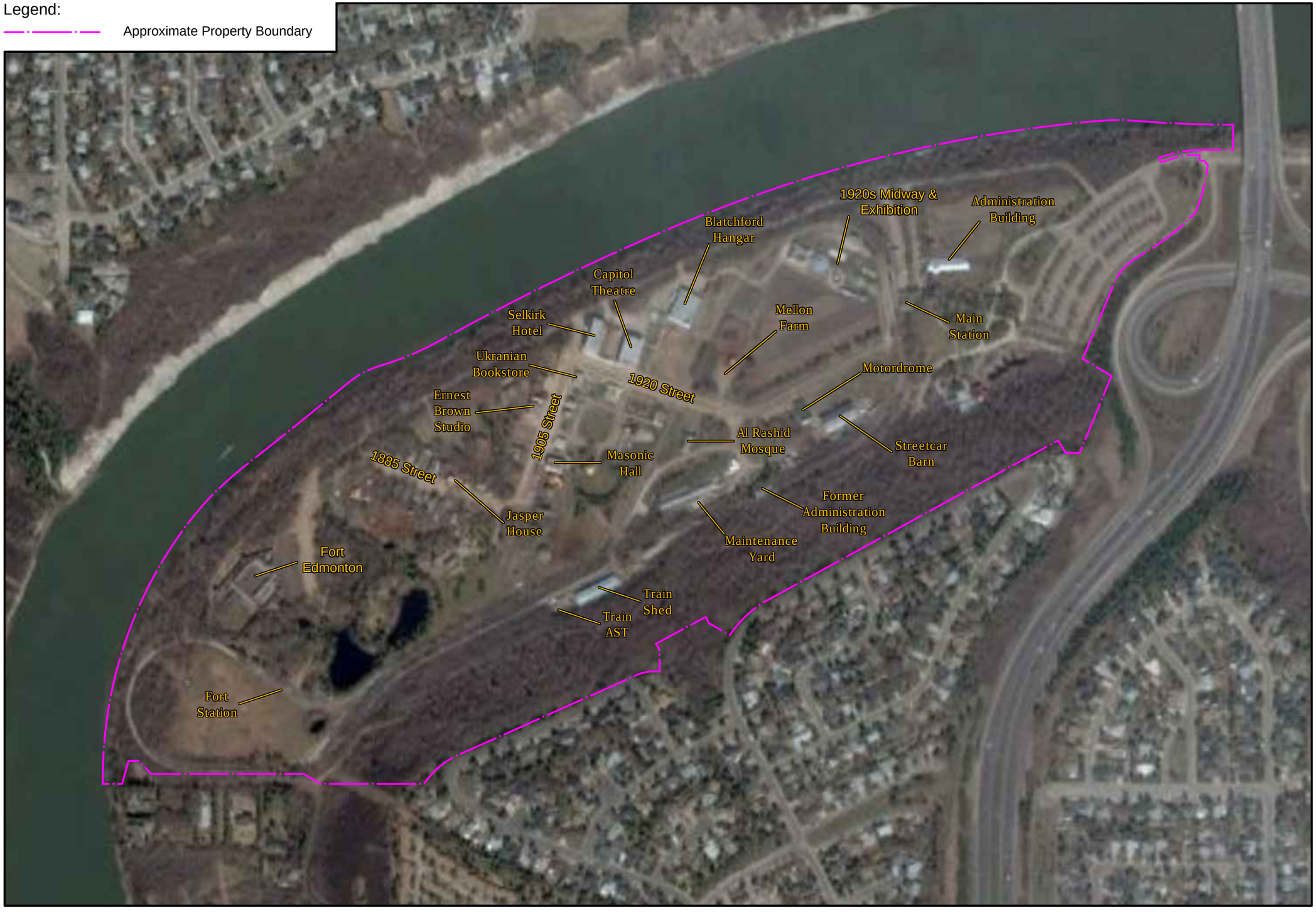
Legend:

Approximate Property Boundary



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CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

Site Detail

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:5,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Figure 2

NICHOLS ENVIRONMENTAL (CANADA) LTD.

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APPENDIX A

LIST OF REPORTS

- AECOM. March 2013. Initial Project Report (IPR) - Fort Edmonton Park Sewage Pumping Station Upgrade.
- AECOM. April 2013. *Fort Edmonton Park Sewage Pumping Station Upgrade, Geotechnical Report - Final*.
- AGRA Earth & Environmental. June 1996. Results of Bulk Asbestos Analysis, Fort Edmonton Park.
- Alberta Environment. June 2002. Fort Edmonton Park Train Refueling Station, Hydrocarbon Contamination.
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- Cascade Environmental Consulting Ltd. March 2015. Final Report for The City of Edmonton, Jasper House, Fort Edmonton Park, Moderate-Risk Asbestos Abatement.
- Cascade Environmental Consulting Ltd. March 2015. March 11, 2015 Daily Site Inspection Report for The City of Edmonton, Jasper House, 7000 - 143 Street, Edmonton, AB, Moderate Risk Asbestos Abatement.
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- J.R. Paine & Associated Ltd. August 1994. *Soils Investigation, Proposed Water Tower and Retaining Wall Replacement, Fort Edmonton Park, Edmonton, Alberta.*

- Petroleum Enviro Services. May 2001. *Petroleum Storage System Services Report. Installation of 25,000 Litre AST Pump and Piping System*.

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- The City of Edmonton, Materials & Testing, Engineering Department. January 1980. *Fort Edmonton Park, Proposed Water Fall*.
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- The City of Edmonton, Materials & Testing, Engineering Department. June 1980. *Fort Edmonton Park, Fire Hall #1*.
- The City of Edmonton, Materials & Testing, Engineering Department. August 1980. *Fort Edmonton Park Streetcar Barns*.
- The City of Edmonton, Public Works. July 1990. *North Saskatchewan Riverboat Environmental Impact Assessment, Rafters' Landing & Fort Edmonton Docking Locations, North Saskatchewan Riverboat Ltd*.
- The City of Edmonton Transportation Services, Engineering Services Section. January 2015. Fort Edmonton Park Soil Excavation.
- Thurber Engineering Ltd. May 2010. *Environmental Investigation, Proposed Capitol Theatre, Fort Edmonton Park, Edmonton, Alberta*.

APPENDIX B

Photograph 1: Fort Edmonton located at the west portion of the Property.

Photograph 2: The view west down 1885 Street.

Photograph 3: The view north down 1905 Street, with the street car line situated on the centre of the road.

Photograph 4: The view east down 1920 Street, with the street car line situated on the centre of the road.

Photograph 5: General staining noted on the rail line looking southwest adjacent Blatchford Hangar.

Photograph 6: Absorbent pads present on the rail line at the main Train Station, looking north. New ballast material is also present.

Photograph 7: Absorbent mats and new ballast material at main Train Station. The 1920s Midway & Exhibit is in the background, looking west.

Photograph 8: Absorbent mat and new ballast material at the Fort Station, looking north.

Photograph 9: Absorbent mat and new ballast material at the Train Shed, looking southwest.

Photograph 10: General staining noted on the rail line near the Train Shed, looking west.

Photograph 11: Fuel AST at the Train Shed yard, looking northwest.

Photograph 12: Fuel ASTs present within the maintenance yard, with some staining noted on the diesel AST.

Photograph 13: Storage of rail ties within the Streetcar Barn yard, looking west toward the Streetcar Barn in the background.

Photograph 14: Sump present within the Motordrome building, as well as general chemical storage.

Photograph 15: The maintenance yard, looking west.

Photograph 16: Former administration building which has been identified to contain mould, looking south toward the adjacent forested area.

Photograph 17: The John Janzen Nature Centre, looking southwest.

Photograph 18: Out buildings utilized for storing composting materials at the John Janzen Nature Centre, looking southwest.

Photograph 19: The pond to the east of the John Janzen Nature Centre, looking east from the roof.

Photograph 20: Pipe wrap labelled “asbestos” in the basement of the John Janzen Nature Centre.

APPENDIX C

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0011 023 017	8521469;A	852 149 449

LEGAL DESCRIPTION
PLAN 8521469
BLOCK A
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 62.7 HECTARES (155.02 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
AIS REFERENCE: 4;25,52,21,H
AIS REFERENCE: 4;25,52;21;S

MUNICIPALITY: CITY OF EDMONTON

REGISTERED OWNER(S)

REGISTRATION	DATE(D/M/Y)	DOCUMENT TYPE	VALUE	CONSIDERATION
852 149 449	18/07/1985			NIL

OWNERS

THE CITY OF EDMONTON.
OF #1 SIR WINSTON CHURCHILL SQUARE, EDMONTON
ALBERTA T5J 2R7

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
2924JC	29/10/1952	UTILITY RIGHT OF WAY GRANTEE - TRANS MOUNTAIN PIPELINE INC.. AS TO PORTION OR PLAN:4125HW (DATA UPDATED BY: TRANSFER OF UTILITY RIGHT OF WAY 992816G9)
3259MF	18/05/1961	CAVEAT

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

PAGE 2
852 149 449

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
		CAVEATOR - THE CITY OF EDMONTON. "PART"
4900MG	10/08/1981	CAVEAT CAVEATOR - THE CITY OF EDMONTON "PART"
752 053 906	14/06/1975	UTILITY RIGHT OF WAY GRANTEE - TRANS MOUNTAIN PIPELINE INC.. "PART" (DATA UPDATED BY: TRANSFER OF UTILITY RIGHT OF WAY 072330388)
782 069 882	07/04/1978	UTILITY RIGHT OF WAY GRANTEE - TRANS MOUNTAIN PIPELINE INC.. AS TO PORTION OR PLAN:8704HW (DATA UPDATED BY: TRANSFER OF UTILITY RIGHT OF WAY 072410845)

TOTAL INSTRUMENTS: 005

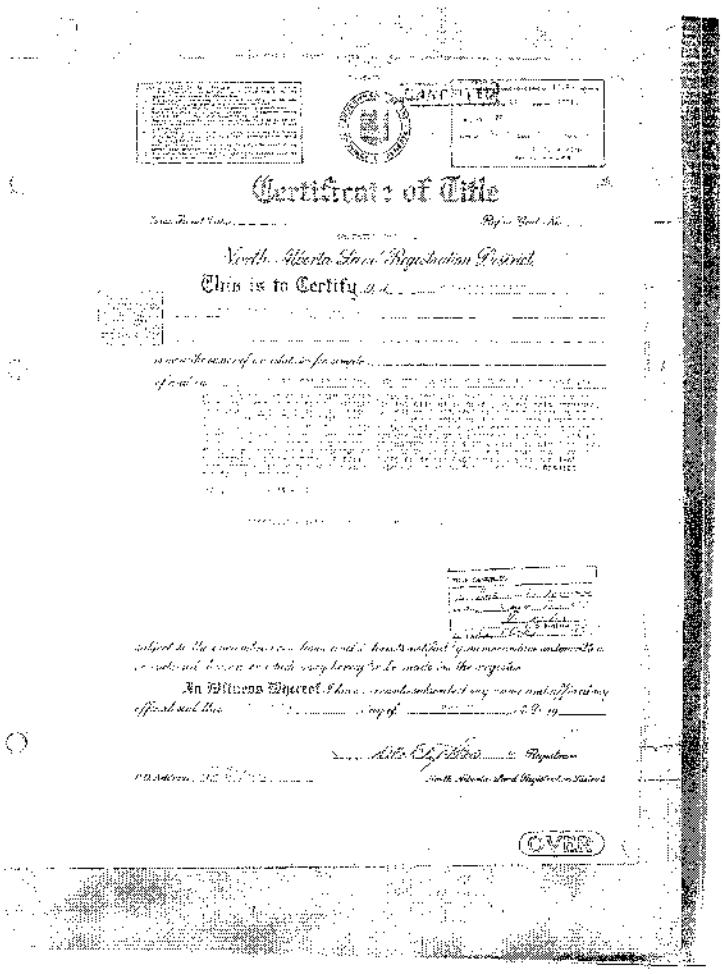
THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 29 DAY OF JULY, 2009 AT 11:42 A.M.

ORDER NUMBER:14502419

CUSTOMER FILE NUMBER:

REGISTRAR OF LAND TITLES

END OF CERTIFICATE



Certificate of Title

North Alberta Land Registration District

This is to Certify

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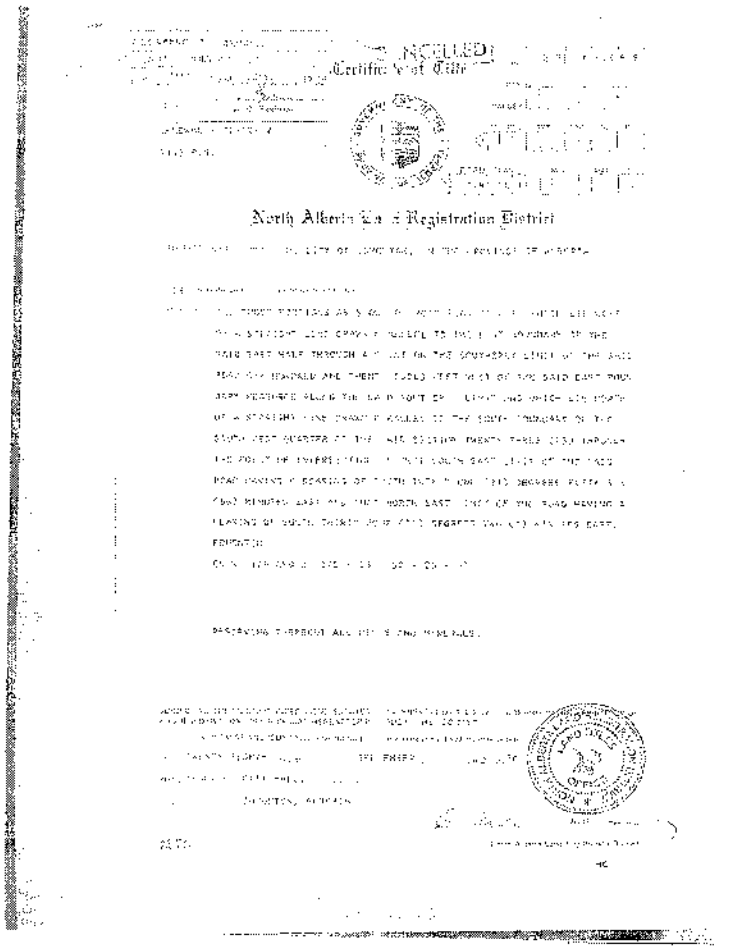
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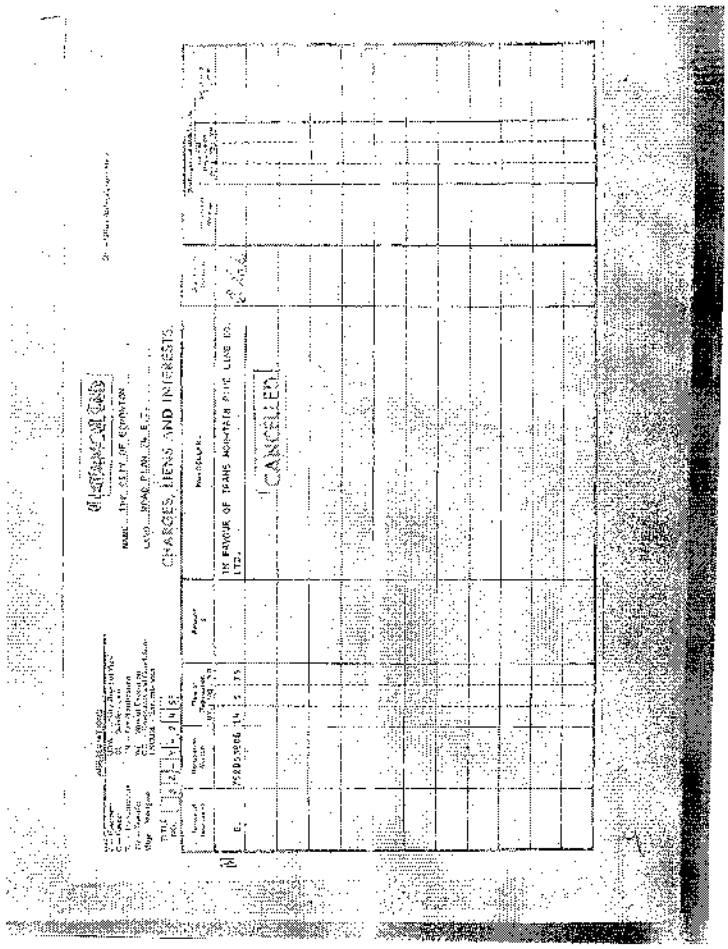
North Alberta Land Registration District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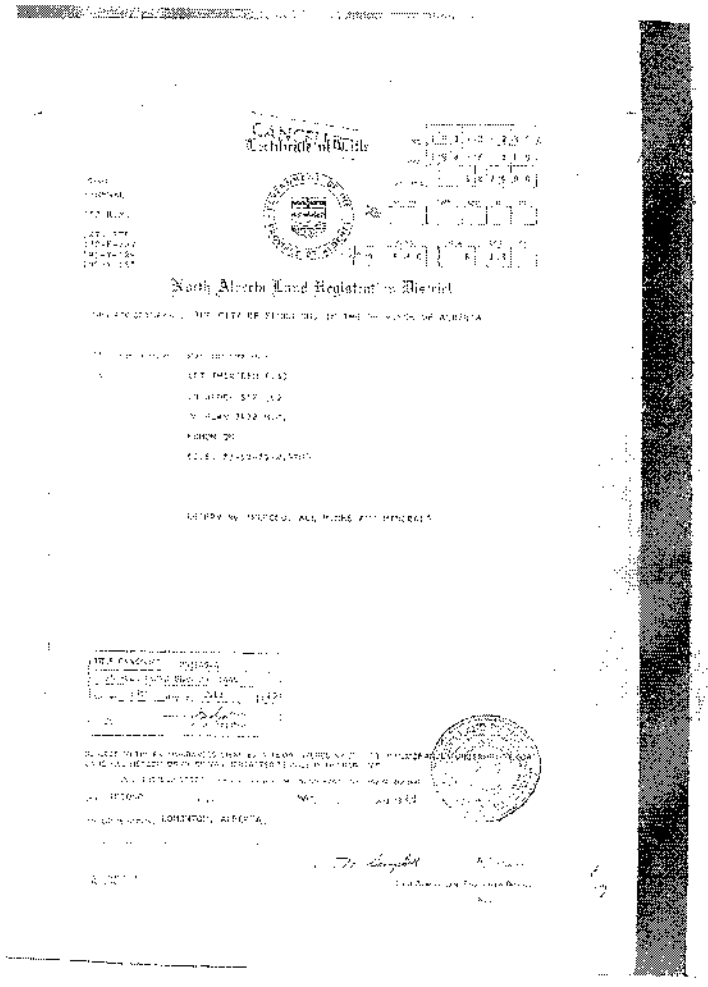
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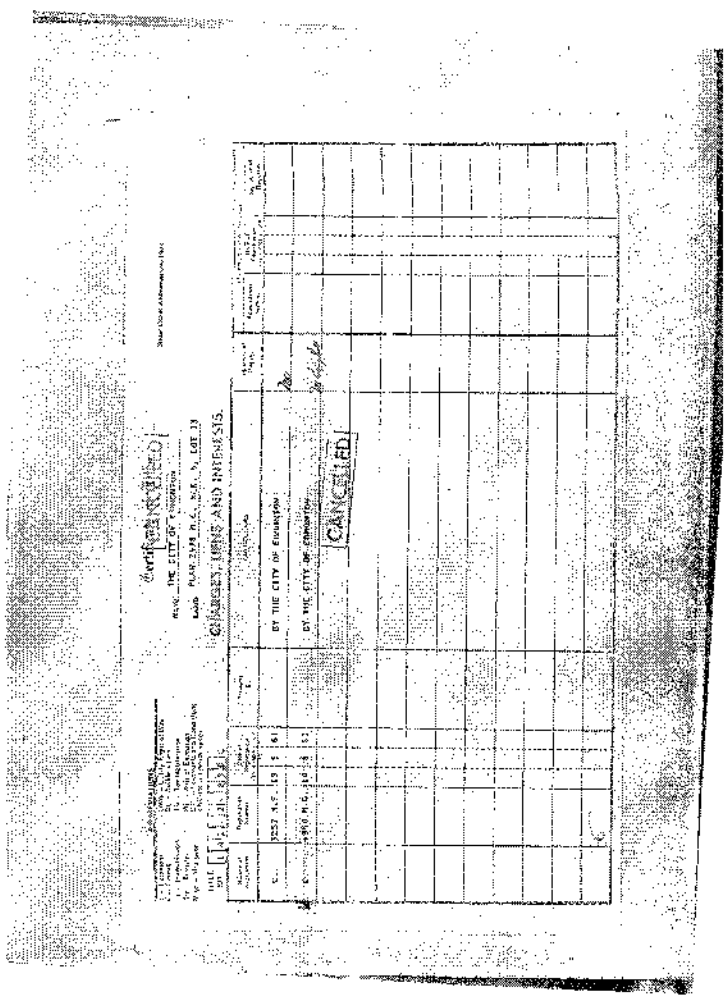
North Alberta Land Registration District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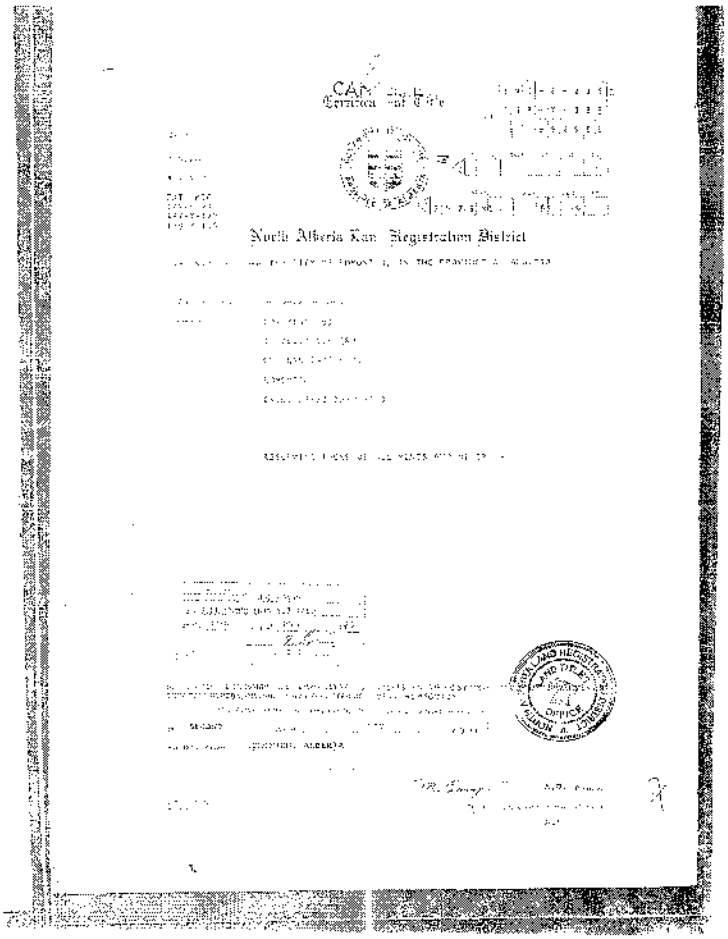
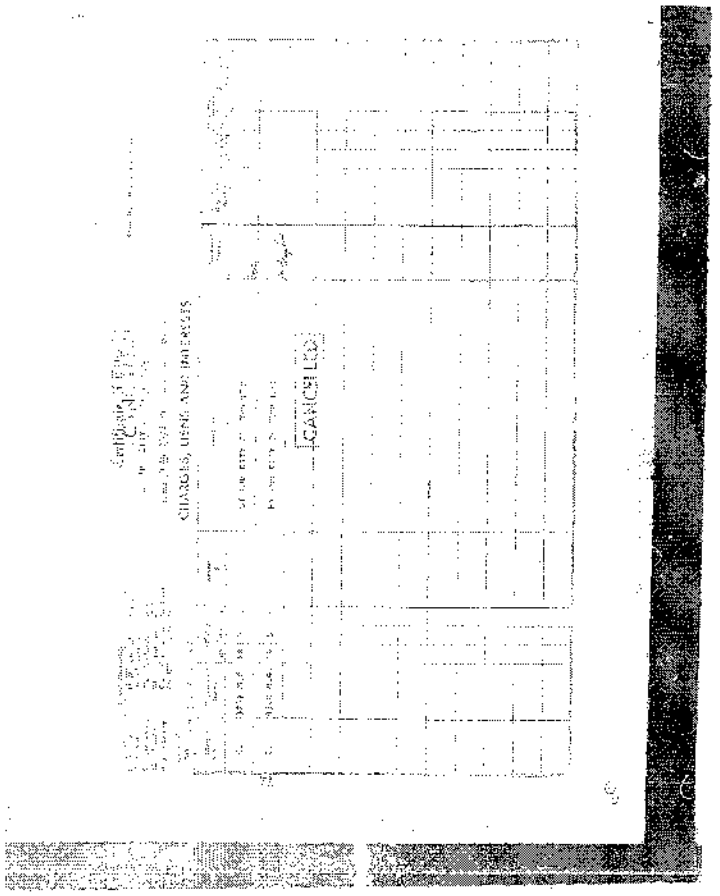
CHARGES, LIENS AND INTERESTS



North Alberta Land Registration District



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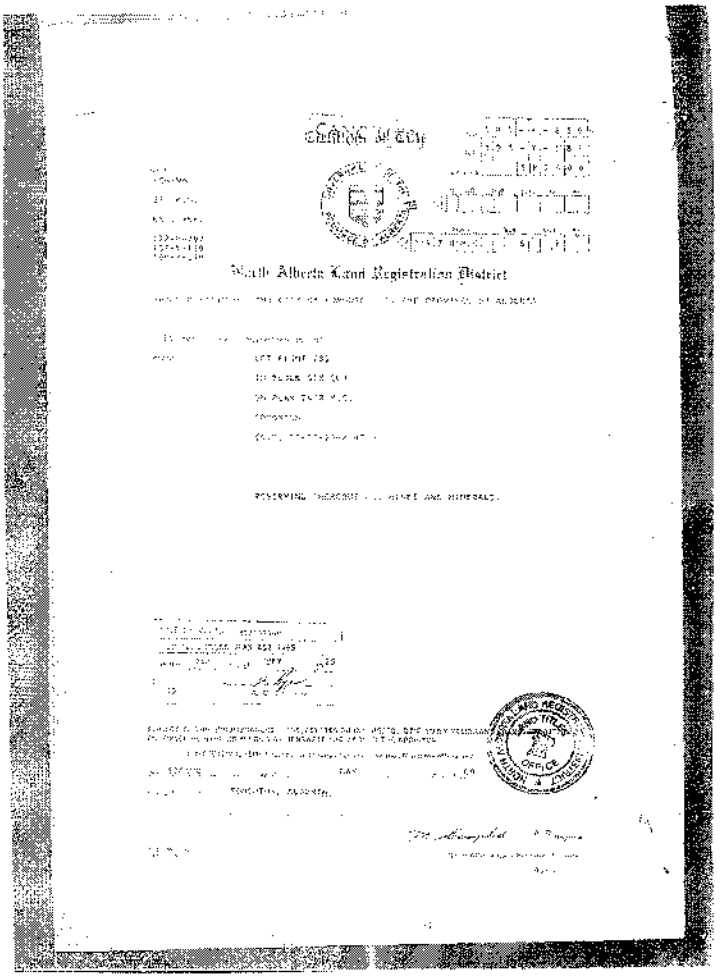
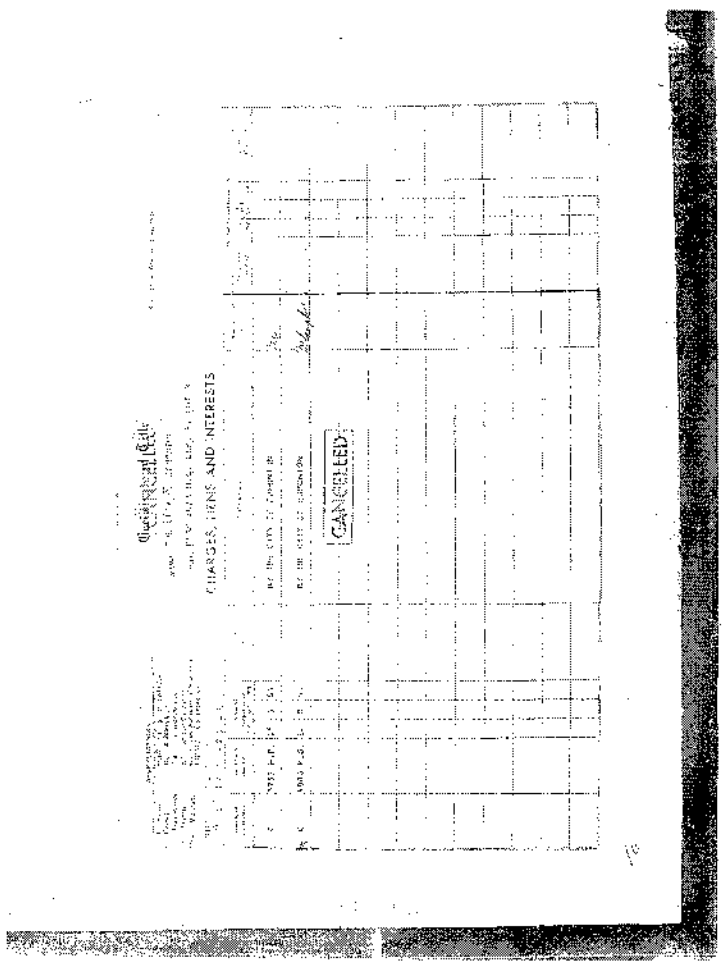


North Alberta Land Registration District



CHARGES, LIENS AND INTERESTS

CANCELLED

CANCELLED

North Alberta Land Registration District

CHANGES, LIENS AND INTERESTS

CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that

CANCELLED

OVER

CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that

CANCELLED

CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that [illegible]

is now the owner of an estate in fee simple

of and in [illegible]

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible] A.D. 19[illegible]

Registrar

P.O. Address [illegible]

North Alberta Land Registration District

OVER

CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that [illegible]

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of and in [illegible]

CANCELLED

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Registrar

P.O. Address [illegible]

North Alberta Land Registration District

OVER

CANCELLED

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Registrar

P.O. Address [illegible]

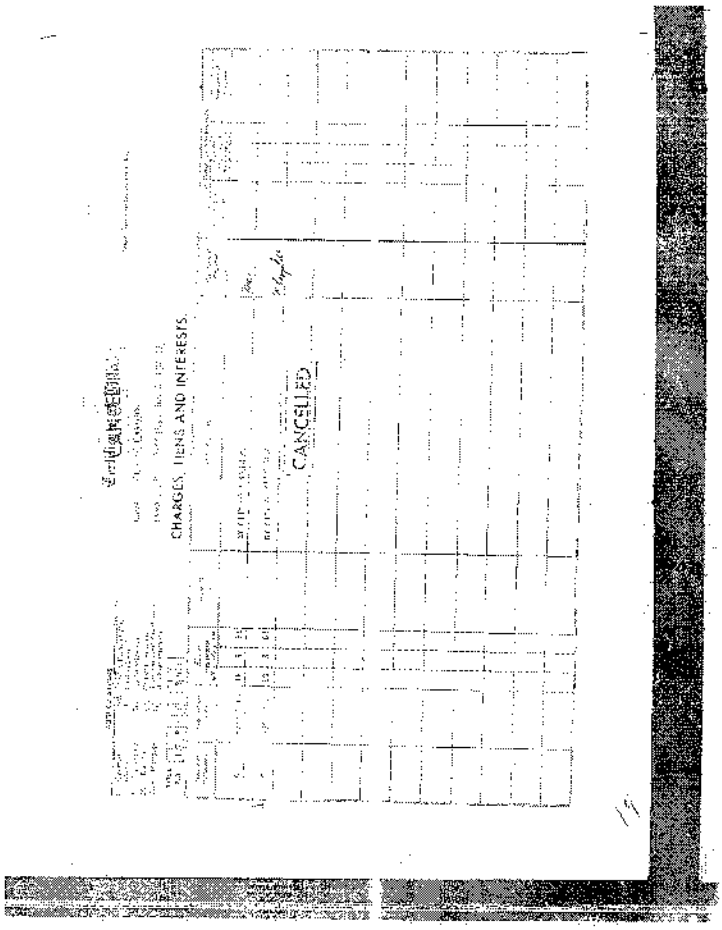
North Alberta Land Registration District

OVER

CANCELLED

Certificate of Title

North Alberta Land Registration District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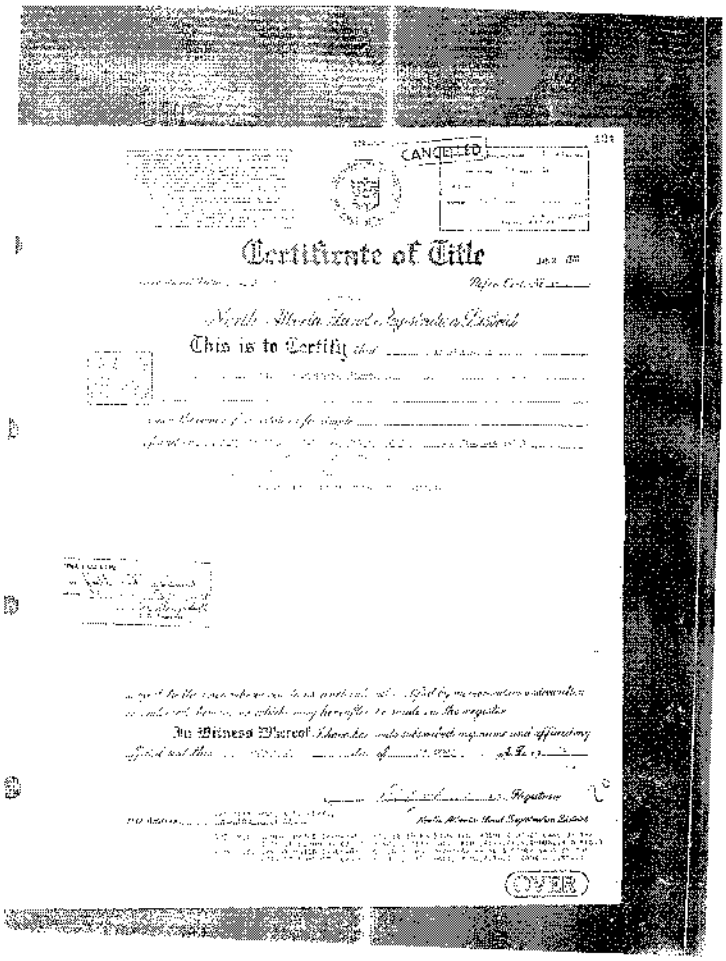
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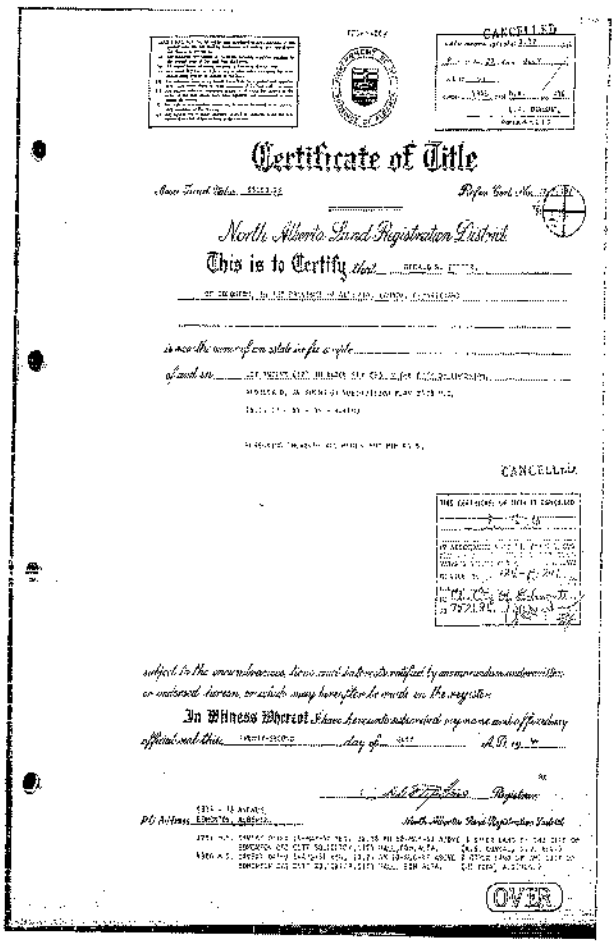
Certificate of Title
North Alberta Land Registration District
This is to Certify that
In Witness Whereof
OVER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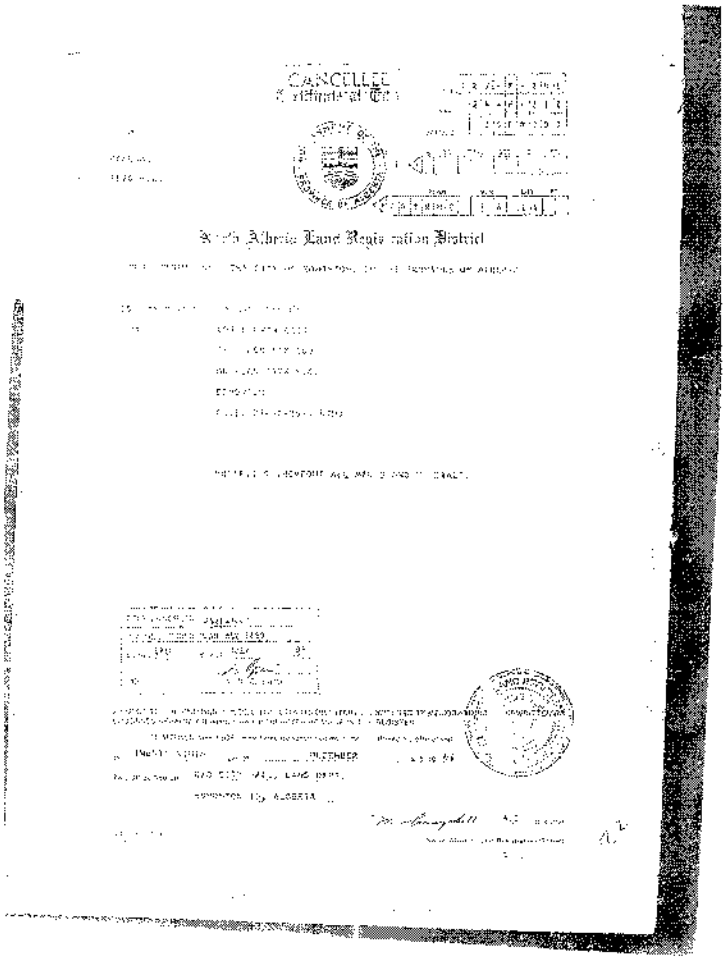
Registrar
North Alberta Land Registration District
OVER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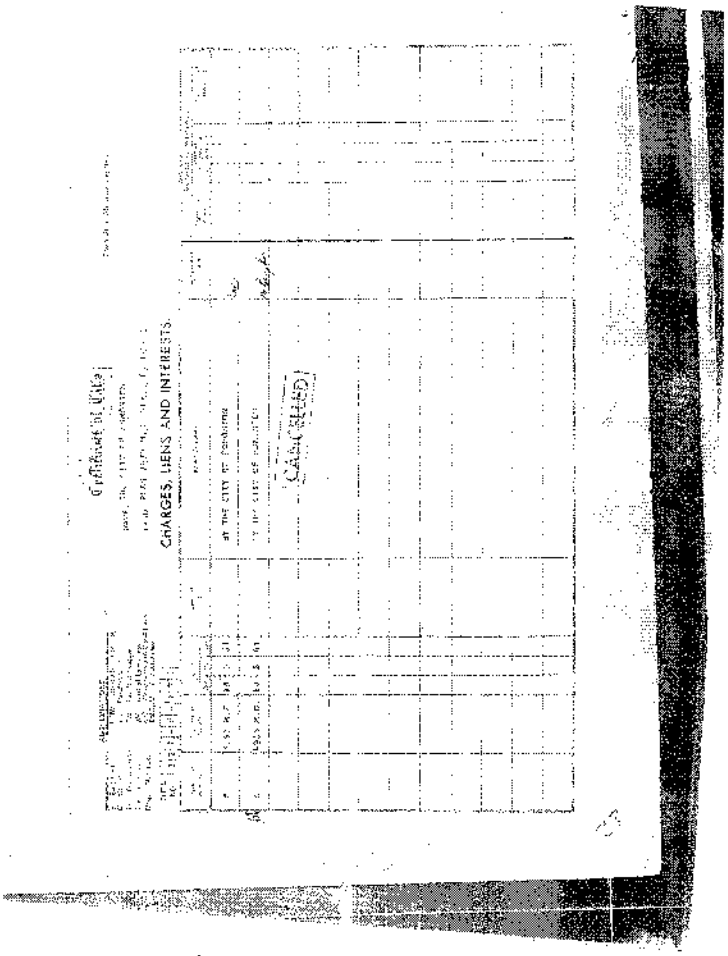

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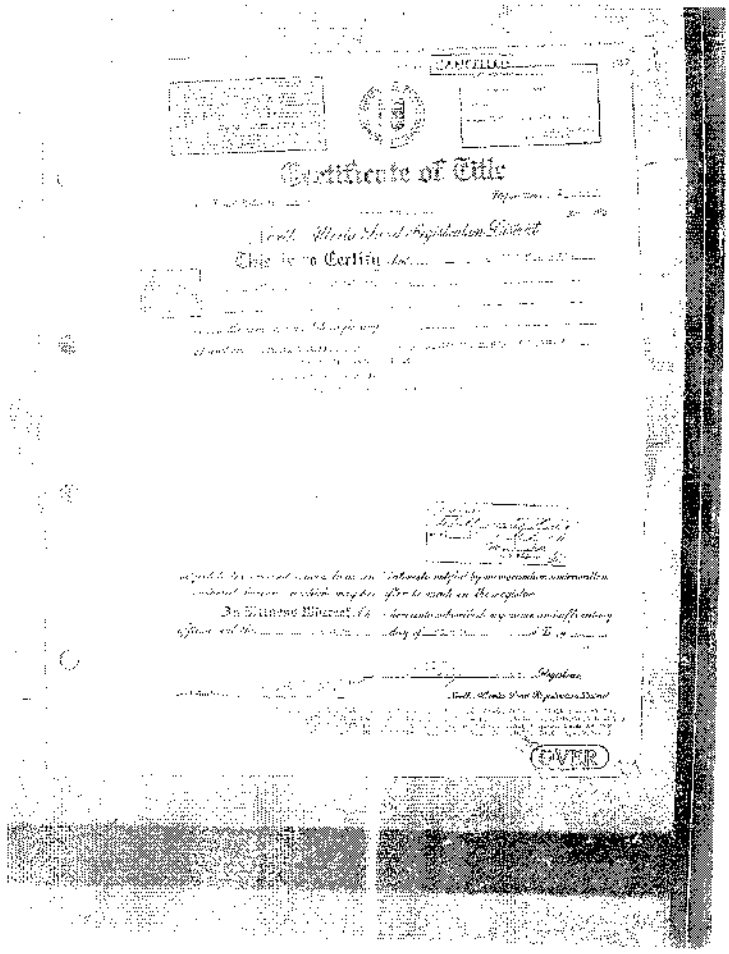

Certificate of Title

North Alberta Land Registration District

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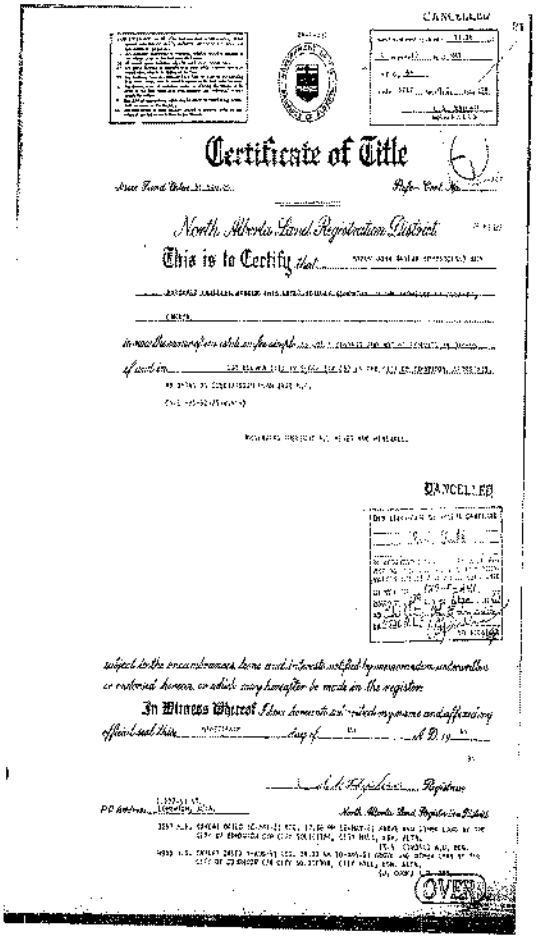

CANCELLED

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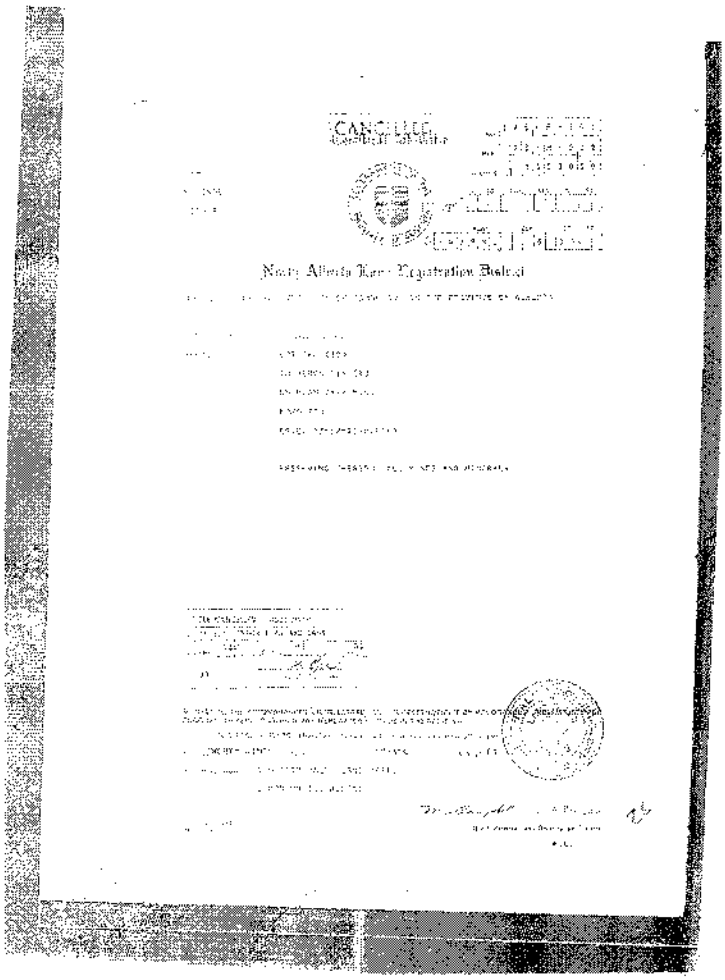
Registrar

North Alberta Land Registration District

OVER



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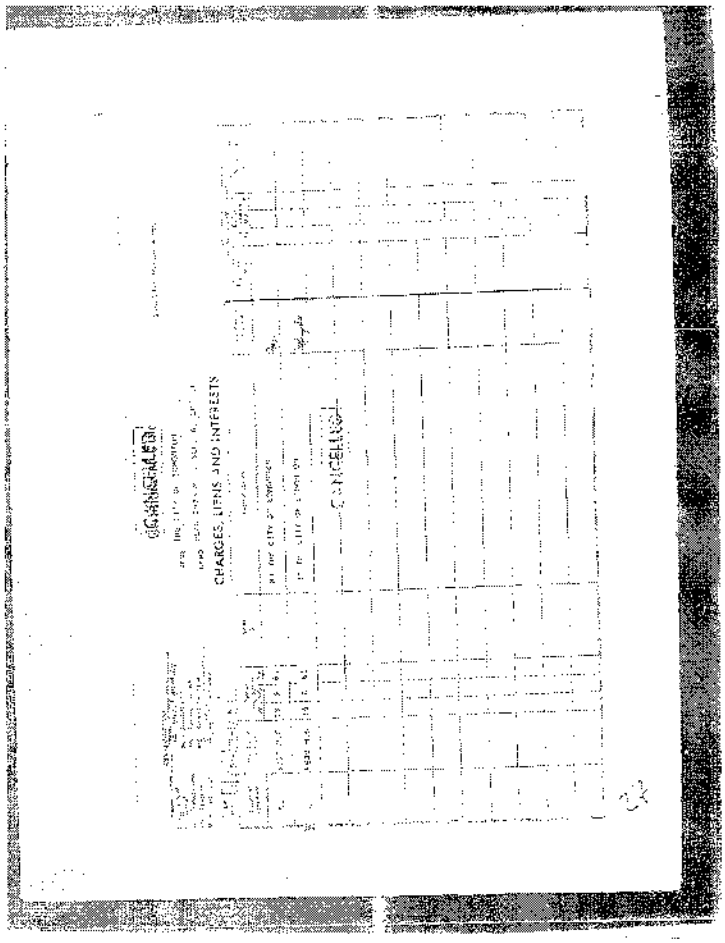
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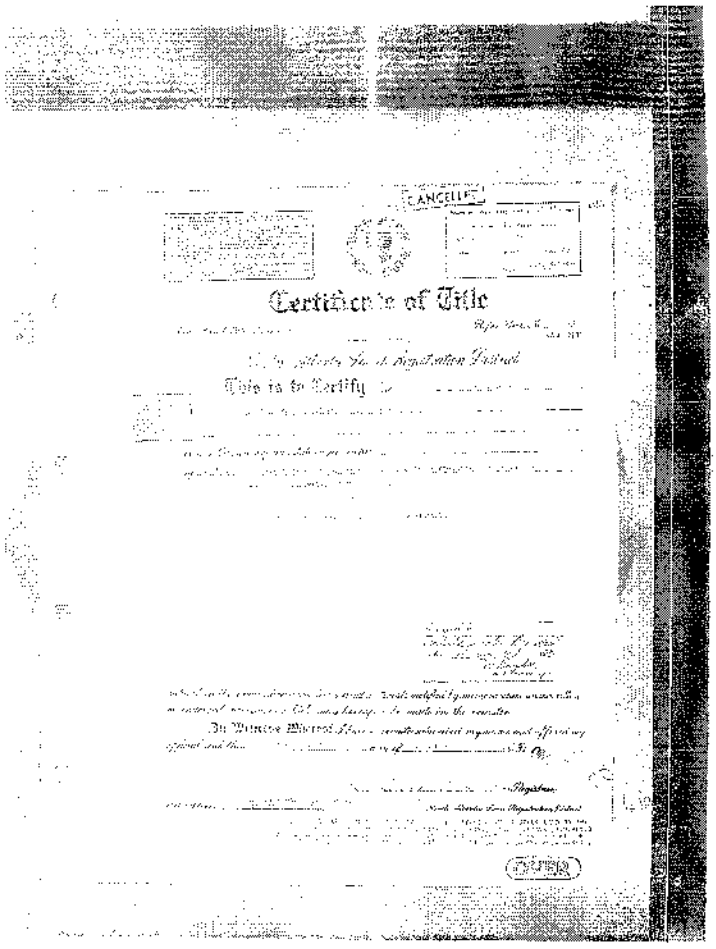
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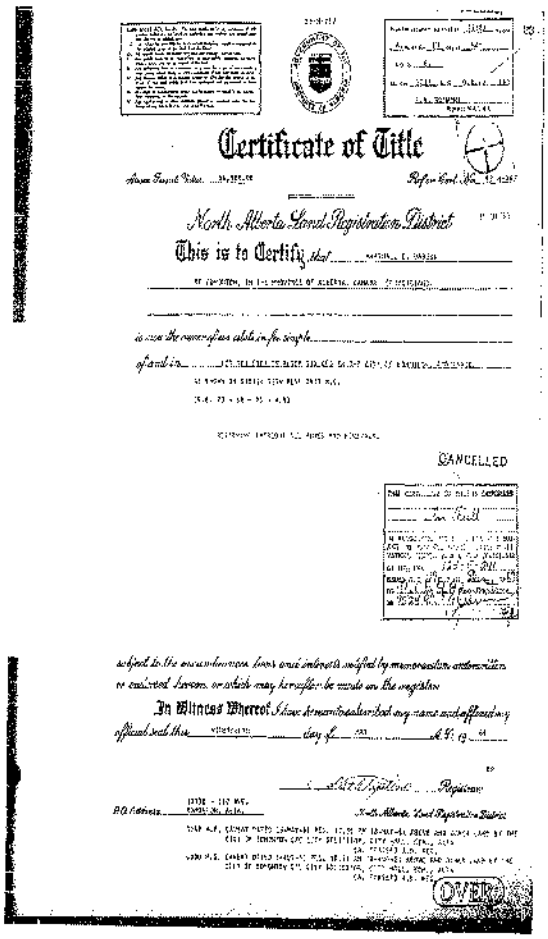
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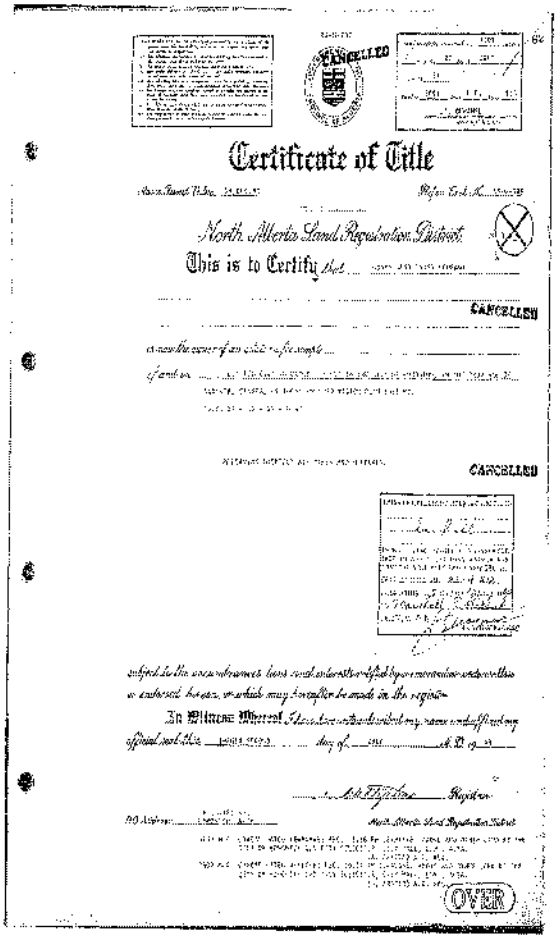
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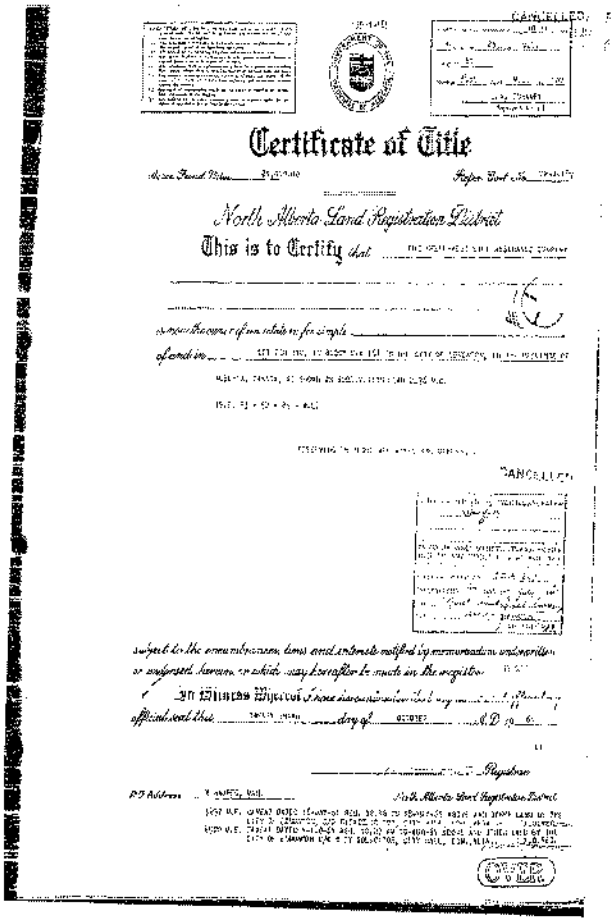

Certificate of Title

North Alberta Land Registration District

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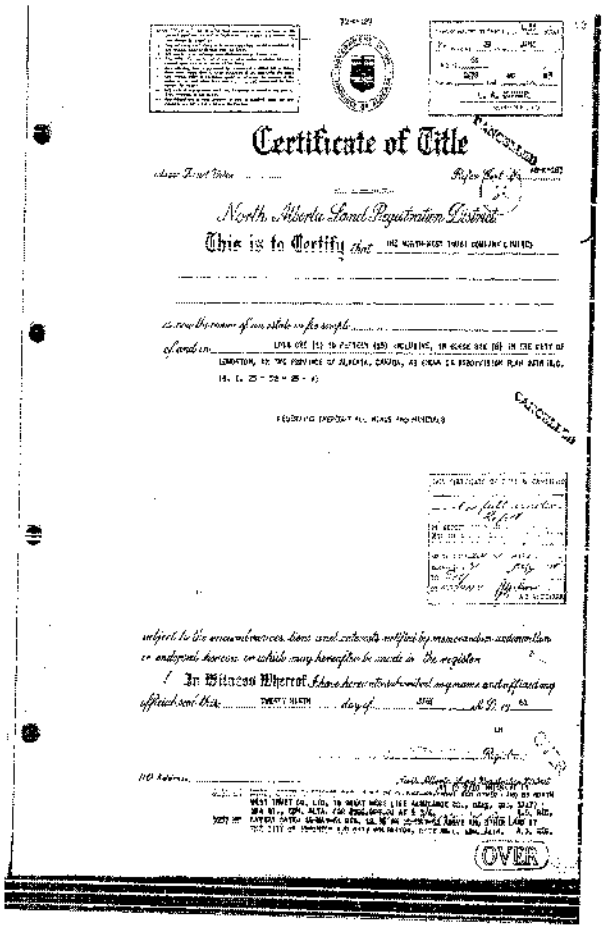
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this

Registrar

OVER



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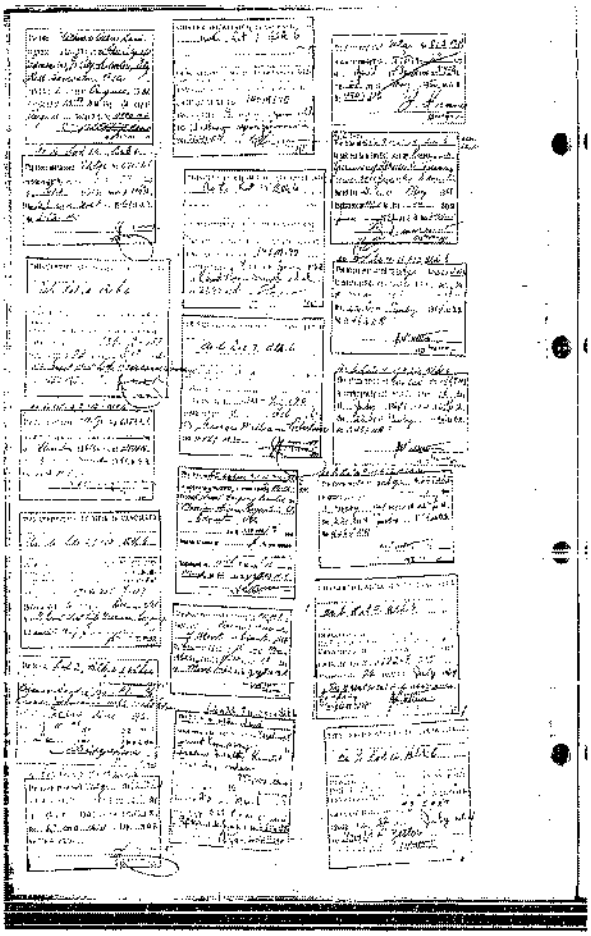

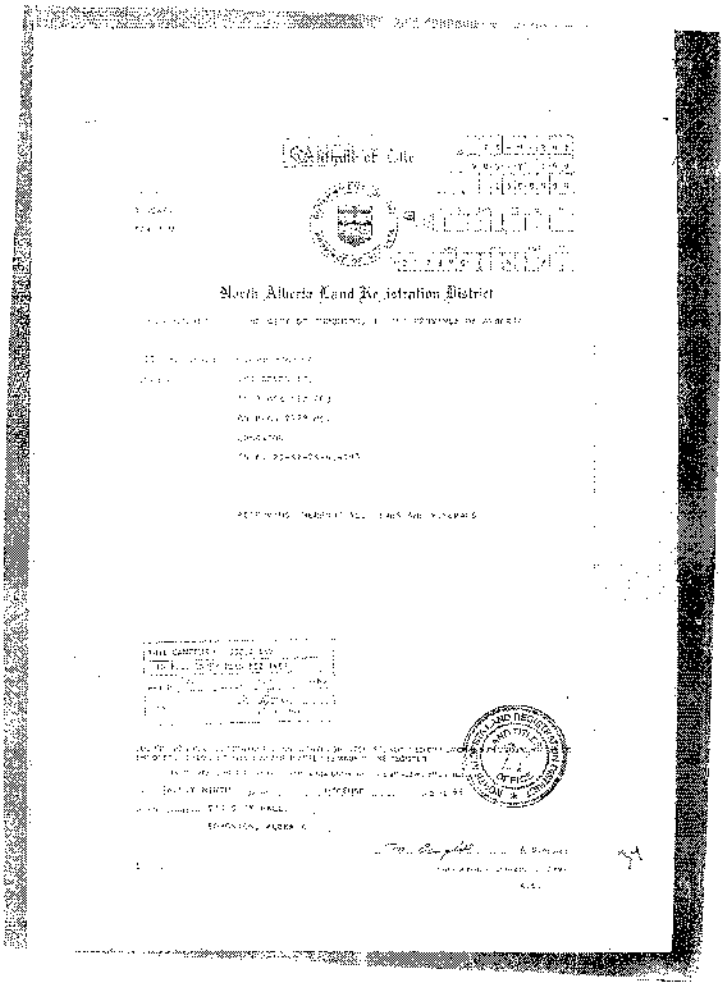

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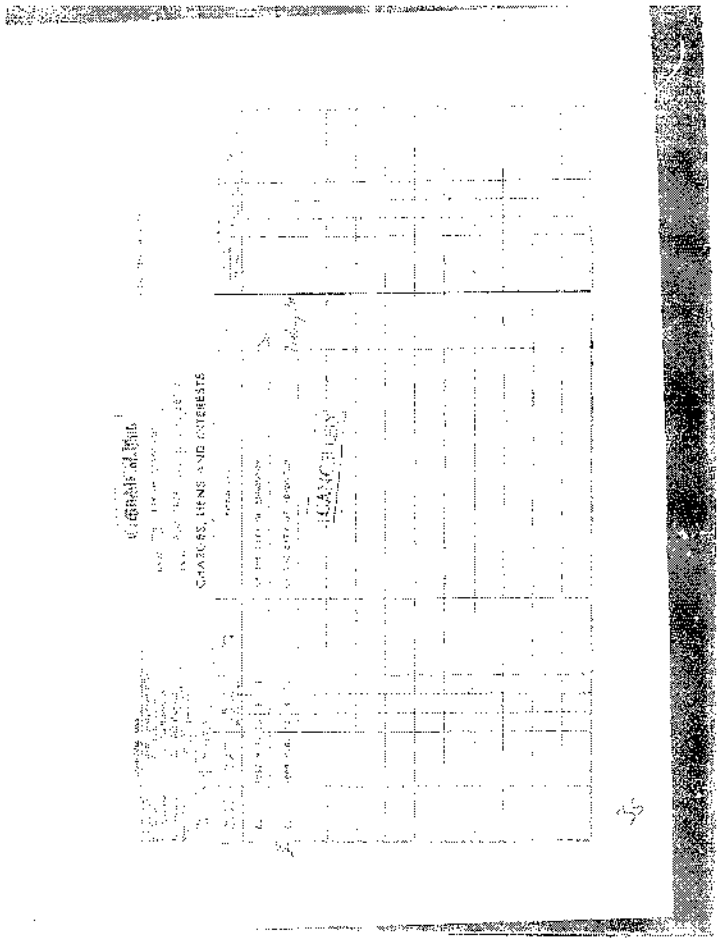
North Alberta Land Registration District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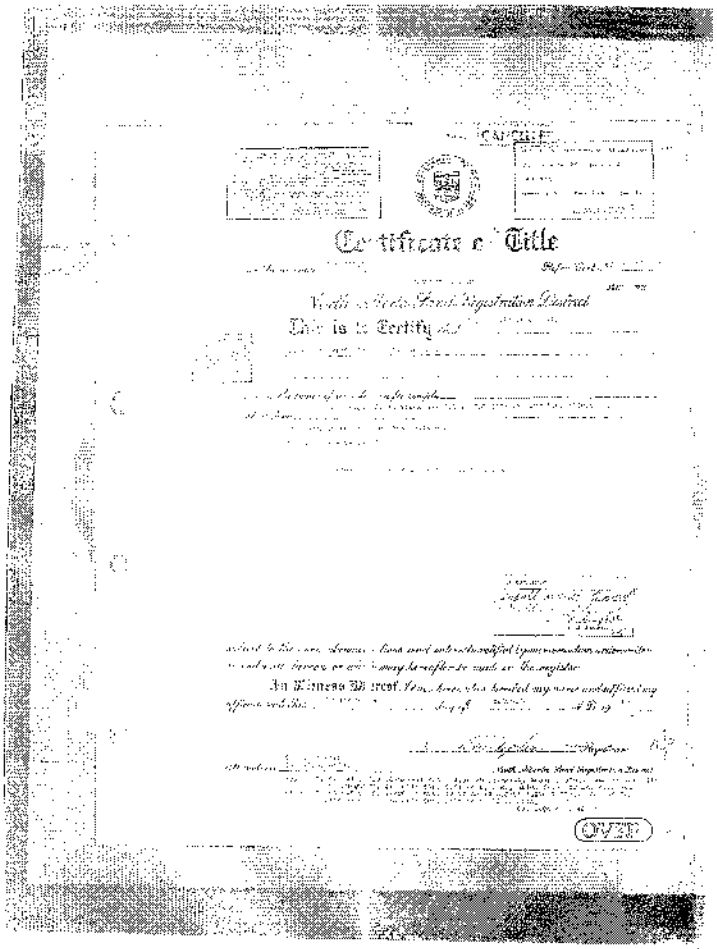
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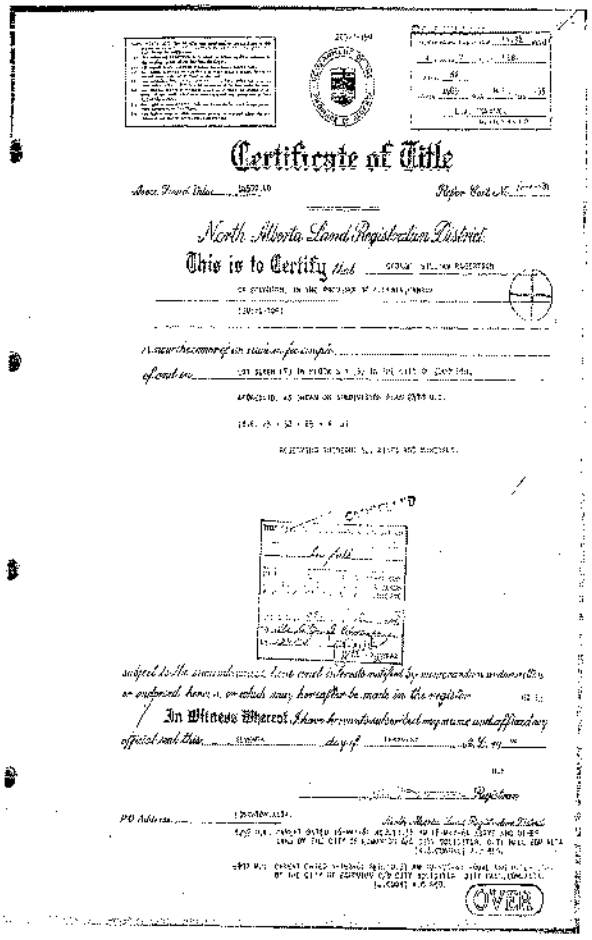
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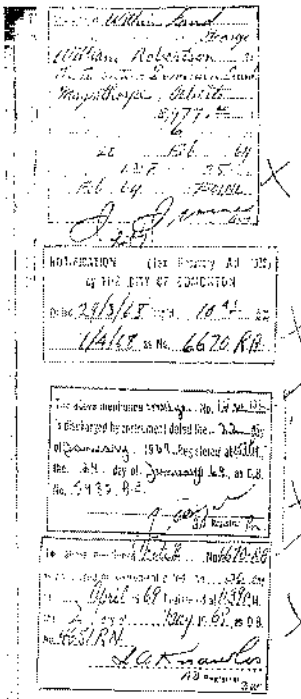
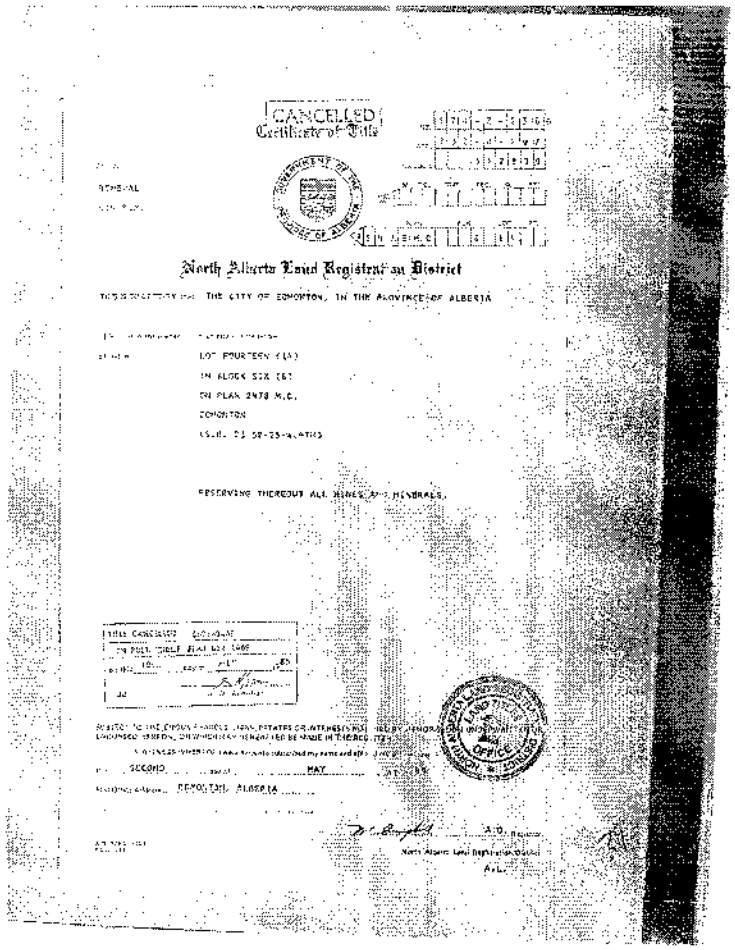

NOTIFICATION
OF THE CITY OF EDMONTON



CANCELLED
Certificate of Title

North Alberta Land Registration District

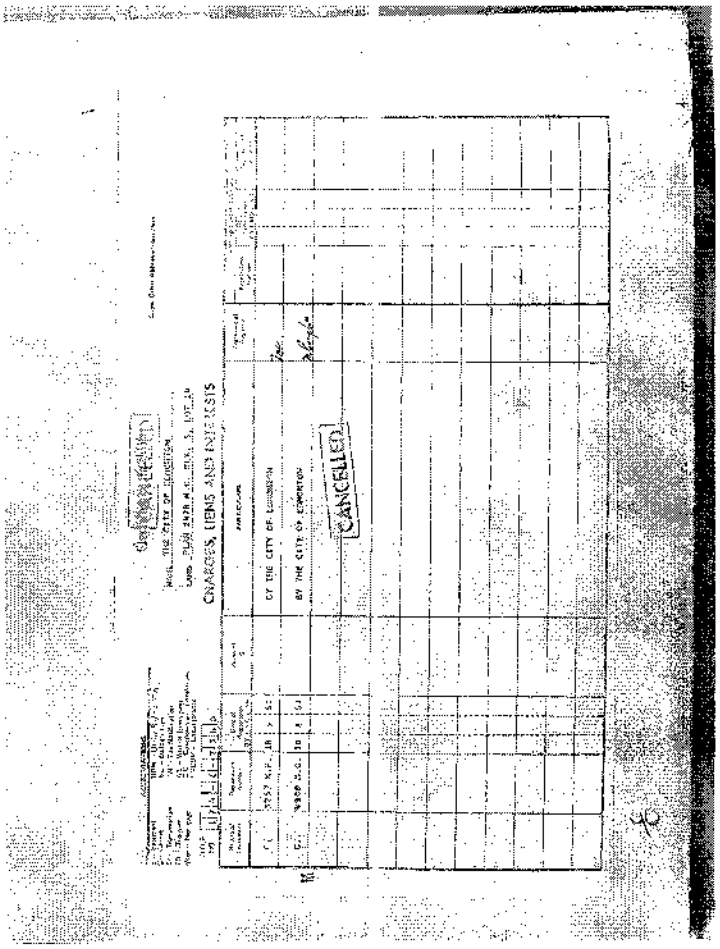
THE CITY OF EDMONTON, IN THE PROVINCE OF ALBERTA

LOT FOURTEEN (14)
IN BLOCK SIX (6)
ON PLAN 2478 M.C.
EDMONTON
(S.E. 23-52-25-W4TH)

RESERVING THEREOUT ALL MINES AND MINERALS.

SECOND MAY

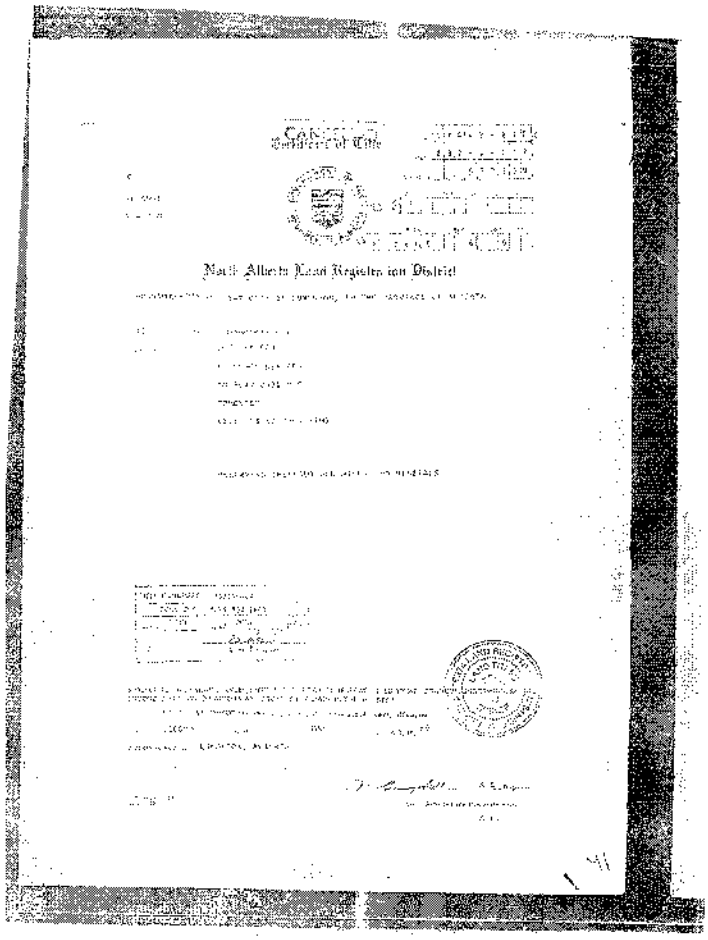
EDMONTON, ALBERTA



CANCELLED

CHARGES, LIENS AND INTERESTS

BY THE CITY OF EDMONTON



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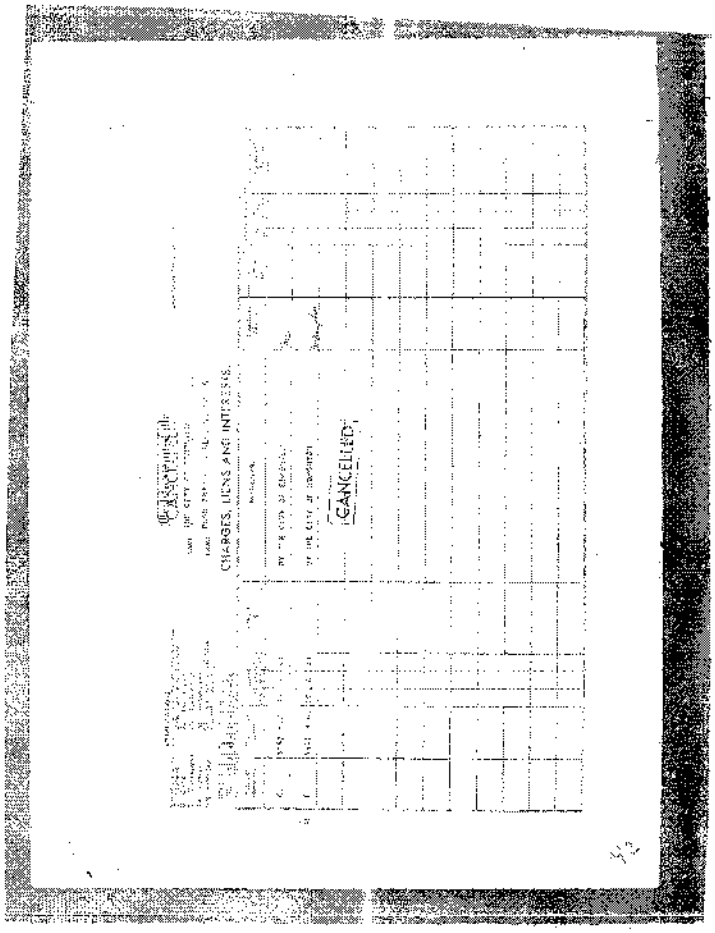
North Alberta Land Registration District



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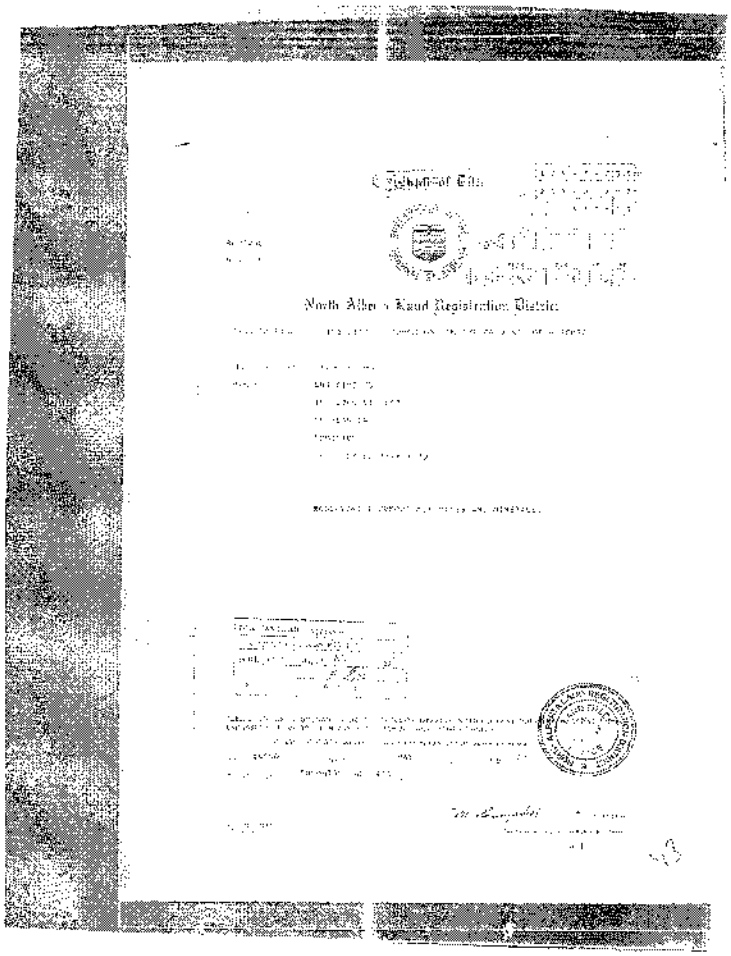
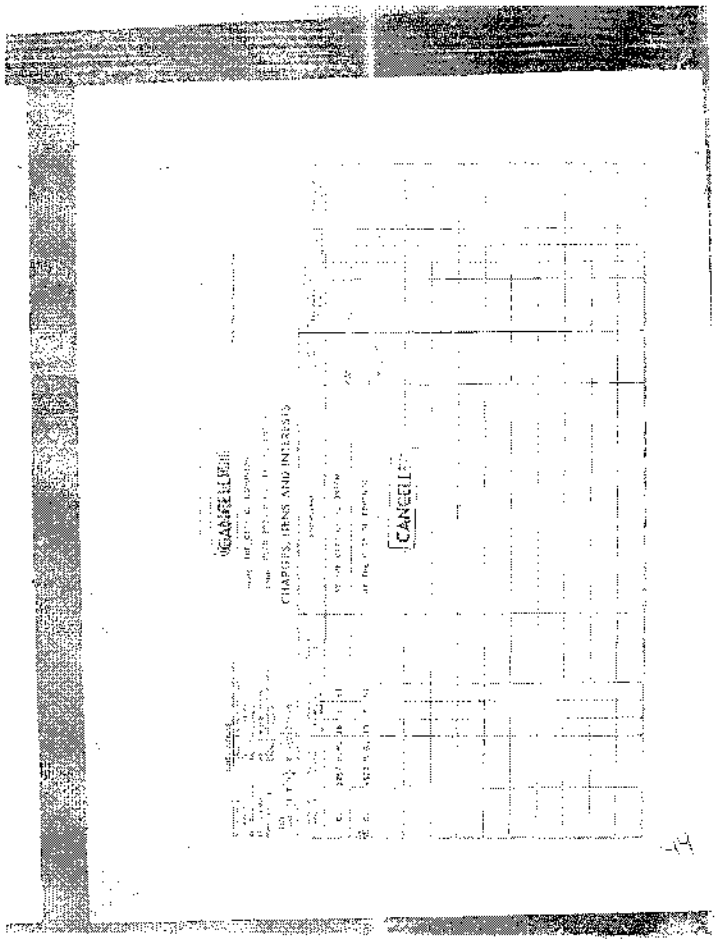
CHARGES, LIENS AND INTERESTS



North Alberta Land Registration District



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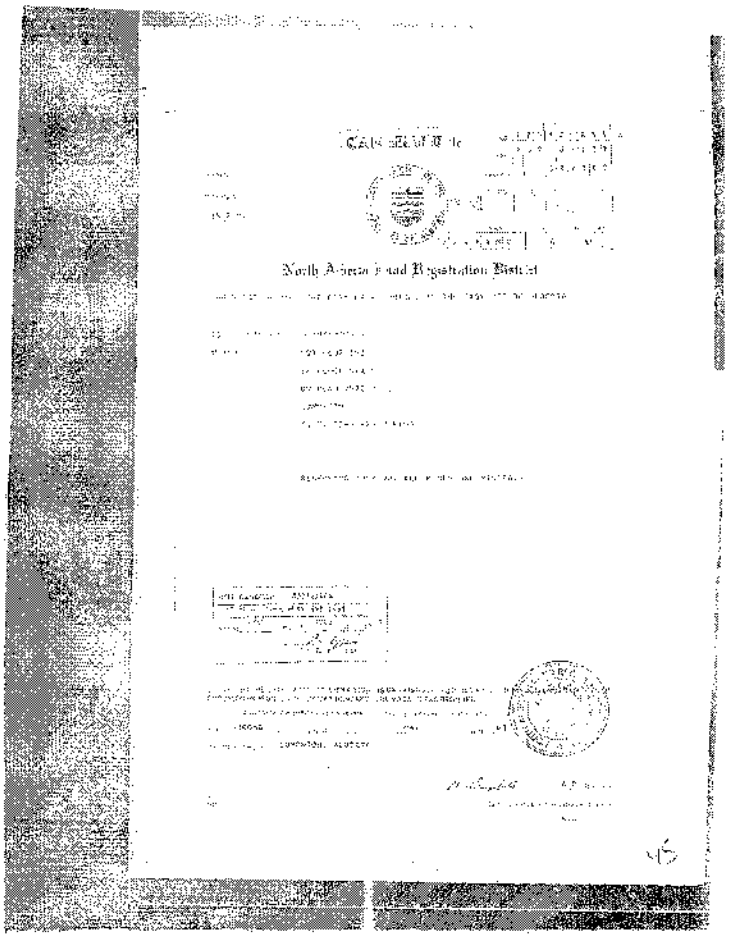
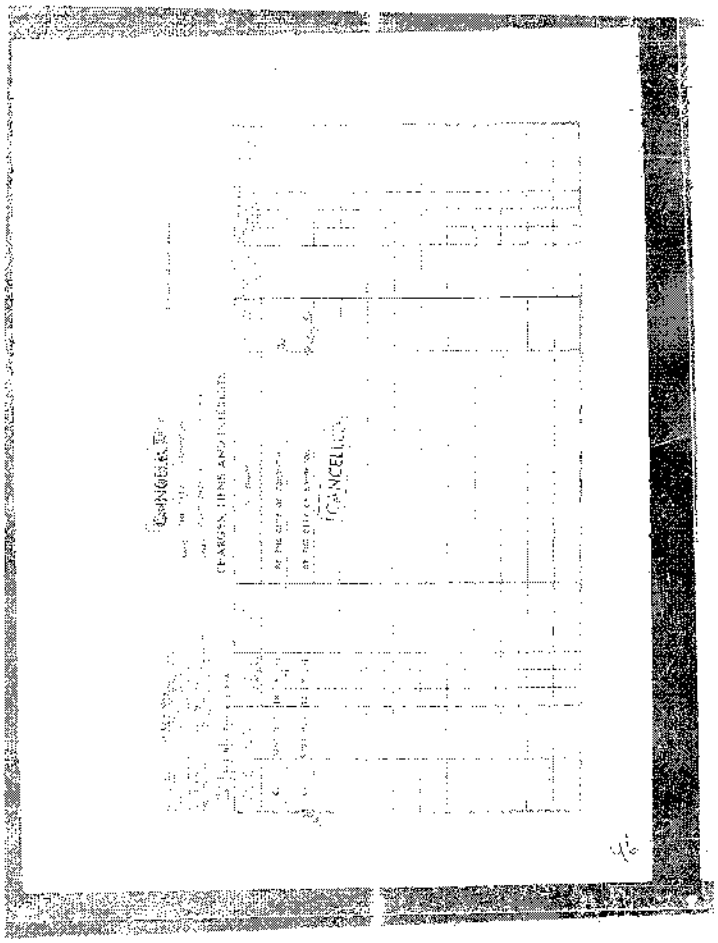
CHARGES, LIENS AND INTERESTS



North Alberta Land Registration District



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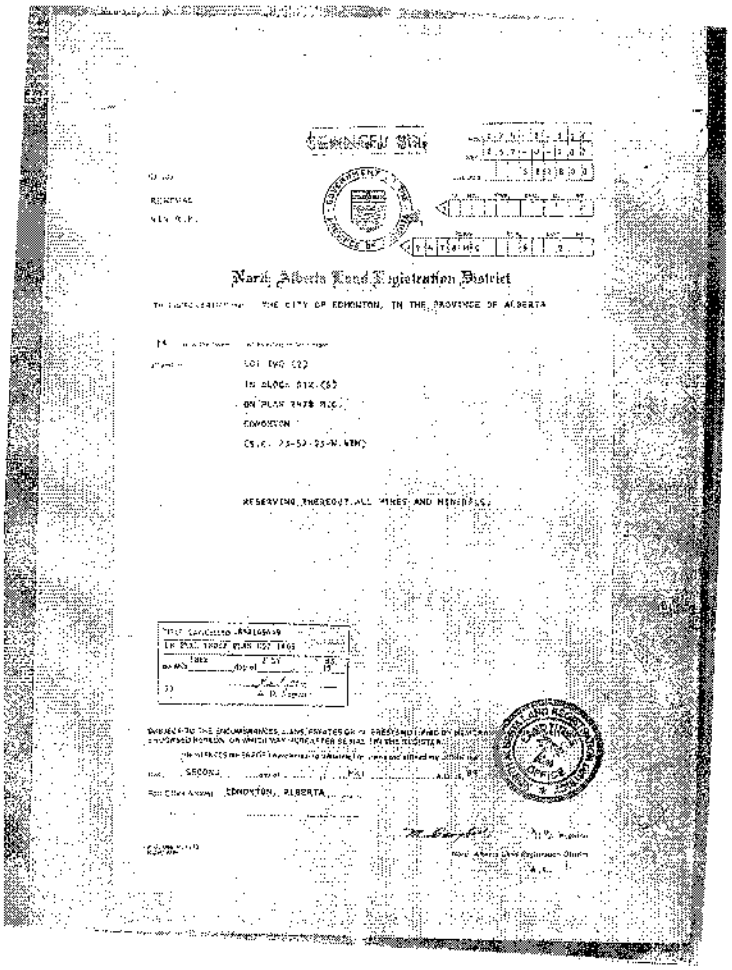
CHARGES, LIENS AND INTERESTS



CANCELLED

North Alberta Land Registration District

THE CITY OF EDMONTON, IN THE PROVINCE OF ALBERTA

LOT TWO (2)

IN BLOCK SIXTY-SIX (66)

ON PLAN 7478 H.W.

EDMONTON

CONTAINING 23.52 - 23.41 ACRES MORE OR LESS

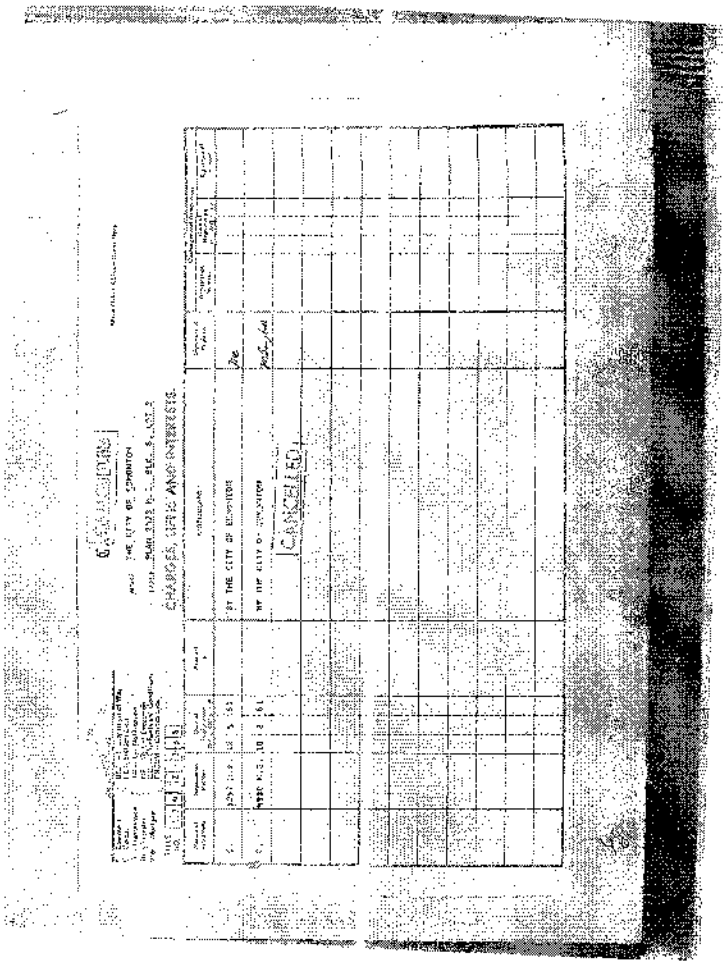
RESERVING THEREOUT ALL MINES AND MINERALS

SUBJECT TO THE ENCUMBRANCES, LIENS, ESTATES OR INTERESTS NOTIFIED BY MEMORANDUM UNDERWRITTEN OR ENDORSED HEREON, OR WHICH MAY HEREAFTER BE MADE IN THE REGISTER

IN WITNESS WHEREOF I HAVE HEREUNTO SUBSCRIBED MY NAME AND AFFIXED MY OFFICIAL SEAL

THIS SECOND DAY OF MAY A.D. 1957

FOR DISTRICT REGISTRAR, EDMONTON, ALBERTA



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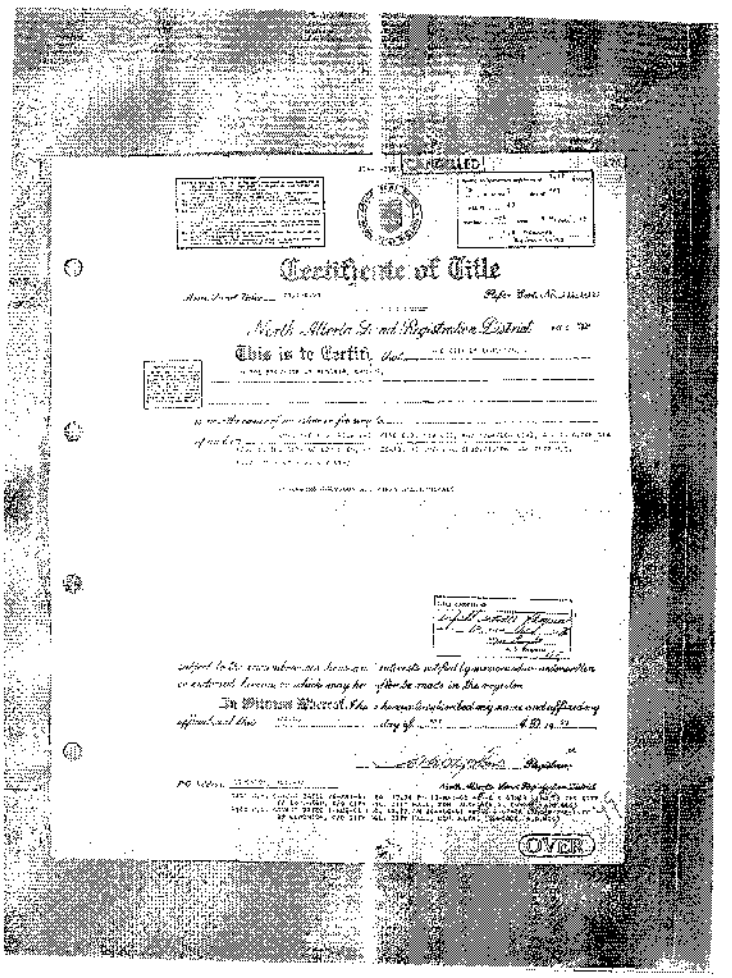
CHARGES, LIENS AND INTERESTS



CANCELLED

Certificate of Title

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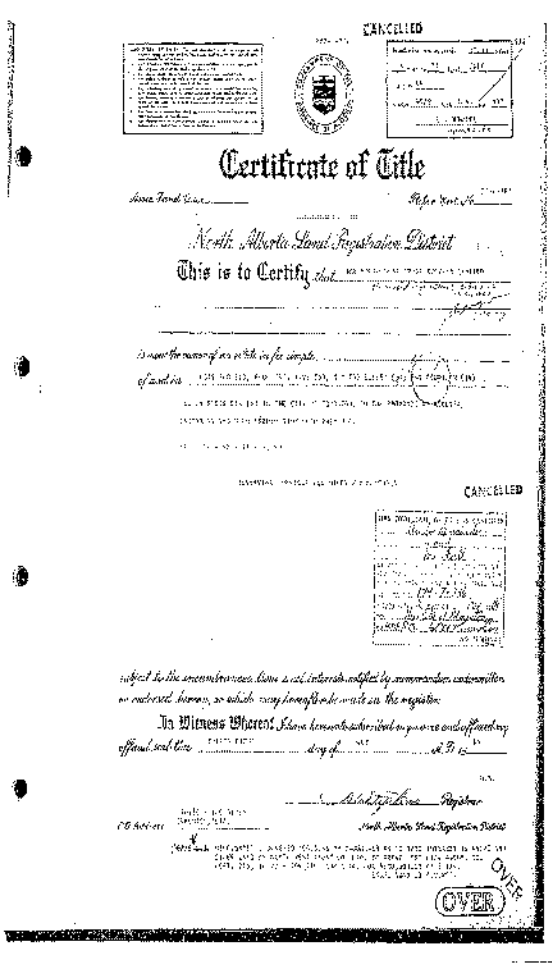
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

Registrar

North Alberta Land Registration District

OVER



CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that

CANCELLED

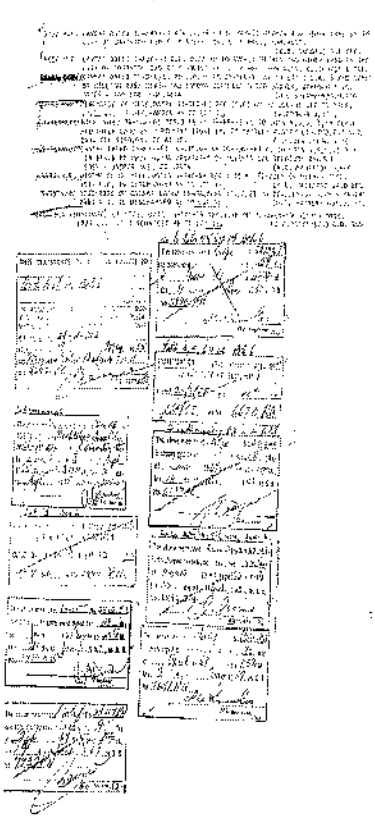
subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

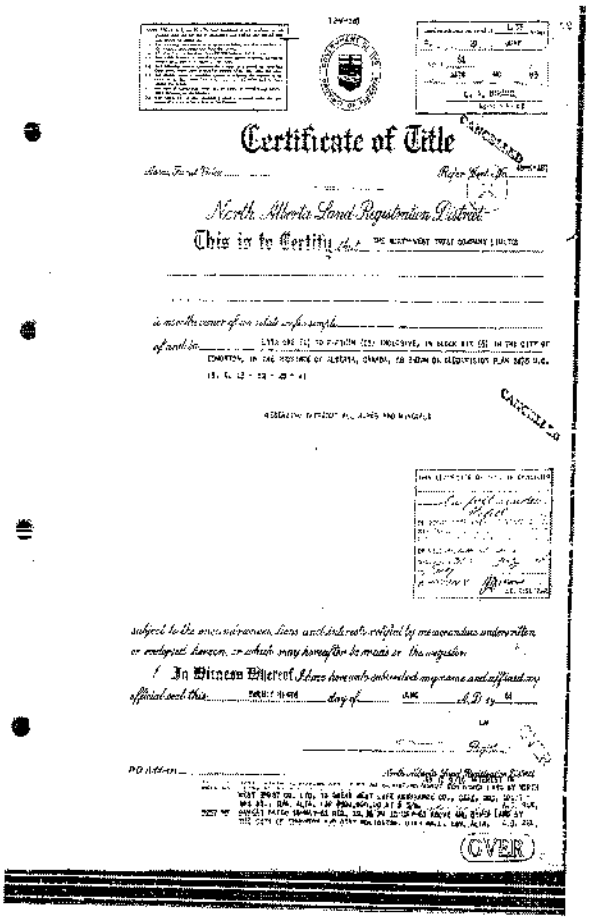
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

Registrar

North Alberta Land Registration District

OVER





Certificate of Title

North Alberta Land Registration District

This is to Certify that

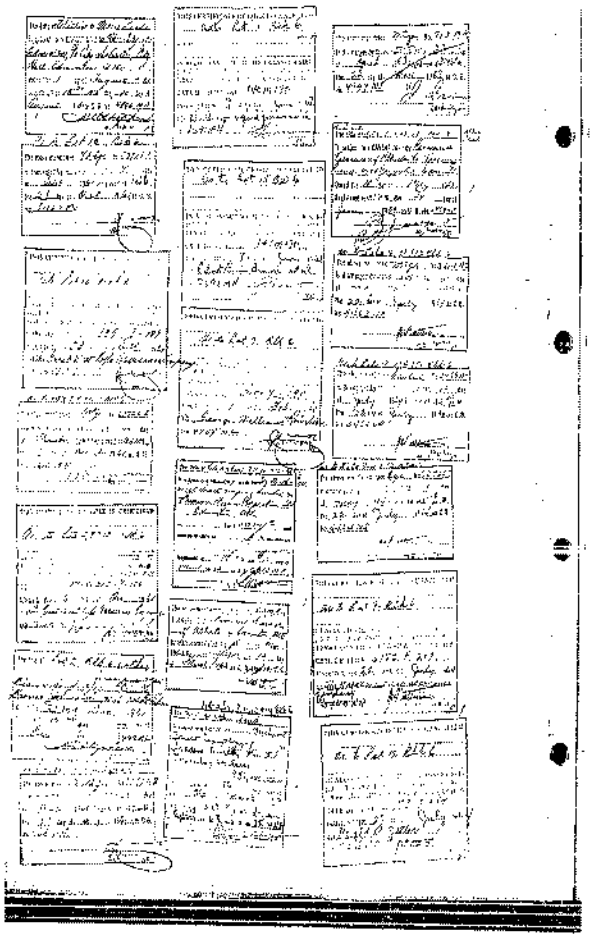
CANCELLED

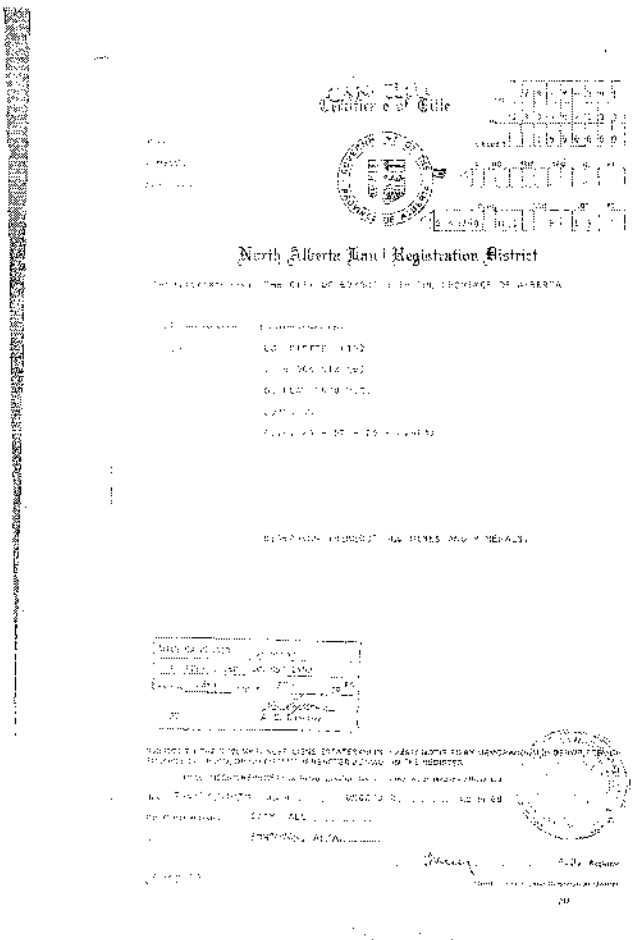
CANCELLED

subject to the encumbrances, liens and interests noted on the memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this

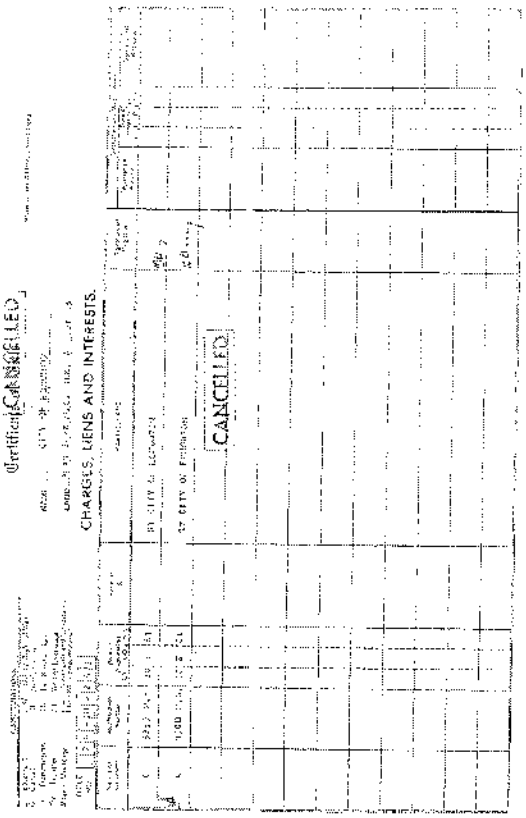
OVER

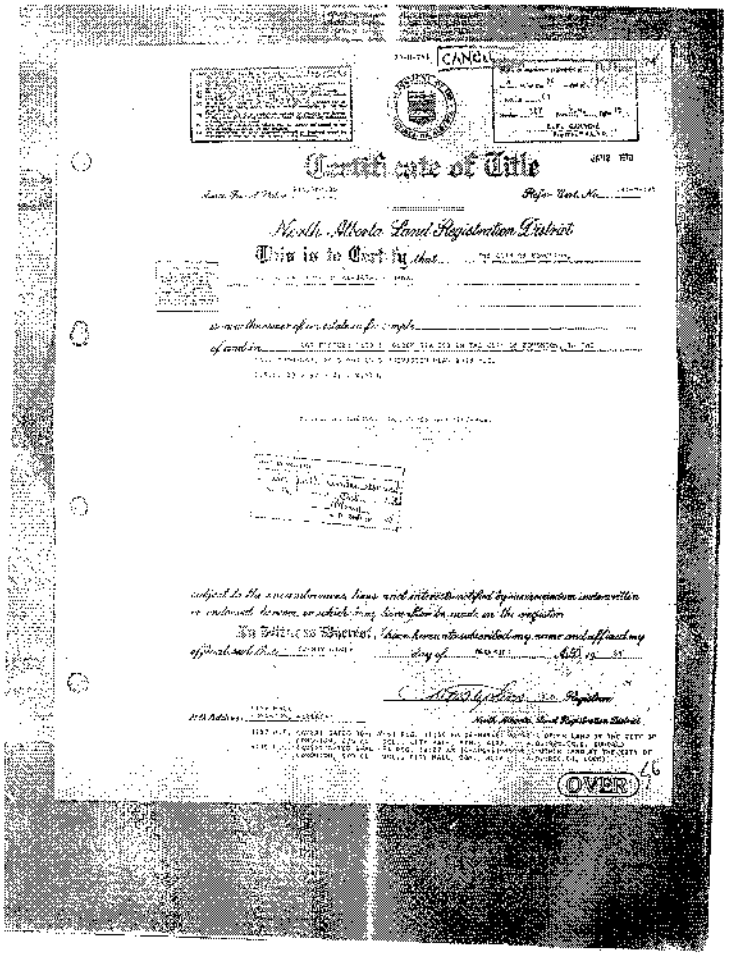




Certificate of Title

North Alberta Land Registration District


Certificate CANCELLED
CHARGES, LIENS AND INTERESTS
CANCELLED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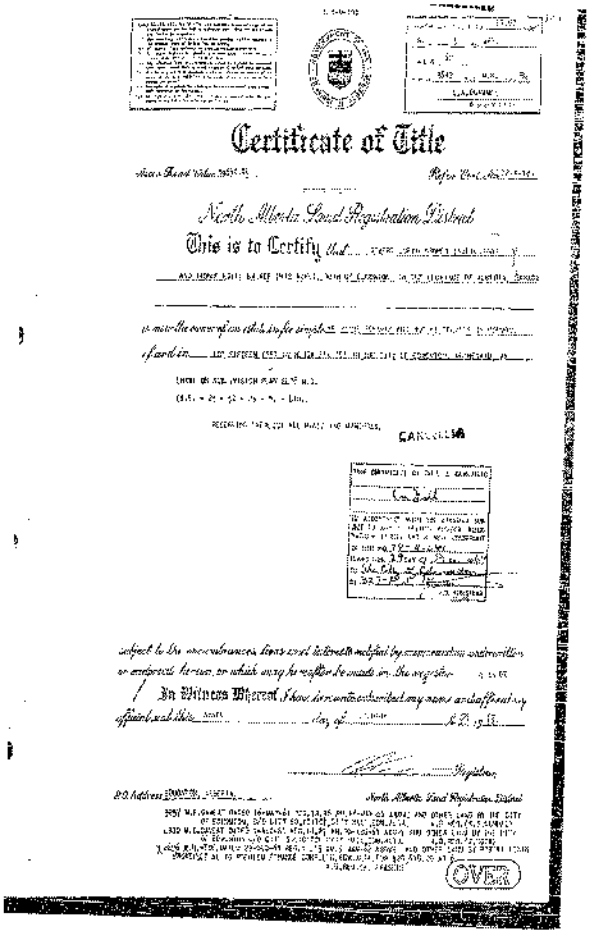
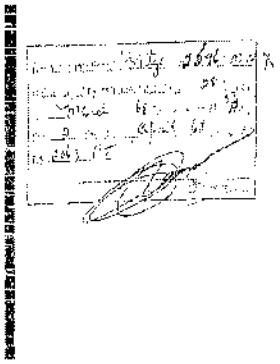
Certificate of Title
North Alberta Land Registration District
This is to Certify that
OVER


Certificate of Title
North Alberta Land Registration District
This is to Certify that
CANCELLED
In Witness Whereof
OVER



CANCELLED

Certificate

RENEWAL

2975 R.L.

North Alberta Land Registration District

[illegible] IN THE PROVINCE OF ALBERTA

LOT ONE (1)

IN BLOCK SIX (6)

ON PLAN 2975 R.L.

EDMONTON

(S.E. 29-52-23-W.4TH)

RESERVING THEREOF ALL MINES AND MINERALS.

TITLE CANCELLED [illegible]

[illegible] PLAN 852 1365

SUBJECT TO THE ENCUMBRANCES, LIENS, AND INTERESTS NOTIFIED BY MEMORANDUM UNDERWRITTEN OR ENDORSED HEREON, OR WHICH MAY HEREAFTER BE MADE IN THE REGISTER

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal

this TWENTY NINTH day of DECEMBER A.D. 19[illegible]

C/O CITY SALES [illegible] DEPT.

EDMONTON, ALBERTA

A.D.R., Registrar

North Alberta Land Registration District

THE CITY OF EDMONTON

BY THE CITY OF EDMONTON

CANCELLED

60

The above mentioned [illegible] is discharged by instrument [illegible] the 2 day of April [illegible]

CANCELLED

Certificate of Title

Assessed Value [illegible] Before Cert. No. [illegible]

North Alberta Land Registration District

This is to Certify that [illegible]

[illegible], CANADA,

is now the owner of an estate in fee simple [illegible]

of and in LOT ONE (1) IN BLOCK SIX (6) [illegible] CITY OF EDMONTON [illegible]

(S.E. - 29 - 52 - 23 - W. - 4TH.)

RESERVING THEREOUT ALL MINES AND MINERALS.

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible] A.D. 19[illegible]

Registrar

P.O. Address [illegible]

North Alberta Land Registration District

OVER

61

62

T2-K-107

Certificate of Title

Assess. Fixed Value ___ Refer Cert. No. ___

CANCELLED

North Alberta Land Registration District

This is to Certify that THE NORTHWEST TRUST COMPANY LIMITED

is now the owner of an estate in fee simple of and in LOTS ONE (1) TO FIFTEEN (15) INCLUSIVE, IN BLOCK SIX (6) IN THE CITY OF EDMONTON, IN THE PROVINCE OF ALBERTA, CANADA, AS SHOWN ON SUBDIVISION PLAN 2820 U.C. (O. E. 23 - 52 - 25 - 4)

CANCELLED

RESERVING THEREOUT ALL MINES AND MINERALS

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this TWENTY NINTH day of JUNE A.D. 19__

Registrar

P.O. Address ___ North Alberta Land Registration District

(OVER)

63

64

40-K-107

Certificate of Title

Assess. Fixed Value $80,360.00 Refer Cert. No. ___

North Alberta Land Registration District

This is to Certify that THE NORTH-WEST TRUST COMPANY LIMITED

is now the owner of an estate in fee simple of and in ALL THAT PORTION OF SECTION TWENTY THREE (23) TOWNSHIP FIFTY ONE (51) RANGE TWENTY FIVE (25) WEST OF THE FOURTH MERIDIAN, IN THE PROVINCE OF ALBERTA, CANADA, LYING SOUTH OF THE SASKATCHEWAN RIVER, AS SHOWN ON A PLAN OF SURVEY OF THE SAID TOWNSHIP SIGNED AT OTTAWA ON THE 25TH DAY OF OCTOBER, A.D. 1907, CONTAINING TWO HUNDRED AND FORTY EIGHT (248) ACRES MORE OR LESS. EXCEPTING THEREOUT ... OF THE SOUTH WEST QUARTER ... ACRES MORE OR LESS AND ... OF THE SOUTH EAST QUARTER ... AS SHOWN ON SAID PLAN ... THE LAND HEREBY DESCRIBED CONTAINING ...

RESERVING THEREOUT ALL COAL ... RESERVING THEREOUT ALL OTHER MINES AND MINERALS

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this THIRTY NINTH day of JUNE A.D. 19 61

Registrar

P.O. Address ___ North Alberta Land Registration District

(OVER)

65

66

Certificate of Title

Area Land Value 120,000.00 — Prior Cert. No. 151-I-173

North Alberta Land Registration District

This is to Certify that THE [illegible] TRUST COMPANY, [illegible]

is now the owner of an estate in fee simple [illegible]

of and in ALL THAT PORTION OF SECTION THIRTY THREE (33) TOWNSHIP FIFTY TWO (52) RANGE TWENTY FIVE (25) WEST OF THE FOURTH MERIDIAN, IN THE PROVINCE OF ALBERTA, CANADA, LYING SOUTH OF THE SASKATCHEWAN RIVER AS SHOWN ON A PLAN OF SURVEY OF THE SAID TOWNSHIP SIGNED AT OTTAWA ON THE 13TH DAY OF OCTOBER A.D. 1893, CONTAINING TWO HUNDRED AND FORTY EIGHT (248) ACRES MORE OR LESS. EXCEPTING [illegible] OUT OF THE SOUTH WEST QUARTER, SIX AND FORTY SEVEN HUNDREDTHS (6.47) ACRES MORE OR LESS AND [illegible] AND NINETY FIVE HUNDREDTHS (1.95) ACRES MORE OR LESS OUT OF THE SOUTH EAST QUARTER, BOTH AS SHOWN ON ROAD PLAN [illegible]

THE LAND HEREIN DESCRIBED CONTAINING TWO HUNDRED AND THIRTY NINE AND FIFTY EIGHT HUNDREDTHS (239.58) ACRES MORE OR LESS.

RESERVING THEREOUT ALL COAL AND ALSO [illegible] ALL OTHER MINES AND MINERALS

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this TWENTY SIXTH day of JUNE A.D. 19 61

Registrar, North Alberta Land Registration District

P.O. Address [illegible]

OVER

Certificate of Title

North Alberta Land Registration District

This is to Certify that [illegible]

is now the owner of an estate in fee simple [illegible]

of and in [illegible]

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible] A.D. 19 [illegible]

Registrar, North Alberta Land Registration District

P.O. Address [illegible]

OVER

The above mentioned Caveat No. [illegible] [illegible] dated the 7 day of Sept 1958 [illegible] Has 17 day of Sept 1959 [illegible] No. 7339 L.K.

Registrar

The Title of within & other land is subject to a CAVEAT filed by The City of Edmonton [illegible] City Hall, Edmonton dated the 26 day of May [illegible] Registered at 12.36 P.M. the 28 day of May [illegible] as C.D. No. 3257 M.F.

Registrar

Certificate of Title

North Alberta Land Registration District

This is to Certify that [illegible]

is now the owner of an estate in fee simple [illegible]

of and in [illegible]

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible] A.D. 19 [illegible]

Registrar, North Alberta Land Registration District

P.O. Address [illegible]

71

72

5455 J.J. MTGE. DATED 2-OCT-53 REG. 2.41 PM 8-OCT-53 WITHIN EDM. CAT. 6984 J.G. AND OTHER CASE. AND OTHER LAND IS SUBJECT TO A MTGE. BY TRANS MOUNTAIN OIL PIPE LINE CO. TO MONTREAL TRUST CO., MONTREAL, QUE., FOR $65,000,000.00 AT 4 AND 4 1/8.
A.D.REG.
2458 K.P. CAVEAT DATED 18-JAN-57 REG. 4.33 PM 18-JAN-57 WITHIN LAND BY CROSSTOWN INVESTMENTS LTD. C/O SHEPONSEN AND BURCER, 734 TEGLER BLDG., EDM. ALTA.
A.D.REG.

THIS CERTIFICATE OF TITLE IS CANCELLED

A.D. REGISTRAR

73

CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that [illegible]

is now the owner of an estate in fee simple

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible] 19[illegible]

Registrar
North Alberta Land Registration District

P.O. Address EDMONTON, ALTA.

OVER

74

41

75

CANCELLED 102

Certificate of Title.

North Alberta Land Registration District

This is to Certify that [illegible]

is now the owner of an estate in fee simple

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

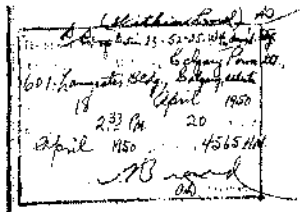
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible] 19[illegible]

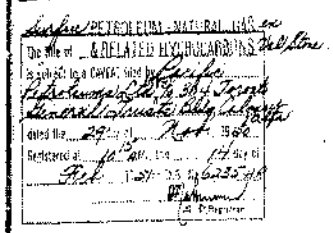
Registrar
North Alberta Land Registration District

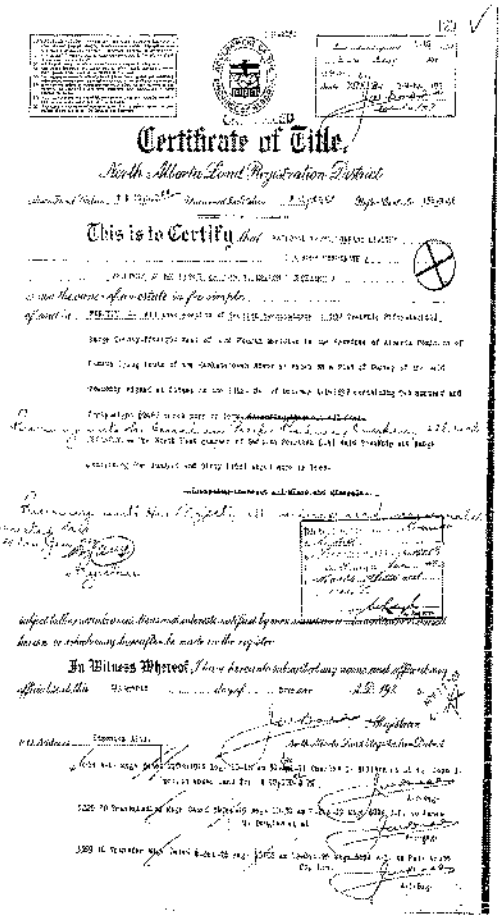
P.O. Address EDMONTON, ALTA.

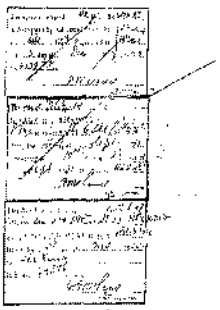
76

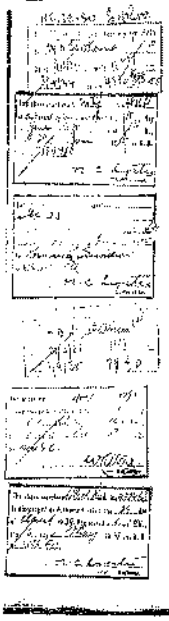
OVER

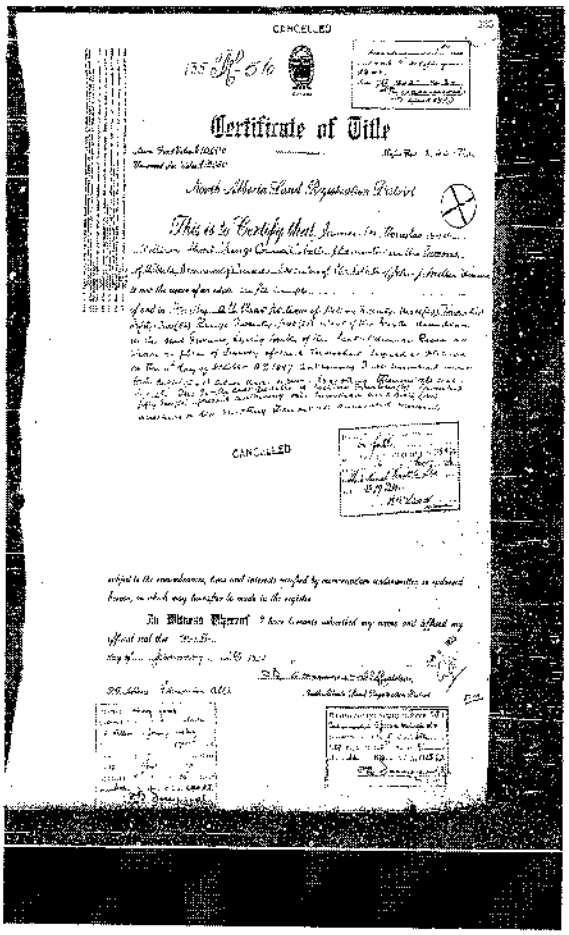












above Land
[illegible] the day
[illegible]
[illegible] day of Octobe[r]
Registered at [illegible]
Dec 1922 [illegible]
F.B. [illegible]
Registrar

The above mentioned [illegible] No. [illegible]
is discharged by instrument dated the [illegible] day
of [illegible] 1923, Registered at [illegible] M.,
the [illegible] day of [illegible] 192[illegible], as D. B.
No. [illegible]
F.B. [illegible]
Registrar

The above mentioned mortgage No. [illegible]
TRANSFERRED to National Trust Co. Ltd
by instrument dated the [illegible] day of Oct
192[illegible] Registered at 10 [illegible] the 12 day
of Oct 192[illegible] as D. B. No. 3359 [illegible]
A.M. [illegible]
Registrar

No. T50

Certificate of Title.

[illegible]

[illegible] CANCELLED [illegible] Land Registration District.

This is to Certify that [illegible] and Charles [illegible] of [illegible] in the Province of [illegible] and William [illegible] in the Province of [illegible] Dominion of Canada.

[illegible] estate in fee simple

of and in [illegible] All that portion of Section [illegible] of Township [illegible] in the Province of Alberta [illegible] containing [illegible] acres more or less. Excepting thereout all [illegible] acres more or less [illegible]

[illegible]

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this Twenty [illegible] day of [illegible] A.D. 192[illegible]

[illegible] Registrar,

[illegible] Land Registration District [illegible]

[illegible] above Land [illegible] John [illegible] [illegible] Registrar

The title of above Land is subject to a Caveat filed by [illegible] Dated the 2[illegible] day of [illegible] 19[illegible] Registered [illegible] the [illegible] day of July 19[illegible] as Day Book No. [illegible] Registrar

The title of [illegible] is subject to a Ca[veat] filed by David [illegible] [illegible] Dated the 2[illegible] day of July 19[illegible] Registered [illegible] the 2[illegible] day of July 19[illegible] as D. Book No. [illegible] Registrar

The above mentioned Caveat [illegible] is discharged by instrument dated the [illegible] day of [illegible] 192[illegible] Registered at [illegible] the [illegible] day of [illegible] as D. B. No. 6[illegible] [illegible] Registrar

The above mentioned Caveat [illegible] is discharged by instrument dated the [illegible] day of [illegible] 192[illegible] Registered at [illegible] the [illegible] day of [illegible] 192[illegible] as D. B. No. 6[illegible] [illegible] Registrar

The title of [illegible] Land is subject to a CAVEAT for [illegible] by the [illegible] Dated the [illegible] day of Oct 192[illegible] Registered at [illegible] the [illegible] day of [illegible] as D. B. No. [illegible] Registrar

[illegible] A I [illegible]
The above mentioned [illegible] is [illegible] by instrument dated the 5 day of Dec 19[illegible] Registered at 10 [illegible] the 7 day of Dec 19[illegible] as [illegible] Registrar

No. D39

Certificate of Title.

[illegible]

[illegible] Land Registration District [illegible]

This is to Certify that [illegible] and [illegible] of the Province of [illegible] estate in fee simple

of and in [illegible] All that portion of Section [illegible] Township [illegible] [illegible] acres more or less. Excepting thereout [illegible]

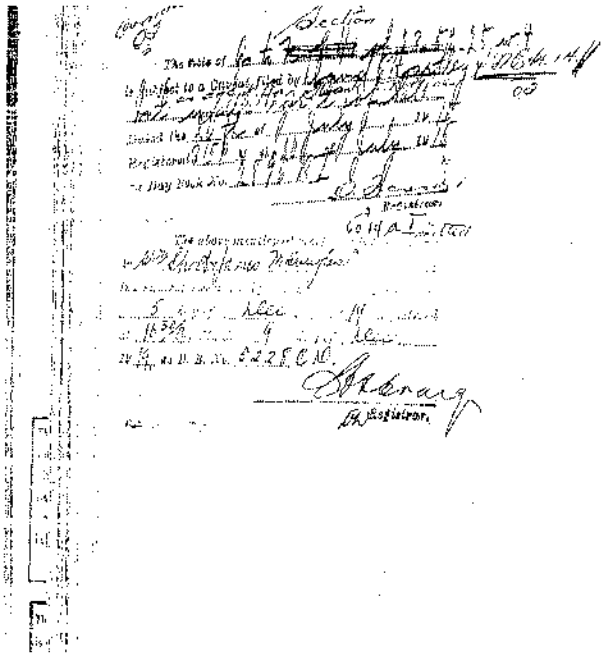
[illegible]

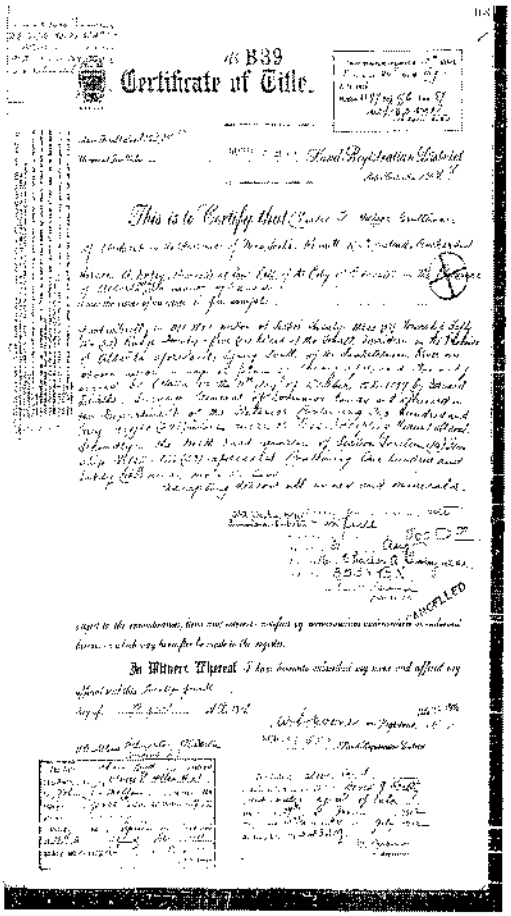
subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

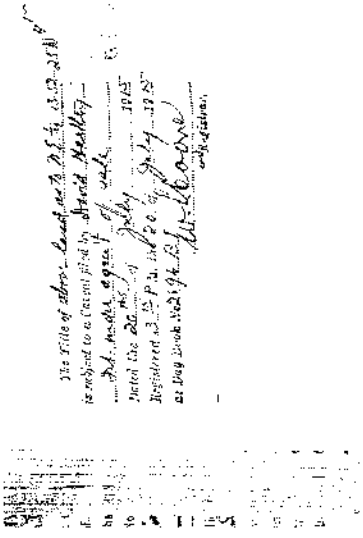
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible] [illegible] Registrar

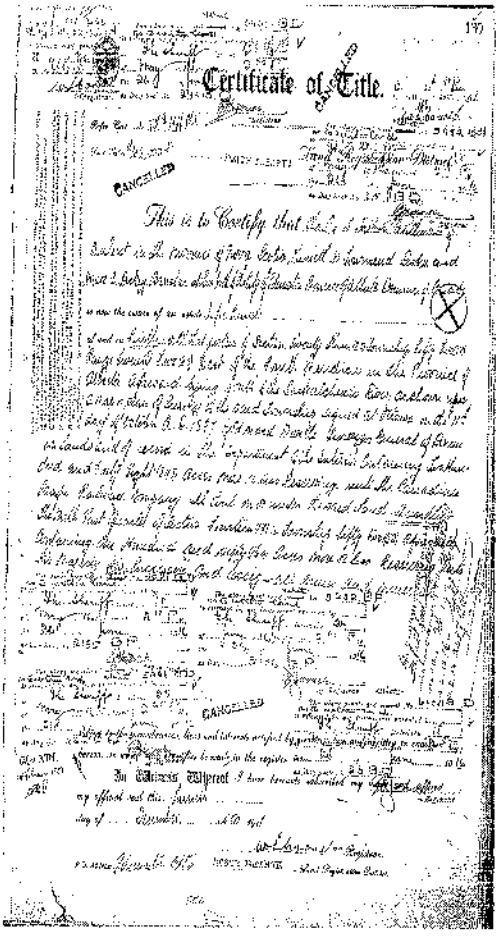
[illegible] Land Registration District

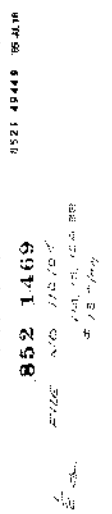
[illegible]




Certificate of Title.
This is to Certify that
In Witness Whereof
CANCELLED




Certificate of Title.
CANCELLED
This is to Certify that
In Witness Whereof



852 1469

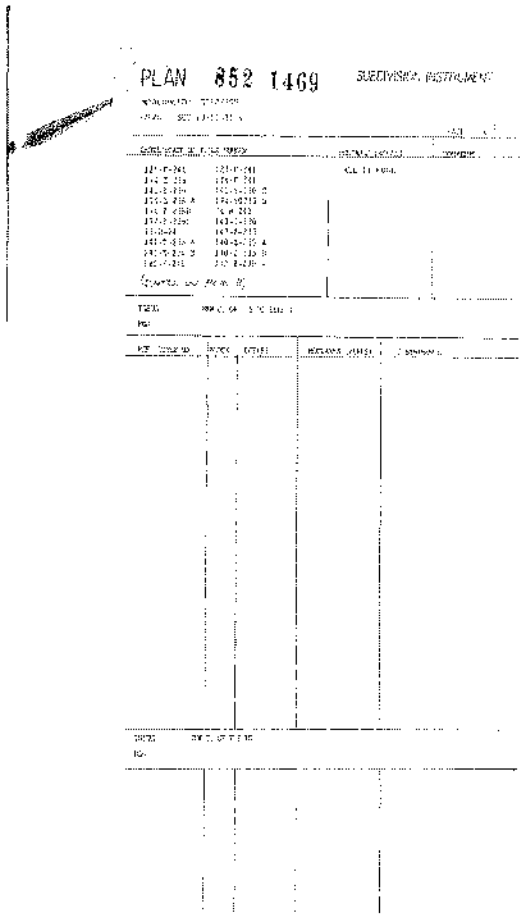
PLAN

SHOWING CONSOLIDATION OF

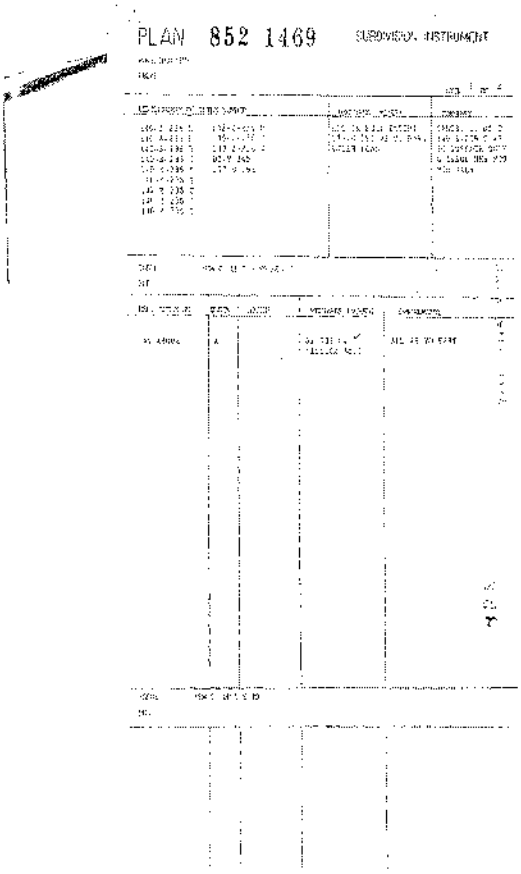
SEC. 23 TP 52 RGE 25 W4M

ALBERTA

EDMONTON



PLAN 852 1469 SUBDIVISION INSTRUMENT



PLAN 852 1469 SUBDIVISION INSTRUMENT

CANCELLED

Certificate of Title

North Alberta Land Registration District

CONVERTED
NOV 0 1984

NORTH ALBERTA LAND REGISTRATION DISTRICT
LAND TITLES OFFICE

CANCELLED

Certificate of Title

CANCELLED

Certificate of Title

North Alberta Land Registration District

THE CITY OF EDMONTON IN THE PROVINCE OF ALBERTA

LOT FIFTEEN (15)
IN BLOCK SEVEN (7)

RESERVING THEREOUT ALL MINES AND MINERALS.

EDMONTON, ALBERTA

CANCELLED

Certificate of Title

CHARGES, LIENS AND INTERESTS

CANCELLED

THE CITY OF EDMONTON

CANCELLED

North Alberta Land Registration District

THE CITY OF EDMONTON IN THE PROVINCE OF ALBERTA.

LOT EIGHT (8)
IN BLOCK SEVEN (7)
ON PLAN 1925 H.C
EDMONTON
(REVERSEND - S 1/2 = 53-53-25-W.4)

RESERVING THEREOUT ALL MINES AND MINERALS.

EDMONTON, ALBERTA.

MAY

Certificate of Title
CANCELLED

CHARGES, LIENS AND INTERESTS.

CANCELLED

BY THE CITY OF EDMONTON

CANCELLED

North Alberta Land Registration District

THE CITY OF EDMONTON IN THE PROVINCE OF ALBERTA.

LOT EIGHT (8)
IN BLOCK SEVEN (7)
ON PLAN 1925 H.C.
EDMONTON
(REVERSEND - S 1/2 = 53-53-25-W.4)

RESERVING THEREOUT ALL MINES AND MINERALS.

EDMONTON, ALBERTA.

MAY

Certificate of Title
CANCELLED

CHARGES, LIENS AND INTERESTS.

CANCELLED

BY THE CITY OF EDMONTON

CANCELLED

Certificate of Title

North Alberta Land Registration District

THE CITY OF EDMONTON IN THE PROVINCE OF ALBERTA

LOT FIVE (5)

IN BLOCK SEVEN (7)

ON PLAN 4694 H.W.

EDMONTON

EXCEPTING THEREOUT ALL MINES AND MINERALS

SUBJECT TO THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM UNDERWRITTEN OR ENDORSED HEREON OR HEREAFTER MADE IN THE REGISTER.

GIVEN UNDER THE SEAL OF THE LAND TITLES OFFICE

AT EDMONTON, ALBERTA, THIS 30TH DAY OF MAY A.D. 1969

LAND TITLES OFFICE

CHARGES, LIENS AND INTERESTS

CANCELLED

CANCELLED

Certificate of Title

North Alberta Land Registration District

THE CITY OF EDMONTON IN THE PROVINCE OF ALBERTA

LOT FIVE (5)

IN BLOCK SEVEN (7)

ON PLAN 4694 H.W.

EDMONTON

EXCEPTING THEREOUT ALL MINES AND MINERALS

SUBJECT TO THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM UNDERWRITTEN OR ENDORSED HEREON OR HEREAFTER MADE IN THE REGISTER.

GIVEN UNDER THE SEAL OF THE LAND TITLES OFFICE

AT EDMONTON, ALBERTA, THIS 30TH DAY OF MAY A.D. 1969

LAND TITLES OFFICE

CHARGES, LIENS AND INTERESTS

CANCELLED

Certificate of Title

North Alberta Land Registration District

CHARGES, LIENS AND INTERESTS.

CANCELLED

CANCELLED

Certificate of Title

CANCELLED

North Alberta Land Registration District

CHARGES, LIENS AND INTERESTS.

CANCELLED

Certificate of Title

North Alberta Land Registration District

THIS IS TO CERTIFY THAT ... THE CITY OF EDMONTON ... IN THE PROVINCE OF ALBERTA

RESERVING THEREOUT ALL MINES AND MINERALS

TITLE CANCELLED

Certificate of Title

CHARGES, LIENS AND INTERESTS.

CANCELLED

CANCELLED
Certificate of Title

North Alberta Land Registration District

THIS IS TO CERTIFY THAT ... THE CITY OF EDMONTON ... IN THE PROVINCE OF ALBERTA

EDMONTON

RESERVING THEREOUT ALL MINES AND MINERALS

TITLE CANCELLED

C/O CITY HALL

EDMONTON, ALBERTA

Certificate of Title

CANCELLED

CHARGES, LIENS AND INTERESTS.

CANCELLED

CANCELLED

Certificate of Title

North Alberta Land Registration District

CANCELLED

CHARGES, LIENS AND INTERESTS

CANCELLED

Certificate of Title

North Alberta Land Registration District

CANCELLED

CHARGES, LIENS AND INTERESTS

CANCELLED

CANCEL
Certificate of Title

North Alberta Land Registration District

CANCELLED

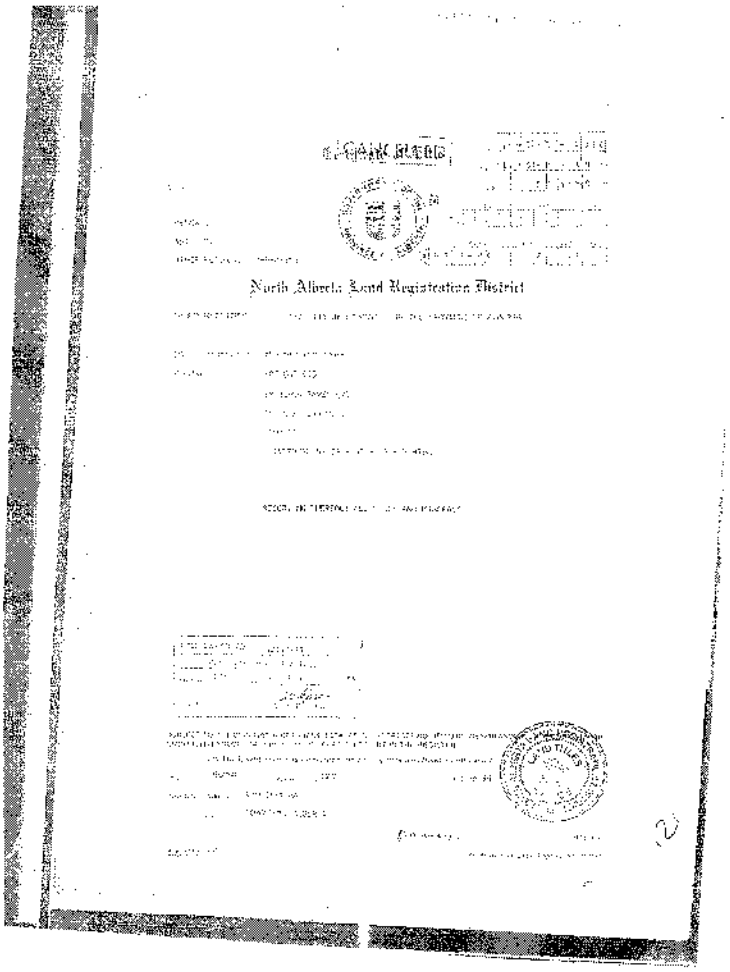
CHARGES, LIENS AND INTERESTS

CANCEL
Certificate of Title

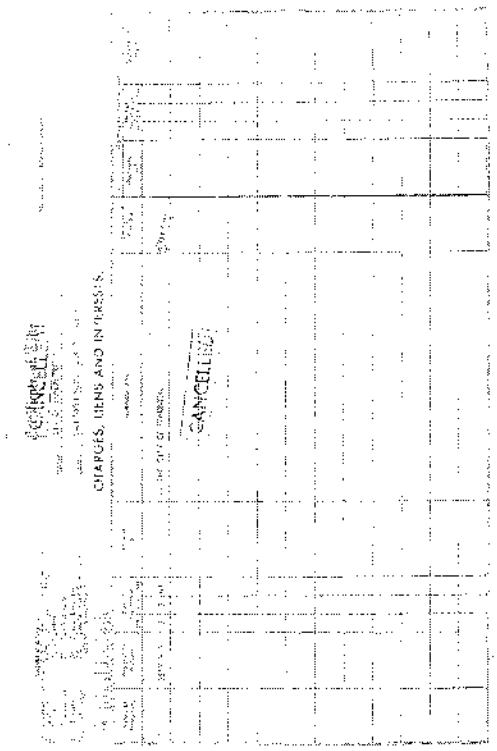
North Alberta Land Registration District

CANCELLED

CHARGES, LIENS AND INTERESTS

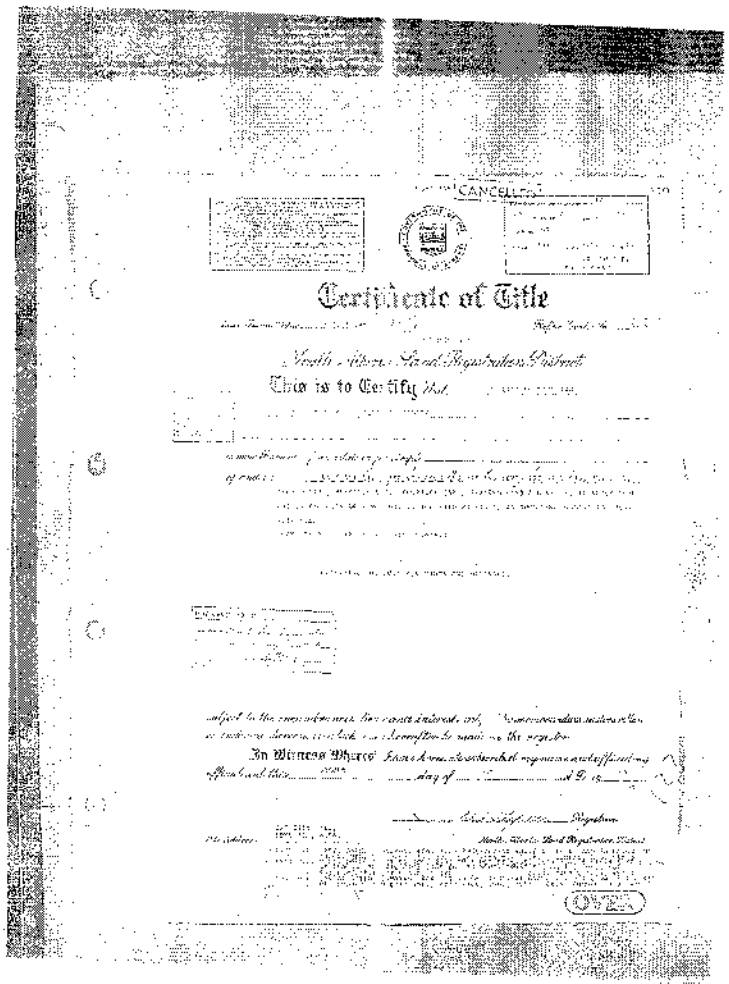


North Alberta Land Registration District



CHARGES, LIENS AND INTERESTS

CANCELLED



CANCELLED

Certificate of Title

North Alberta Land Registration District

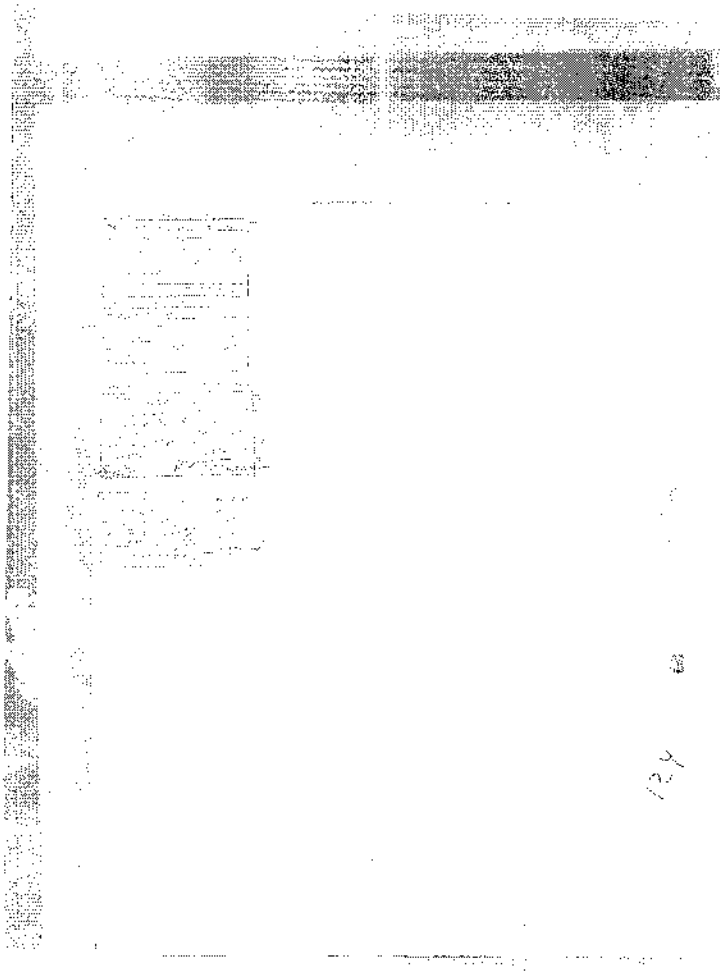
This is to Certify that

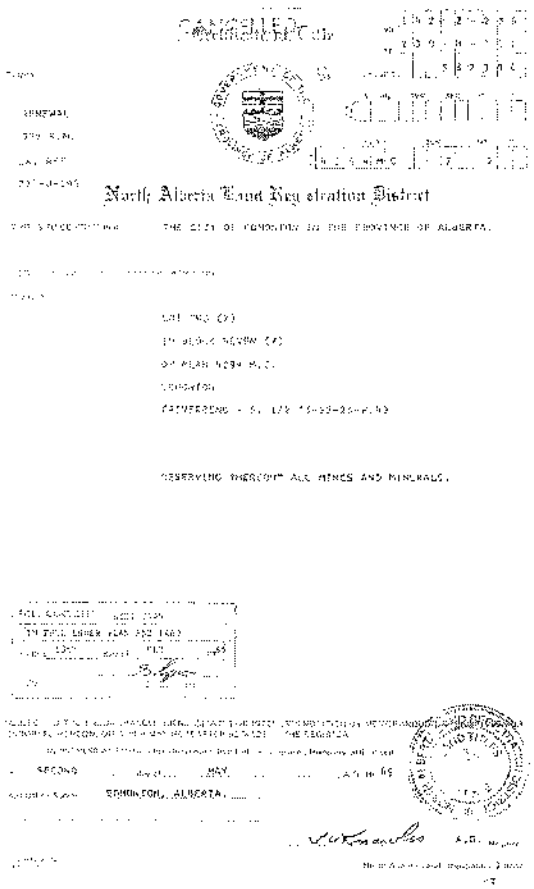
In Witness Whereof I have hereunto subscribed my name and affixed my

Seal this day of

Registrar

North Alberta Land Registration District



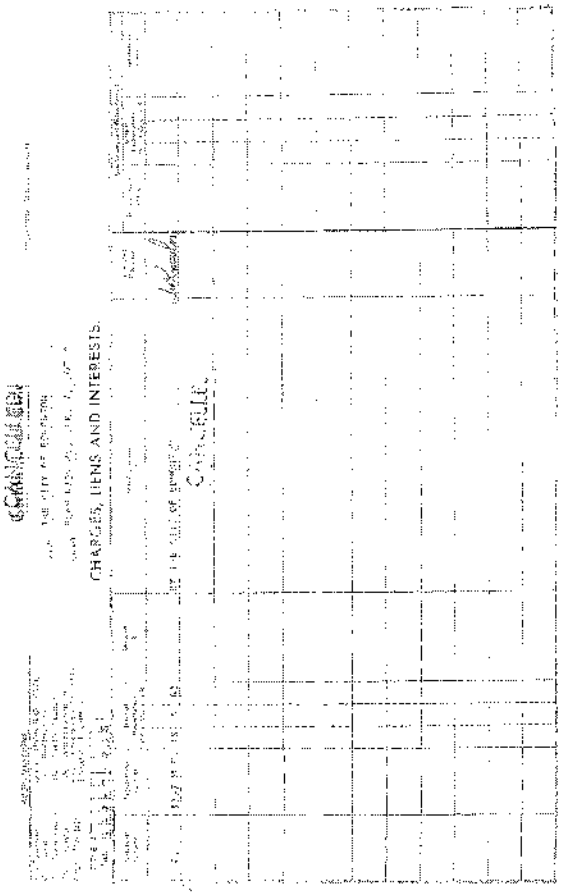


North Alberta Land Registration District

THE CITY OF EDMONTON IN THE PROVINCE OF ALBERTA.

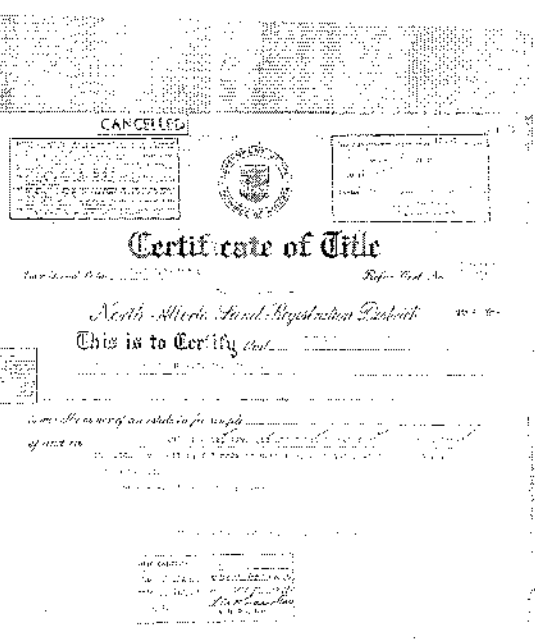
SECOND

EDMONTON, ALBERTA.



CHARGES, LIENS AND INTERESTS.

CANCELLED



Certificate of Title

North Alberta Land Registration District

This is to Certify that

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon or which may hereafter be made in the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

Registrar

North Alberta Land Registration District

CANCELLED

Certificate of Title

North Alberta Land Registration District CANCELLED

This is to Certify that

is now the owner of an estate in fee simple

of and in

subject to the encumbrances, liens and interests notified by memorandum endorsed hereon or which may hereafter be entered on the register

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

Registrar

OVER

CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that

CANCELLED

is now the owner of an estate in fee simple

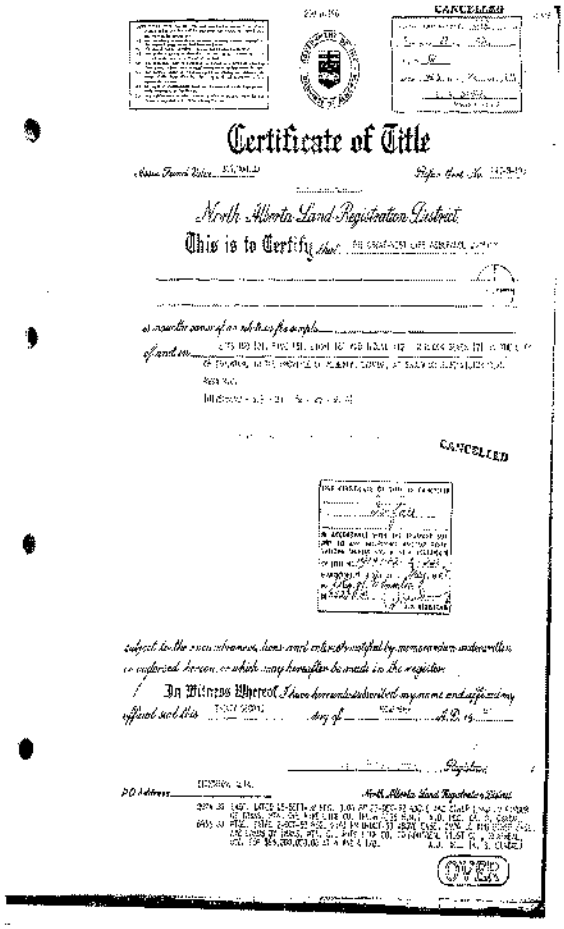
of and in

subject to the encumbrances, liens and interests notified by memorandum endorsed hereon or which may hereafter be entered on the register

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

Registrar

OVER



CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

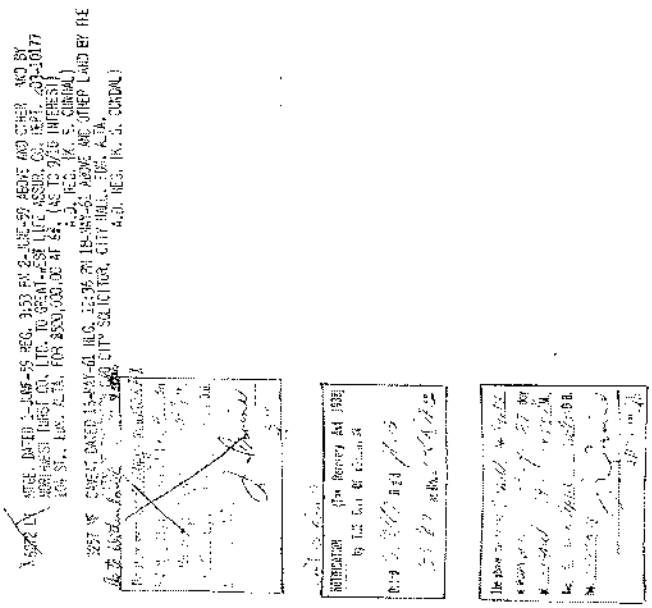
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

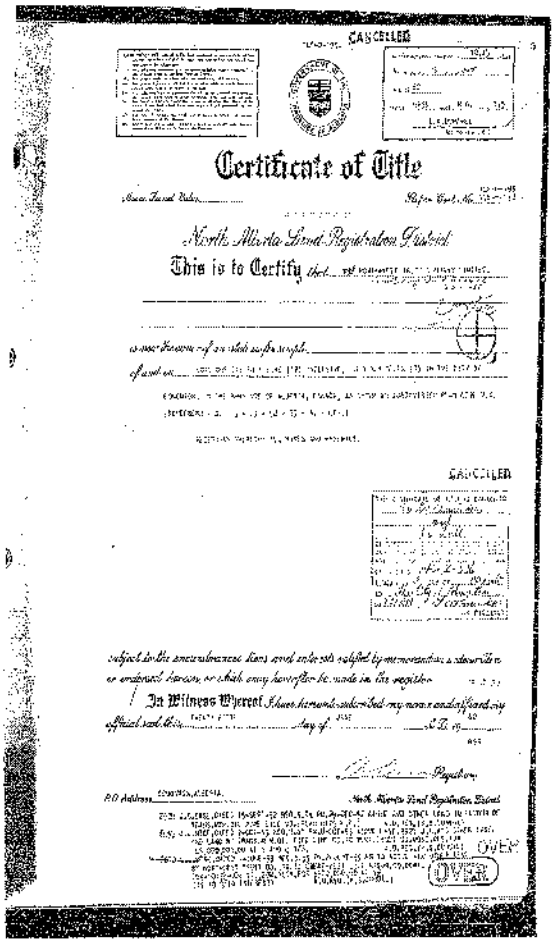
Registrar

P.O. Address

North Alberta Land Registration District

OVER





CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the register.

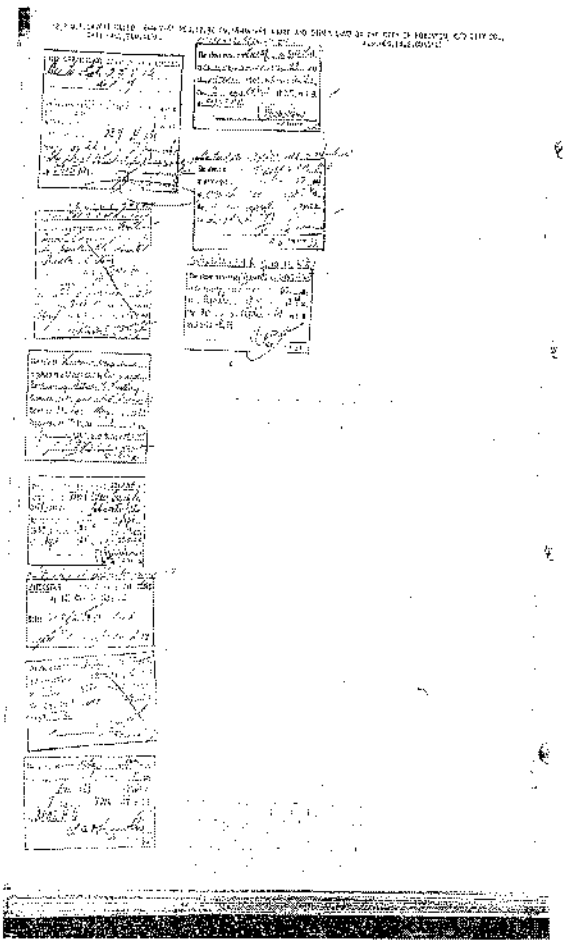
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

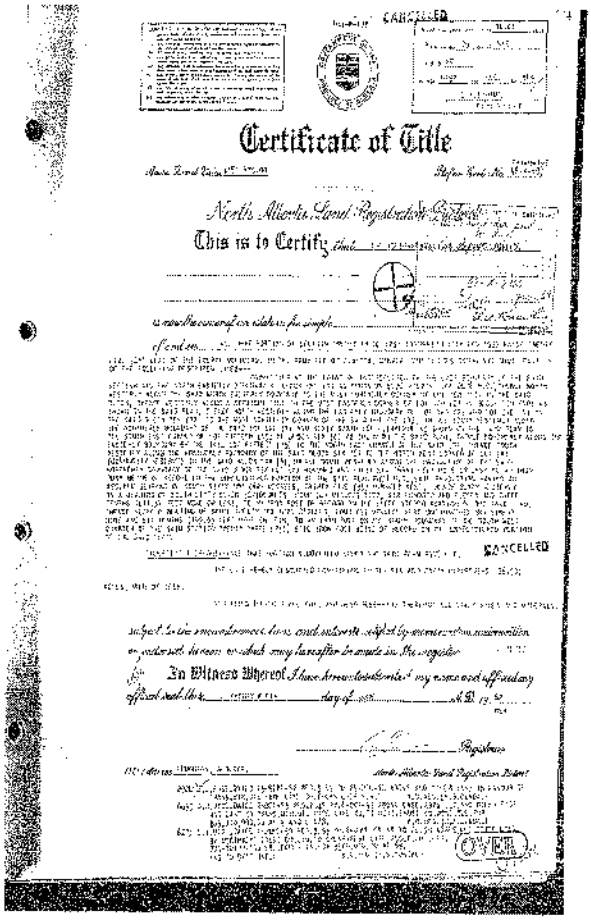
Registrar

P.O. Address

North Alberta Land Registration District

OVER





CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that

is now the owner of an estate in fee simple

of and in

CANCELLED

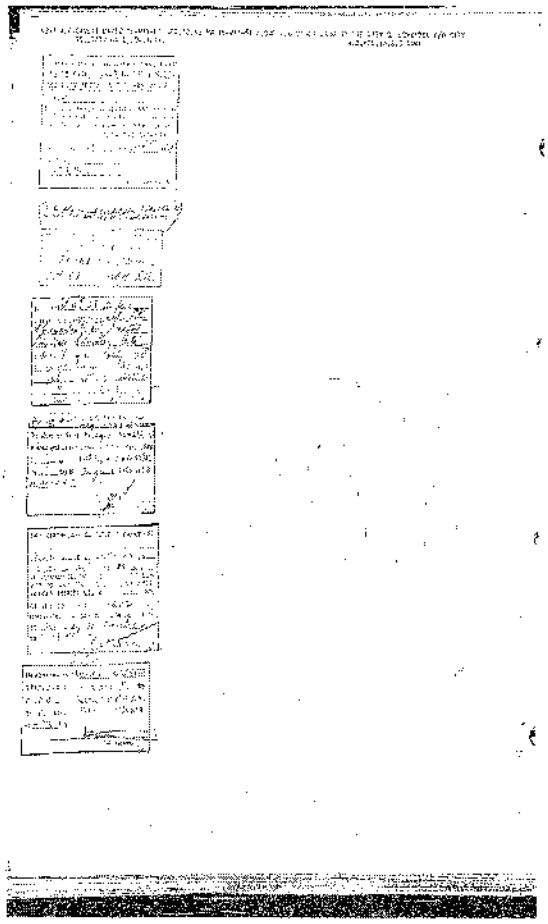
subject to the encumbrances, liens and interests notified by memorandum endorsed hereon or which may hereafter be made in the register

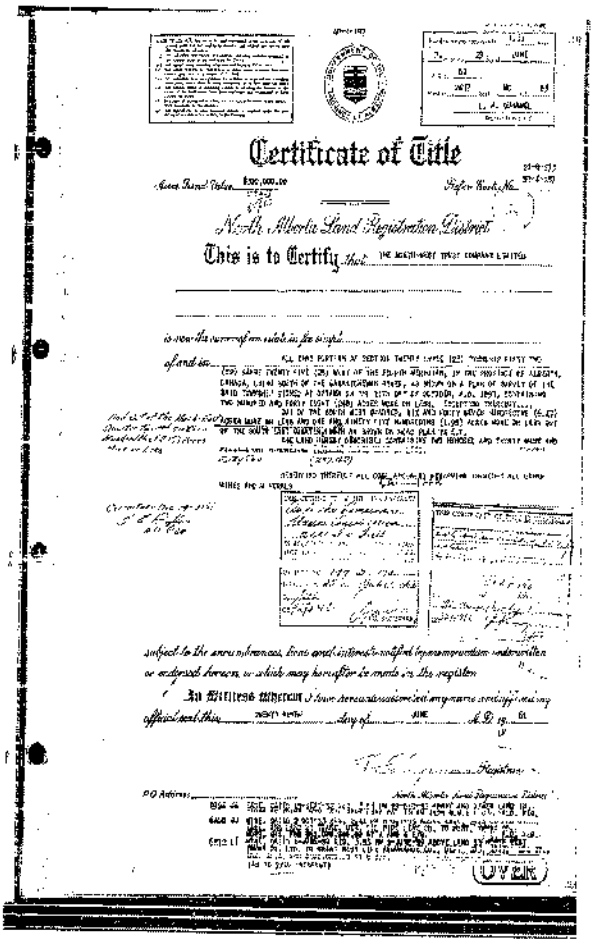
In Witness Whereof I have hereunto subscribed my name and affixed my official seal this day of A.D. 19

Registrar

North Alberta Land Registration District

OVER





CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that THE NORTH-WEST TRUST COMPANY LIMITED

is now the owner of an estate in fee simple

of and in ALL THAT PORTION OF SECTION TWENTY THREE (23) TOWNSHIP FIFTY TWO (52) RANGE TWENTY FIVE (25) WEST OF THE FOURTH MERIDIAN, IN THE PROVINCE OF ALBERTA, CANADA, LYING NORTH OF THE SASKATCHEWAN RIVER, AS SHOWN ON A PLAN OF SURVEY OF THE SAID TOWNSHIP FILED AT OTTAWA ON THE 15TH DAY OF OCTOBER, A.D. 1907, CONTAINING TWO HUNDRED AND FORTY EIGHT (248) ACRES MORE OR LESS, EXCEPTING THEREOUT:...

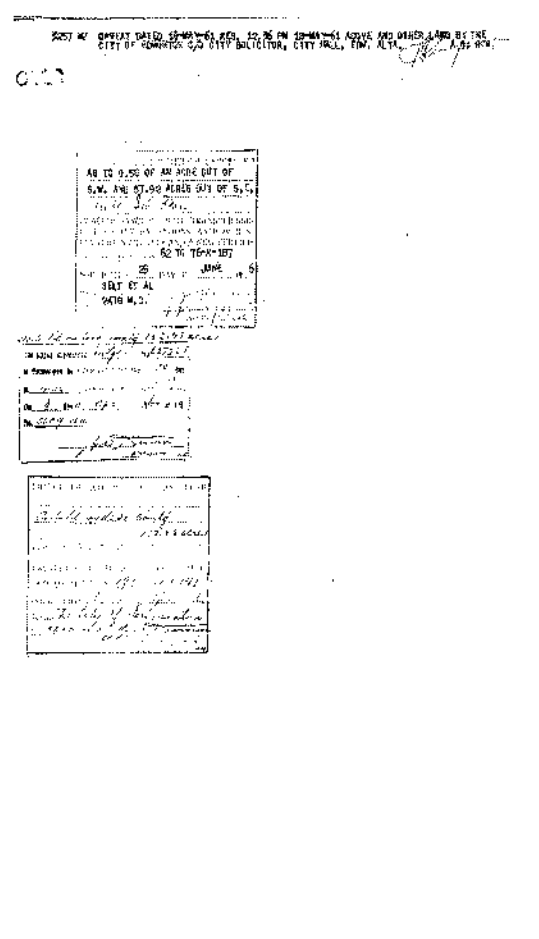
subject to the encumbrances, liens and interests notified by memorandum endorsed hereon or which may hereafter be made in the register

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this TWENTY NINTH day of JUNE A.D. 19 61

Registrar

North Alberta Land Registration District

OVER



231-M-242

4851 · 99 · 349

E. A. DUNAWEL

Certificate of Title

Assur. Fund Value $16,212.00 — Refer Cert. No. 202-E-190

North Alberta Land Registration District

This is to Certify that THE NORTH-WEST TRUST COMPANY LIMITED

is now the owner of an estate in fee simple AS TO AN UNDIVIDED TWENTY TWO AND FIFTY HUNDREDTHS (22.50) INTEREST

of and in ALL THAT PORTION OF SECTION TWENTY THREE (23) TOWNSHIP FIFTY TWO (52) RANGE TWENTY FIVE (25) WEST OF THE FOURTH MERIDIAN, IN THE PROVINCE OF ALBERTA CANADA, WHICH LIES SOUTH AND SOUTH EAST OF THE FOLLOWING DESCRIBED LINE---

COMMENCING AT THE POINT OF INTERSECTION OF THE EAST BOUNDARY OF THE SAID SECTION AND THE NORTH EASTERLY BOUNDARY OF BLOCK ONE (1), AS SHOWN ON SUBDIVISION PLAN 2478 M.C., THENCE NORTH WESTERLY ALONG THE SAID NORTH EASTERLY BOUNDARY TO THE MOST NORTHERLY CORNER OF LOT TEN (10) IN THE SAID BLOCK THENCE WESTERLY ALONG A STRAIGHT LINE TO THE MOST EASTERLY CORNER OF LOT TWO (2) IN BLOCK TEN (10) AS SHOWN ON THE SAID PLAN, THENCE NORTH WESTERLY ALONG THE EASTERLY BOUNDARY OF LOT TWO (2) AND LOT ONE IN THE SAID BLOCK TEN (10) TO THE MOST NORTHERLY CORNER OF THE SAID LOT ONE (1), THENCE SOUTH WESTERLY ALONG THE NORTHERLY BOUNDARY OF THE SAID LOT ONE (1) AND SIXTY SIXTH (66TH) AVENUE AS SHOWN ON THE SAID PLAN TO THE NORTH EAST CORNER OF LOT FIFTEEN (15) IN BLOCK SIX (6) AS SHOWN ON THE SAID PLAN, THENCE NORTH-[illegible] ALONG THE EASTERLY BOUNDARY OF THE SAID LOT FIFTEEN (15) TO THE NORTH EAST CORNER OF THE SAID LOT, THENCE SOUTH WESTERLY ALONG THE NORTHERLY BOUNDARY OF THE SAID BLOCK SIX (6) TO THE NORTH WEST CORNER OF LOT (R) (COMMUNITY RESERVE) IN THE SAID BLOCK SIX (6), THENCE SOUTH WESTERLY ALONG THE PRODUCTION OF THE SAID NORTHERLY BOUNDARY OF THE SAID BLOCK SIX (6) SIX HUNDRED AND FIFTY SIX (656) FEET MORE OR LESS TO AN IRON POST BEING OF RECORD ON THE UNREGISTERED PORTION OF THE SAID PLAN 2478 M.C., [illegible] HAVING AN ASSUMED BEARING OF SOUTH SIXTY TWO (62) DEGREES, [illegible] (35) MINUTES WEST, THENCE SOUTH WESTERLY ON A BEARING OF SOUTH SIXTY SEVEN (67) DEGREES, FOUR (4) MINUTES WEST, SIX HUNDRED AND ELEVEN AND THREE TENTHS (611.3) FEET MORE OR LESS TO AN IRON POST OF RECORD ON THE UNREGISTERED PORTION OF THE SAID PLAN, THENCE ALONG A BEARING OF SOUTH TWENTY TWO (22) DEGREES, FOUR (4) MINUTES [illegible] ONE HUNDRED AND NINETY NINE AND SIX TENTHS (199.6) FEET MORE OR LESS TO AN IRON POST ON THE SOUTH BOUNDARY OF THE SOUTH WEST QUARTER OF THE SAID SECTION TWENTY THREE (23), SAID IRON POST BEING OF RECORD ON THE UNREGISTERED PORTION OF THE SAID PLAN.

CANCELLED

EXCEPTING THEREOUT... ALL THAT PORTION SUBDIVIDED UNDER THE SAID PLAN 2478 M.C.

THE LAND HEREBY DESCRIBED CONTAINING TWENTY SIX AND FIFTY HUNDREDTHS (26.50) ACRES MORE OR LESS.

RESERVING THEREOUT ALL COAL AND ALSO RESERVING THEREOUT ALL [illegible]

Less fully ... Under Consolidation

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made on the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this TENTH day of MAY A.D. 19 62

LH

Registrar

P.O. Address LOMKNIEN, ALTA.

North Alberta Land Registration District

2924 JO EASE. DATED 15-SEPT-52 REG. 3.04 PM 29-DEC-52 ABOVE AND OTHER LAND IN FAVOR OF TRANS MTN. OIL PIPE LINE CO. (PLAN 5125 H.W.) A.D. REG. (K. S. GUNDAL)

5455 JO MTGE. DATED 24-OCT-53 REG. [illegible] EASE. 2924 JO AND OTHER EASE. AND LAND BY TRANS MTN. OIL PIPE LINE CO. TO MONT. TRUST CO., MONT. QUE. FOR $65,000,000.00 AT 3 AND 1/8. A.D. REG. (K. S. GUNDAL)

6272 LI MTGE. DATED 1-JUNE-59 REG. 3.53 PM 2-JUNE-59 ABOVE AND OTHER LAND BY NORTHWEST TRUST CO. LTD. TO GREAT-WEST LIFE ASSUR. CO., [illegible] 10177 - 104 ST., EDM. ALTA. FOR $500,000.00 AT 6 3/4. [illegible]

OVER

5257 MF CAVEAT DATED 16-MAY-61 REG. 12.36 PM 18-MAY-61 ABOVE AND OTHER LAND BY THE CITY OF EDMONTON C/O CITY SOL. CITY HALL, EDM. ALTA.
A.D. REG. (K. S. GUNDAL)

CANCELLED

Certificate of Title

North Alberta Land Registration District

This is to Certify that [illegible]

is now the owner of an estate in fee simple [illegible]

of and in [illegible]

CANCELLED

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made on the register.

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this [illegible] day of [illegible]

Registrar

P.O. Address [illegible]

North Alberta Land Registration District

[illegible]

OVER

As to the undiv. int. 152.42 ac.

The within [illegible] Mtge. No. 6272 L.I. is discharged [illegible] the 28 day of Mar. 1962 at 10:17 AM. On 3 day of Apr. 1962 as No. 5649 M.H.

Registrar

THIS CERTIFICATE [illegible] As to the undiv. int. 152.42 acres

IN ACCORDANCE [illegible]

CANCELLED [illegible] 176-W-197, ISSUED THIS 3 [illegible] Apr. 1962 to City of Edmonton

as 5611 M.H.

A.D. REGISTRAR

APPENDIX D

Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS0135-043

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1949 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

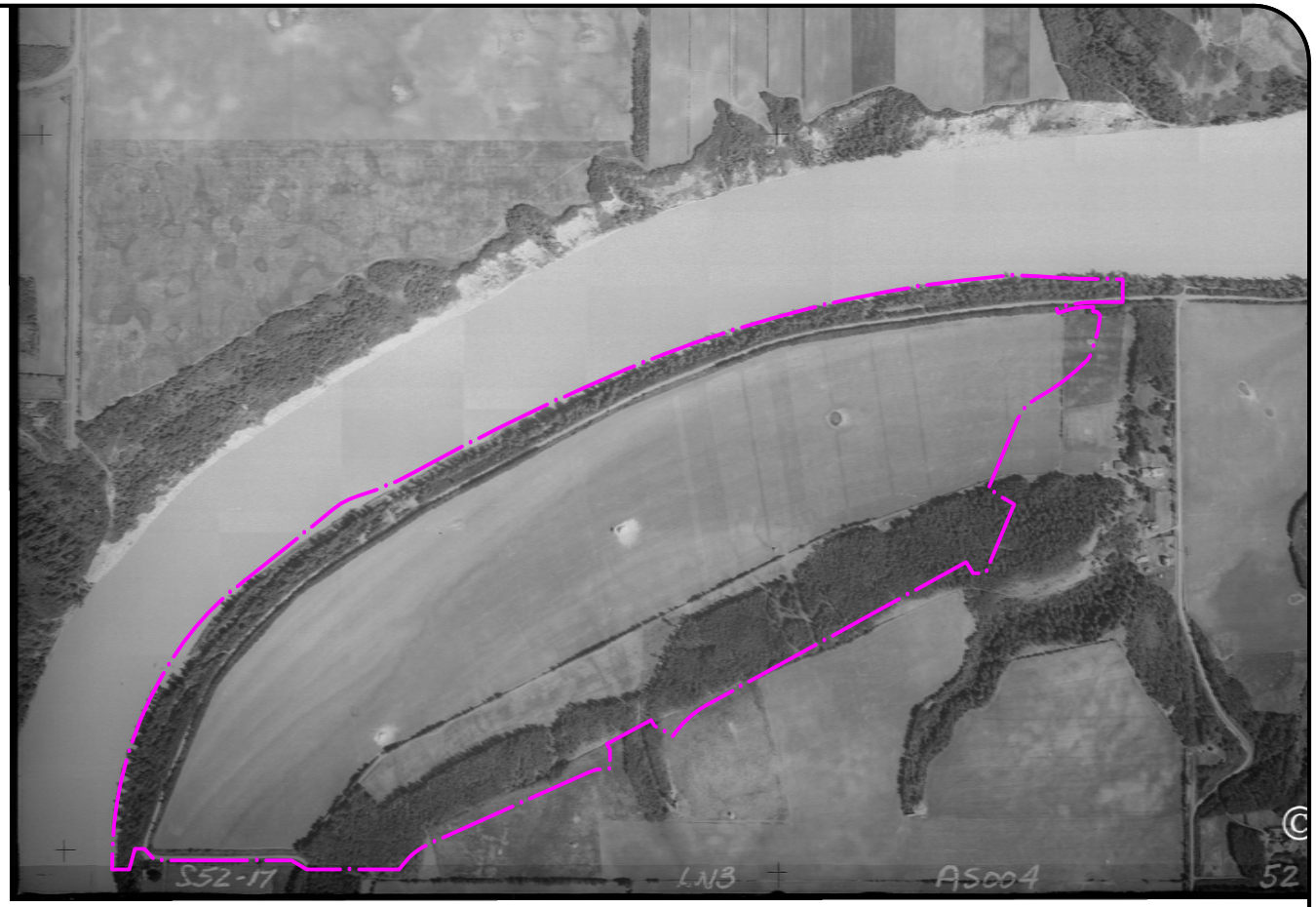
PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 1

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.



Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS0004-052

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1952 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 2

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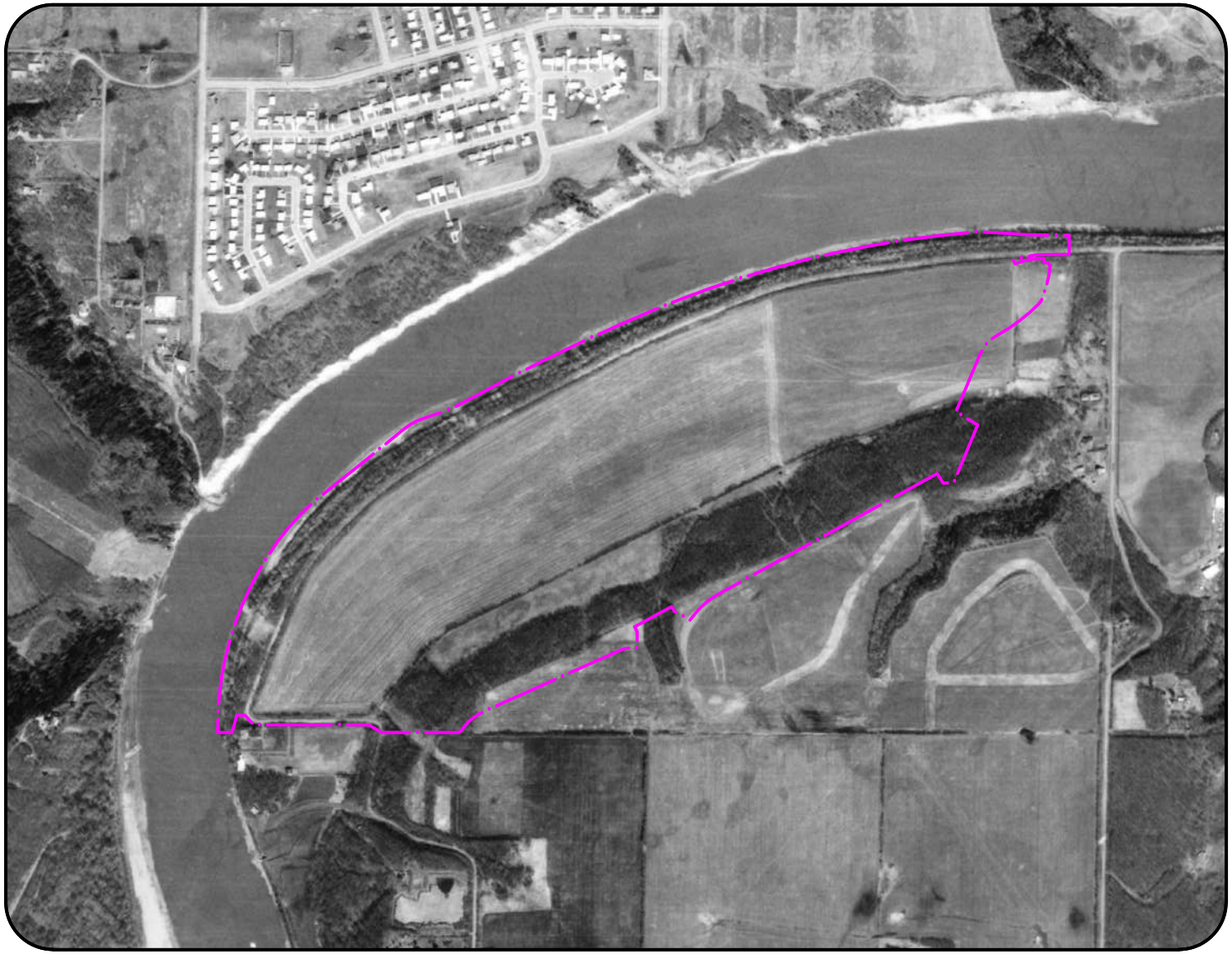


Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS0818-080

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1962 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 3

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS0979-115

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1967 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

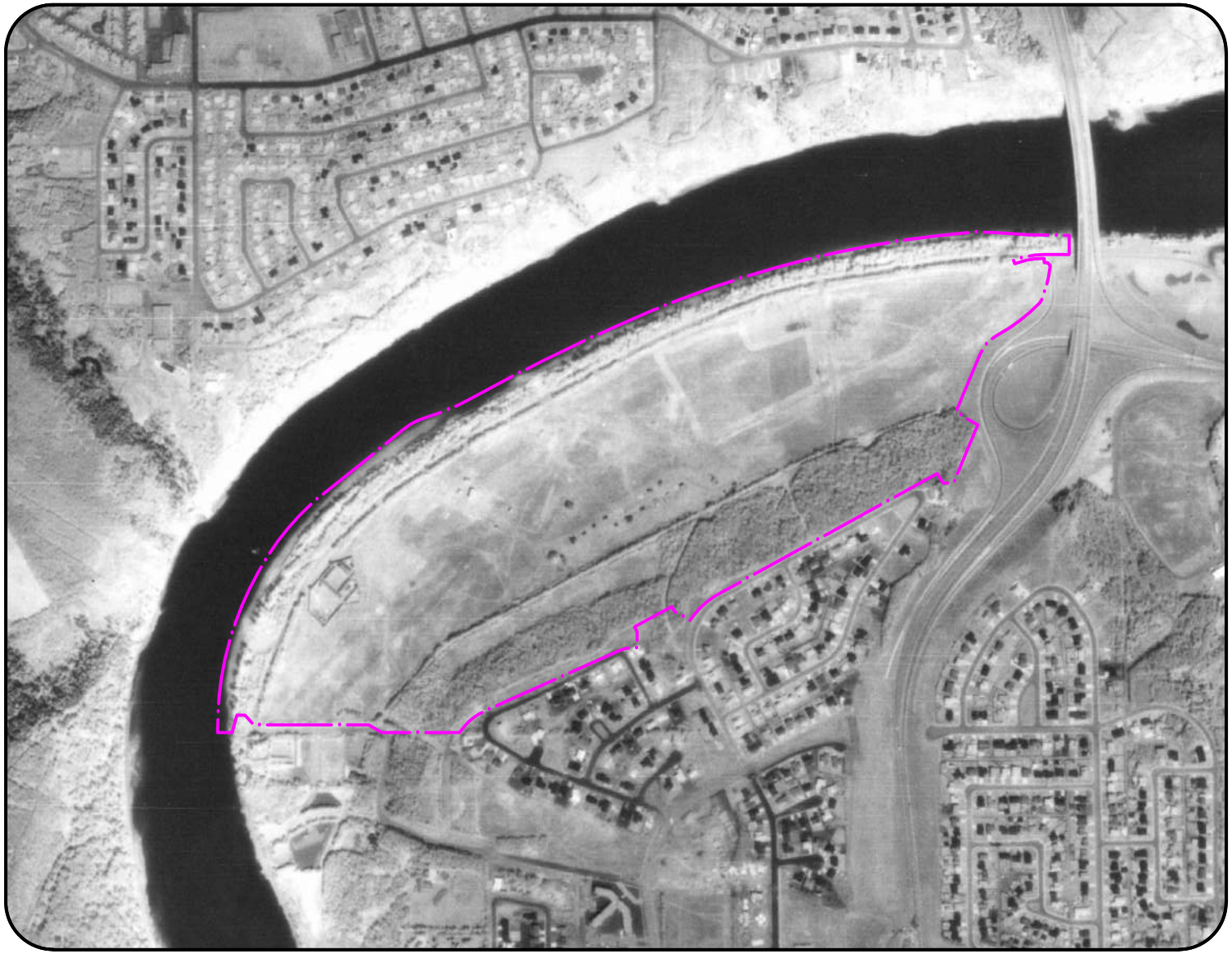
PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 4

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.



Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS1248-299

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1973 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 5

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS1592-095

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1977 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 6

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS2568-172

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1982 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 7

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/AS3590-170

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1987 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 8

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: The City of Edmonton Archives/ED9205-105 & 107

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT
The City of Edmonton

PROJECT
Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE
1992 Aerial Photograph

BASE/SITE PLAN PROVIDED BY
Nichols Environmental (Canada) Ltd.

REVISION DATE
August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.
15-305-CFE

DRAWING NO.
Plate 9

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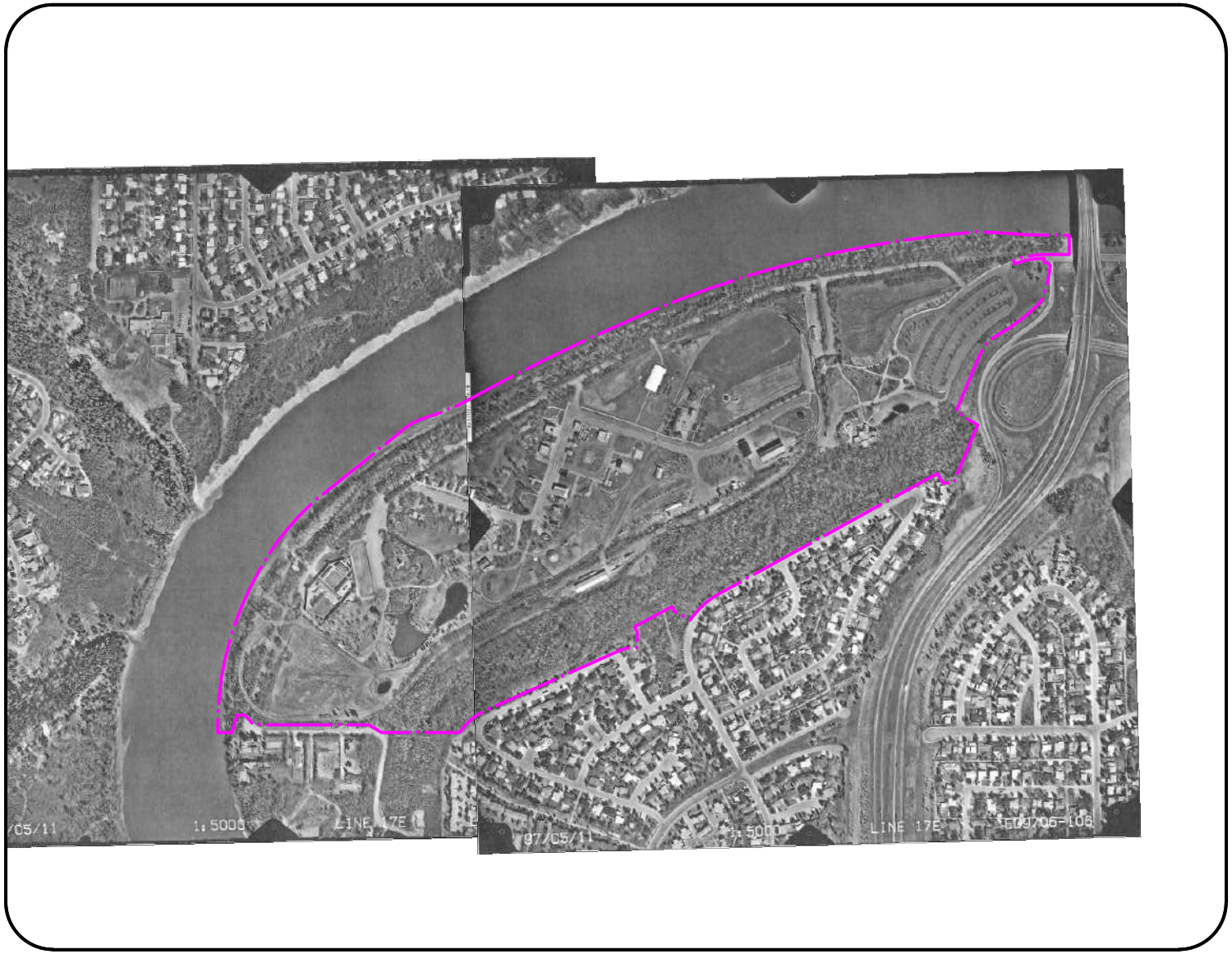


Legend:

Approximate Property Boundary

Air Photo Source: The City of Edmonton Archives/ED9706-104 & 106

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

1997 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 10

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/G0305055-106

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

2003 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 11

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: Alberta Environment and Parks/ED2007-01-141

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

2007 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 12

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

Legend:

Approximate Property Boundary

Air Photo Source: Google Earth

NICHOLS ENVIRONMENTAL (CANADA) LTD.

-100 0 100 200 300m

CLIENT

The City of Edmonton

PROJECT

Phase I ESA
7000 - 143rd Street NW
Edmonton, Alberta

DRAWING TITLE

2015 Aerial Photograph

BASE/SITE PLAN PROVIDED BY

Nichols Environmental (Canada) Ltd.

REVISION DATE

August 2015

SCALE	APPROVED
1:11,000	TA/KK

PROJECT NO.

15-305-CFE

DRAWING NO.

Plate 13

J:\2015\15-305-CFE\Drawings\15-305-CFE.dwg Original drawing in colour. Black and white copies may not interpret properly.

APPENDIX E

Petroleum Tank Management
Association of Alberta
Suite 980, 10303 Jasper Avenue
Edmonton, Alberta T5J 3N6
PH: (780)425-8265 or 1-866-222-8265
FAX: (780)425-4722

June 11, 2015

Tawnya Anderson
Nichols Environmental (Canada) Ltd.
17331 - 107 Avenue
Edmonton, AB
T5S 1E5

Dear Tawnya Anderson:

As per your request, the PTMAA has checked the registration of active tank sites and inventory of abandoned tank sites and have included records for the property with the legal land description:

7000 - 143 Street NW, Edmonton
Plan 8521469, Block A
2-52-25-W4

Information is provided is governed by the Freedom of Information and Protection of Privacy Act. Please note that both databases are not complete. The main limitation of these databases is that they only include information reported through registration or a survey of abandoned sites completed in 1992 and should not be considered as a comprehensive inventory of all past or present storage tank sites. The PTMAA **cannot** guarantee that tanks do not or have not existed at this location. Information in the databases is based on information supplied by the owner and the PTMAA cannot guarantee its accuracy. Information on storage tanks or on past or present contaminant investigations may be filed with the local Fire Department or Alberta Environment.

Yours truly,

Connie Jacobsen
PTMAA

TMS - Tank Management System

Site Tank Detail by Site by Site Name

(Section A General Information)

1. Site Name: FORT EDMONTON PARK-REFUELING DEPOT Site Number: 8063 Class: B

   Status: Active

2. Reference:

3a. Urban: Address: 7000-143 STR.

   City/Town: 904-00 EDMONTON (A)

3b. Rural: County/MD/ID:

3b. Legal Land Description: LSD: ¼ of Sec. / Twp. / Rge. / W. of Mer.

   Lot: Block: A Plan: 8521469

4. Owner: 610
   CITY OF EDMONTON-PARKS & RECREATION
   PO BOX 2359
   EDMONTON
   AB T5J 2R7
   Contact: 11 Robin Benbow
   Site Contact (780) 496 - 1485

5. Operator: 610
   CITY OF EDMONTON-PARKS & RECREATION
   PO BOX 2359
   EDMONTON
   AB T5J 2R7
   Contact: 11 Robin Benbow
   Site Contact (780) 496 - 1485

6. Type of Facility: a. Petroleum Sales:

   b. Facility Owner Usage: 6 Municipal Government

7. Supplier of petroleum products:

8. Number of Tanks: Underground: 0 Aboveground: 1

Under the authority of the Safety Codes Act, this information is being collected by the Petroleum Tank Management Association of Alberta (PTMAA) and will be released to the public upon request in accordance with the Freedom of Information and Protection of Privacy (FOIP) Act. If you have any questions, please contact the PTMAA at the address noted on the form or call (780)425-8265.

TMS - Tank Management System

Site Tank Detail by Site by Site Name

(Section B Petroleum Tank Information)

Site Name: FORT EDMONTON PARK-REFUELING DEPOT Site Number: 8063

1. Tank I.D. Number: 1

2. Tank Type: 2 Aboveground
3. Tank Serial #: A550238
4. Year & Month of Removal:
   Removal Company:
   Foreman's Certification #:
   Foreman's Name:
   Reason for Removal:
5. Is the tank a: 1 New Installation
   Facility Design Engineer's: Reid Crowther
   Firm:
   Professional Registration #: P153
   Installer Company Name: Southbend Constr.
   Foreman's Name:
   Foreman's Certification #: 498
6. Year and Month of Installation: 01/05 - 1 Known
7. Condition at Installation: 1 New
   Year of previous service:
8. Status of Tank: 1 Currently in service
   year & month of last use:
9. Tank Material: 1 Steel
   Other Tank Material:
10. Contents: 6 Used Oil
    Allied Petroleum Products:
11. Tank Capacity: Y
    Other: 25,469 litres
12. Tank Construction Specifications: 14 ULC 653
    Other:
13. Cathodic Corrosion Protection:
14. Secondary Containment System: 4 Steel

    Other:
16. Spill Containment:
    (Underground Tanks)

17. Overfill Prevention: 4 High Level Detection
    Other:
    Upgrade required:
18. Tank Leak Test: 2 No
    Date:
    Method:
    Other Methods:
    Result:
19. Underground, horizontal piping: 2 No

20. Leak Detection Employed At This Site : 4 Monitoring of Secondary Containment
    Other :
    Upgrade required:

Site Tank Detail by Site by Site Name

Site Name: FORT EDMONTON PARK-REFUELING DEPOT Site Number: 8063

(Section C Piping System Information)

1. Piping Material:
   Other:
2. Piping Secondary Containment:
   Other:
3. Steel Piping Cathodic Corrosion Protection:
4. Type of Pumping System:
5. Line Leak Detection Installed:
   Other:
   Upgrade required:

(Section D Site Sensitivity)

1. Tanks located within 500 metres of a groundwater well: 2 No
2. Tanks located within 200 metres of a surface water body: 2 No
   Type of surface water:
   Other:
3. Tanks located within 150 metres of a major underground structure: 2 No
   Type of underground structure:
   Other:

(Section E Other Information)

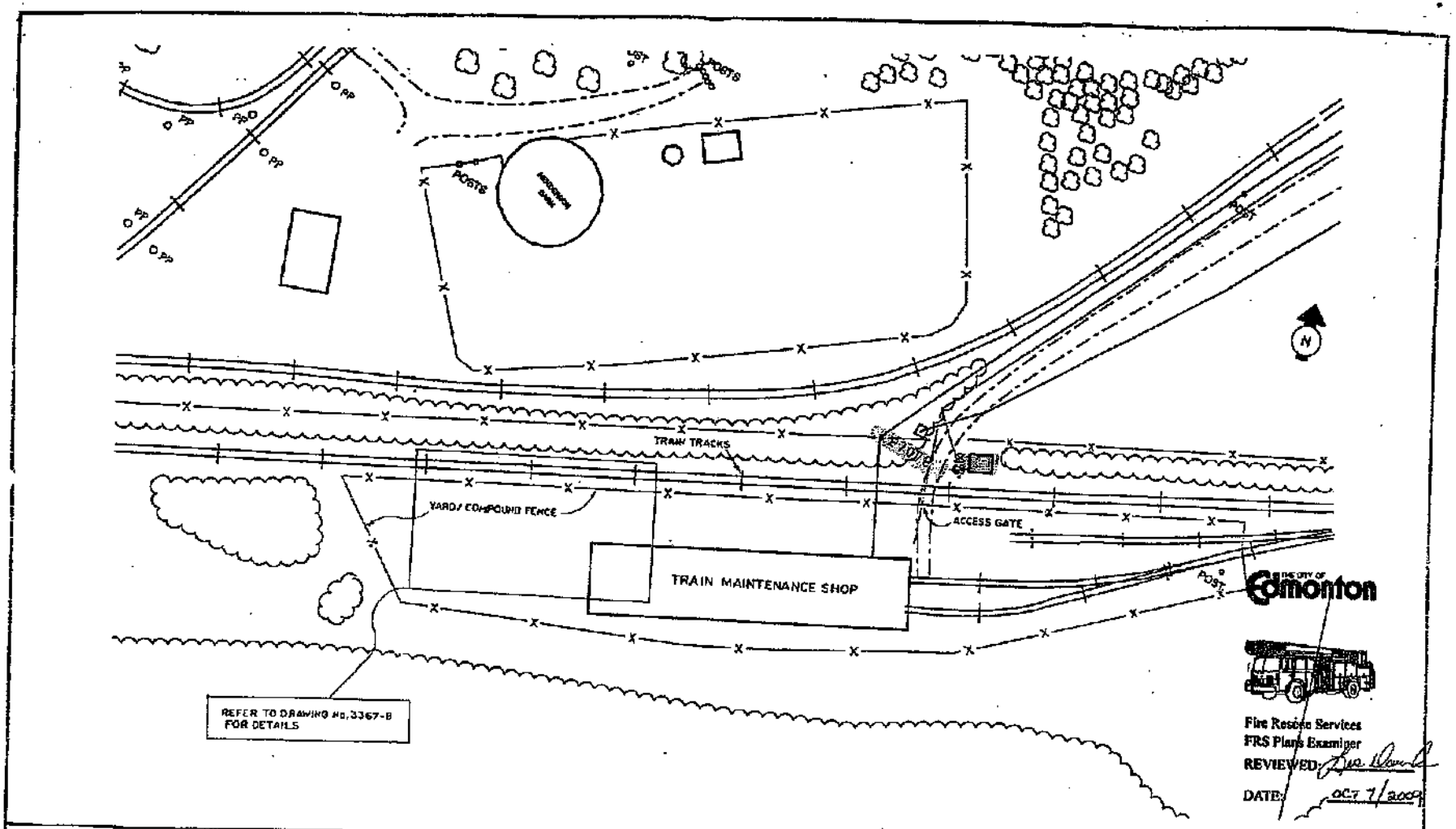
1. Site Diagram: 1 Yes
3. Questionnaire Completed By: Kevin Bokenfohr Phone: (780) 944 - 7445
4. Signature on the form: 1 Yes Date: 2009/10/16 Information Complete: 1 Yes

Date form sent: 2014/07/04 Date form received: 2009/10/16

(Notepad)

Note:

Oct 19, 2009 - AHJ Fire Approval on file.
- Closure for AST Rec'd May 2001 (Ung)



THE CITY OF Edmonton

Fire Rescue Services
FRS Plans Examiner
REVIEWED:
DATE: OCT 7/2009

No.	REVISION	DATE	BY

FOR
CITY OF EDMONTON

SITE LAYOUT DRAWING
FORT EDMONTON PARK-TRAIN REFUELING STATION
EDMONTON, ALBERTA

DESIGNED BY:	SCALE: N.T.S	DRAWING No.
DRAWN BY: G.V.C	DATE: 01.08.28	3371-B

S-8063

Petroleum Tank Management Association of Alberta
Suite 1560, 10303 Jasper Avenue
Edmonton, AB Canada T5J 3N6
PH: 403-425-8265 FAX: 403-425-4722

Petroleum Storage Tank Closure Report
Part A

Underground storage tank systems must be removed from the ground and disposed of in accordance with Section 4.10.3 and 4.10.4 of the Alberta Fire Code. Upon completion of the tank(s) removal, complete this form and mail or fax same to the PTMAA. If contamination is encountered during removal of tank(s), notification must be made to the fire authority in accordance with Article 4.3.16.3 of the Alberta Fire Code 1997 and Alberta Environmental Protection at 1-800-222-6514 in accordance with Section 99 of the Environmental Protection & Enhancement Act.

FOR PTMAA USE ONLY

Date Received: 2001/06/26 Municipality #: 904-00 Site # NOT REGISTERED
Inspection by: P.C.D. ☐ Yes ☐ No File # _____
Fire Official ☐ Yes ☐ No File # _____ GPB File # _____

SECTION 1: FACILITY INFORMATION

Facility Name: Fort Edmonton Park Site #: Train Refueling Station
Address: West of Quesnel Bridge and South of North Saskatchewan River (Box 2359)
City: Edmonton, Alberta Postal Code: T5J 2R7 Telephone: (780) 944-7565
Legal Land Descr.: LSD __ ¼ of Sec.__ /Twp.__ /Rge.__ /W of __ Mer. or Lot __ Block A Plan 9521469

SECTION 2: TANK OWNER INFORMATION

Name: City of Edmonton - Land and Buildings Branch
Address: 20th Floor, 9803 -102A Avenue City: Edmonton, Alberta
Postal Code: T5J 3A3 Contact Person: Mr. D. Raugust Telephone: (780) 496-6612

SECTION 3: TANK REMOVAL INFORMATION

Tank Reg. #	Capacity (litres)	Age	Product Stored	Material	Date Removed	Reason For Removal (Decomm., Upgrade Leaking)	Tank Replaced Yes/No
Nil	58, 000	35 Yrs	Fuel Oil	Steel	May 15, 2001	Decommissioned	Yes

AST

SECTION 4: INFORMATION ON PARTY PERFORMING TANK REMOVAL

Name: Petroleum Enviro Services Telephone #: (780) 481-4799
Address: #2, 10016 29A Avenue City: Edmonton
Postal Code: T6N 1A8 Certified Contractor : E.L. MacKelgan, P. Eng. Certification #: A-0058 A & B

[redacted]

[redacted]

PETROLEUM STORAGE TANK CLOSURE REPORT - Part B

SECTION 5: TANK DISPOSAL INFORMATION

Tanks were transported to: Maple Leaf Metal Industries Ltd. (Name)

4510 - 68 Avenue, Edmonton, Alberta T6B 2P3 (Address)

for: ☒ recycle (salvage) or ☐ landfill or ☐ unregulated use (specify) _____

SECTION 6: SITE REMEDIATION INFORMATION (where applicable)

Was contamination encountered during removal or decommissioning? ☒ Yes ☐ No

Was a site subsurface investigation conducted? ☒ Yes ☐ No

If yes,

Who did investigation: Shelby Engineering (Company) Mr. G. Hunter (Contact)

9632 - 54 Avenue, Edmonton, Alberta (Address) (780) 438-2540 (Telephone)

Was remediation/clean-up work conducted at the site? (soil and/or groundwater). ☒ Yes ☐ No
(soil and/or groundwater)

Current Status of Work

Remediation/clean-up work ☒ Complete ☐ Ongoing If complete, date completed: 01/05/25 (YY MM DD)

Complete to Level: ☒ Level I ☐ Level II ☐ Level III ☐ Other

Nature of remediation: ☐ Insitu ☐ Onsite Treatment ☒ Offsite Treatment

Method of soil treatment: ☒ Landfilling ☐ Landspreading ☐ Other Specify: _____

Was groundwater impacted? ☐ Yes ☒ No

Explain Surface Spills and Shallow Soil Contamination - Fuel Oil

Remediation supervised by: Petroleum Enviro Services (Company) Ms. L. Mazuryk (Contact)

#2, 10016 - 29A Avenue, Edmonton, Alberta (Address) (780) 461-4799 (Telephone)

If ongoing, date of anticipated completion: / / (YY MM DD)

Was Alberta Environmental Protection notified? ☒ Yes ☐ No 01/04/23 (YY MM DD)

Notification to: Alberta Environment Mr. Dave Lepp, M. Sc Branch: Contaminated Sites

Was the Fire Official notified? ☐ Yes ☒ No / / (YY MM DD)

Notification to: _____ Department: _____

Report on remediation completed/submitted ☒ Yes ☐ No

Submitted to: City of Edmonton, Mr. D. Raugust Department: Land and Buildings Branch

[redacted]

[redacted]

PETROLEUM STORAGE TANK CLOSURE REPORT - Part B

SECTION 7: OFFSITE SOIL REMEDIATION/DISPOSAL INFORMATION (where applicable)

365 cubic metres of contaminated soil transported to Leduc Landfill

Soil removed/disposed by: Southbend Contruction Company Ltd. (Company) Mr. Brian Forbes (Contact)

#1, 707 - 12th Avenue, Nisku, Alberta (Address) (780) 955-7844 (Telephone)

Date(s) removed/disposed: 01/05/16 (YY MM DD) to 01/05/18 (YY MM DD)

Comments:

I certify that the information in this report is true and complete to the best of my knowledge.

Owner/Operator

Mr. D. Raugust, Project Officer, City of Edmonton

01/06/31 (YY/MM/DD)

[redacted]

Order Fulfillment Non-Availability Form

Calgary Head Office
Suite 1000, 250 – 5 Street SW
Calgary, Alberta T2P 0R4
Canada

www.aer.ca

Company Name: Nichols Environmental (Canada) Ltd.
Customer Name: Tawnya Anderson
Order Date: June 23, 2015

Task I.D: F11O-K4058

Requested information has not been supplied. Please see code index for reason.

License No.	Unique Well Identifier/Facility Location	Code
	23-052-25W4	1,12

1	No wells in location provided
2	Confidential
3	Well not on production
4	Historical well – no production required to be submitted prior to 1962
5	No cores cut
6	Core cut, not analyzed
7	No DST run
8	No pressure tests submitted
9	No fluid analysis submitted
11	No pipelines
12	No complaint or release records
13	No directional survey submitted
14	Vertical well – no directional survey required
15	No facilities in location provided
16	Retrospective facility – no file available **to request licensing information refer to COM section of the AER Catalogue*
17	No logs run

Additional information (if necessary):

15-305-CFE

Legend

- ATS v4_1 Alberta Provincial Boun
- World Imagery
- Low Resolution 15m Imagery
- High Resolution 60cm Imagery
- High Resolution 30cm Imagery
- Citations
- Abandoned Wells (large scale)

Wednesday, July 15, 2015 17:13:51 -06:00

1.6 0.78 0 1.6 Kilometers

Map Scale: 1: 30,731

Alberta Government
GeoDiscover Alberta

15-305-CFE

N

Wellheads
- Abandoned Wellhead
- Suspended Gas Wellhead
- Suspended Oil Wellhead
- Flowing Gas Wellhead
- Location Wellhead
- Flowing Oil Wellhead
- Miscellaneous Wellhead
- Water Wellhead
- Well Downhole Location
- L Newly Licenced Well
- S Newly Spudded Well

High Pressure Pipelines
- Gas Pipeline
- Oil Pipeline
- Water Pipeline
- LVP/HVP Pipeline
- Foreign Pipeline (Only when a company is specified.)

Low Pressure Pipelines
- Gas Co-op Pipeline

PRINT REPORT | CLOSE REPORT

WELL ID: W0 / 05-24-052-25 W4 / 0

AER COMPANY INFORMATION
CURRENT TO June 30, 2015

COMPANY NAME:	PLAINS MIDSTREAM CANADA ULC		
ADDRESS:	1400 - 607 8 Ave SW Calgary, AB T2P 0A7		
PHONE #:	403-298-2100	**BUSINESS ASSOCIATE CODE:**	A31G

There is no Production data for this well.

AER WELL LICENSING DATA

UNIQUE WELL ID:	0524252405W00	**WELL LICENCE NUMBER:**	0002483 W
REGULATION SECTION:	Section 2.030	**WELL LICENCE DATE:**	JANUARY 2, 1951
SURFACE LOCATION:	05-24-052-25 W4	**SURFACE OFFSETS:**	N 670.6 W 1619.3
ACTUAL SURFACE LATITUDE:	53.50367	**LONGITUDE:**	113.565711
THEORETICAL SURFACE LATITUDE:	0	**LONGITUDE:**	0
LICENCEE:	PLAINS MIDSTREAM CANADA ULC		
AER AREA OFFICE:	ST. ALBERT	**TERMINATING FORMATION:**	NONE IDENTIFIED
LAHEE CLASSIFICATION:	TEST HOLE	**CONFIDENTIAL STATUS:**	NON CONFIDENTIAL
SURFACE OWNER:	CROWN	**MINERAL RIGHTS OWNER:**	CROWN
AGREEMENT NUMBER:		**AGREEMENT TYPE:**	
AGREEMENT EXPIRY DATE:		**DRILL COST AREA:**	
SCHEME APPROVAL NUMBER:		**SCHEME EXPIRY DATE:**	
INCENTIVE CERTIFICATE NUMBER:	00000	**INCENTIVE CERTIFICATE DATE:**	
SURFACE ABANDONED TYPE:	OTHER	**SURFACE ABANDONED DATE:**	JANUARY 3, 1951

AER WELL DRILLING OCCURRENCE DATA

WELL NAME:	DOME 23 ST. ALBERT TH 5-24-52-25	**FIELD:**	UNDEFINED
POOL:		**OIL SANDS AREA:**	
OIL SANDS DEPOSIT:		**DOWNHOLE OFFSETS:**	N 670.6 W 1619.3
ACTUAL DOWNHOLE LATITUDE:	53.50367	**LONGITUDE:**	113.565711
THEORETICAL DOWNHOLE LATITUDE:	0	**LONGITUDE:**	0
GROUND ELEVATION:	623.9	**KB ELEVATION:**	623.9
CF ELEVATION:	0	**WELL TOTAL DEPTH:**	153
TRUE VERTICAL DEPTH:	0	**PB DEPTH:**	0
SPUD DATE:	JANUARY 2, 1951	**FINAL DRILL DATE:**	JANUARY 2, 1951
RIG RELEASE DATE:		**ON PRODUCTION DATE:**	
DRILLING CONTRACTOR:		**RIG NUMBER:**	

There is no Tops & Markers data for this well.

There is no Log data for this well.

There is no DST data for this well.

There is no Tour - Occurrence data for this well.

There is no Tour - Direction Drilling data for this well.

There is no Tour - Casing data for this well.

There is no Tour - Cementing data for this well.

There is no Tour - Cores Cut data for this well.

There is no Tour - Perforation/Treatment data for this well.

There is no Tour - Initial Production data for this well.

There is no Tour - Plug Back / Abandonment data for this well.

AER WELL STATUS HISTORY DATA

DATE	STATUS
Jan 2 1951	
Jan 3 1951	ABD

There is no Completion data for this well.

There is no Production Control data for this well.

There is no Surface Case Vent Flow data for this well.

AER DATA | ATTACHED FILES

Close Screen

This pipeline falls under NEB regulations. The graphics were originally supplied by the AER however, they are no longer maintaining the data. In order to provide the most accurate product possible, AbaData is attempting to maintain these NEB regulated pipelines. If you notice an error or omission, please email abadata@abacusdatagraphics.com and we will recity the data.

AER PIPELINE INFORMATION
CURRENT TO JULY 3, 2015

LICENCE/LINE #:	80045 - 1		**PERMIT DATE:**	JANUARY 22, 1998	
ABACUS #:			**LICENCE DATE:**		
COMPANY:	TERASEN INC.				
FROM LOCATION:	04-05-053-23 W4M PT		**TO LOCATION:**	16-13-053-06 W5M PS	
LENGTH:	99.4 kms	61.76 mi	**STATUS:**	O	
SUBSTANCE:	CO		**H2S:**	0 mol/kmol	0 ppm
OD:	610 mm	24.02 "	**WT:**	6.35 mm	0.25 "
MATERIAL:	S		**TYPE:**	5L	
GRADE:	X52		**MOP:**	5380 kPa	780 psi
JOINTS:	W		**INTL COATING:**	U	
STRESS LEVEL:	72 %		**ENVIRONMENT:**	RC	
ORIGINAL PERMIT DATE:	JANUARY 22, 1998		**CONST. DATE:**		
ORIGINAL LICENCE/LINE #:	80045 - 1		**NEB REG:**	Yes	

OPTIONS

View Company Info

View Installation Info

View Entire Licence

View Licence Ticket

View Spill Incidents

Highlight Line

Highlight Entire Licence

Print Screen

Alberta Environment and Parks

FOIP Office. Informatics
5th Floor, Great West Life,
9920 - 108 Street
Edmonton, Alberta, T5K 2M4
Telephone: 780-427-4429
Fax: 780-427-9838
www.aep.alberta.ca

July 07, 2015

Mrs. Tawnya Anderson
Nichols Environmental
17331 - 107 Avenue NW
Edmonton Alberta T5S 1E5

Fax: (780) 484-5093

Your File #: 15-305-CFE
Access Request: E15-G-0796

Dear Mrs. Anderson,

Re: Freedom of Information and Protection of Privacy Act Request for records pertaining to the property located at 7000 - 143 Street NW, Edmonton, AB.

The following is in response to your request of June 11, 2015 for access under the *Freedom of Information and Protection of Privacy Act* to the subject records.

A search of Alberta Environment and Parks record holdings has not identified any records relating to the subject of your request, based on the search parameters you provided to this office.

If you have any questions or concerns about the processing of your request, please write to the above address or call me at **(780) 641-8666,** so that we can look at ways to address these issues. If, however, we are unable to resolve your concerns, you have the right to ask the Information and Privacy Commissioner to conduct a review under section 65 of the Act. You have 60 days from the receipt of this notice to request a review by writing to:

Information and Privacy Commissioner
410, 9925 - 109 Street
Edmonton, Alberta, T5K 2J8
Telephone (780) 422-6860
Fax (780) 422-5682

If you request a review, please provide the Commissioner with a copy of your original request, any letters of clarification, a copy of this letter and the reason why you are requesting a review.

Sincerely,

Debra J. Watson,
Access & Privacy Advisor

ENVIRONMENTAL LAW CENTRE
Suite 800, 10025 - 106 Street, Edmonton, AB T5J 1G4
Phone: (780) 424-5099 Fax: (780) 424-5133
Internet: www.elc.ab.ca E-Mail: elc@elc.ab.ca

June 11, 2015 Our File: 101181

Ms. Tawnya Anderson
Nichols Environmental (Canada) Ltd.
17331 107 Ave
Edmonton, AB T5S 1E5

Dear Ms. Anderson:

RE: Search Requested - The City of Edmonton

In response to your request of June 11, 2015, we have searched the Environmental Enforcement Historical Search Service database for an exact match with respect to the above request, and can advise that as of today's date, the enforcement actions listed in the attached report have been issued pursuant to the Alberta "Environmental Protection and Enhancement Act" ("EPEA") and its predecessor legislation, the "Hazardous Chemicals Act", "Agricultural Chemicals Act", "Clean Water Act" and "Clean Air Act" to 1971, and/or pursuant to the "Water Act" from 1999 onwards. The attached report may also contain records which are not an exact match to your search request but may be related to the subject of your search.

This search is limited to the following enforcement actions under EPEA and its predecessor legislation: Tickets, Prosecutions, Administrative Penalties, Warnings, Enforcement Orders, Enforcement Orders Concerning Waste, Environmental Protection Orders, Emergency Environmental Protection Orders, Emission Control Orders, Chemical Control Orders, Water Quality Control Orders and Stop Orders. This search is limited to the following enforcement actions under the Water Act: Prosecutions, Administrative Penalties, Water Management Orders, Warnings and Enforcement Orders. It does not include Clean Up Orders issued under the Litter Act or Environmental Protection Orders respecting unsightly property issued under EPEA; this information may be available from the local municipality.

Enforcement actions are entered in the database following: (1) the decision date, for prosecutions; (2) the date an administrative penalty was paid or due (30 days after issuance), whichever is sooner; and (3) the date the document was issued for all other enforcement actions.

These search results are based on information provided by Alberta Environment ("AENV"). AENV advises that they try to provide the best information possible. However, AENV advises that it cannot guarantee that the information provided is complete or accurate and that any person relying on these search results does so at their own risk. More information may be gained by referring to original enforcement documents.

Copies of orders are available from the Environmental Law Centre. Any other enforcement information may be available directly from Alberta Environment.

Yours sincerely,

Cindy Dewing
Enforcement Search Service
Encl.

ENVIRONMENTAL LAW CENTRE
Suite 800, 10025 - 106 Street, Edmonton, AB T5J 1G4
Phone: (780) 424-5099 Fax: (780) 424-5133
Internet: www.elc.ab.ca E-Mail: elc@elc.ab.ca

Environmental Enforcement Historical Search Service

Accountable Party	Action	Decision Date/ Penalty	Municipality/s Legal Description/s	Act/s & Section/s	Comments/Disposition
Edmonton, City of	Water Quality Control Order	05-Nov-1991 $0.00	Edmonton	CWA 14(1)	Release of water contaminant (raw sewage); failure to report; company to take temporary measures to prevent discharges of raw sewage; submit written report outlining monitoring results and methods; submit written proposal for long term and permanent corrective actions; submit written proposal to identify magnitude of dry weather raw sewage overflows; submit written monthly reports detailing actions taken to comply with Order.
Edmonton, City of	Warning Letter	03-Mar-1992 $0.00	Edmonton	HCA 17	Acceptance of prohibited material at Cloverbar Landfill, contrary to licence conditions and Hazardous Waste Regulations
Edmonton, City of	Water Quality Control Order	19-Feb-1993 $0.00	Edmonton	CWA 14	Discharge of hydrofluosilicic acid from Rossdale Water Treatment and Clean Water Reservoir into the North Saskatchewan River; directed to install additional containment systems; undertake preventative maintenance inspections; develop a plan to ensure adequate (secondary) containment at both Rossdale and E.L. Smith treatment plants; detail existing methods used for keeping inventories of chemicals.
Edmonton, City of	Administrative Penalty	27-Sep-1995 $2,000.00	Edmonton	AEPEA 99(2)	Failed to report the release of hydraulic oil from a City of Edmonton vehicle into the North Saskatchewan River (at Capilano Bridge); paid 23-OCT-1995.
Edmonton, City of	Warning Letter	21-Jul-1999	Edmonton	AEPEA 213(e)	The City of Edmonton contravened the terms of their approval to operate the Goldbar Wastewater Treatment Plant by bypassing the wastewater treatment plant and releasing untreated or partially treated wastewater to the North Saskatchewan River.

Acts:

ACA:	Agriculture Chemicals Act	CAA:	Clean Air Act	HCA:	Hazardous Chemicals Act
AEPEA:	Environmental Protection Enhancement Act(S.A.1992)	CC:	Criminal Code (Canada)	LA:	Litter Act
		CWA:	Clean Water Act	TDGCA:	Transportation of Dangerous Goods Control Act
AEPEA(R)	Environmental Protection & Enhancement Act(R.S.A.2000)	DEA:	Dept. of Environment Act		
		FFA:	Fisheries Act (Canada)	WA:	Water Act
BCA:	Beverage Container Act				

ENVIRONMENTAL LAW CENTRE
Suite 800, 10025 - 106 Street, Edmonton, AB T5J 1G4
Phone: (780) 424-5099 Fax: (780) 424-5133
Internet: www.elc.ab.ca E-Mail: elc@elc.ab.ca

Environmental Enforcement Historical Search Service

Accountable Party	Action	Decision Date/ Penalty	Municipality/s Legal Description/s	Act/s & Section/s	Comments/Disposition
Edmonton, The City of	Prosecution	07-Mar-2002		AEPEA 213(e)	Count 1: On or about September 16, 2000 at or near Edmonton, in the Province of Alberta did unlawfully contravene a term or condition of an approval, to wit: 9.2.1(a)(ii) of Approval No. 95-MUN-117 which provides as follows: The Approval Holder shall contact the Director of Pollution Control at 1-800-222-6514 immediately after any of the following events: (a) if untreated or partially treated sewage; (ii) from the wastewater collection system overflows under dry weather conditions, contrary to s.213(e) of the Environmental Protection and Enhancement Act. Withdrawn 7 March 2002.
Edmonton, The City of	Prosecution	07-Mar-2002 $200,000.00		AEPEA 213(e)	Count 2: On or about September 16, 2000 at or near Edmonton, in the Province of Alberta did unlawfully contravene a term or condition of an Approval, to wit: 9.2.1(a)(iii) of Approval No. 95-MUN-117 which provides as follows: The Approval Holder shall contact the Director of Pollution Control at 1-800-222-6514 immediately after any of the following events: (a) if untreated or partially treated sewage; (iii) bypasses or overflows from lift stations contrary to s.213(e) of the Environmental Protection and Enhancement Act. Pled guilty 7 March 2002 and sentenced to a fine of 5,000 with a creative sentence. Fine paid 11 April 2002. An order requiring the City to pay a further $5,000 to cover the costs of Alberta Environment's investigation into the matter, and a Creative Sentence Order of $190,000 was issued 30 April 2002. The Creative Sentence Order was granted to fund a leading-edge university study to determine potential alternate uses for city wastewater. Order complied with 14 October 2005.

Acts:

ACA:	Agriculture Chemicals Act	CAA:	Clean Air Act	HCA:	Hazardous Chemicals Act
AEPEA:	Environmental Protection Enhancement Act(S.A.1992)	CC:	Criminal Code (Canada)	LA:	Litter Act
AEPEA(R)	Environmental Protection & Enhancement Act(R.S.A.2000)	CWA:	Clean Water Act	TDGCA:	Transportation of Dangerous Goods Control Act
BCA:	Beverage Container Act	DEA:	Dept. of Environment Act	WA:	Water Act
		FFA:	Fisheries Act (Canada)		

ENVIRONMENTAL LAW CENTRE
Suite 800, 10025 - 106 Street, Edmonton, AB T5J 1G4
Phone: (780) 424-5099 Fax: (780) 424-5133
Internet: www.elc.ab.ca E-Mail: elc@elc.ab.ca

Environmental Enforcement Historical Search Service

Accountable Party	Action	Decision Date/ Penalty	Municipality/s Legal Description/s	Act/s & Section/s	Comments/Disposition
Edmonton, The City of	Prosecution	07-Mar-2002		AEPEA 213(e)	Count 3: On or between September 16, 2000 and September 18, 2000, both dates inclusive, at or near Edmonton, in the Province of Alberta, did unlawfully contravene a term or condition of an Approval, to wit: 5.1.2 of Approval No. 95-MUN-117 which provides as follows: Untreated or partially treated wastewater into the treatment plant shall not be bypassed to the North Saskatchewan River during dry weather conditions, contrary to s.213(e) of the Environmental Protection and Enhancement Act. Withdrawn 7 March 2002.
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 98(2)	Count 1: On or between the 3rd day of August and the 8th day of August, 2001, at or near Edmonton, in the Province of Alberta, did unlawfully release or permit the release into the environment of a substance in an amount, concentration or level or at a rate of release that causes or may cause a significant adverse effect, contrary to section 98(2) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(1)	Count 2: On or between the 3rd day of August, 2001 and the 9th day of August, 2001 at or near Edmonton, in the Province of Alberta, being a person who releases or causes or permits the release of a substance into the environment that has caused, is causing, or may cause an adverse effect, did fail, as soon as that person knows or ought to know of the release, report it to the Director, contrary to section 99(1) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.

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Environmental Enforcement Historical Search Service

Accountable Party	Action	Decision Date/ Penalty	Municipality/s Legal Description/s	Act/s & Section/s	Comments/Disposition
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(2)	Count 3: On or between the 3rd day of August, 2001 and the 9th day of August, 2001 at or near Edmonton in the Province of Alberta, being a person having control of a substance that is released into the environment that has caused, is causing, or may cause an adverse effect, did fail, immediately on becoming aware of the release, report it to the Director, contrary to section 99(2) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(1)	Count 4: On or between the 4th day of August, 2001 and the 10th day of August, 2001 at or near Edmonton, in the Province of Alberta, being a person who releases or causes or permits the release of a substance into the environment that has caused, is causing, or may cause an adverse effect, did fail, as soon as that person knows or ought to know of the release, report it to the Director, contrary to section 99(1) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(2)	Count 5: On or between the 4th day of August, 2001 and the 10th day of August, 2001 at or near Edmonton in the Province of Alberta, being a person having control of a substance that is released into the environment that has caused, is causing, or may cause an adverse effect, did fail, immediately on becoming aware of the release, report it to the Director, contrary to section 99(2) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.

Acts:

ACA:	Agriculture Chemicals Act	CAA:	Clean Air Act	HCA:	Hazardous Chemicals Act
AEPEA:	Environmental Protection Enhancement Act(S.A.1992)	CC:	Criminal Code (Canada)	LA:	Litter Act
AEPEA(R)	Environmental Protection & Enhancement Act(R.S.A.2000)	CWA:	Clean Water Act	TDGCA:	Transportation of Dangerous Goods Control Act
BCA:	Beverage Container Act	DEA:	Dept. of Environment Act		
		FFA:	Fisheries Act (Canada)	WA:	Water Act

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Environmental Enforcement Historical Search Service

Accountable Party	Action	Decision Date/ Penalty	Municipality/s Legal Description/s	Act/s & Section/s	Comments/Disposition
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(1)	Count 6: On or between the 5th day of August, 2001 and the 10th day of August, 2001 at or near Edmonton, in the Province of Alberta, being a person who releases or causes or permits the release of a substance into the environment that has caused, is causing, or may cause an adverse effect, did fail, as soon as that person knows or ought to know of the release, report it to the Director, contrary to section 99(1) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(2)	Count 7: On or between the 5th day of August, 2001 and the 10th day of August, 2001 at or near Edmonton, in the Province of Alberta, being a person having control of a substance that is released into the environment that has caused, is causing, or may cause an adverse effect, did fail, immediately on becoming aware of the release, report it to the Director, contrary to section 99(2) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(1)	Count 8: On or between the 8th day of August, 2001 and the 10th day of August, 2001 at or near Edmonton, in the Province of Alberta, being a person who releases or causes or permits the release of a substance into the environment that has caused, is causing, or may cause an adverse effect, did fail, as soon as that person knows or ought to know of the release, to report it to the Director, contrary to section 99(1) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.

Acts:

ACA:	Agriculture Chemicals Act	CAA:	Clean Air Act	HCA:	Hazardous Chemicals Act
AEPEA:	Environmental Protection Enhancement Act(S.A.1992)	CC:	Criminal Code (Canada)	LA:	Litter Act
		CWA:	Clean Water Act	TDGCA:	Transportation of Dangerous Goods Control Act
AEPEA(R)	Environmental Protection & Enhancement Act(R.S.A.2000)	DEA:	Dept. of Environment Act		
		FFA:	Fisheries Act (Canada)	WA:	Water Act
BCA:	Beverage Container Act				

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Environmental Enforcement Historical Search Service

Accountable Party	Action	Decision Date/ Penalty	Municipality/s Legal Description/s	Act/s & Section/s	Comments/Disposition
Edmonton, The City of	Prosecution	17-Feb-2006	Edmonton Plan 2191EO, Block OT	AEPEA 99(2)	Count 9: On or between the 8th day of August, 2001 and the 10th day of August, 2001 at or near Edmonton in the Province of Alberta, being a person having control of a substance that is released into the environment that has caused, is causing, or may cause an adverse effect, did fail, immediately on becoming aware of the release, report it to the Director, contrary to section 99(2) of the Environmental Protection and Enhancement Act. Found not guilty 17 February 2006.

Acts:

ACA:	Agriculture Chemicals Act	CAA:	Clean Air Act	HCA:	Hazardous Chemicals Act
AEPEA:	Environmental Protection Enhancement Act(S.A.1992)	CC:	Criminal Code (Canada)	LA:	Litter Act
		CWA:	Clean Water Act	TDGCA:	Transportation of Dangerous Goods Control Act
AEPEA(R)	Environmental Protection & Enhancement Act(R.S.A.2000)	DEA:	Dept. of Environment Act		
		FFA:	Fisheries Act (Canada)	WA:	Water Act
BCA:	Beverage Container Act				

Alberta Health Services

Environmental Public Health
HSBC Building
Suite 700, 10055 – 106 Street,
Edmonton, AB T5J 2Y2
Fax 780.735.1802
Phone 780.735.1800
AHS.EZ.RecordsSearch@albertahealthservices.ca

June 18, 2015

Tawnya Anderson
Nichols Environmental (Canada) Ltd.
17331- 107 Avenue
Edmonton AB, T5S 1E5

Dear Tawnya:

Re: Your request for records search

On June 16, 2015 our office received your request for information regarding the following properties:

7000- 143 Street NW, Edmonton AB.

We have conducted a search for records created in accordance with public health legislation, including records relating to hazardous waste sites, abandoned landfills and contamination sources constituting a public health nuisance.

No record of a landfill, no record of a contaminated site. However, it should be noted that the fact that records do not exist does not necessarily mean that the property complies with all applicable legislation.

Please be advised that records relevant to your search may be held by other agencies, such as Alberta Environment and Sustainable Resource Development, Alberta Energy and Utilities Board, local governments, and others. You should contact these agencies directly for further information.

Enclosed is the invoice owing for this service. Please issue payment to the address noted above.

$50.00 x 1 file search
TOTAL OWING: $50.00

Sincerely,
Alberta Health Services

For Dragan Sikanjic, BEH, CPHI(C)
Environmental Health Officer/Executive Officer

Enclosure: Invoice

THE CITY OF Edmonton

FINANCIAL SERVICES
AND UTILITIES

OFFICE OF THE CHIEF FINANCIAL
OFFICER & TREASURER
5TH FLOOR, CHANCERY HALL
3 SIR WINSTON CHURCHILL SQUARE
EDMONTON, ALBERTA
T5J 3A3

June 22, 2015

File No.: 71-020-008-001
Search ID: 3350

Tawnya Anderson
Nichols Environmental (Canada) Ltd.
17331 - 107 AVENUE NW
Edmonton, Alberta
T5S 1E5

Dear Sir/Madam:

	ADDRESS	LEGAL
SUBJECT:	7000 - 143 STREET NW	Plan 8521469 Blk A

In response to your recent inquiry, our limited records do not identify a former landfill or dump site on or within a 500 metre radius of the subject property. Please note that this information is provided without prejudice and the onus is on the developer/owner to verify by site tests the suitability of the property for their intended use of it. The search area is restricted to sites within the City of Edmonton's boundaries.

Sincerely,

Mark Demers
Supervisor of GIS Mapping
Waste Management Services

Enclosure

THE CITY OF Edmonton SUSTAINABLE DEVELOPMENT

Current Planning
5th Floor, 10250 - 101 Street NW
Edmonton, Alberta
T5J 3P4

Date: June 23, 2015

Our File: 174138499-001
Your File: 15-305-CFE

NICHOLS ENVIRONMENTAL (CANADA) LTD
17331 - 107 AVENUE NW
EDMONTON, ALBERTA T5S 1E5

Attention: NICHOLS ENVIRONMENTAL (CANADA) LTD:

Re: 7000 - 143 STREET NW Plan 8521469 Blk A

We acknowledge receipt of your inquiry dated Jun 11, 2015, regarding the property located at the above address. The following is the information you requested:

Our records indicate there was a previous infraction of the Weed Control Act, Section 15 against this property. A written warning (Notice to Comply) was issued on September 15, 2014, and the follow up inspection indicated voluntary compliance had been achieved and therefore, the file has been closed.

This is an examination of the Complaints and Investigations files only. Our office has not done a site inspection and there may be bylaw infractions we are not currently aware of.

The information listed above is not warranted to be a complete history of the property as there may be other City of Edmonton departments that have files concerning this property. The above information is given on the express understanding that we incur no responsibility whatever in furnishing it.

The City of Edmonton does not conduct independent environmental checks of land within the City. If you are concerned about the suitability of this property for any purpose, you should conduct your own tests and reviews.

Should you require further information, you can contact the writer at (780)496-6089.

Note: Bylaw Infraction Searches are conducted for a one (1) year time period from the date the request is received in our office. The following are the Bylaws and Acts that the Complaints and Investigation Section is charged with enforcing: 5535, 5590, 5825, 6046, 7083, 7255, 7608, 7829, 8081, 9668, 10396, 10398, 10406, 10670, 10874, 11468, 11869, 12020, 12308, 12452, 12513, 12800, 12972, 13138, 13145, 13333, 13521, 13777, Sections 545, 546 and 645 of the Municipal Government Act, Part 9 Division 2 of the Environmental Protection and Enhancement Act and the Weed Act. To view Bylaws on line visit the City Website at: www.edmonton.ca . Information related to the status and issuance of Municipal Tickets and Violation Tickets to individuals is not included.

Yours truly,

FRANCESCA PERRI-HILL, Service Advisor
Current Planning Service Centre

THE CITY OF Edmonton FINANCIAL SERVICES AND UTILITIES

OFFICE OF THE CHIEF FINANCIAL OFFICER & TREASURER
5TH FLOOR, CHANCERY HALL
3 SIR WINSTON CHURCHILL SQUARE
EDMONTON, ALBERTA
T5J 2C3

June 16, 2015

Application No: 174392708-001
Customer File: PRO-1606

Tami Dolen P.Ag.
Environmental Scientist
c/o Nichols Environmental (Canada) Ltd.
The City of Edmonton
Engineering Services, Transportation Services
11004 – 190 Street NW
Edmonton AB T5S 0G9

Re: Legal Address: Plan 8521469, Block A
Municipal Address: 7000 – 143 Street NW, Edmonton AB

Attached are the results of a record search for the above noted premises with respect to compliance with Edmonton's Sewers Use Bylaw No. 9675, Sewers Bylaw No. 9425 and Drainage Bylaw No. 16200. Inquiries with respect to this search should be directed to the undersigned at (780) 496-4347. You will be invoiced for this service at a later date.
Original will no longer be sent by mail unless requested

Regards,

Dave Johnston
Supervisor – Industrial Source Control
Drainage Services
Regulatory Services

Enclosure

THE CITY OF Edmonton

FINANCIAL SERVICES AND UTILITIES

REGULATORY SERVICES RECORD SEARCH

*SEWERS BYLAW # 9425, SEWERS USE BYLAW # 9675 & DRAINAGE BYLAW 16200

CUSTOMER: City of Edmonton C/O Nichols Environmental (Canada) Ltd.

CUSTOMER FILE #: PRO-1606 **APPLICATION #:** 174392708-001

PROPERTY DETAIL

MUNICIPAL ADDRESS: 7000 – 143 Street NW Edmonton, AB

LEGAL ADDRESS / DESCRIPTION: Plan 8521469, Block A

NAME OF FACILITY: Fort Edmonton Park

TYPE OF BUSINESS:

☐ - **NOT INSPECTED / NO RECORDS FOUND**

☒ - **INSPECTED - DATE OF INSPECTION:** September 26, 2008

☐ - **NO VIOLATION(S) FOUND**

☒ - **VIOLATION(S) FOUND:** See Comments

☒ - **NOTICE TO COMPLY ISSUED:** See Comments

☐ - **FINE(S) ISSUED:**

☐ - **OVERSTRENGTH SURCHARGES LEVIED:**

COMMENTS: Notice to Comply #23-A 1564 Hotel Selkirk - Clean and maintain grease interceptor.
Notice to Comply #23-A 1565 Blatchford Hanger – Clean and maintain grease interceptor.
Notice to Comply # 23-A 1566 Jasper House Hotel - Clean and maintain grease interceptor
Notice to Comply #23-A 1568 Masonic Hall - Clean and maintain grease interceptor

*Note: This search will only contain violations of the Sewers Bylaw No. 9425 (Sections 4 – 38), Sewers Use Bylaw No. 9675 (Sections 4 – 37) and Drainage Bylaw No.16200 (Sections 4-40, 50 and 51).

SEARCH PERFORMED BY: _____ DATE: June 19, 2015

REVIEWED BY: _____ DATE: June 19, 2015.

Tax Roll Owner

Object Edit

Tax Roll Owner

CITY OF EDMONTON COMMUNITY SERVICES
BOX 2359
EDMONTON AB T5J 2R7

Effective Start Date:

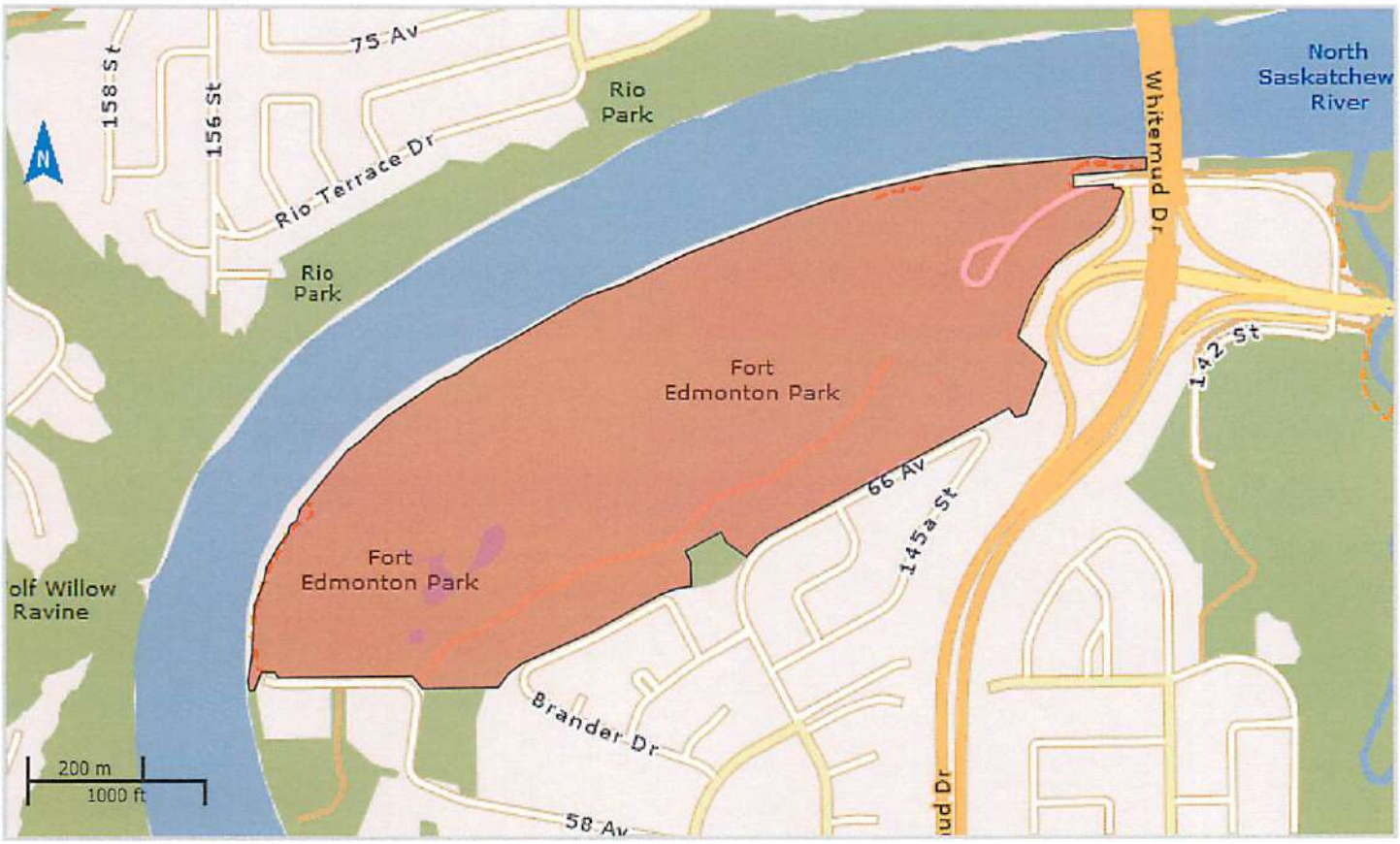
Effective End Date:

Details

Formatted Address:	BOX 2359 EDMONTON AB T5J 2R7
Formatted First Name:	
Formatted Name:	CITY OF EDMONTON COMMUNITY SERVICES
PartyId	54801
Tax Roll Number	3053428

Relationships

Titled Lot: 7000 - 143 STREET NW
Plan 8521469 Blk A (Title(s): 852149449)



Legend

Title Lots

7000 - 143 STREET NW

Address:	7000 - 143 STREET NW
Legal Description for Title Lot:	Lot , Block A, Plan 8521469
Area:	626,712.784 m^2
Neighbourhood:	River Valley Fort Edmonton
Ward:	Ward 09
Waste Collection:	Thursday (Weekly)
Current Zone:	River Valley Activity Node Zone (AN)
Current Bylaw:	12836
Proposed Applications:	None
Proposed Zone:	None
Proposed Bylaw:	None
Overlays:	Floodplain Protection Overlay North Saskatchewan River Valley and Ravine System Protection Overlay
Plan in Effect:	None

THE CITY OF Edmonton ASSET MANAGEMENT AND PUBLIC WORKS

NOTICE TO COMPLY

Name:_____ Title:_____ Date Issued: September 30, 2008

Name of Business: Royal Treats Ltd Date Inspected: September 26, 2008

Address: 8804 - 53 Avenue, Edmonton, AB T6E 5G2

Re: Masonic Hall - Fort Edmonton

OFFENSE	BYLAW / Section
Flow monitoring point not constructed / maintained as required.	☐ 9425 / 18(2)
Means not provided to access flow monitoring point.	☐ 9425 / 18(8)
Interceptor not of sufficient capacity or appropriate design.	☐ 9425 / 19(4)(a)
Interceptor not maintained.	☑ 9425 / 19(4)(c)
Release to sanitary sewer of other than permitted matter.	☐ 9675 / 4(1)
Release to a combined sewer of other than permitted matter.	☐ 9675 / 5(1)
Release to storm sewer / watercourse of other than permitted matter.	☐ 9675 / 10(1)
Release of a hazardous waste to a sanitary sewer.	☐ 9675 / 4(2)
Release of a hazardous waste to a combined sewer.	☐ 9675 / 5(2)
_____	☐ _____
_____	☐ _____

TO COMPLY:

clean interceptor (grease trap) and maintain on a regular basis

Problem to be remedied before: October 14, 2008

If you have any concerns contact Inspector Rolf Johannsen at 496 - 780 - 944-0492

FAILURE TO COMPLY could result in the issuance of a PENALTY TICKET in the amount of $ 1,000.00

☐ MAILED ☐ HAND DELIVERED

231 8228

23-A 1568

THE CITY OF Edmonton ASSET MANAGEMENT AND PUBLIC WORKS

NOTICE TO COMPLY

Name: Dear Treichel Title: _____ Date Issued: September 30, 2008

Name of Business: City of Edmonton Date Inspected: September 26, 2008

Address: c/o Valley Zoo P.O. Box 2359 Edmonton, AB T5J 2R7

Re: Jasper House Hotel - Fort Edmonton

OFFENSE	BYLAW / Section
Flow monitoring point not constructed / maintained as required.	☐ 9425 / 18(2)
Means not provided to access flow monitoring point.	☐ 9425 / 18(8)
Interceptor not of sufficient capacity or appropriate design.	☑ 9425 / 19(4)(a)
Interceptor not maintained.	☐ 9425 / 19(4)(c)
Release to sanitary sewer of other than permitted matter.	☐ 9675 / 4(1)
Release to a combined sewer of other than permitted matter.	☐ 9675 / 5(1)
Release to storm sewer / watercourse of other than permitted matter.	☐ 9675 / 10(1)
Release of a hazardous waste to a sanitary sewer.	☐ 9675 / 4(2)
Release of a hazardous waste to a combined sewer.	☐ 9675 / 5(2)
_____	☐ _____
_____	☐ _____

TO COMPLY:

New interceptor (grease trap) needs to be installed

Problem to be remedied before: December 1, 2008

If you have any concerns contact Inspector Rolf Johannessen at 496-780-944-0442

FAILURE TO COMPLY could result in the issuance of a PENALTY TICKET in the amount of $ 2,500.00

☒ MAILED ☐ HAND DELIVERED

231 8228

23-A 1566

THE CITY OF Edmonton ASSET MANAGEMENT AND PUBLIC WORKS

NOTICE TO COMPLY

Name: Dean Troichel Title: _____ Date Issued: September 30, 2008

Name of Business: City of Edmonton Date Inspected: September 26, 2008

Address: c/o Valley Zoo, PO Box 2359, Edmonton, AB T5J 2R7

Re: Blatchford Hanger - Fort Edmonton

OFFENSE	BYLAW / Section
Flow monitoring point not constructed / maintained as required.	☐ 9425 / 18(2)
Means not provided to access flow monitoring point.	☐ 9425 / 18(8)
Interceptor not of sufficient capacity or appropriate design.	☐ 9425 / 19(4)(a)
Interceptor not maintained.	☑ 9425 / 19(4)(c)
Release to sanitary sewer of other than permitted matter.	☐ 9675 / 4(1)
Release to a combined sewer of other than permitted matter.	☐ 9675 / 5(1)
Release to storm sewer / watercourse of other than permitted matter.	☐ 9675 / 10(1)
Release of a hazardous waste to a sanitary sewer.	☐ 9675 / 4(2)
Release of a hazardous waste to a combined sewer.	☐ 9675 / 5(2)
_____	☐ _____
_____	☐ _____

TO COMPLY:

Clean interceptor / grease trap/ and maintain on a regular basis

Problem to be remedied before: October 14, 2008

If you have any concerns contact Inspector Rolf Johannessen at 496-780-944-0442

FAILURE TO COMPLY could result in the issuance of a PENALTY TICKET in the amount of $ 1,000.00

☑ MAILED ☐ HAND DELIVERED

231 8228

23-A 1565

THE CITY OF Edmonton ASSET MANAGEMENT AND PUBLIC WORKS

NOTICE TO COMPLY

Name: Dean Treichel Title: _____ Date Issued: September 30, 2008

Name of Business: City of Edmonton Date Inspected: September 26, 2008

Address: c/o Valley Zoo P.O Box 2359, Edmonton, AB T5J 2R7

Re: Hotel Selkirk - Fort Edmonton

OFFENSE	BYLAW / Section
Flow monitoring point not constructed / maintained as required.	☐ 9425 / 18(2)
Means not provided to access flow monitoring point.	☐ 9425 / 18(8)
Interceptor not of sufficient capacity or appropriate design.	☐ 9425 / 19(4)(a)
Interceptor not maintained.	☑ 9425 / 19(4)(c)
Release to sanitary sewer of other than permitted matter.	☐ 9675 / 4(1)
Release to a combined sewer of other than permitted matter.	☐ 9675 / 5(1)
Release to storm sewer / watercourse of other than permitted matter.	☐ 9675 / 10(1)
Release of a hazardous waste to a sanitary sewer.	☐ 9675 / 4(2)
Release of a hazardous waste to a combined sewer.	☐ 9675 / 5(2)
_____	☐ _____
_____	☐ _____

TO COMPLY:

Clean interceptor (grease trap) and maintain on a regular basis

Problem to be remedied before: October 14, 2008

If you have any concerns contact Inspector Rolf Johannessen at 496 - 780-944-0442

FAILURE TO COMPLY could result in the issuance of a PENALTY TICKET in the amount of $ 1,000.00 ea.

☑ MAILED ☐ HAND DELIVERED

231 8228

23-A 1564

THE CITY OF Edmonton COMMUNITY SERVICES

FIRE RESCUE SERVICES
FIRE PREVENTION
10425 - 106 AVENUE NW
EDMONTON, ALBERTA
T5H 0P5
PHONE: 780-496-3628
FAX: 780-442-7364

June 30, 2015

Our Reference No.: 124441139-011

City of Edmonton
Engineering Services, Transportation Services
11004 – 190 Street NW
Edmonton, Alberta T5S 0G9

Attention: Tami Dolen

RE: **Your File No.:**
Legal: 8521469, Block A
Municipal: 7000 – 143 Street NW, Edmonton, Alberta

A Fire Rescue Services record file search was conducted on June 25, 2015. Your payment has been received.

The following information has been reported to Fire Prevention:

- 25,469 litre aboveground heavy industrial fuel oil at the Train Garage.
- 200 litre gas tidy tank at Maintenance Yard.
- 2 x 455 litre aboveground diesel and gas tank at the Maintenance Administration Building.
- Our records also show that at one time there was a 45 gallon used oil container at the Motordrome and a 200 gallon gas container at the Maintenance Yard. Flammable liquid storage cabinet located at the rear of the workshop of the Motordrome building. Oxygen and acetylene cylinders in the Motordrome building and the Street Car Garage.
- Paints and thinners in the Exhibit Building.

You may wish to contact the Petroleum Tank Management Association of Alberta at (780) 425-8265 for more detailed information.

We make no representations or warranties whatsoever as to the present condition of the property or whether the property complies with the Safety Codes Act. We recommend that you take steps to satisfy yourself as to the condition of the property and the property's compliance with the Safety Codes Act.

.../2

Future requests for information should be accompanied by a prepayment of the charge and forwarded to Fire Prevention, 10425 – 106 Avenue, Edmonton, Alberta T5H 0P5. Please note, effective January 1, 2015, the File Search fees per address are $126.00 + $6.30 (G.S.T.) = $132.30

Should you have any questions, please contact Fire Prevention at (780) 496-3628.

Yours truly,

G. Mayorchak
Fire Marshal

GGM/jrc/slg

Appendix F – Historical Resources Impact Assessment

Alberta Culture and Tourism

Heritage Division
Old St. Stephen's College
8820 – 112 Street
Edmonton, Alberta T6G 2P8
Canada
Telephone: 780-431-2300
www.alberta.ca

Via e-mail: debbie.cashion-kalinowski@edmonton.ca

February 16, 2016

HRM Project File: 4725-15-0018
Permit File: 2015-186
OPaC HR Appl: 008021125

Debbie Cashion-Kalinowski
City of Edmonton
12th Flr, CN Tower
10004, 104 Ave NW
Edmonton AB
T5J 2R7

Dear Ms. Cashion-Kalinowski:

SUBJECT: *HISTORICAL RESOURCES ACT* APPROVAL WITH CONDITIONS
4725-15-0018-002
CITY OF EDMONTON
FORT EDMONTON PARK - UTILITY UPGRADES
LSDs 2 - 10, SECTION 23, TOWNSHIP 52, RANGE 25, W4M
HISTORIC RESOURCES IMPACT ASSESSMENT - FINAL REPORT

Acting on behalf of City of Edmonton (Proponent) and in accordance with Section 37(2)(a)(b) of the *Historical Resources Act,* Circle CRM Group Inc.:

- carried out a Historic Resources Impact Assessment for the Fort Edmonton Park - Utility Upgrades (Project); and,
- provided Alberta Culture and Tourism with copies of a final report summarizing the assessment, *Final Report Historical Resources Impact Assessment City of Edmonton Fort Edmonton Park - Utility Upgrades* (Permit: 2015-186).

HISTORIC RESOURCES IMPACT ASSESSMENT

Terms of Reference

The terms of reference for the Historic Resources Impact Assessment were outlined in the Schedule "A" of the letter dated August 26, 2015. These requirements included a targeted Historic Resources Impact Assessment for archaeological resources of high potential landforms in areas with minimal previous disturbance.

ARCHAEOLOGICAL RESEARCH PERMIT NO. 2015-186

Under Archaeological Research Permit No. 2015-186, Circle CRM Group Inc. conducted an assessment of lands with high archaeological potential. The field assessment consisted of a pedestrian traverse, intensive examination of fortuitous exposures, shovel testing and an auger testing program.

RESULTS

Previously Recorded Historic Resources: One archaeological site (FjPj-68) had been previously recorded within the proposed Project footprint. FjPj-68 yielded minimal cultural material and no further studies are required.

Newly Recorded Historic Resources: Circle CRM Inc. Inc. did not identify any new historic resources during the conduct of the impact assessment.

HISTORICAL RESOURCES ACT APPROVAL WITH CONDITIONS

Based upon the results of the Historic Resources Impact Assessment, *Historical Resources Act* approval is granted to the Proponent for the Project, as illustrated on the attached plan and subject to the requirements outlined in the attached Schedule.

Conditions of Approval

The attached Schedule outlines Alberta Culture and Tourism's requirements for the proposed footprint of the Project. These requirements involve construction monitoring in targeted areas. The Proponent is granted *Historical Resources Act* approval to proceed with development of the remainder of the project on the understanding that the required construction monitoring will be conducted.

Should you require additional information or have any questions concerning this approval, contact George Chalut, Land Use Planner, at 780-431-2329 (toll-free by first dialing 310-0000) or george.chalut@gov.ab.ca.

I would like to thank representatives of the City of Edmonton for their cooperation in our endeavour to document the Province's historic resources.

Sincerely,

David Link, PhD
Assistant Deputy Minister

Attachments

Alberta
Culture and Tourism

Historic Resources Application

Activity Administration

Date Received: January 20, 2016 HRA Number: 4725-15-0018-002

Project Category:	Recreation and Tourism (4725)

Application Purpose:	☑	Requesting HRA Approval / Requirements
Lands Affected	☑	Additional Lands

Project Type:	☑	Water Supply	GIS Shapefiles are attached (yes/no)	yes
	☑	Electrical / Utility		
	☑	Waste Management	Approximate Project Area (ha)	22.5

Project Name:	Fort Edmonton Park - Utility Upgrades
Additional Name(s):	

Key Contact:	Kristin E Soucey	Affiliation:	Circle CRM Group Inc.
Address:	211, 10544 106 Street	City / Province:	Edmonton, AB
Postal Code:	T5H 2X6	Phone:	(780) 423-5840
E-mail:	kristin@circleconsulting.ca	Fax:	() -
		Your File Number:	

Proponent:	City of Edmonton	Contact Name:	Debbie Cashion-Kalinowski
Address:	12th Flr, CN Tower 10004, 104 Ave NW	City / Province:	Edmonton, AB
Postal Code:	T5J 2R7	Phone:	(780) 944-7539
E-mail:	debbie.cashion-kalinowski@edmonton.ca	Fax:	() -

Proposed Development Area					Land Ownership			
MER	RGE	TWP	SEC	LSD List	FRH	SA	CU	CT
4	25	52	23	2-10	☐	☐	☑	☐

Historical Resources Impact Assessment:						
For archaeological resources:						
Has a HRIA been conducted?	☑	Yes	☐	No	Permit Number (if applicable):	15-186
For palaeontological resource:						
Has a HRIA been conducted?	☐	Yes	☑	No	Permit Number (if applicable):	

Historical Resources Act approval is granted for the activities described on this application and its attached plan(s)/sketch(es) subject to the conditions specified in the attached document(s).

David Link

February 17, 2016

Date

Alberta Culture and Tourism

OPaC Historic Resources Appl: 008021125

HISTORICAL RESOURCES ACT APPROVAL WITH CONDITIONS

CITY OF EDMONTON
FORT EDMONTON PARK - UTILITY UPGRADES
WATER SUPPLY, ELECTRICAL / UTILITY, WASTE MANAGEMENT

HISTORIC RESOURCES MANAGEMENT PROJECT FILE: 4725-15-0018-002

SCHEDULE

For the purposes of this Schedule City of Edmonton shall be referred to as the "Proponent" and Fort Edmonton Park - Utility Upgrades shall be referred to as the "Project".

The following *Historical Resources Act* approval is based upon the results of the Historic Resources Impact Assessment carried out by Circle CRM Group Inc. under Archaeological Research Permit No. 15-186 and reported upon in *Final Report Historical Resources Impact Assessment City of Edmonton Fort Edmonton Park - Utility Upgrades*.

Part I provides the Proponent with *Historical Resources Act* approval for components of the Project while Part II outlines the terms and conditions attached to this approval.

I. *HISTORICAL RESOURCES ACT* APPROVAL

Historical Resources Act approval is granted to the Proponent for the Project, as illustrated on the attached plan.

II. CONDITIONS OF APPROVAL

Historical Resources Act approval is granted on the understanding that a construction monitoring program will occur, as outlined below.

1.0 ARCHAEOLOGICAL RESOURCES

The potential for the Project to affect archaeological resources is high.

February 17, 2016

1.1 Historic Resources Requirements

Pursuant to Section 37(2) of the *Historical Resources Act*, additional studies are to be conducted on behalf of the Proponent by an archaeologist qualified to hold an archaeological research permit within the Province of Alberta. A permit must be issued by Alberta Culture and Tourism prior to the initiation of any archaeological field investigations. Please allow ten working days for the permit application to be processed.

1.1.1 Alberta Regulation 254/2002

Archaeological investigations conducted under permit in Alberta are subject to the conditions stated within Alberta Regulation 254/2002, *Archaeological and Palaeontological Research Permit Regulation*, conditions set forth in the approved permit, and any other conditions that the Minister of Alberta Culture and Tourism imposes under Section 30 of the *Historical Resources Act*.

1.1.2 Contacting the Archaeological Survey

For further information regarding the acquisition of an archaeological research permit and/or consulting archaeologists' obligations under Alberta Regulation 254/2002, please contact Martina Purdon, Head, Regulatory Approvals & Information Management, at 780-431-2331 (toll-free by first dialing 310-0000) or martina.purdon@gov.ab.ca.

1.1.3 Coverage

A construction monitoring program must be undertaken in the following targeted locations:
1) Target Area 2 (Shovel Test Area 8) within LSD 4-23-52-25-W4M
2) Target Area 8 (Shovel Test Area 5) within LSD 6-23-52-25-W4M
3) Target Area 15 (Shovel Test Area 3) within LSD 7-23-52-25-W4M

Should significant archaeological resources be encountered during the conduct of the monitoring program contact Eric Damkjar at 780-431-2346 (toll-free by first dialing 310-0000) or eric.damkjar@gov.ab.ca. It may then be necessary for Alberta Culture and Tourism to issue further instructions regarding these resources.

1.1.4 Timing

No excavation activities are to take place in the targeted areas until a professional consulting archaeologist is on-site to monitor construction activities.

1.2 Reporting the Results of Archaeological Resources Studies

1.2.1 Submission of Archaeological Site Inventory Data Forms

The Proponent's consulting archaeologist is required to submit site inventory data forms for each archaeological site recorded or re-examined during the conduct of the required studies. The discovery of a site must be reported within 30 days following the date of discovery. Site data forms are to be submitted within 30 days of the date on which the permit period ends or prior to the submission of any interim report or the final report, whichever comes first.

1.2.2 Submission of Final Report

The final report must be submitted within 180 days after the expiration of the permit or upon completion of a required monitoring program, whichever comes first. Copies of the final report are to be submitted by the Proponent's consulting archaeologist to the Archaeological Survey, Historic Resources Management Branch, Heritage Division, Alberta Culture and Tourism, Old St. Stephen's College, 8820 – 112 Street, Edmonton, Alberta, T6G 2P8.

2.0 FURTHER SALVAGE, PRESERVATIVE OR PROTECTIVE MEASURES

Based upon the results of the Historic Resources Impact Assessment, the Proponent may be ordered to undertake further salvage, preservative or protective measures or take any other actions that the Minister responsible for the *Historical Resources Act* considers necessary.

3.0 PRE-EMINENCE OF *HISTORICAL RESOURCES ACT* REQUIREMENTS

Should conditions included within this Schedule be at variance with any instructions associated with the *Listing of Historic Resources* and/or the permit application(s), the conditions of the Schedule take precedence. Following instructions as outlined in this Schedule should result in the granting of *Historical Resources Act* approval and/or the issuance of requirements regarding further historic resources studies in a timely manner.

4.0 COMPLIANCE IS MANDATORY

These conditions shall be considered directions of the Minister of Alberta Culture and Tourism under the *Historical Resources Act*. The Proponent and agents acting on behalf of the Proponent are required to become knowledgeable of the conditions. Failure to abide by the conditions will result in *Historical Resources Act* approval being delayed or not granted.

Alberta Culture and Tourism

ATTACHMENT 1

STANDARD REQUIREMENTS UNDER THE *HISTORICAL RESOURCES ACT*: REPORTING THE DISCOVERY OF HISTORIC RESOURCES

If proponents and/or their agents become aware of historic resources during the course of development activities, they are required, under Section 31 of the *Historical Resources Act*, to report these discoveries to the Heritage Division of Alberta Culture and Tourism. This requirement applies to all activities in the Province of Alberta.

1.0 REPORTING THE DISCOVERY OF ARCHAEOLOGICAL RESOURCES

The discovery of archaeological resources is to be reported to Eric Damkjar, Head, Archaeology, at 780-431-2346 (toll-free by first dialing 310-0000) or eric.damkjar@gov.ab.ca.

2.0 REPORTING THE DISCOVERY OF PALAEONTOLOGICAL RESOURCES

The discovery of palaeontological resources is to be reported to Dan Spivak, Head, Resource Management, Royal Tyrrell Museum of Palaeontology, at 403-820-6210 (toll-free by first dialing 310-0000) or dan.spivak@gov.ab.ca.

3.0 REPORTING THE DISCOVERY OF HISTORIC PERIOD SITES

The discovery of historic period sites is to be reported to Brenda Manweiler, Manager, Historic Places Research and Designation Program, at 780-431-2309 (toll-free by first dialing 310-0000) or brenda.manweiler@gov.ab.ca. Please note that some historic period sites may also be considered Aboriginal traditional use sites.

4.0 REPORTING THE DISCOVERY OF ABORIGINAL TRADITIONAL USE SITES

The discovery of any Aboriginal traditional use site that is of a type listed below is to be reported to Valerie Knaga, Director, Aboriginal Heritage Section, at 780-431-2371 (toll-free by first dialing 310-0000) or valerie.k.knaga@gov.ab.ca.

Aboriginal Traditional Use sites considered by Alberta Culture and Tourism to be historic resources under the *Historical Resources Act* include:

Historic cabin remains;
Historic cabins (unoccupied);
Cultural or historical community camp sites;

ATTACHMENT 1

STANDARD REQUIREMENTS UNDER THE *HISTORICAL RESOURCES ACT*: REPORTING THE DISCOVERY OF HISTORIC RESOURCES

Ceremonial sites/Spiritual sites;
Gravesites;
Historic settlements/Homesteads;
Historic sites;
Oral history sites;
Ceremonial plant or mineral gathering sites;
Historical Trail Features; and,
Sweat/Thirst/Fasting Lodge sites

5.0 FURTHER SALVAGE, PRESERVATIVE OR PROTECTIVE MEASURES

If previously unrecorded historic resources are discovered, proponents may be ordered to undertake further salvage, preservative or protective measures or take any other actions that the Minister of Alberta Culture and Tourism considers necessary.

NO.	DATE	ENG.	BY	SUBJECT
D	2014APR11	AM	NS	SCHEMATIC DESIGN
C	2014MAR14	AM	NS	SCHEMATIC DESIGN
B	2014FEB12	AM	NS	SCHEMATIC DESIGN
A	2014JAN28	AM	NS	SCHEMATIC DESIGN

REVISIONS

DRAWING REDUCED TO HALF SIZE

Associated Engineering

PROJECT No.	20123701
SCALE	1:1000
DRAWN	N. SCHERER
DESIGNED	A. MILLER

THE CITY OF Edmonton

CONSTRUCTION IMPACT AREA WEST

FORT EDMONTON PARK UTILITY REPLACEMENT

DRAWING NUMBER	REV. NO.	SHEET
FIGURE 19-2	D	1 / 2

Final Report
Historical Resources Impact Assessment
City of Edmonton
Fort Edmonton Park - Utility Upgrades

ASA Permit 15-186

Prepared for:

City of Edmonton
12th Floor, CN Tower
10004- 104 Avenue NW
Edmonton, AB
T5J 2R7

On behalf of:

Associated Environmental
1000, 10909 Jasper Avenue
Associated Engineering Plaza
Edmonton, AB
T5J 5B9

By:

Kristin Soucey, M.A., M.Sc.
Circle CRM Group Inc.
Suite 304, 716 3 Ave NW
Calgary, AB
T2N 0J1

December 2, 2015

EXECUTIVE SUMMARY

This report details the results of an Historical Resources Impact Assessment (HRIA) conducted for the proposed City of Edmonton Fort Edmonton Park - Utility Upgrades Project. Methods of investigation, which included in-field survey, as well as the writing and submission of this final report, incorporate archaeological permit obligations as set out by the *Guidelines for Archaeological Permit Holders in Alberta*, the *Archaeological and Palaeontological Research Permit Regulation (Alberta Regulation 254/2002)* and the *Historical Resources Act,* as well as the associated Schedule A (HRA Requirements Project File: 4725-15-0018-001).

The current HRIA did not result in the identification of, or revisit to, any historic resource sites, previously unknown or otherwise. HRIA investigations were conducted on November 9, 13 and 18, 2015. Shovel testing (n=30) did not result in the identification of surface or subsurface cultural material. During the course of the HRIA, deeply buried palaeosols indicative of long periods of landform stability were identified in select areas. Due to the presence of the palaeosols, and the potential for deeply buried cultural resources, **it is recommended that the City of Edmonton Fort Edmonton Park - Utility Upgrades Project be granted *Historical Resources Act* clearance as per the survey plans in Appendix A and in accordance with the Schedule A (HRA Requirements Project File 4725-15-0018-001) on the condition that construction monitoring be conducted in Target Areas 2, 8 and 15 within LSDs 4, 6 and 7 of 23-52-25-W4M as identified in this report.** These recommendations are subject to the approval of Alberta Culture and Tourism.

CREDITS

Permit Holder:
Kristin Soucey, M.A., M.Sc.

Field Supervisor:
Kristin Soucey, M.A., M.Sc.

Field Assistant:
Sheila Macdonald, M.A.

Report Author:
Kristin Soucey, M.A., M.Sc.

Senior Edit:
Margarita de Guzman, M.A.

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1.0 INTRODUCTION

An Historical Resources Impact Assessment (HRIA) was conducted for the City of Edmonton Fort Edmonton Park - Utility Upgrades Project (the Project), following the receipt of archaeological research permit 15-186 on November 4, 2015. *Historical Resources Act* Requirements for an archaeological HRIA were issued under the Schedule A for the Project, citing high potential to affect archaeological resources (Project File 4725-15-0018-001). Archaeological survey and in-field site assessments were conducted on November 9, 13 and 18, 2015; no historic resource sites were identified and no previously recorded sites were revisited.

This report details the physical and cultural history of the area, and the methodologies used during the current HRIA; these are in accordance with the *Guidelines for Archaeological Permit Holders in Alberta*, the *Archaeological and Palaeontological Research Permit Regulation* (Alberta Regulation 254/2002) and the *Historical Resources Act.* Ensuing sections detail the results of the pre-field research and the in-field archaeological survey, with recommendations for all associated historic resources.

2.0 SCOPE

The Project occurs within the boundaries of Fort Edmonton Park (the Park), located on an elevated terrace along the south shore of the North Saskatchewan River within the southwestern quadrant in the City of Edmonton (the City) (Figure 1; Appendix A). The City proposes to upgrade existing utilities and lay new utility lines, however, the exact location of the upgrades is currently unknown. Therefore, large areas for possible upgrades were identified throughout the Park, with the extent and depth of potential disturbances also unknown. One known HRV 0 site, FjPj-68, is recorded as being within the eastern portion of the Project.

Archaeological survey, which included foot-traversing to identify target areas, as well as subsurface testing in select target areas, occurred on November 9, 13 and 18, 2015. No new historic resource sites were identified and no known sites were revisited. The results of this assessment follow a discussion of the environmental and cultural background of the project area, as well as the methodologies used to ensure compliance with the *Historical Resources Act.*

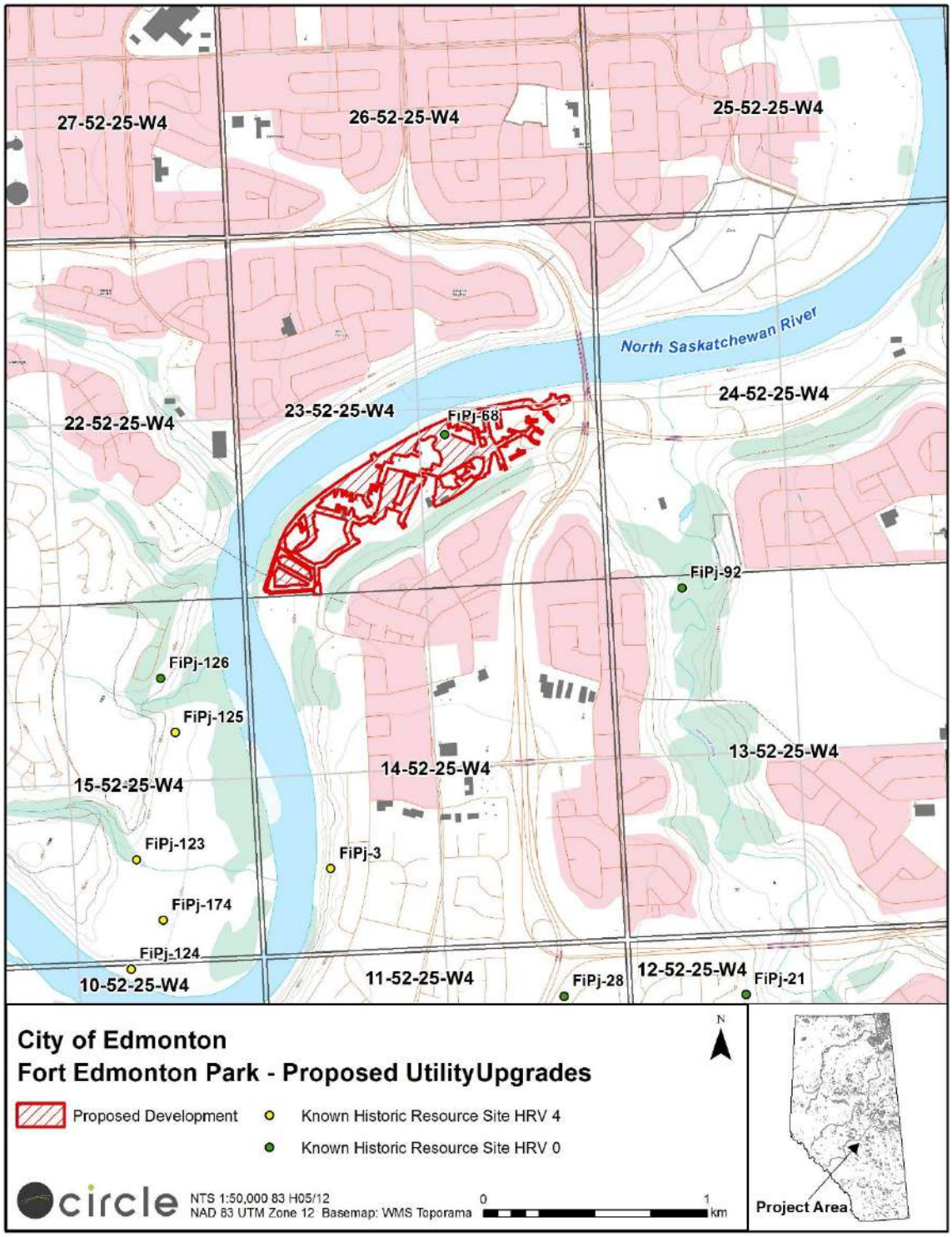

Figure 1. Map showing location of the current proposed development.

3.0 BACKGROUND

Pre-field research was conducted to ensure a clear understanding of the development area, in terms of environmental surroundings, the archaeology, and local history, as it pertains to the potential for identifying further cultural deposits. This research includes, but is not limited to, the review of relevant references, existing site forms, and reports for previous investigations, as well as updated information with regard to known and previously unrecorded sites and local histories. Comparing the location, as well as the context and significance, of known sites in relation to topographic and historic maps will reveal the potential for identifying further archaeological sites, as well as further identifying the extent of necessary field investigations.

3.1 ENVIRONMENT

The earliest evidence for human occupation in Alberta dates back almost 12,000 years, during the Pleistocene-Holocene transition, when the Cordilleran and Laurentide ice sheets began to retreat, creating a habitable corridor along the eastern slopes of the Rocky Mountains (Dyke 2004; Frison & Bonnichsen 1996; see also Catto & Mandryk 1990, Wedel 1953). The beginning of the Holocene period witnessed increases in temperature and decreases in precipitation, to which human populations were forced to continually adapt. Continued climatic variations have resulted in the development of a wide-ranging biotic landscape. These landscapes have been classified into a number of natural regions, according to landscape patterns, vegetation, soil and physiographic features, as well as other features, such as climate, topography, geology and wildlife distribution patterns (NRC 2006; see also Fenton *et al.* 2013 and Strong & Leggat 1992).

The current development occurs in the Central Parkland Subregion of the Parkland Natural Region (Figure 2). The Central Parkland encompasses over 8% of the province, consisting predominately of cultivated lands with small remnants of native parkland. Wetlands occupy about 10%; less than 2% is occupied by lakes and streams (NRC 2006).

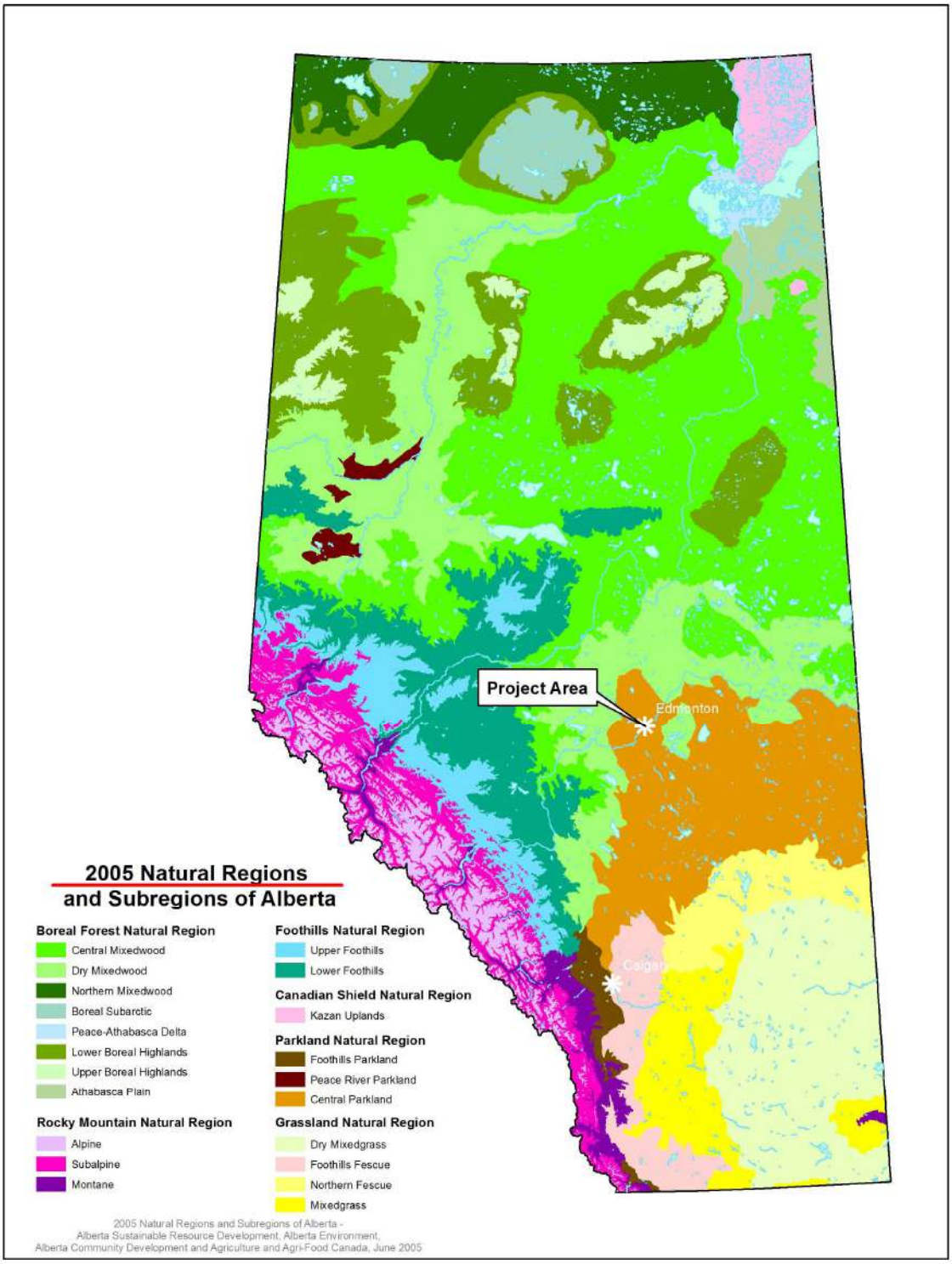

Figure 2. Natural regions and subregions of Alberta (from NRC 2006).

The Central Parkland consists predominately of aspen; wetlands are commonly surrounded by black spruce and tamarack. Soils are predominantly Black Chernozems, with Dark Gray Chernozems, Gleysols, Solonetzic and organic soils occurring in wetter areas along lower slopes and in valley bottoms. The underlying geology consists mainly of Upper-Cretaceous sandstone and mudstone with some marine shales, generally overlain by fine textured till and glaciolacustrine and glaciofluvial sediments (Fenton *et al.* 2013; NRC 2006).

Characteristic wildlife populations have historically included Bison, as well as moose, black bear and white-tailed deer. Smaller species include the Snowshoe hare, cottontail rabbit, red fox, northern pocket gopher, Franklin's ground squirrel and a wide variety of avifauna (*ibid.*).

3.2 CULTURE HISTORY

The chronological sequence that defines the culture history of Alberta is based essentially on projectile point styles recovered throughout the Plains (Figure 3). First defined in the late 1960s (Wormington & Forbis 1965; Reeves 1969), the culture-historical model defines three main periods prior to European contact, namely, the Early Prehistoric (11,500 – 7,500 BP), the Middle Prehistoric (7,500 – 2,000 BP) and the Late Prehistoric (2,000 – 250 BP); these periods have been further defined with the identification, recovery and analysis of new materials (Vickers 1986; Peck 2010, 2011). The Protohistoric Period is defined by the acquisition of the horse (ca. 250 BP) and ends with the first documented contact with Europeans. European contact marks the beginning of the Historic Period, which extends to approximately 50 years ago.

The Early Prehistoric Period is characterized by spear points and big game hunting, and is first associated first with the Clovis point (ca. 11,000 – 10,900 BP) thus far. Clovis points have only been identified in surface finds and artifact collections; they have yet to be recovered from an excavated component (Wormington & Forbis 1965; Reeves 1969). Similarly, fluted Folsom (ca. 10,900 – 10,200 BP) and Basally Thinned Triangular (ca. 10,500 BP) points are limited to surface finds in Alberta; these are associated with communal hunting of bison elsewhere in the plains.

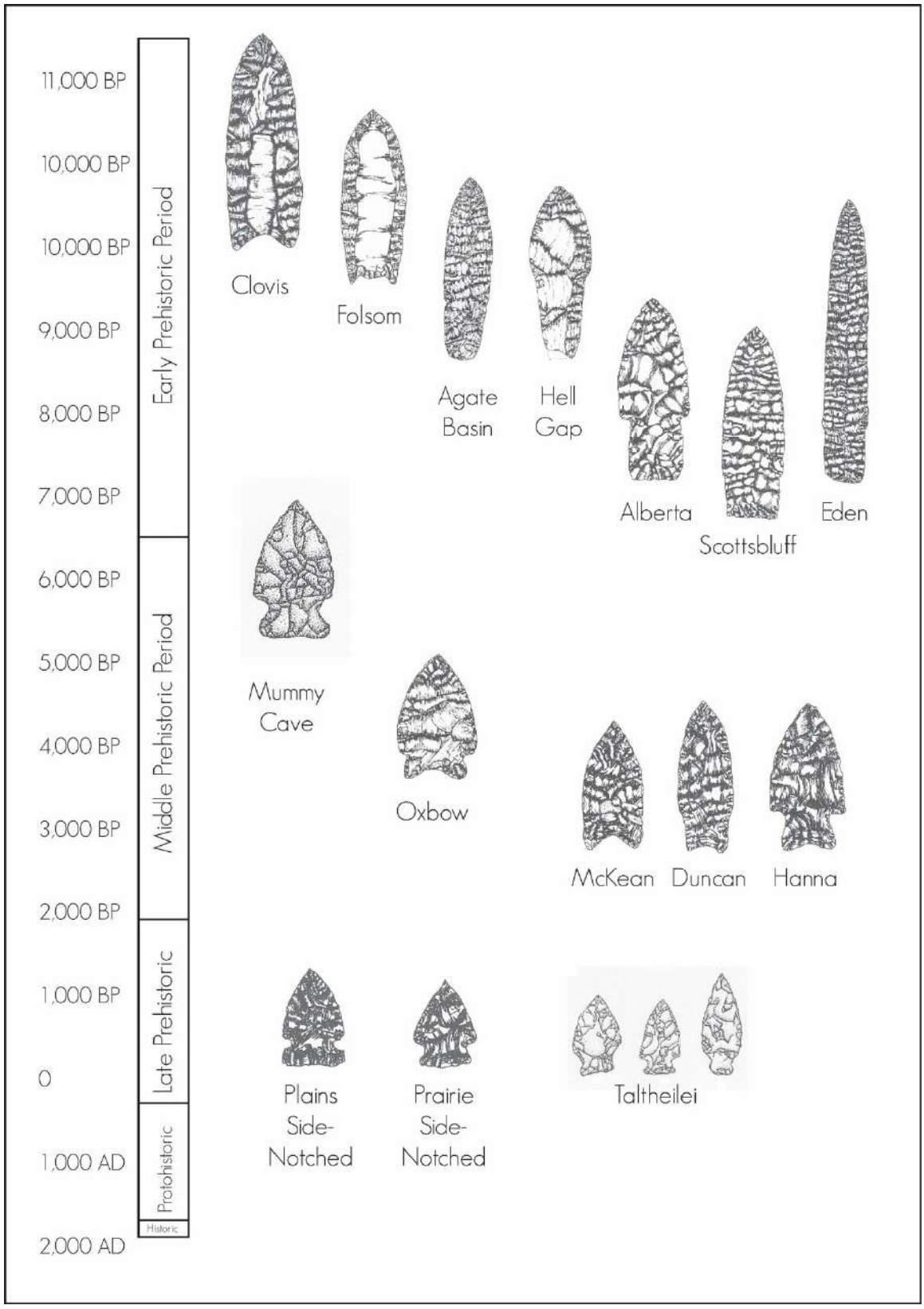

Figure 3. Culture-historical model of central Alberta (from Vickers 1986, Dyck 1983)

Points from this era are generally large and lanceolate in shape, reflecting their use on thrusting spears as opposed to the dart/atlatl system of the following Middle Prehistoric Period (Vickers 1986). A number of Clovis, Folsom and other early points have been recovered from the Edmonton area, however, the vast majority of these finds were from disturbed contexts, such as ploughed fields.

The Middle Prehistoric Period is characterized by the appearance of relatively smaller, side-notched projectile points. These 'dart' points were used in association with the atlatl (or spear thrower) and enabled the hunter to propel his spear a greater distance with a more forceful impact. Form variability among projectile points of this period resulted in a series of points being collectively referred to as the Mummy Cave Complex (7,300 – 4,500 BP). Subsequent complexes include Oxbow (4,500 – 4,100 BP) and McKean (4,200 – 3,500 BP), the latter of which also includes Duncan and Hanna dart points, each with distinct basal features. The Middle Prehistoric Period is well represented in Edmonton and the surrounding areas, with a number of sites found within the valley of the North Saskatchewan River, such as the Strathcona Site (FjPi-29) (Ives 1979).

The Late Prehistoric Period is characterized as representing two themes: a continued presence of Plains influences as evidenced by a variety of small, notched points and a connection to groups in the north through the presence of Taltheilei projectile points (LeBlanc 2004: 142). Projectile points of this time period are smaller, more finely worked and are also generally side-notched. Increased sedentism and the introduction of the bow and arrow are also characteristic of this time period. Additionally, the presence of pottery is a key characteristic, but has limited representation. The Late Prehistoric Period is also well represented within Edmonton with a number of sites found within the river valley.

The Protohistoric Period is marked by the use of the introduction of European goods. Items of European manufacture such as metal projectile points, metal pots, and glass beads have been found in the archaeological record indicating European goods first arrived in the mid-18th century (Byrne 1973; Gillespie 1976; Smith 1976).

While these trade goods are indicative of European contact, there is no documentation of this exchange until the arrival of Anthony Henday, an explorer for the Hudson's Bay Company, in 1754. The competitive fur trade led to the increased establishment of posts throughout the prairies, and encouraged explorers and mappers to

expand their horizons. Explorers such as Peter Pond, Alexander Mackenzie, David Thompson, Simon Fraser, Peter Fidler, and later, John Palliser, expanded fur trade, as well as scientific knowledge, north and west, establishing important new posts and establishing new areas for trade and settlement. In 1795, the first Fort Edmonton was established in Fort Saskatchewan, and in the early 19th century, the fort was moved to lands east of the Provincial Legislature building, overlooking the North Saskatchewan River in Edmonton. In 1870, John A. Macdonald and his Canadian government's National Policy sought to build the Dominion of Canada, establishing high protective tariffs, constructing a transcontinental railway, and encouraging immigration and settlement of western Canada. In 1873, the North West Mounted Police were established, with posts erected throughout the province. In 1874, the first of three treaties affecting Alberta's First Nations groups were signed, followed by Treaties 6, 7 and 8, which were signed in 1876 (central Alberta), 1877 (southern Alberta) and 1899 (northern Alberta) respectively. Edmonton became a Town in 1894, then a City in 1904; shortly thereafter, Edmonton was named the capital of Alberta.

3.3 PREVIOUS WORK

The majority of newly identified historic resource sites continue to be discovered in the course of HRIAs in association with future developments. Known historic resource sites are recorded on Archaeological and Historic Site Inventory Data forms, which are kept on file with the Historic Resources Management Branch of Alberta Culture and Tourism. Newly identified archaeological sites are designated a Borden number (Borden 1952) and assigned a historic resource value (HRV) ranging from 1 to 4 in decreasing significance; sites with an HRV 1 are generally World Heritage Sites or Provincial Historic Resources, while sites with an HRV 4 indicate potential significance. Sites with no further significance are assigned an HRV of 0.

3.3.1 Archaeological Sites

There are three known sites within one kilometre of the project area (Table 1). FiPj-68 is mapped within the Project area; however, FiPj-68 was identified in advance of the construction of Midway Treats and Treasures building, which is now standing.

Furthermore, the recorded site location in the HRIA final report is not the same as the mapped site location; the mapped location of the site in the final report for ASA 04-159 shows the site within the footprint of the Midway Treats and Treasures building (Kowal 2006). As this site has already been impacted (and is of limited significance), it was not revisited under the current permit.

Remaining sites within 1 km of the Project are located on the opposite side of the river and are not subject to impact. As such, these sites were not subject to revisit.

Borden No.	Location	Site Type	HRV	Distance from Development
FiPj-68	7-23-52-25-W4M	Scatter <10	0	n/a – in project area
FiPj-125	9-15-52-25-W4M	Killsite	4	750 m southwest
FiPj-126	16-15-52-25-W4M	Scatter>10; workshop	0	600 m southwest

Table 1. Known historic resource sites within 1 km of proposed development.

3.3.2 Historic Sites

Historic sites are designated unique HS numbers; these sites often replicate archaeological sites but focus on the historic portion of the site, i.e., standing structures, above-ground features, as opposed to the archaeological portion, i.e. buried, or once-buried, cultural material. Much of the recorded information is limited to general location and site name, as many site forms have not been updated for over 10 to 20 years. Regardless, their presence is indicative of historic occupation in the area. No Historic Sites have been recorded within the proposed Project area.

4.0 METHODOLOGY

Field investigations are conducted in accordance with the *Historical Resources Act*, the *Guidelines for Archaeological Permit Holders in Alberta,* the *Archaeological and Palaeontological Research Permit Regulation* (Alberta Regulation 254/2002), and all applicable Historic Resources Management Branch (HRMB) "Survey Notes" and "Information Bulletins," with the objective of identifying previously unknown archaeological and historic sites within the project area, as well as assessing the impact of the current development to any known heritage resources.

Fieldwork was undertaken in late fall/early winter conditions, i.e., under snow-free conditions with occasional areas having frozen ground. Traditional techniques of archaeological survey were employed, including pedestrian reconnaissance of the Project, along with subsurface testing where landforms and vegetation reveal a moderate to high potential for deep deposition and/or the identification of intact buried cultural material. Eroded profiles and any upturned soils were also examined for evidence of historic resources. Areas with archaeological potential received judgmental subsurface testing; a total of 30 subsurface tests were excavated during the current HRIA. Shovel test areas were selected based on target areas identified during pre-field research and submitted to the regional archaeologist prior to the commencement of in-field investigations, as well as in-field professional judgment; areas within the project area that were not shovel tested were deemed in the field to be of limited potential, i.e., previously disturbed to depths below the mineral soil, poorly-drained, poorly defined, featureless or sloping.

Shovel tests, which were strictly limited to project boundaries, were approximately 40-cm by 40-cm. The City advised that backhoe testing was not permissible anywhere within the Project; therefore, deep testing by way of hand auger was undertaken in each of the shovel test areas, augured from the base of one or more shovel tests, per test area. Following consultation with the regional archaeologist, Caroline Hudecek-Cuffe, on November 13 at the Park, it was decided that due to the amount of surface disturbances within the Project and the limits of hand auguring on a project of this size, the HRIA should focus on determining areas with deeply buried sediments and intact palaeosols below surface disturbances in large, open areas in order to select areas to recommend for construction monitoring (pers. comm). Shovel tests were

excavated to 30-100 cm below the surface (cmbs) and select tests were then augured to depths up to 300 cm below surface. Occasionally, shovel tests were halted at shallower depths due to dense tree roots; the City of Edmonton forbade the cutting of tree roots greater than two inches in diameter. Shovel tests were placed judgementally in all shovel test areas. All sediments removed from shovel tests were hand sorted and observed for cultural material, before being returned, as best as possible, to their original state. For each test area, the stratigraphy of each test was noted and representative photographs, as well as detailed notes, were taken.

The ensuing section details the field investigations conducted with regard to the City of Edmonton Fort Edmonton Park - Utility Upgrades Project; reporting is also in accordance with the *Historical Resources Act*, the *Guidelines for Archaeological Permit Holders in Alberta* and the *Archaeological and Palaeontological Research Permit Regulation* (Alberta Regulation 254/2002), as well as the associated Schedule A.

5.0 RESULTS

The purpose of these investigations was to assess unknown historic resources in potential conflict with the current development. Field investigations, including ground reconnaissance and subsurface testing, were conducted on November 9, 13 and 18, 2015. Pre-field research shows the Project encompasses 20.6 ha of disturbed land within Fort Edmonton Park. Review of historic aerial photographs shows that the Project area has been under cultivation since 1924, and possibly earlier (Figure 4). The land remained under cultivation until it was purchased from the Mellon family by the City for the purpose of constructing Fort Edmonton Park in the late 1960s/early 1970s (Figure 5).

Following receipt of the permit, a pedestrian reconnaissance of the Project was undertaken under snow-free conditions on November 9, 2015 to identify areas with potential to contain deeply buried, intact archaeological deposits. A total of twenty areas were selected as HRIA target areas (Figure 6). These target areas were subject to pedestrian reconnaissance by foot, with shovel testing conducted in areas deemed to have potential to contain intact, subsurface archaeological deposits on November 13 and 18, 2015. During these investigations, no previously recorded sites were revisited and no new sites were identified; none of the subsurface tests (n=30) were positive for cultural material (Table 2). For ease of discussion, the Project will be discussed by quarter section.

Location	Topography/Vegetation	# of Shovel Tests/ Exposures	Historic Resources	Recommendation
NE of 23-52-25-W4M	Flat terrain, aspen forest	0/0	n/a	*HRA** Clearance
SE of 23-52-25-W4M	Flat terrain, non-native species & mixed aspen forest	14/0	FjPj-68	*HRA* Clearance with condition that construction monitoring be conducted in LSD 7
SW of 23-52-25-W4M	Steeply sloping to flat terrain, mixed aspen forest	16/0	n/a	*HRA* Clearance with condition that construction monitoring be conducted in LSDs 4 and 6

**Historic Resources Act*

Table 2. Summary of HRIA under the current permit.

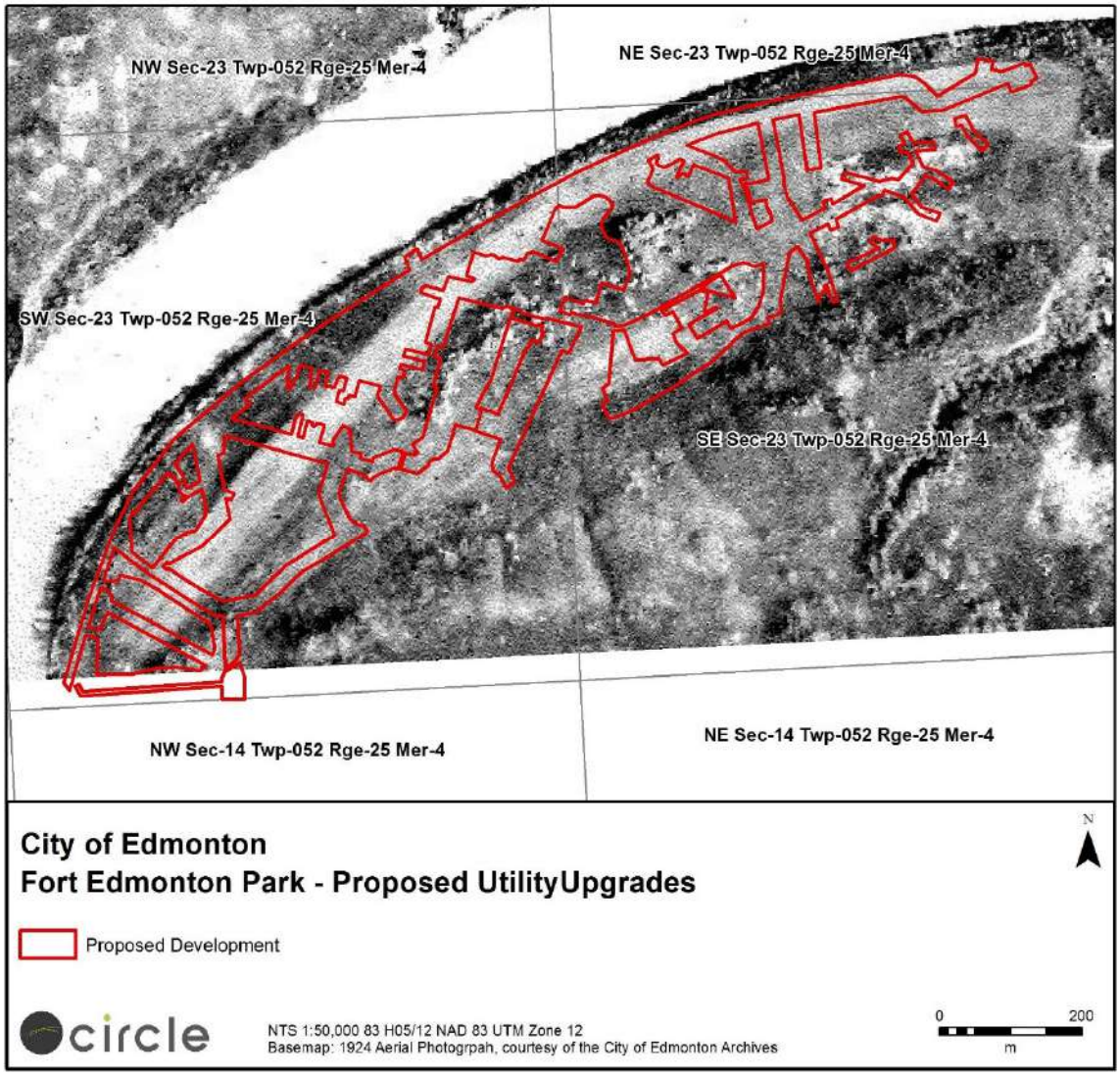

Figure 4. Map showing the Project overlying an aerial photograph from 1924.

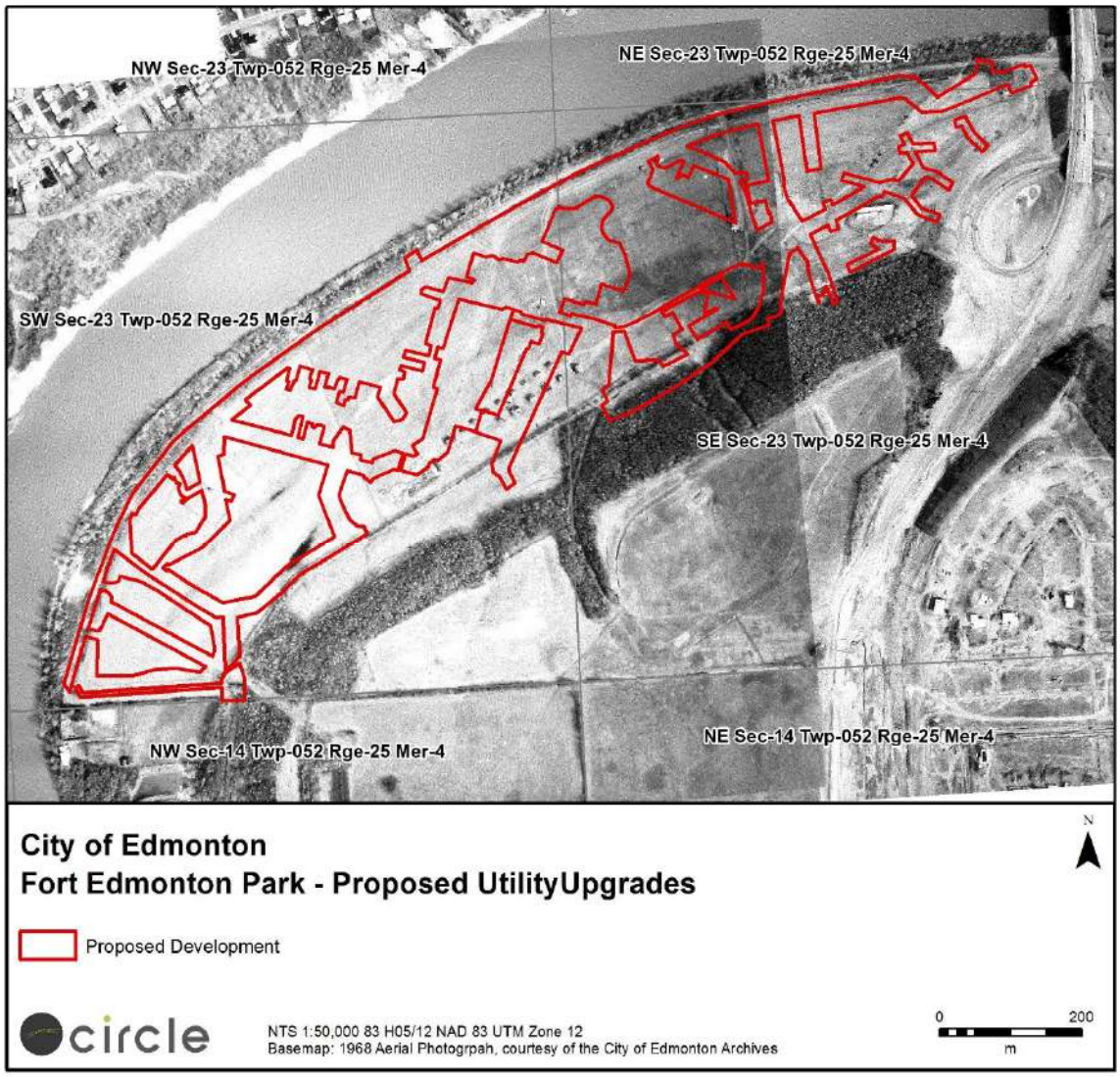

Figure 5. Map showing the Project overlying an aerial photograph from 1969.

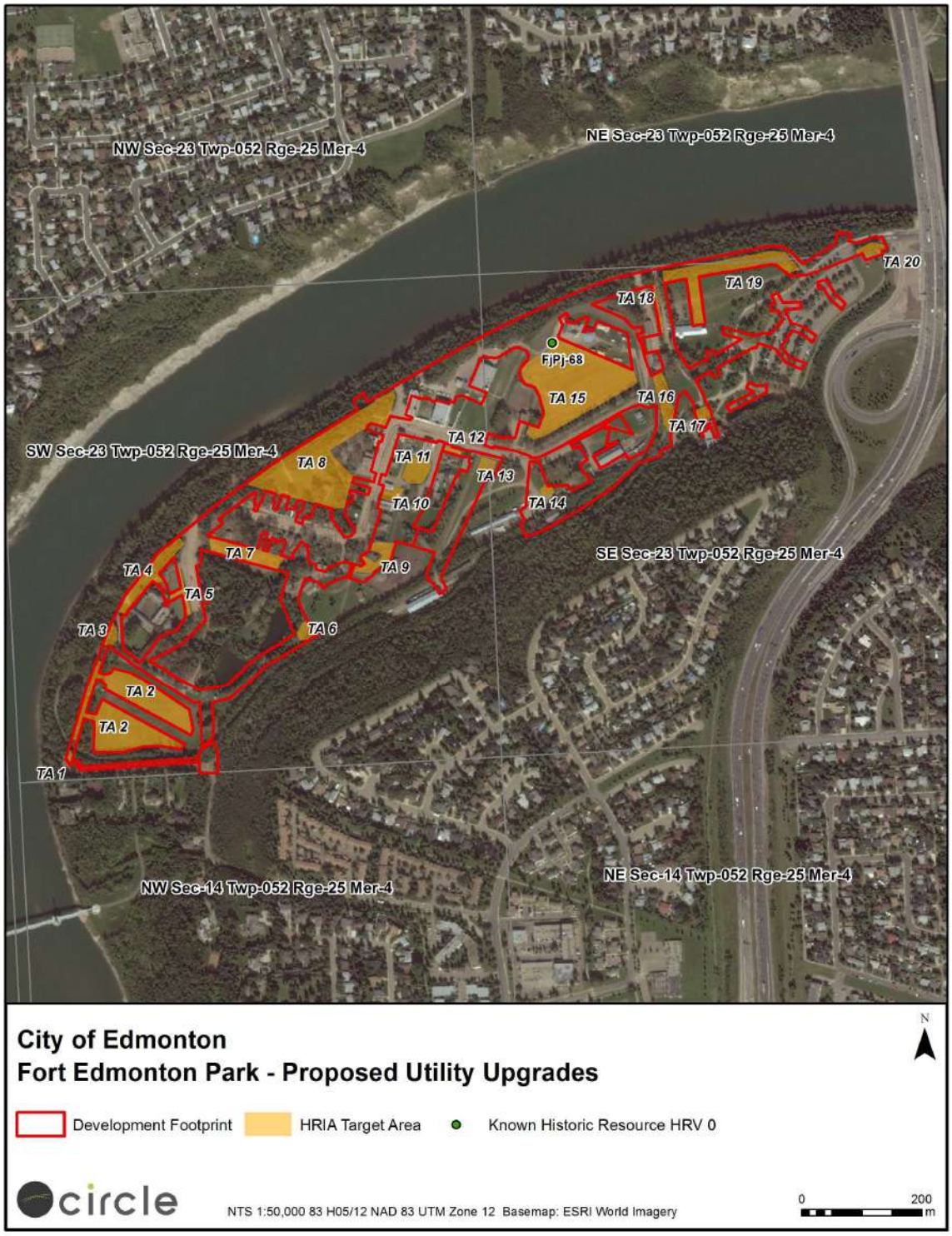

Figure 6. Map showing the location of HRIA target areas identified within the Project during the initial pedestrian traverse.

5.1 NE and SE of 23-52-25-W4M

The eastern portion of the Project occurs within the SE and NE of 23-52-25-W4M (Figure 7). Approximately one quarter of the Project occurs outside of Fort Edmonton Park; this area contains modern developments such as the parking lots for the John Janzen Nature Centre and Fort Edmonton Park, walking trails and terraforming. Inside the Park gates, modern disturbances include the train station, the midway, rail lines, various shops and agricultural outbuildings, terraforming, streets and walkways, landscaping, and a cultivated field.

During the walkthrough on November 9, a total of seven HRIA target areas were identified. All of the target areas occur on generally flat terrain. Shovel testing was conducted in three of these target areas on November 13 and 18, 2015. The target areas not shovel tested were either deemed to be small and enclosed (TA 16, TA 17, TA18) or had several buried utilities in close proximity to one other (TA 20).

Shovel test area 1 (STA 1; TA 19) occurs within a roughly 200 m long by 20 m wide area with aspen forest along the south side of an access road, outside of the Park's gates (Figure 8). The terrain within the shovel test area was generally flat with a shallow ditch that paralleled the road, within one metre of the road edge. This narrow wooded area is at the same elevation as the road to the north and the grass covered bus parking lot to the south until approximately 80 m from the west, where the land slumps down by 50 cm between the road and the bus parking lot. The road to the north and the lot to the south remain at the higher elevation. A total of six shovel tests were excavated under snow-free and frost-free conditions. Tests were placed in a line parallel to the road to the north and spaced 25 to 50 m apart.

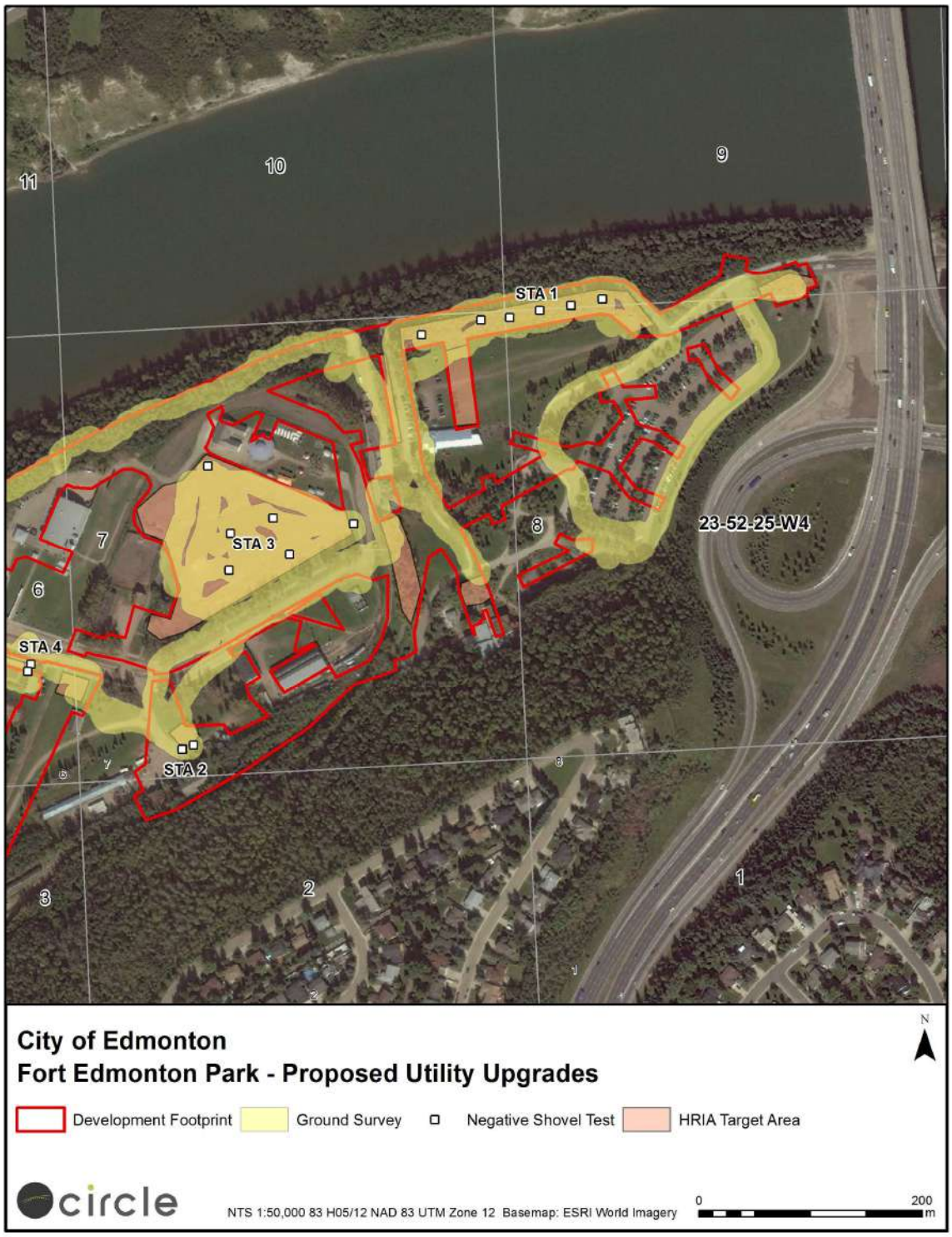

Figure 7. Map showing the location of the survey route and shovel tests within the NE of 23-52-25-W4M.

Figure 8. Photograph of STA 1, view east with the bus parking lot in the background to the right.

Four shovel tests were excavated to 100 cmbs, then two of those tests were hand augured to 200-250 cmbs. Two additional tests were halted at 30 cmbs due to dense tree roots; one test was hand augured to 250 cmbs. The soil profile consisted of 20-30 cm of dark brown clayey silt plough soil mixed with overburden underlain by mottled brown silty clay to 50 cmbs followed by homogenous brown silty clay to 250 cmbs (Figure 9). No palaeosols were identified in any of the shovel tests in this area and none of the tests contained cultural material.

Within the Park, two target areas were selected for shovel testing in LSD 7. Shovel test area 2 (STA 2; TA 14) is located on a small, level terrace in the southwestern corner of 7-23-52-25-W4M (Figure 10). The portion of the terrace within the Project area measures approximately 18 m west-southwest to east-northeast by 40 m north-northwest to south-southeast. Ground cover consisted of a well-maintained grass lawn. A gravel road delineates the target area on the terrace; it passes to the west and south of the shovel test area.

Figure 9. Photograph showing the soil profile at STA 1.

Figure 10. Photograph showing the location of STA 2, view north-northeast.

To the north, the terrace slopes down at 45° for 4-5 m and to the east, south and west the ground remains flat, continuing outside of the Project area. Two shovel tests were excavated under frozen conditions to 15 cmbs, approximately 5 m apart. The shovel tests were excavated to 50 cmbs then hand augured to 100 cmbs. The soil profile consisted of dark brown plough soil mixed with frequent small gravels to 20 cmbs underlain by brown silty clay to 26 cmbs followed by light beige silty clay with occasional charcoal inclusions to 30 cmbs followed by clean, brown basal clay to 100 cmbs (Figure 11). All tests were negative for cultural material.

Shovel test area 3 (STA 3; TA 15) is located within the cultivated field (Figure 12). The field measures 162 m east to west at its widest and 107 m north to south at its longest and is bound by the midway to the northeast, an access road to the east, south and north and more fields to the west. Six shovel tests were excavated under frost-free conditions, all to 100 cmbs, and two tests were hand augured to 250-300 cmbs. The soil stratigraphy was the same across all six shovel tests, with occasional variation in the depths of the deposits. The soil profile consisted of dark brown plough soil to 30 cmbs underlain by light brown silt to 35 cmbs followed by a well-developed, 5 cm thick palaeosol to 40 cmbs then light brown silt to 50 cmbs followed by a palaeosols to 52 cmbs underlain by light brown silt to 100 cmbs (Figure 13). The light brown silt continued to 300 cmbs with two additional palaeosols identified between 100 and 300 cmbs during auguring. All tests were negative for cultural material.

Due to the presence of intact palaeosols within an area of minimal surface disturbance, **construction monitoring is recommended in 7-23-52-25-W4M**.

5.2 SW of 23-52-25-W4M

The western portion of the Project occurs within SW 23-52-25-W4M (Figure 14). Previous disturbances within this portion of the Project include terraforming, railway tracks, various roads, 1885 Street, 1905 Street and 1920 Street, all with associated buildings, outbuildings, yards and an animal stockade.

During the walkthrough on November 9, a total of 13 HRIA target areas were identified. All of the target areas occur on generally flat terrain. Shovel testing was conducted in six of these target areas on November 13 and 18, 2015.

Figure 11. Photograph showing the soil profile at STA 2.

Figure 12. Photograph showing the location of STA 3, view north.

Figure 13. Photograph showing the soil profile in STA 3.

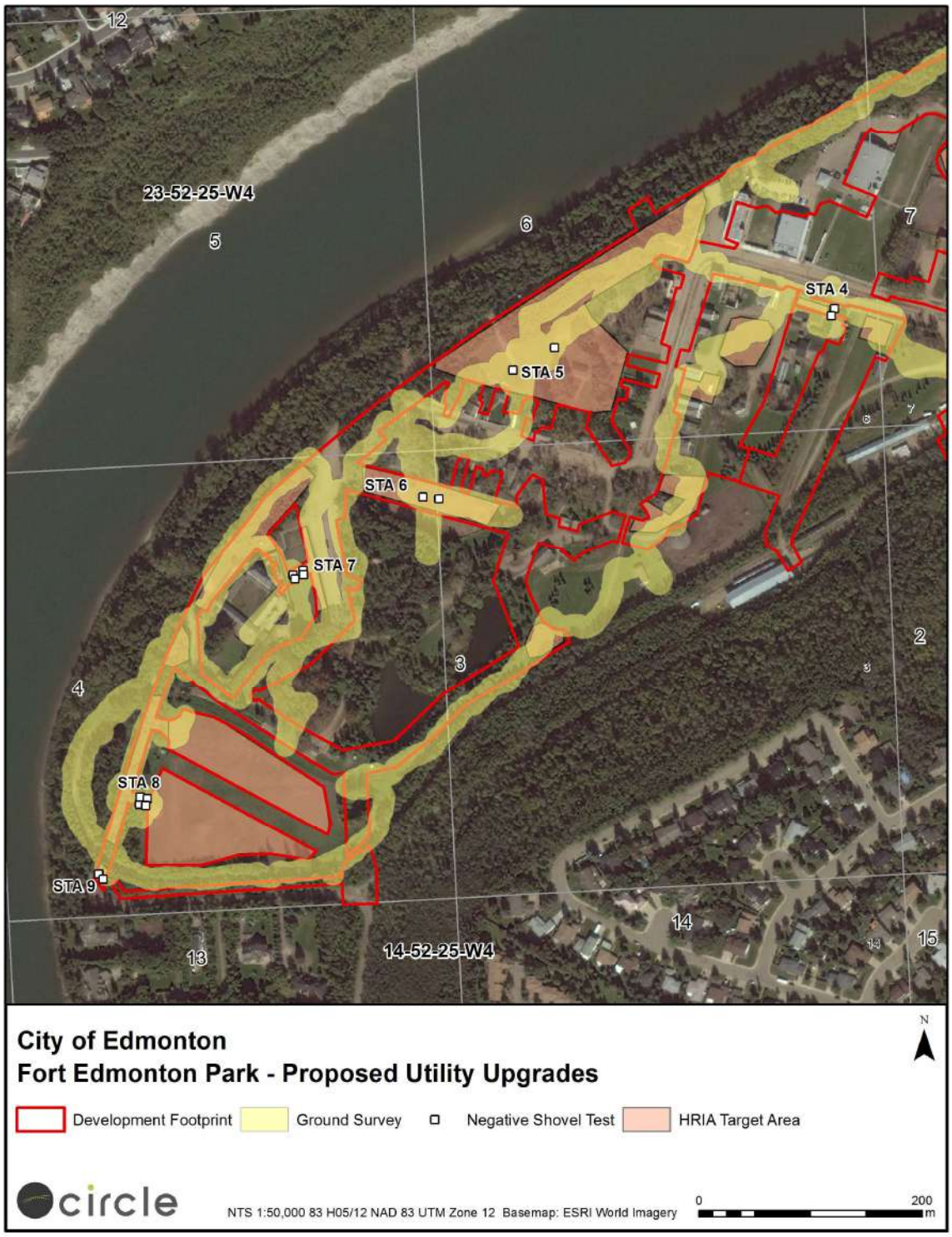

Figure 14. Map showing the location of the survey route and shovel tests in the SW of 23-52-25-W4M.

The areas not shovel tested include those small in size (TA 6, TA 9, TA 10), a small square behind 1905 and 1920 Streets as it was being used to stockpile roofing materials for a nearby roof replacement (TA 11), a small patch of aspen forest northwest of the 1846 Fort that been terraformed and partially disturbed by road construction (i.e., ditches and push piles; TA 3) and the back lawn of the 1846 Fort, which was continually in use as an activity area for school groups (TA 4).

Shovel test area 4 (STA 4; TA 12) is located in a peony garden on the northwest side of the AGT building on 1920 Street (Figure 15). The Project is limited to the north half of the garden, and measures 30 m east to west by 10 m north to south. Review of aerial photographs show that the Park rail line passed through this area in 1978. A total of two shovel tests were excavated in the garden under frozen conditions. The soil profile consisted of dark brown silty clay plough soil to 25 cmbs followed by dark brown garden soil with frequent small, rounded and sub-angular gravels underlain brown silty clay with occasional coal inclusions to 60 cmbs followed by brown clayey silt that gradually transitions to a homogenous brown silty clay to 150 cmbs (Figure 16). No cultural material was identified.

Shovel test area 5 (STA 5; TA 8) is located within an empty, grassed lot on the east side of 1885 Street (Figure 17). The target area is bound to the west by 1885 Street, to the south by 1905 Street, to the east by a playground and the north by the project boundary. A 30 m wide, east to west orientated swath of aspen forest occurs along the northern boundary of the target area. Close inspection of the forested area showed that it has been disturbed by push piles and a shallow ditch that parallels an access road to the north. Several large pieces of farming machinery and implements were also observed in the forested area. Due to the disturbances within the forested area, shovel tests were excavated in the open field. A total of two shovel tests were excavated under frozen conditions, with a soil profile consisting of dark brown plough soil to 30 cmbs, which was frozen from 0-25 cmbs, followed by brown silty clay to 50 cmbs underlain by clean, homogenous brown silt to 250 cmbs (No photograph available). No palaeosols were identified. Due to the large size of this minimal disturbed area and the potential for deeply buried archaeological deposits, **construction monitoring is recommended in 6-23-52-25-W4M**.

Figure 15. Photograph showing the location of STA 4, view northeast.

Figure 16. Photograph showing the soil profile at STA 4.

Figure 17. Photograph showing the location of STA 5, view west.

Shovel test area 6 (STA 6; TA 7) is located within a pig and sheep enclosure on the southwest side of 1885 Street (Figure 18). The area had been terraformed, however, there were no less disturbed areas to test, therefore, two shovel tests were excavated under frozen conditions. The soil profile consisted of frozen mulch and animal waste to 40 cmbs followed by clean clay to 125 cmbs (Figure 19). No cultural material was identified.

Shovel test area 7 (STA 7; TA 5) is located within a vegetable patch adjacent to the east side of the 1846 Fort (Figure 20). A narrow section of the Project measuring 10 m north to south crosses east to west across the vegetable patch. A total of four shovel tests were excavated under frost-free conditions, revealing dark brown plough soil to 30 cmbs followed by brown sandy silt to 60 cmbs underlain by compact clay with frequent gravel inclusions to 100 cmbs (Figure 21). Testing was halted at 100 m due to the densely packed gravel within a solid clay matrix which was presumed to be basal sediments. No cultural material was identified.

Figure 18. Photograph showing the location of STA 6, view southeast.

Figure 19. Photograph showing the soil profile at STA 6.

Figure 20. Photograph showing the location of STA 7, view south.

Figure 21. Photograph showing the soil profile at STA 7.

Shovel test area 8 (STA 8; TA 2) is located 70 m east of STA 4 and immediately north of the horse pasture (Figure 22). This area was chosen from within a much larger target area that included inside the horse pasture, as it had been minimally disturbed in comparison to the other portions of the target area. The horse pasture to the south was extensively terraformed and is underlain by utilities and a pipeline right-of-way (Figure 23). To the north, the Project encompasses a 2 m high berm that follows the length of the Project from east to west. The minimally disturbed area had aspen forest with a rose and willow understory. A total of four shovel tests were excavated within an area measuring 13 m north to south by 17 m east to west. The soil profile consisted of dark brown plough soil to 30 cmbs followed by brown silt to 40 cmbs underlain by a palaeosol to 43 cmbs followed by brown silt to 100 cmbs underlain by a palaeosol to 105 cmbs followed by undifferentiated brown silt to 250 cmbs (Figure 24). All tests were negative for cultural material. Due to the presence of intact palaeosols below surface disturbances, **construction monitoring is recommended in 4-23-52-25-W4M.**

Shovel test area 9 (STA 9, in TA 1) is located on an elevated terrace at the northwestern extent of the project, approximately 45 m inland from the river (Figure 25). Two shovel tests were excavated in an area measuring 15 m northwest to southeast by 18 m northeast to southwest. A railway track bounds the STA to the east and project boundaries delineated the remaining sides. The terrace is elevated approximately 1 m above the railway track to the east, and is level with a residential road located to the west, outside of the Project. The soil profile consisted of dark brown silty clay plough soil and overburden to 60 cmbs followed by mottled yellow-brown clay to 70 cmbs underlain by undifferentiated brown silt to 100 cmbs (Figure 26). Shovel tests were halted at 100 cmbs due to roots greater than two inches in diameter.

Figure 22. Photograph showing the location of STA 8 between the horse pasture (background) and east to west oriented berm (left), view southeast.

Figure 23. Photograph showing terraforming in the horse pasture south of STA 8.

Figure 24. Photograph showing the soil profile at STA 8.

Figure 25. Photograph showing the location of STA 9, view southwest.

Figure 26. Photograph showing the soil profile at STA 9.

6.0 SUMMARY AND RECOMMENDATIONS

On October 23, 2015, an HRIA was conducted for the City of Edmonton Fort Edmonton Park - Utility Upgrades Project. The Project is located on an elevated terrace on the south bank of the North Saskatchewan River in the southwest quadrant of the City of Edmonton.

Project lands within the target areas were subject to pedestrian reconnaissance, as well as subsurface testing. A total of nine areas were selected for shovel testing, with 30 shovel tests excavated; none of the subsurface tests were positive for cultural material. Shovel tests were excavated to depths of 30 to 100 cmbs and select tests in each shovel test area were then hand augured up to 300 cmbs, identifying basal deposits in several instances. Deeply buried palaeosols were identified in two of the shovel test areas. There areas have potential to contain buried, intact cultural deposits.

Given the results of the HRIA, **it is recommended that the City of Edmonton Fort Edmonton Park - Utility Upgrades Project be granted *Historical Resources Act* clearance as per the survey plans in Appendix A and in accordance with the Schedule A (HRA Requirements Project File 4725-15-0018-001) on the condition that construction monitoring be conducted in Target Areas 2, 8 and 15 within LSDs 4, 6 and 7 of 23-52-25-W4M as identified in this report.** These recommendations are subject to the approval of Alberta Culture and Tourism.

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APPENDIX A:
DEVELOPMENT PLAN

City of Edmonton
Fort Edmonton Park - Utility Upgrades

NO.	DATE	ENG.	BY	SUBJECT
D	2014APR11	AM	NS	SCHEMATIC DESIGN
C	2014MAR14	AM	NS	SCHEMATIC DESIGN
B	2014FEB12	AM	NS	SCHEMATIC DESIGN
A	2014JAN28	AM	NS	SCHEMATIC DESIGN

REVISIONS

DRAWING REDUCED TO HALF SIZE

Associated Engineering

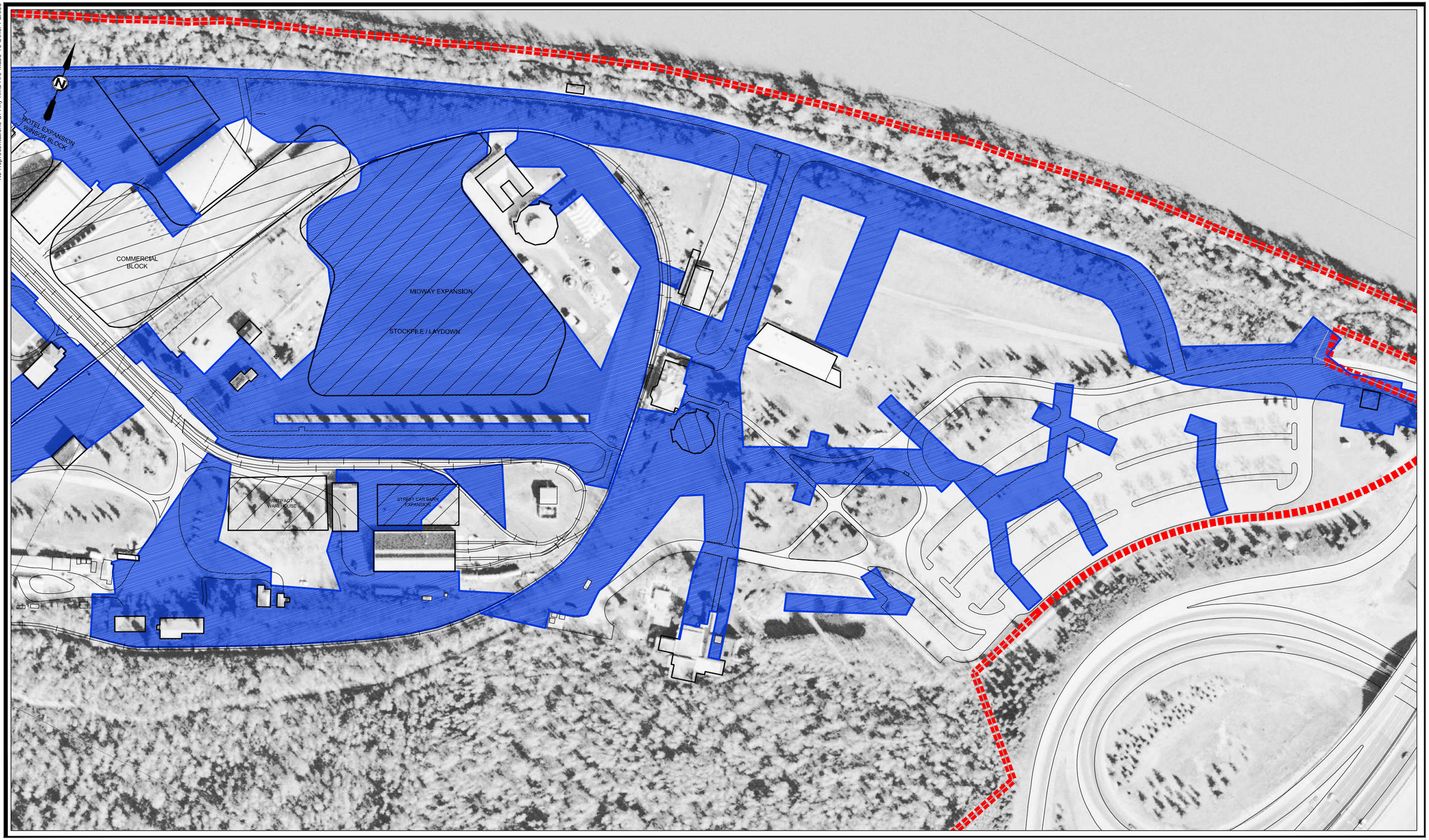
PROJECT No.	20123701
SCALE	1:1000
DRAWN	N. SCHERER
DESIGNED	A. MILLER

THE CITY OF Edmonton

CONSTRUCTION IMPACT AREA WEST

FORT EDMONTON PARK UTILITY REPLACEMENT

DRAWING NUMBER	REV. NO.	SHEET
FIGURE 19-2	D	1 / 2



NO.	DATE	ENG.	BY	SUBJECT
D	2014APR10	AM	NS	SCHEMATIC DESIGN
C	2014MAR14	AM	NS	SCHEMATIC DESIGN
B	2014FEB12	AM	NS	SCHEMATIC DESIGN
A	2014JAN28	AM	NS	SCHEMATIC DESIGN

REVISIONS

DRAWING REDUCED TO HALF SIZE

Associated Engineering

PROJECT No.	20123701	
SCALE	1:1000	
DRAWN	N. SCHERER	
DESIGNED	A. MILLER	

THE CITY OF Edmonton

CONSTRUCTION IMPACT AREA EAST

FORT EDMONTON PARK
UTILITY REPLACEMENT

DRAWING NUMBER	REV. NO.	SHEET
FIGURE 19-3	D	2 / 2

APPENDIX B:
SCHEDULE A

HRA Requirements File: 4725-15-0018-001

Alberta Culture and Tourism

OPaC HR Appl #: 007487234

HISTORICAL RESOURCES ACT REQUIREMENTS

CITY OF EDMONTON
FORT EDMONTON PARK AREA - UTILITY REPLACEMENT AND REDEVELOPMENT PROJECTS
CULTURAL / ENTERTAINMENT FACILITY, PARK DEVELOPMENT, ACCESS ROAD, WATER SUPPLY, ELECTRICAL / UTILITY, WASTE MANAGEMENT

HRA REQUIREMENTS PROJECT FILE: 4725-15-0018-001

(Schedule "A")

For the purposes of this Schedule City of Edmonton shall be referred to as the "Proponent" and Fort Edmonton Park Area - Utility Replacement and Redevelopment Projects shall be referred to as the "Project".

1.0 ARCHAEOLOGICAL RESOURCES

The potential for the Project to affect archaeological resources is high.

1.1 Historic Resources Impact Assessment

Pursuant to Section 37(2) of the *Historical Resources Act* a Historic Resources Impact Assessment (HRIA) for archaeological resources and any work resulting from this assessment is to be conducted on behalf of the Proponent by an archaeologist qualified to hold an Archaeological Research Permit within the Province of Alberta. In order to conduct the HRIA, the archaeological consultant must submit "An Application for an Archaeological Research Permit - Mitigative Research Project" to the Historic Resources Management Branch, Heritage Division, Alberta Culture and Tourism. Please allow ten working days for the permit to be processed. An approved permit must be issued prior to the initiation of any archaeological field investigations.

1.1.1 Alberta Regulation 254/2002

Archaeological investigations conducted under permit in Alberta are subject to the conditions stated within Alberta Regulation 254/2002, Archaeological and Palaeontological Research Permit Regulation, conditions set forth in the approved permit, and any other conditions that the Minister imposes under Section 30 of the Historical Resources Act.

1.1.2 Contacting the Archaeological Survey

For further information regarding the acquisition of a Permit to Excavate Archaeological Resources and/or archaeological consultants obligations under Alberta Regulation

254/2002, please contact Martina Purdon, Head, Archaeological Information & Regulatory Approvals at 780-431-2331 (toll-free 310-0000) or martina.purdon@gov.ab.ca

1.1.3 Coverage

The HRIA must target high potential landforms where significant project impacts are anticipated in areas of minimal previous disturbance.

1.1.4 Timing

The HRIA is to be carried out prior to the initiation of any land surface disturbance activities under snow-free, unfrozen ground conditions.

1.1.5 Deep Testing

A deep testing program is required in areas that exhibit elevated sedimentation potential.

1.1.6 Location of HRIA studies

Within the final report and any interim report(s) the location of pedestrian surveys, deep testing program(s) and the location and number of shovel tests must be discussed and clearly illustrated.

1.2 Reporting the results of archaeological resources HRIA

1.2.1 Submission of "Archaeological Site Inventory Data" forms

The Proponent's archaeological consultant is required to submit "Archaeological Site Inventory Data" forms for each prehistoric and historic archaeological site recorded or re-examined during the conduct of the HRIA. While the discovery of a site must be reported within 30 days following the date of discovery, site data forms are to be submitted within 30 days of the date on which the permit period ends, or at the same time or prior to the submission of any interim report or the final report, whichever comes first.

1.2.2 Submission of HRIA final report

The final report must be submitted within 180 days after the expiration of the permit, or at least six weeks prior to the anticipated conduct of land surface disturbance activities, whichever comes first. Copies of the final report and any interim reports are to be submitted to the Historic Resources Management Branch, Heritage Division, Alberta Culture and Tourism, Old St. Stephen's College, 8820 – 112 Street, Edmonton, Alberta, T6G 2P8.

1.2.3 Submission of interim report(s)

Should the Proponent find it necessary to obtain *Historical Resources Act* approval for portions or all of the lands affected by the Project prior to the submission of the final

report, Alberta Culture and Tourism will consider accepting the submission of an interim report, or reports.

2.0 REPORTING THE DISCOVERY OF HISTORIC RESOURCES

During the conduct of historic resources studies a consultant may encounter historic resources that are not the subject of their field of expertise. Under this circumstance, the consultant must follow instructions included in Attachment 1, *Standard Requirements under the Historical Resources Act, Reporting the Discovery of Historic Resources.*

The Proponent must also comply with standard conditions under the *Historical Resources Act*, which are applicable to all land surface disturbance activities in the Province. Standard conditions require applicants to report the discovery of historic resources. These requirements are stated in Attachment 1- *Standard Requirements under the Historical Resources Act, Reporting the Discovery of Historic Resources*.

3.0 FURTHER SALVAGE, PRESERVATIVE OR PROTECTIVE MEASURES

Based upon the results of the HRIA(s), reporting the discovery of archaeological resources, palaeontological resources, historic period sites and/or Aboriginal Traditional Use Site(s) of a type described in Attachment 2, the Proponent may be ordered to undertake further salvage, preservative or protective measures or take any other actions that the Minister responsible for the *Historical Resources Act* considers necessary.

4.0 REQUESTS FOR *HISTORICAL RESOURCES ACT* APPROVAL

Based upon the results of the HRIA studies, Alberta Culture and Tourism may consider granting *Historical Resources Act* approval to all or portions of the Project area. In the final report, and any interim report(s) the Proponent's consultant(s) must clearly identify and illustrate those portions of the Project area for which *Historical Resources Act* approval is requested.

5.0 PRE-EMINENCE OF *HISTORICAL RESOURCES ACT* REQUIREMENTS

Should the contents of conditions included within this Schedule be at variance with any instructions associated with the *Listing of Historic Resources* and/or the permit application, the conditions of the Schedule take precedence. Following instructions as outlined in this Schedule should result in the granting of *Historical Resources Act* approval and/or the issuance of requirements regarding further historic resources studies in a timely manner.

6.0 COMPLIANCE IS MANDATORY

These conditions shall be considered directions of the Minister of Alberta Culture and Tourism under the *Act*. The Proponent and agents acting on behalf of the Proponent are required to become knowledgeable of the conditions. Failure to abide by the conditions will result in *Historical Resources Act* approval not being granted, or delayed.

THE CITY OF Edmonton

SUSTAINABLE DEVELOPMENT **MEMORANDUM**

November 10th, 2015

TO: Sarina Loots
Summit Environmental

FROM: Brittany Davey
Urban Ecology
City of Edmonton

SUBJECT: **BD15-36 IPR for Fort Edmonton Park Redevelopment – Historical Resources Impact Assessment**

The Urban Ecology Unit has completed our review and has no further concerns. This letter is an environmental sign off and approval for your project to proceed. Provided locally accepted construction practices and restoration techniques are followed, I would anticipate that this project can be carried out without significant adverse impacts to the river valley and the surrounding lands.The following are conditions for the sign off:

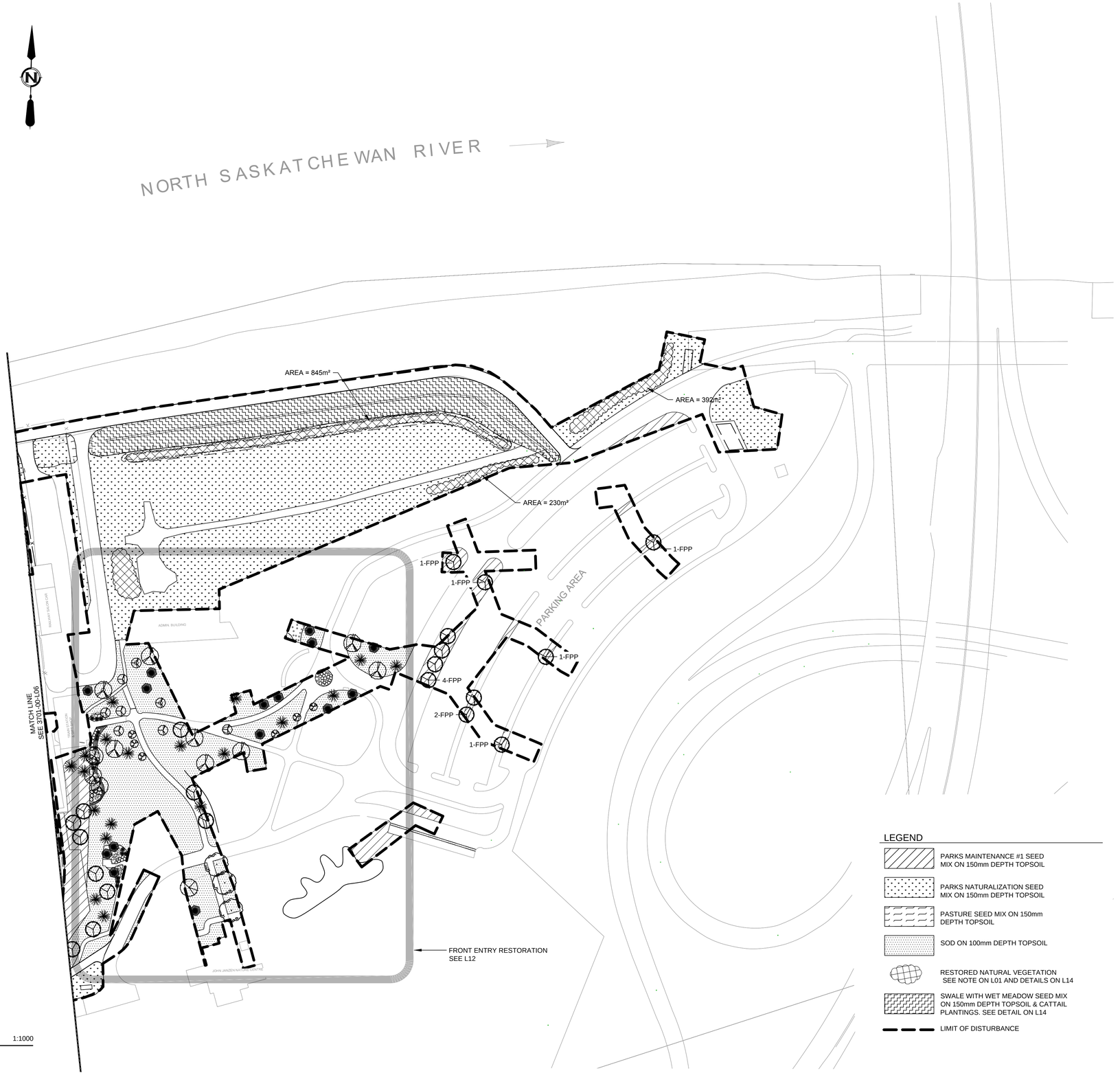
1. All mitigation measures and commitments outlined by City reviewers and in the IPR must be incorporated into the construction work plan.
2. This sign off satisfies the North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188.
3. The proponent is responsible for seeking approval for any other regulatory permits from provincial and federal agencies.
4. Please attach this letter for any further City approvals.

Please call me at 780-442-3261 if you or the proponent has any questions.

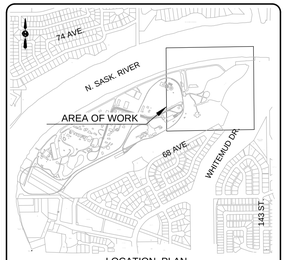
Regards,

Brittany Davey
Ecological Planner

Appendix G – Landscape Restoration Planting Plans



1 / L07 PLAN 1:1000



LOCATION PLAN

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no.	description	date	checked
A	PROGRESS SUBMISSIONS - 90%	2015/05/13	A.M.

revisions

issue date	date
ISSUED FOR BIDS	2015/12/18

seal

seal

permit

APEGA Permit to Practice P 3979

consultants

Associated Engineering

consultant project no. 20123701

THE CITY OF Edmonton PROJECT MANAGEMENT & MAINTENANCE SERVICES

project

FORT EDMONTON PARK AREA UTILITY REPLACEMENT

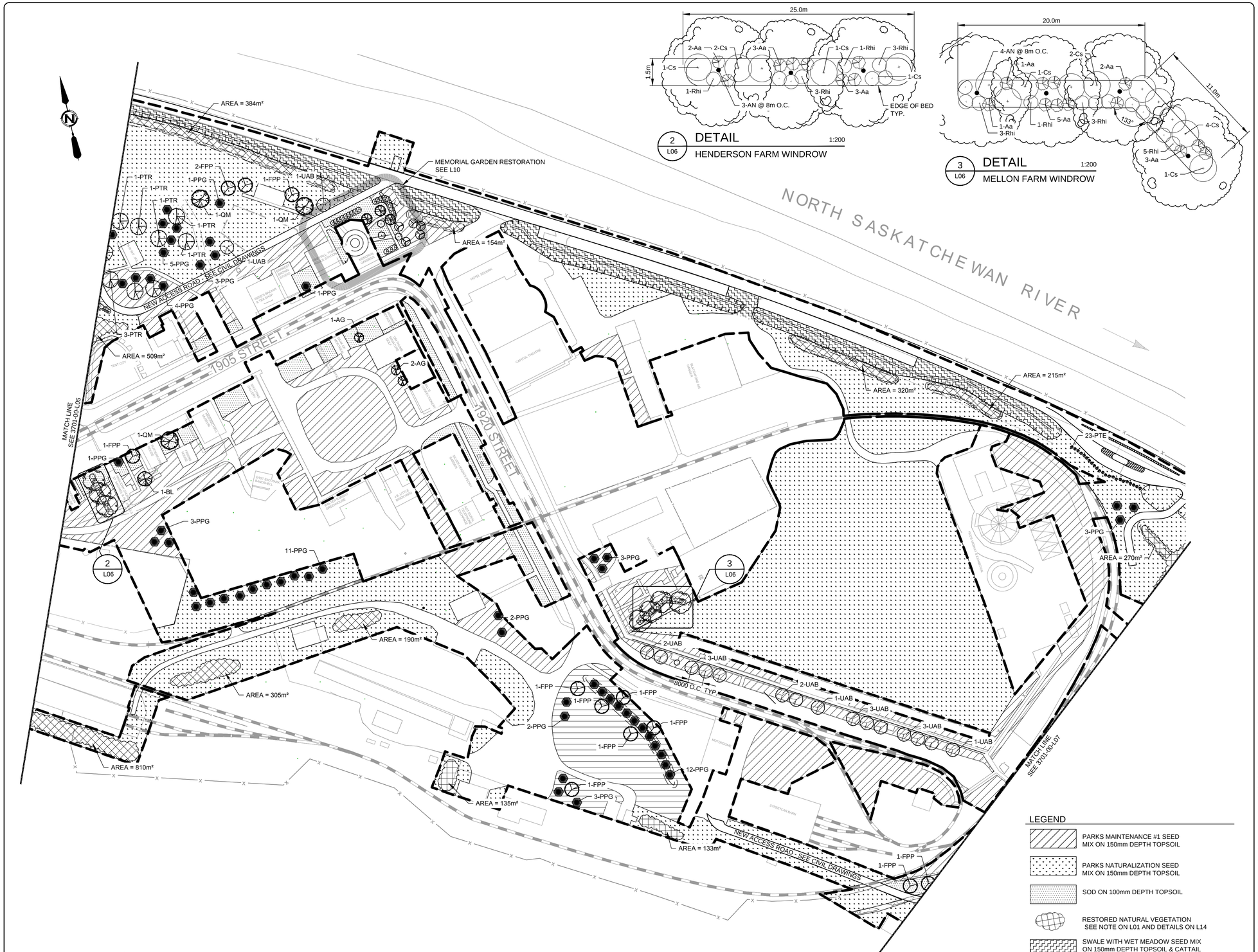
location : EDMONTON

drawing title

LANDSCAPE RESTORATION PLANTING PLAN SHEET No. 3

scale	1 : 1,000
drawn by / date	H. Hodgson 2015/06/25
checked by / date	D. Cook 2015/06/25
reviewed by / date	P. Spearey 2015/06/25
drawing no.	L07
sheet no.	83 of --
project no.	CP - 5274
CAD file name	FORT_EDM-14-L07

\\ts-edm1\ts-01\projects\20123720100_FL_Edmonton_Util\Working_Dwgs\175_Landscape\d02-Detailed Design\3701-00-L07.dwg
DATE: 2015-12-17, Danielle Cook



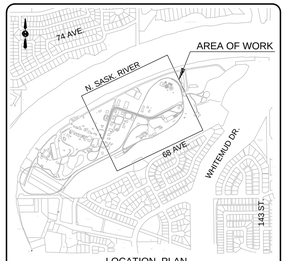
2 L06 **DETAIL** 1:200
HENDERSON FARM WINDROW

3 L06 **DETAIL** 1:200
MELLON FARM WINDROW

1 L06 **PLAN** 1:1000

LEGEND

- PARKS MAINTENANCE #1 SEED MIX ON 150mm DEPTH TOPSOIL
- PARKS NATURALIZATION SEED MIX ON 150mm DEPTH TOPSOIL
- SOD ON 100mm DEPTH TOPSOIL
- RESTORED NATURAL VEGETATION SEE NOTE ON L01 AND DETAILS ON L14
- SWALE WITH WET MEADOW SEED MIX ON 150mm DEPTH TOPSOIL & CATTAIL PLANTINGS. SEE DETAIL ON L14
- LIMIT OF DISTURBANCE



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	revisions		
A	PROGRESS SUBMISSIONS - 90%	2015/05/13	A.M.

issue date	date
ISSUED FOR BIDS	2015/12/18

seal

The Alberta Association of Landscape Architects
Issued for use date: Dec 18, 2015

seal

permit

APEGA Permit to Practice P 3979

consultants

Associated Engineering

consultant project no. 20123701

THE CITY OF EDMONTON PROJECT MANAGEMENT & MAINTENANCE SERVICES

project

FORT EDMONTON PARK AREA UTILITY REPLACEMENT

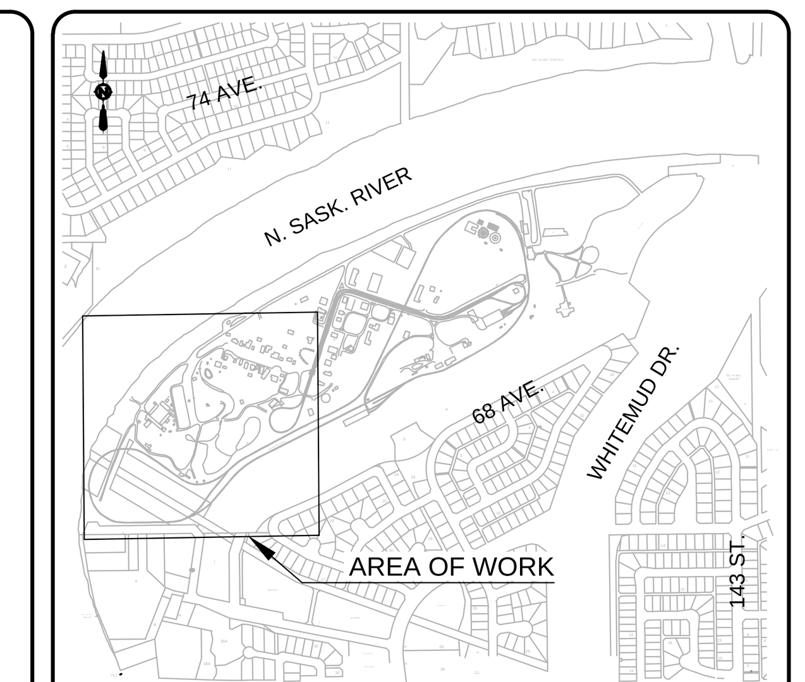
location : EDMONTON

drawing title

LANDSCAPE RESTORATION PLANTING PLAN SHEET No. 2

scale	1 : 1,000
drawn by / date	H. Hodgson 2015/06/25
checked by / date	D. Cook 2015/06/25
reviewed by / date	P. Spearey 2015/06/25
drawing no.	L06
sheet no.	82 of --
project no.	CP - 5274
CAD file name:	FORT_EDM-14-L06

1
L05
PLAN 1:1000



LOCATION PLAN

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issue	date
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seal

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APEGA Permit to Practice P 3979

consultants

Associated Engineering

consultant project no. 20123701

THE CITY OF Edmonton PROJECT MANAGEMENT & MAINTENANCE SERVICES

project

FORT EDMONTON PARK AREA UTILITY REPLACEMENT

location: EDMONTON

drawing title

LANDSCAPE RESTORATION PLANTING PLAN SHEET No. 1

scale 1 : 1,000

drawn by: H. Hodgson date: 2015/06/25

checked by: D. Cook date: 2015/06/25

reviewed by: P. Spearey date: 2015/06/05

drawing no. L05

sheet no. 81 of --

project no. CP - 5274

CAD file name: FORT_EDM-14-L05

LAYOUT NOTES:

A. SITE WORK

i) THE CONTRACTOR TO CALL ALBERTA ONE- CALL AT 1-800-242-3447 TO HAVE EXISTING UTILITIES LOCATED PRIOR TO START OF ANY CONSTRUCTION.
ii) THE CONTRACTOR IS TO VISIT THE SITE TO CONFIRM ALL SITE CONDITIONS PRIOR TO SUBMITTING BIDS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE CITY FOR CLARIFICATION.
iii) THE CONTRACTOR IS RESPONSIBLE FOR THE HOARDING OF ALL TREES WITHIN OR ADJACENT TO CONSTRUCTION AREAS.
iv) THE CONTRACTOR IS RESPONSIBLE FOR THE ADJUSTMENT OF ALL EXISTING CATCHBASINS, CATCHBASIN MANHOLES, MANHOLES, WATER VALVES, HYDRANTS, ETC. TO MATCH PROPOSED GRADES.
v) THE CONTRACTOR IS RESPONSIBLE FOR HAULING OF ALL EXCESS MATERIALS OFF THE SITE TO A LOCATION DESIGNATED BY THE CITY.
vi) THE CONTRACTOR IS RESPONSIBLE FOR GENERAL SITE CLEAN UP.
vii) THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO LANDSCAPED AREAS AND MUST MAKE ALL NECESSARY RESTORATIONS AND REPAIRS

B. PERMITS AND STANDARDS

i) THE CONTRACTOR IS TO ENSURE THAT ALL NECESSARY ARRANGEMENTS ARE MADE WITH THE PIPELINE COMPANIES CONCERNING THE MOVEMENT OF ANY MATERIALS AND/OR EQUIPMENT NEAR ANY PIPELINE RIGHTS OF WAY.
ii) ALL ANCILLARY WORK NORMALLY ASSOCIATED WITH THIS TYPE OF CONSTRUCTION SHALL BE DEEMED TO BE PART OF THE CONTRACT.
iii) ALL WORK IS TO CONFORM TO THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.

C. MATERIALS

i) THE CONTRACTOR SHALL SUPPLY ALL MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWINGS. ANY DISCREPANCIES IN QUANTITIES SHALL BE REPORTED TO THE CITY FOR DIRECTION.
ii) NO SUBSTITUTIONS OF MATERIALS, PRODUCTS, OR QUANTITIES SHALL BE PERMITTED WITHOUT PRIOR CONSENT OF THE CITY.

UTILITY SETBACKS

CONTRACTOR TO LOCATE ALL SITE UTILITIES PRIOR TO CONSTRUCTION AND PLANT NO CLOSER THAN THE FOLLOWING DIMENSIONS FROM THE SERVICES:

1. 3.5m FROM LIGHT STANDARDS/ POWER HARDWARE
2. 3.5m FROM FIRE HYDRANTS
3. 3.5m FROM STOP SIGNS
4. 3.5m FROM YIELD SIGNS
5. 3.5m FROM TRANSIT ZONES
6. 2.0m FROM OTHER SIGNS
7. 2.0m FROM PRIVATE PROPERTY ON WALKWAY ROW
8. 3.0m FROM PRIVATE PROPERTY ON OPEN PARKLAND
9. 1.0m FROM PRIVATE PROPERTY ON BOULEVARDS
10. 3.0m FROM ALL UNDERGROUND UTILITIES
11. CONTACT UTILITY FOR DISTANCE FROM GAS OR OIL ROW

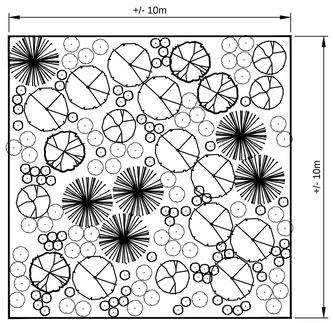
THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES AND LIABILITIES INCURRED BY DAMAGES TO SITE UTILITIES.

NATURALIZATION NOTES:

GROUND TREATMENT FOR ALL NATURALIZATION AREAS TO BE SEEDED WITH ANNUAL RYEGRASS (*Lolium multiforum)* AT A RATE OF 50 kg/ha.

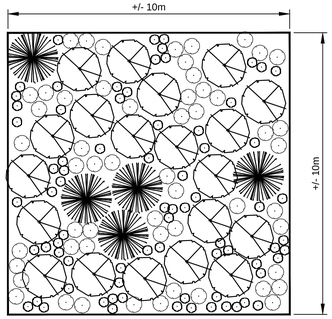
BERM NATURALIZATION PLANTING
10X10 ENLARGEMENT SAMPLE

QUANTITY	SCIENTIFIC NAME	COMMON NAME	SPACING
TREES			
4	*Betula papyrifera*	White Birch	
6	*Picea glauca*	White Spruce	
5	*Populus balsamifera*	Balsam Poplar	
10	*Populus tremuloides*	Trembling Aspen	
SHRUBS			
15	*Amelanchier alnifolia*	Saskatoon	1m
8	*Cornus stolonifera*	Red Osier Dogwood	1m
6	*Lonicera involucrata*	Bracted Honeysuckle	1m
11	*Prunus pensylcvanica*	Pincherry	1m
8	*Symphoricarpus albus*	Common Snowberry	1m
7	*Virburnum edule*	Low-bush Cranberry	1m
FORBS			
15	*Achillea millefolia*	Common Yarrow	0.3m
15	*Aralia nudicaulis*	Wild Sarsaparilla	0.3m
15	*Cornus canadensis*	Bunchberry	0.3m
15	*Epilobium palustre*	Marsh Willowherb	0.3m
15	*Galium triflorum*	Sweet-Scented Bedstraw	0.3m



OPEN AREAS NATURALIZATION PLANTING
10X10 ENLARGEMENT SAMPLE

QUANTITY	SCIENTIFIC NAME	COMMON NAME	SPACING
TREES			
5	*Picea glauca*	White Spruce	
20	*Populus tremuloides*	Trembling Aspen	
SHRUBS			
14	*Amelancheir anifolia*	Sasaktoon	1m
6	*Cornus stolonifera*	Red Osier-Dogwood	1m
5	*Corylus cornuta*	Beaked Hazelnut	1m
6	*Rosa acicularis*	Prickly Rose	1m
10	*Rubus idaeus*	Red Raspberry	1m
6	*Symphoricarpus albus*	Common Snowberry	1m
8	*Virburnum edule*	Low-Bush Cranberry	1m
FORBS			
15	*Achillea millefolia*	Common Yarrow	0.3m
15	*Aralia nudicaulis*	Wild Sarsaparilla	0.3m
15	*Cornus canadensis*	Bunchberry	0.3m
15	*Galium triflorum*	Sweet-Scented Bedstraw	0.3m
15	*Maianthemum canadense*	Wild Lily-of-the-Valley	0.3m



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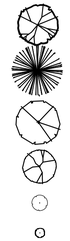
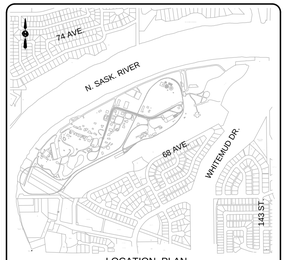


WHITE BIRCH
WHITE SPRUCE
TREMBLING ASPEN
BALSAM POPLAR
SHRUBS
FORBS



LOCATION PLAN

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no.	description	date	checked
A	PROGRESS SUBMISSIONS - 90%	2015/05/13	A.M.

revisions

issue date	date
ISSUED FOR BIDS	2015/12/18

seal

The Association of Landscape Architects
Patrick L. Spearey
ISSUED FOR PERMIT
DEC. 18, 2015

seal

permit

APEGA Permit to Practice P 3979

consultants

Associated Engineering

consultant project no. 20123701

THE CITY OF Edmonton PROJECT MANAGEMENT & MAINTENANCE SERVICES

project

FORT EDMONTON PARK AREA UTILITY REPLACEMENT

location : EDMONTON

drawing title

LANDSCAPE RESTORATION NOTES

scale NOT TO SCALE

drawn by : H. Hodgson
date 2015/06/25

checked by : D. Cook
date 2015/06/25

reviewed by : P. Spearey
date 2015/06/25

drawing no. L01
sheet no. 77 of --

project no. CP - 5274

CAD file name: FORT_EDM-14-L01

Appendix H – Aerial Images


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1:12,000
21-5-75
UAgl 3036 16299
75-84 PAN


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UAgM 3036 15299


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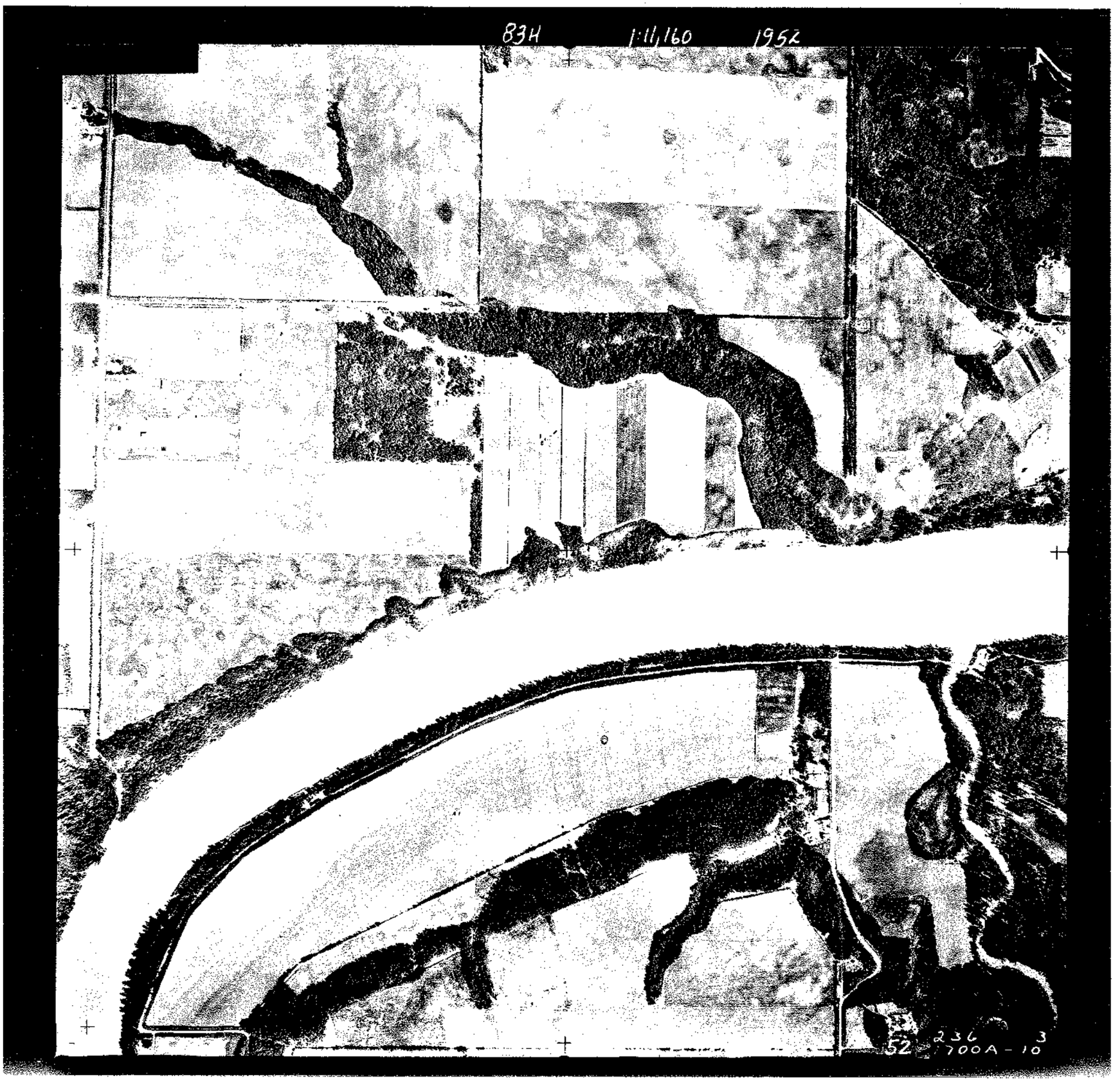
1700A-9 3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52 236 3
700A-10

Environmental Impact Assessment

Fort Edmonton Park - Staff Parking Lot

Introduction:

This is an addendum to the Fort Edmonton Park Utility Replacement Environment Impact Assessment. The area of interest is the Fort Edmonton Staff Parking Lot, and the scope of work involves a redevelopment of a parking lot within the existing footprint.

Project Background:

A utility assessment for Fort Edmonton Park was completed in 2010 that identified that the utilities in the area needed to be replaced in order to handle additional loads. The utility work consists of replacement to the following systems: storm and drainage collection, water distribution, sanitary sewer, natural gas and power distribution.

One of the areas that will be impacted by this utility project is The Fort Edmonton Park Staff Parking Lot, located west of the Fort Edmonton Park Administration Building. The area is bounded by the Fort Edmonton Park Attraction site to the south and a ravine to the north. Typically, vehicular traffic commutes to this area from the east. The areas west of the site is fenced and gated off from vehicular and pedestrian traffic. Access is granted only by approved passage through a security gate.

With the impending construction of utility facilities affecting this site, this presented an opportunity to redesign the parking lot within the existing parking lot footprint into a more effective space, taking into consideration of the other changes that are planned for this area.

This project shares some of the relevant Bylaws/Plans/Policies identified through the Fort Edmonton Park Area Utility Replacement Design Environmental Impact Assessment. As such it supports:

- Bylaw 7188 (North Saskatchewan River Valley Area Redevelopment Plan);
- The Fort Edmonton Park 2010 Master Plan Update;
- The Alberta Historical Resources Act;
- The Way We Live - by enhancing and furthering the potential of this historic site.

Project Scope:

The project scope consists of:

• Designing a new paved lot that will encompass two existing separate, but joined, parking lots into one consolidated parking lot. The new lot will improve parking stall delineation and improve City Operations and Maintenance.

• Maximizing the parking spaces within this established footprint. The proposed design allows for 124 stalls, up from the 70 stalls that currently exist on the site.

The design will consist of lighting, planting, fencing, security gate, gate call box relocation, grading, surfacing, and pedestrian walkways elements. It will also consider the movement of traffic within this location, considering that deliveries will not impede parking and delivery and emergency vehicles have the ability to mobilize safely.

Justification:

The current site will be disturbed by the impeding utility replacement project construction and would have required construction to take place in order to bring it to a similar or better state. This location is needed to support the existing park amenities, and any other location would not be conducive to supporting this initiative. Another location would have required additional land, which would have resulted in additional costs to the City of Edmonton, as well as introducing new potential environmental impacts to accommodate the construction of this new site. It may also require additional roadway infrastructure to support this other location, with the resultant construction and approval impacts to be assessed and addressed.

Public Impact and Consideration:

As discussed in the Fort Edmonton Park Utility Replacement Environment Impact Assessment, impacts and consideration to the public were considered through engagement with the public.

Environmental Consideration and Mitigation:

The current site will be disturbed by the impeding utility replacement project construction and would have required construction to take place in order to bring it to a similar or better state. The new parking lot will be within the same footprint of the existing park lots. This area is away from any riverbank and

won't compromise the slope stability. The function of a parking lot does not support wildlife so there is no effect to any wildlife species in its current and future state.

The usage of the land will not change, but the enhancement would change the gravel parking lot to that of a paved parking lot. The maintenance and operations of a paved parking lot will be less intrusive then a gravel parking lot, and there will be better drainage on a paved surface.

City of Edmonton Forestry have been engaged and provided recommendation on what tree removals could take place on this site. These marked trees stem from a lack of maintenance and present a potential overhead hazard to this site. The opportunity for positive vegetation control will be achieved by this project. New landscaping elements will also be introduced with consideration of appropriate plant species in this area.

There will be active construction on this site. Construction personnel will need to adhere to City of Edmonton standards and regulations when working in this area.

Conclusion:

The proposed recommendation is to allow for the construction of a paved parking lot located within the existing Fort Edmonton Park Staff Parking Lot footprint. Construction of the approved utility replacement work will disturb the existing footprint; hence the opportunity to enhance the parking lot and to allow for a more effective design should be realized. The opportunities that result from this work will provide financial and social benefits to the Fort Edmonton Park Attraction by having a larger, more accommodating amenity for visitors to this historical site.

The key stakeholders have been engaged and have provided support for the project.

Environmental Impact Assessment

Fort Edmonton Park - Playground

Introduction:

This is an addendum to the Fort Edmonton Park Utility Replacement Environment Impact Assessment. The area of interest is the Fort Edmonton Playground site, and the scope of work involves a redevelopment of a playground within the existing footprint.

Project Background:

A utility assessment for Fort Edmonton Park was completed in 2010 that identified that the utilities in the area needed to be replaced in order to handle additional loads. The utility work consists of replacement to the following systems: storm and drainage collection, water distribution, sanitary sewer, natural gas and power distribution.

One of the areas that will be impacted by this utility project is The Fort Edmonton Park Playground, located within the Fort Edmonton Park attraction behind Reed's Bazaar. Typically only pedestrian traffic consisting of patrons and employees of the Fort Edmonton Park attraction can access the site, though maintenance vehicles through a secured gate may access the site as required.

The current playground equipment does not meet Canadian Safety Association (CSA) standards and needs to be addressed. With the impending construction of utility facilities affecting this site, this presented an opportunity to redesign and update the existing playground site to meet current safety standards while considering the play requirements and aesthetics expected of Fort Edmonton Park.

This project shares some of the relevant Bylaws/Plans/Policies identified through the Fort Edmonton Park Area Utility Replacement Design Environmental Impact Assessment. As such it supports:

- Bylaw 7188 (North Saskatchewan River Valley Area Redevelopment Plan);
- The Fort Edmonton Park 2010 Master Plan Update;
- The Alberta Historical Resources Act;
- The Way We Live - by enhancing and furthering the potential of this historic site.

Project Scope:

The project scope consists of:

• A playground design that would aesthetically fit within the Fort Edmonton Park, adhering to an early 1900's period look and feel;

- Playground equipment that meet CSA standards;
- Trees within the existing playground are kept;
- Playground that is able to accommodate large classroom groups.

The design will also consist of subsurface work.

Justification:

The existing playground is well used and is a destination site within the Fort Edmonton Park attraction. Many children programs incorporate a visit to the playground as a scheduled activity. Through the engagement with the public and with the Fort Edmonton Management Company, it was concluded that having a playground at the Fort Edmonton Park attraction would be highly desired. The historic aspect of the playground offers a themed and unique experience for free roaming and imaginative play.

The current site will be disturbed by the impeding utility replacement project construction and this presented an opportunity to bring the playground to current CSA standards within the current location. Another location would have required additional land, which would have resulted in additional costs to the City of Edmonton, as well as introducing new potential environmental impacts to accommodate the construction of this new site.

Public Impact and Consideration:

As discussed in the Fort Edmonton Park Utility Replacement Environment Impact Assessment, impacts and consideration to the public were considered through engagement with the public.

Environmental Consideration and Mitigation:

The current site will be disturbed by the impeding utility replacement project construction and construction to abandon or replace the playground would have to occur. The new playground will be within the same footprint of the existing playground within the Fort Edmonton Park attraction. This area is away from any riverbank and won't compromise the slope stability. The function of a playground does not support wildlife so there is no effect to any wildlife species in its current and future state.

The usage of the land will not change, but the new equipment will meet CSA standards. The maintenance and operations of the new playground should be similar to what to that of the current playground.

Two large trees that are within the current playground will remain and be incorporated in the new playground design.

There will be active construction on this site. Construction personnel will need to adhere to City of Edmonton standards and regulations when working in this area.

Conclusion:

The proposed recommendation is to allow for the construction of a playground located within the existing Fort Edmonton Park attraction. Construction of the approved utility replacement work will disturb the existing footprint, and there is a strong desire from the public and Fort Edmonton Management Company to have a playground at the Fort Edmonton Park attraction. This presented the opportunity to enhance the playground with new equipment that meets CSA standards while meeting the aesthetic period look. The opportunities that result from this work will provide financial and social benefits to the Fort Edmonton Park Attraction by having a safer, larger, more accommodating amenity for visitors to this historical site.

The key stakeholders have been engaged and have provided strong support for the project.

REPORT

Fort Edmonton Management Company

Indigenous People's Experience
Environmental Impact Assessment

February 2017

ISO 9001 and 14001 Certified | An Associated Engineering Company

Associated Environmental

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March 6, 2017
File: 2016-8133

Brittany Davey
Planner
City of Edmonton
Edmonton Tower
7th Floor, 10111 - 104 Avenue NW
Edmonton AB T5J 0J4

Re: INDIGENOUS PEOPLE'S EXPERIENCE ENVIRONMENTAL IMPACT ASSESSMENT

Dear Ms Davey:

Associated Environmental Consultants Inc. is pleased to provide you with this final Environmental Impact Assessment Report for the Indigenous People's Experience development project that incorporates comments from the City reviews. This report presents environmental sensitivities identified and proposed mitigation strategies to reduce potential environmental impacts resulting from the overall project.

Please do not hesitate to contact me should you require any additional information.

Yours truly,

Julie Lefebvre, MEDes, P. Biol.
Senior Environmental Scientist

JL

Executive Summary

Associated Environmental Consultants Inc., a division of Associated Engineering, (Associated) completed this Environmental Impact Assessment (EIA) for the proposed Indigenous People's Experience (IPE) development in the Fort Edmonton Park (FEP). The FEP is located on the south bank of the North Saskatchewan River (NSR), and is one of the City of Edmonton's cultural highlights. Visitors can experience four historical periods and visit more than 80 original and reconstructed historical structures that represent the history of Edmonton from 1846 to 1929.

The Spirit of First Nations, later renamed *Indigenous People's Experience* (IPE), is described in the FEP 2010 Master Plan Update (FEP Management Company 2010), which proposed the redevelopment of the FEP through a range of new programs, buildings, and entertainment initiatives.

The study area for the EIA extends from between the site of Fort Edmonton buildings, towards the train track to the south and west, and east towards the Streetcar loop and 1885 Street (**Figure 1-1**). It also includes a small pond to the west of the train track that is hydrologically connected to the ponds of Egge's Pond. This area provides a naturalized tree habitat that has re-grown since inception of the FEP, and includes Egge's Pond which consists of two small man-made ponds and a riparian area along the man-made stream that flows out of the ponds towards a stormwater management stream.

The information in this report presents the findings of the EIA. This EIA completes the overall assessment of the planned developments in the FEP, as presented in the Utility Replacement Design (CP3247) Environmental Impact Assessment (Associated 2016). That previous EIA addressed other planned developments across a larger area referred to the Fort Edmonton Park Area (Park Area). The Park Area includes three separate parts: Fort Edmonton Park, John Janzen Nature Centre, and a large parking area.

The proposed IPE is anticipated to include the following facilities:

- main facility is a cultural hall that includes exhibits, multi-purpose show space, classrooms and back of house support space;
- an amphitheatre;
- interpretive trails; and,
- water features that include two smaller ponds connected by streams that flow to the stormwater system along 1885 Street.

The proposed IPE development trigger municipal, provincial, and federal legislation. This EIA was required because the planned developments for the IPE meet the definition of a "Major Facility" defined in Bylaw 7188, North Saskatchewan River Valley Area Redevelopment Plan (City of Edmonton 2014). Administrative fulfillment of requirements under Bylaw 7188 was obtained on February 17, 2017 (**Appendix A**). In addition to this EIA, a Site Location Study will be required to establish the need for the proposed development within the River Valley. The City holds a Licence to Divert and Use Water (19257), issued pursuant to the *Water*

Act (R.S.A. 2000, C. W-3), to draw water from the NSR to maintain the two man-made water features. Pursuant to the *Water Act,* an Approval for dewatering waterbodies will be required and conditions may apply if water is released to the NSR.

Pursuant to the *Historical Resources Act* (R.S.A. 2000, C. H-9), clearance will be required because of the potential for archaeological and paleontological resources within the study area. An application for site clearance was made with Alberta Culture and Tourism (HRA number 4725-16-0029-001) and Approval (**Appendix B**) was granted on September 22, 2016. With the previously obtained clearance, this completes the regulatory requirements under this legislation for all planned developments in the FEP.

Both the *Fisheries (Alberta) Act* (R.S.A 2000, c. F-16) and the federal *Fisheries Act* (R.S.C., 1985, c. F-14) apply to activities that have the potential to cause serious harm to fish. Measures, such as rescuing stranded fish under the authority of a Fish Research Licence issued pursuant to the *Fisheries (Alberta) Act*, are required to meet the legislated requirements under both Acts.

Timing restrictions for vegetation clearing are imposed by both the the *Wildlife Act* (R.S.A. 2000, c. W-10) and the the *Migratory Birds Convention Act, 1994* (S.C. 1994, c. 22). Timing restrictions should be considered for vegetation removal during the nesting season for migratory birds as well as owls and other birds of prey. In the area of the proposed development, the timing restrictions extend from February 15 to August 31.

Information reviewed for this EIA included publicly available data and information from government databases, previous studies and reports, regulatory documents, and other pertinent materials. Field verification included a delineation of the boundaries of the ponds based on vegetation indicators; a targeted survey to confirm the presence and to assess the status of two rare plants previously identified (Associated 2014, revised 2015); a determination of the fish-bearing status of Egge's Pond using an electrofishing method to sample the two ponds; and a sweep of the ponds to identify invertebrates.

The site has several constraints that limit opportunities for IPE infrastructure development. The planned underground utilities corridor on the north side close to Fort Edmonton and the train tracks on the south and west sides restricts the potential locations for IPE infrastructure. In addition, creating the desired visitor experience requires the retention of the forested area to visually shield the rest of the FEP. The main facility that houses exhibits is proposed to be placed in the space currently used for the west pond. Using this space allows the building to be earth-sheltered, covered with vegetation to blend into the surroundings and appear as if it were a knoll. Maintaining the trees and other vegetation on the site provides functional landscape connectivity between the NSR and the reserve area to the south of the FEP.

The proposed IPE developments are considered to have short-term "**moderate**" environmental impacts because the existing ponds will be drained during construction. Longer term residual impacts are anticipated to be "**low**" overall following site restoration and landscaping activities because, although one pond will be removed, water features will be retained on the site. These will continue to provide suitable habitat for wildlife and will contribute to the biodiversity of the FEP.

There are several mitigation measures that can be implemented to reduce the short-term impacts of construction activities and minimize longer term residual impacts. Key mitigation strategies include:

- Minimize the amount of Class B habitat disturbed during construction of the project.
- Clear trees outside of the restricted periods for migratory birds and other sensitive species such as amphibians.
- Revegetate and restore disturbed areas with native vegetation as quickly as possible after the end of construction activities to reduce the duration of impacts and minimize opportunities for the establishment of invasive plants.
- Rescue fish prior to draining the ponds to prevent serious harm to fish.
- Implement an Environmental Construction Operations (ECO) Plan that describes appropriate erosion and sediment control measures to prevent stormwater runoff from eroding sediment and depositing it into the NSR.

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1 Introduction

1.1 PROJECT BACKGROUND

Associated Environmental Consultants Inc., a division of Associated Engineering, (Associated) completed this Environmental Impact Assessment (EIA) for the proposed Indigenous People's Experience (IPE) development in the Fort Edmonton Park (FEP). The EIA was needed to meet the requirements of the NSR Valley Area Redevelopment Plan, Bylaw No. 7188 (City of Edmonton 2014).

The FEP is located on the south bank of the North Saskatchewan River (NSR) and is accredited by the Alberta Museum Association. It has been one of the City of Edmonton's cultural highlights since opening in 1969. Visitors can experience four historical periods, including the establishment of Fort Edmonton by the Hudson's Bay Company. The FEP includes more than 80 original and reconstructed historical structures that represent the history of Edmonton from 1846 to 1929.

The IPE was first introduced in the FEP 2010 Master Plan Update (FEP Management Company 2010) which proposed the redevelopment of the FEP through a range of new programs, buildings, and entertainment initiatives. The 2010 Master Plan Update proposed to broaden the scope to include additional exhibit components and programming that will raise awareness of the stories of the Indigenous Peoples in Edmonton over time. The 2010 Master Plan Update proposed developments for an area termed *The Spirit of First Nations*, which was later renamed *Indigenous People's Experience*.

1.2 SITE DESCRIPTION

The IPE is located in the west end of the FEP. The study area for the EIA is the portion of the FEP bounded between the site of Fort Edmonton, to the south and the west towards the train track, and east towards the Streetcar loop and 1885 Street (**Figure 1-1**). Because of the hydrological connection, the study area also includes a small pond to the west of the train track.

The study area has a varied forest with diverse vegetation species compared to other parts of the FEP where vegetation ranges from manicured lawns and gardens to mature trees that line roads and rail lines. Key environmental features of the study area include:

- naturalized treed areas that have re-grown since inception of the FEP;
- Egge's Pond, which is comprised of two small man-made ponds that support wildlife habitat; and
- riparian areas along the man-made stream that flows out of the ponds towards a stormwater management stream.

The project footprint includes the lands subject to direct disturbance from the development as well as the construction and laydown areas (**Figure 1–2**).

1.3 PREVIOUS STUDIES AND REPORTS

The Utility Replacement Design (CP3247) Environmental Impact Assessment (Associated 2016) addressed all other planned developments described in the 2010 Master Plan Update for the Park Area, which includes three separate parts: FEP, John Janzen Nature Centre, and a large parking area to the east. At that time, the site design and concepts for the IPE were not sufficiently detailed to allow for a meaningful EIA to be completed, and therefore the IPE was not included in the overall assessment work. This EIA completes the overall assessment of the planned developments in the FEP.

Associated conducted a Rare Plant Study that includes additional site details and documents observations of rare plant species and communities, including a list of plants observed within the area proposed for the IPE (Associated 2015).

Thurber Engineering Ltd. completed an Initial Project Review (IPR) that provided a preliminary description of the project and described general impacts and mitigation measures (Thurber 2015). Since this IPR was completed, work has continued to develop the concepts and refine the infrastructure planned for the site, which have resulted in changes to the project details. There is one noteworthy change to the proposed project from the description provided in the IPR. The IPR describes that Egge's Pond will be expanded to create two ponds. In the current concept, part of Egge's Pond will be remove to provide space for the new IPE facility. Additional details of the planned developments are provided in **Sections 1.4** and **3.2.1**.

1.4 OVERVIEW OF SITE DEVELOPMENT

The conceptual site layout includes:

- main facility is a cultural hall that includes exhibits, multi-purpose show space, classrooms and back of house support space;
- an amphitheatre;
- interpretive trails; and
- water features that include two small ponds connected by streams that flow, during high water times, to the stormwater system along 1885 Street.

The site and infrastructure development concepts attempted to minimize disturbance to existing trees and other plant species to create opportunities for an authentic experience that connects people to the indigenous culture and history. While some of the details of site design and landscaping are still under development, there is sufficient information available to assess the environmental impacts associated of the anticipated project footprint.

As presently understood, the approach to the IPE is landscaped so that visitors feel as if they are in the wilderness where the trees and other vegetation provide a visual barrier to the rest of the FEP. The main cultural hall will be earth-sheltered, covered with vegetation and rock work to blend into the surroundings and appear as if it were a knoll when viewed from the side, or a canyon as visitors enter the space. Interpretive trails will guide visitors to additional temporary and permanent facilities scattered among and hidden by dense vegetation.

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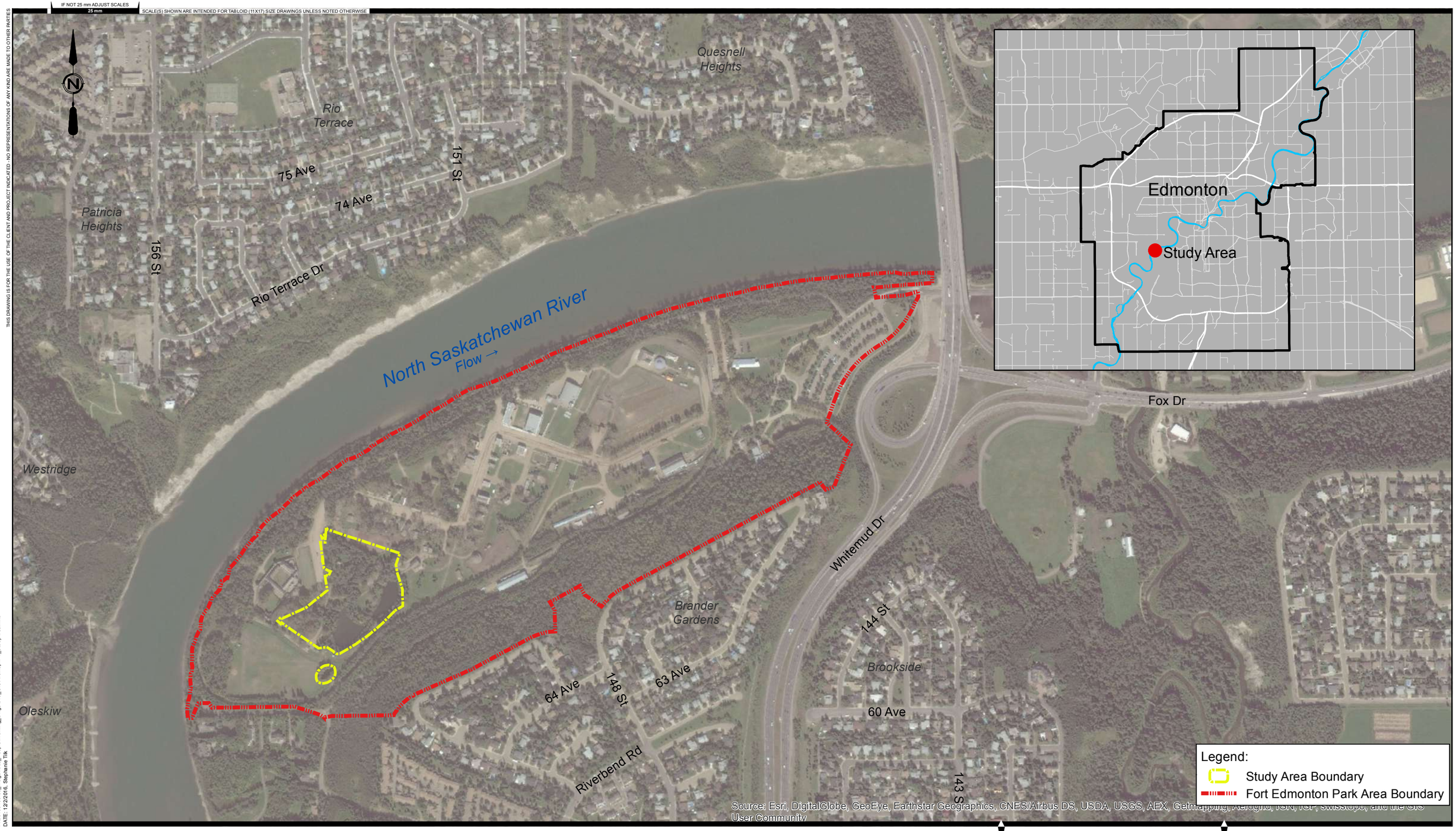

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Associated Environmental

THE CITY OF Edmonton

AE PROJECT No.	2016-8133
SCALE	1:7,000
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FIGURE No. 1-1

FORT EDMONTON PARK AREA
INDIGENOUS PEOPLE EXPERIENCE

STUDY AREA

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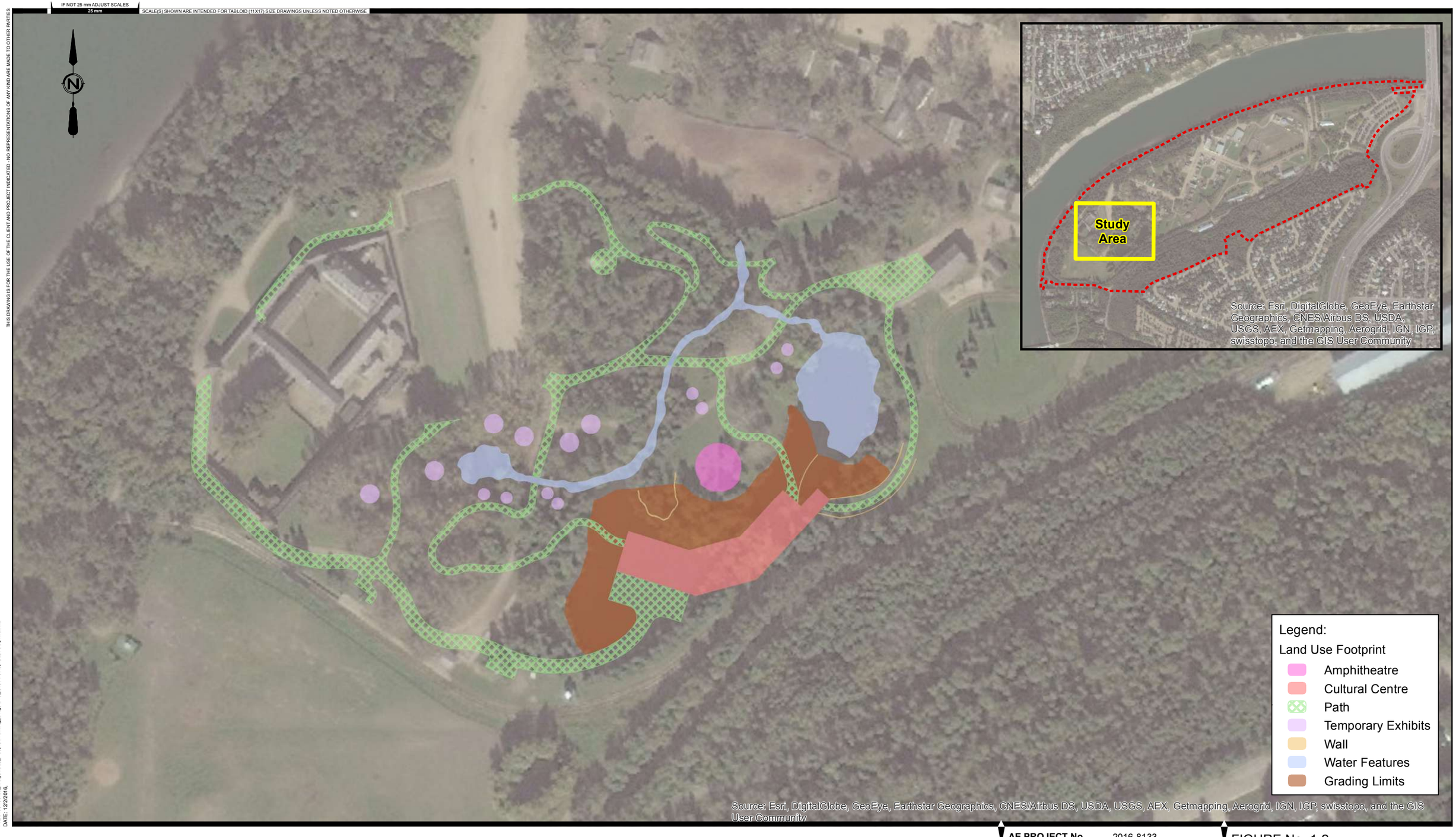

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DATE: 12/22/2016

Associated Environmental

THE CITY OF Edmonton

AE PROJECT No.	2016-8133
SCALE	1:1,500
APPROVED	
DATE	2016 DECEMBER
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE No. 1-2

FORT EDMONTON PARK
INDIGENOUS PEOPLE EXPERIENCE

PROJECT FOOTPRINT

1.5 REGULATORY FRAMEWORK

Municipal, provincial, and federal legislation were reviewed to ensure project compliance. The proposed site development for the IPE will require permitting as required under one City Bylaw and two provincial Acts. Federal legislation provides further constraints that will need to be considered during the planning of construction activities. Additional information on the regulatory context is provided in the comprehensive EIA (Associated 2016).

1.5.1 North Saskatchewan River Valley Area Redevelopment Plan – Bylaw No. 7188

The IPE supports objectives and policies of Bylaw No. 7188 because it will contribute to cultural and recreational opportunities within and alongside the natural features of the river valley.

This project meets the definition of a “Major Facility” defined in Bylaw No. 7188 because it is publicly owned or is developed on public lands. In addition to this EIA, a Site Location Study will be required to establish the need for the proposed development to be located within the context of the river valley. The Study must be undertaken prior to Council committing funds for capital expenditure for the development of the project (Section 3.5.3 in City of Edmonton, 2014).

This EIA was reviewed and obtained administrative fulfillment of requirements under Bylaw 7188 on February 17, 2017 (**Appendix A**).

1.5.2 Drainage Bylaw – Bylaw 16200

The purpose of this bylaw is to regulate connections with the drainage systems and the use of the sewerage system. In addition, this Bylaw regulates surface drainage, including stormwater management on public and private land.

The proposed water features are anticipated to form part of the stormwater management system, similarly to the existing ponds. Currently in the design phase, the water features are not expected to change the volume of water released by this project. Approval will be required if additional discharge volumes are projected as the concepts are further defined.

Proposed changes to the existing wastewater system as part of the construction of the facility will require approval under this Bylaw.

1.5.3 Water Act

All waterbodies, including wetlands, are protected under the provincial *Water Act* (R.S.A. 2000, C. W-3). There are three components under this Act that must be considered. A development involving the alteration or destruction of these waterbodies requires appropriate approvals, a Licence to divert and use water is required, and the Alberta Wetland Policy (Government of Alberta 2013) must be considered.

Egge's Pond is a man-made water feature comprising two small ponds, which are maintained through a diversion system that draws water from the NSR under the authority of a Licence to Divert and Use Water (19257) issued pursuant to the *Water Act*. Under this Licence, the City of Edmonton is authorized to divert up to 74,000 m^3 (60.0 acre-feet) annually. If the required amount or timing of diversion does not change and the points of intake and outfall remain unchanged, an amendment to the Licence is not required to make adjustments, repair, or have maintenance work done during the course of operation (*Water Act* subsection 54(4)). Changes to the means and works associated with this Licence will require submission of updated drawings showing the new configuration of the ponds and infrastructure associated with the system.

A *Water Act* Approval for the dewatering of the waterbodies will be required. If water will be released to the NSR, conditions of the approval may require testing of the water to ensure that the water released from the water features will not cause an adverse effect on the aquatic environment, human health, or public safety and to demonstrate that the water is of equal or better quality than the receiving body, the NSR.

The Alberta Wetland Policy (Government of Alberta 2013) applies to natural wetlands in Alberta, including bogs, fens, swamps, marshes, and shallow open water and restored natural wetlands, as well as wetlands constructed for the purposes of wetland replacement. Since Egge's Pond is a man-made feature, the policy does not apply.

A discussion with the regulators prior to initiating construction may be required to ensure that all legal requirements are addressed.

1.5.4 Public Lands Act

The provincial *Public Lands Act (*R.S.A. 2000, C. P-40) states that the title to the bed and shore of all permanent and naturally occurring bodies of water rests with the Crown. This Act does not apply to created water features where there was no pre-existing bed and shore of a waterbody. Upon review of historical photos of the site, it does not appear that there were pre-existing waterbodies in the location that Egge's Pond currently occupies. Therefore, disturbance of the wetlands would not trigger the need for a disposition under the *Public Lands Act*. For certainty, a request should be submitted to Alberta Environment and Parks to determine whether the Crown claims wetlands in this area under the *Public Lands Act*. This determination will identify any wetlands that will require additional approval under the *Public Lands Act*, which would then also require a *Water Act* Approval for proposed wetland impacts.

We understand that the project does not include changes to the intake and outfall locations on the NSR that would require amendments to dispositions under the *Public Lands Act* since they are located within the bed and shore of the river. Dispositions under the *Public Lands Act* were not available at the time of the database search.

1.5.5 Historical Resources Act

Because of the potential for archaeological and paleontological resources within the study area, clearance under the provincial *Historical Resources Act* (R.S.A. 2000, C. H-9) for the IPE was needed. An application

for site clearance was made with Alberta Culture and Tourism (HRA number 4725-16-0029-001). Approval (**Appendix B**) was granted on September 22, 2016.

This completes the clearance required for the FEP. A Historical Resources Impact Assessment (HRIA) was previously completed (Circle CRM Group Inc. 2015) and clearance was received from Alberta Culture and Tourism in February 2016 (**Appendix B**).

1.5.6 Environmental Protection and Enhancement Act

The purpose of the provincial *Environmental Protection and Enhancement Act* (EPEA) (R.S.A. 2000, c. E-12) is to support and promote the protection, enhancement, and wise use of the environment.

Like the current ponds, the proposed water features are anticipated to form part of the stormwater management system. There are no changes to the system itself anticipated by this project and therefore will not require notification under the *Wastewater and Storm Drainage Regulation* established under EPEA (Alberta Regulation 119/1993).
Changes to the existing stormwater and wastewater systems as part of the construction of the facility will trigger the *Wastewater and Storm Drainage Regulation*. Under subsection 6(1) of the Regulation, extension and replacement of wastewater or stormwater collection systems require a notification to undertake the extension or replacement.

1.5.7 Wildlife Act

The provincial *Wildlife Act* (R.S.A. 2000, c. W-10) defines “wildlife” as including birds of prey and upland game birds. Wilful molestation, disruption, or destruction of wildlife, or a house, nest, or den of wildlife, are all prohibited under this Act. The nesting season for owls and other birds of prey, from February 15 to July 15, should be considered when planning vegetation removal.

1.5.8 Fisheries (Alberta) Act

The *Fisheries (Alberta) Act* (R.S.A 2000, c. F-16) applies to the research, collection, display, transport, or salvage activities that occur in Alberta waters. A Fish Research Licence (Government of Alberta 2015) issued under this Act is required to conduct a fish rescue. This rescue is defined as fish that are collected as part of a rescue operation for the purpose of avoiding fish mortality from carrying out an activity such as dewatering for construction purposes.

1.5.9 Fisheries Act

Provisions under the federal *Fisheries Act* (R.S.C., 1985, c. F-14) apply to activities that have the potential to cause serious harm to fish where the focus is on commercial, recreational, or Aboriginal fishery. “Serious harm” is defined as the death of fish or the permanent alteration or destruction of fish habitat. A review of the project under this Act is not required because the ponds are artificial waterbodies that are not directly

connected to a waterbody that contains fish. Fish were found in the ponds. Measures such as rescuing stranded fish should be undertaken to avoid causing serious harm to fish (Government of Canada 2013).

1.5.10 Migratory Birds Convention Act, 1994

The federal *Migratory Birds Convention Act, 1994* (S.C. 1994, c. 22) seeks to protect migratory birds as well as their eggs and nests. Timing for vegetation clearing during construction should consider nesting season for migratory birds. The area of proposed development is located in the "B4" nesting zone (Government of Canada 2016), which has a nesting period from April 15 to August 31 for migratory birds.

1.5.11 Species at Risk Act

Activities with potential to impact a species at risk or species of concern and/or the habitat are regulated under the federal *Species at Risk Act* (SARA) (S.C. 2002, c. 29). A permit will be required if any fish or wildlife species listed in Schedule 1 of SARA may be handled during the project.

1.6 ALTERNATIVE OPTIONS CONSIDERED

The IPE is an intrinsic part of the visitor experience that contributes to the overall social benefits of FEP because it will increase opportunities for visitors to experience everyday life of Indigenous people. Completing this site while other redevelopment activities are ongoing will contribute to reducing the potential for impacts to visitors by limiting the duration of construction activities.

The same three alternative options described in the previous EIA (Associated 2016) apply to this project. Options considered included: no redevelopment; defer redevelopment to a later date; or proceed with redevelopment as described in the 2010 Master Plan Update.

1.7 PUBLIC PARTICIPATION PLAN

We recommend that residents in communities neighbouring the FEP and Edmontonians be invited to review the project details. Key findings from this EIA could be used to support various communication activities or other engagement approaches. The key findings would enhance public understanding of the project and the mitigation measures that will be undertaken during and after construction to protect environmental values.

Public engagement is anticipated as part of the FEP redevelopment process. Schedule and methods for public outreach will be defined as plans for construction proceed.

2 Environmental Assessment Methods

2.1 DATABASE SEARCHES

A review of publicly available data and information was completed to identify potential environmental constraints specific to the study area. Sources of information included:

- Fish and Wildlife Management Information System (FWMIS) (Government of Alberta 2014a);
- Alberta Conservation Information Management System (ACIMS) (Government of Alberta 2015b);
- Historical Resources Act listings (ABADATA 2016); and
- Water Act / Environmental Protection and Enhancement Act Authorization Viewer (Government of Alberta 2016).

2.2 LITERATURE REVIEW

Previous studies and reports, regulatory documents, and other pertinent materials were reviewed in preparation of this assessment. These included:

- Fort Edmonton Park 2010 Master Plan Update (FEP Management Company 2010);
- Bylaw No. 7188, North Saskatchewan River Valley Area Redevelopment Plan (City of Edmonton 2014);
- Initial Project Reviews (Thurber Engineering Ltd. 2015);
- Fort Edmonton Park Rare Plants Survey (Associated 2014, revised 2015);
- Historical Resources Impact Assessment, Fort Edmonton Park (Circle CRM Group Inc. 2015);
- Blatchford Kitchen EIA (Associated 2015); and
- Utility Replacement Design (CP-3247) Environmental Impact Assessment (Associated 2016).

2.3 FIELD VERIFICATION

Field verification included a delineation of the boundaries of the ponds based on vegetation indicators following the protocols described in the Alberta Wetland Identification and Delineation Directive (Government of Alberta 2015b). Data were collected on vegetation and hydrology at each data plot where the boundary of the ponds was observed. Ponds were photographed and observations recorded on data forms. Global Positioning System (GPS) data were collected at each plot location along the boundaries.

Previous field surveys conducted for rare plants (Associated 2015) identified two vascular plant species tracked on the Alberta List of Tracked and Watched Elements (Government of Alberta 2015b). A targeted survey, following the Guidelines for Rare Vascular Plant Surveys in Alberta (Alberta Native Plant Council 2012), was performed to confirm the species' presence and to assess the status of the population. Plants were identified using a hand lens and appropriate taxonomic keys (Moss et al. 1983, Johnson et al. 1995, Kershaw et al. 2001). Locations of existing trails and rare plant species were mapped using GPS coordinates.

The fish-bearing status of Egge's Pond (Waterbody ID 6812) was not known. A presence/absence study of the waterbody was conducted under the authority of a Fish Research Licence (16-3844) using an

electrofishing method to sample the pond. Electrofishing was conducted for 531 seconds. Fish were found in the pond on the east side.

Field data were collected for the invertebrate species of the ponds. Protocols to sample for invertebrates were based on a modified version of those used by the United States Environmental Protection Agency as reported by King and Richardson (2002). Samples from the ponds were collected on September 2, 2016 using a D-frame dip net (0.3 m wide with a 500 µm mesh). Samples were collected from representative areas by rapidly jabbing the net into the wetland substrate and dragging the net a distance of 1.0 m before raising it to the surface. The net was immediately swept through the water column along the same path to collect any additional disturbed individuals. The sample was rinsed in the net and transferred to a sorting tray. Invertebrates were further cleaned and sorted in the field and transferred to a dissection tray for identification. Individuals were identified to Class.

3 Environmental Impact Analysis and Mitigation Strategies

3.1 IMPACT ANALYSIS METHODS

The data gathered during the desktop review and field verification guided the assessment of environmental impacts related to the IPE project. Environmental impacts were assessed by analyzing existing site conditions (baseline) in relation to the anticipated conditions during construction (short term) and post-construction (residual, long term) impacts.

Key environmental features of the study area include: 1) the presence of rare plants, 2) important wildlife habitat, and 3) vegetation that supports fish and wildlife species and biodiversity. The potential impacts were evaluated using a high, moderate, and low rating as described in **Table 3-1**.

Table 3-1
Significance rating of potential impacts

Significance	Rating	Legend Symbol
High	The differences between baseline and post-construction/operation are expected to be greatest in the context of the FEP, such as loss of functional wildlife habitat or significant loss of vegetation.	
Moderate	The differences between baseline and post-construction/operation are expected to be noticeable but will be mitigated through landscape restoration and re-planting efforts.	
Low	The differences between baseline and post-construction/operation are expected to be of short duration or may easily be mitigated.	

3.2 INDIGENOUS PEOPLE'S EXPERIENCE

3.2.1 Project Description and Location

The construction footprint for the Indigenous People's Experience, including the trails and amphitheatre, is anticipated to cover close to 1.1 ha or about 1.7% of the Park Area which is estimated to be 64 ha in size. This project represents 4.8% of the overall disturbances to the Park Area during construction.

The site of the IPE is one of the more densely vegetated area within the FEP. The area was assessed as a Class B sensitivity (Associated 2016) because of its moderate sensitivity as wildlife habitat when considering vegetation removal. It contains nesting habitat for migratory species and is large enough that some raptor species may establish nests. Although it is not a large continuous forested area, it does

provide a habitat island between the forested landscape along the NSR and the reserve area to the south of the FEP. It may contribute to wildlife movement since it is one of the only such area within the FEP.

Selective clearing of trees may be needed to construct the main facility and establish the trails. The clearing should attempt to avoid trees and other plant species of high value to minimize the long-term environmental impacts.

Although Egge's Pond is not a naturally occurring wetland, the two ponds have been a landscape feature for more than 25 years. In this time, the vegetation that has colonized the site has increased the wildlife habitat diversity of FEP.

Egge's Pond was excavated and established in 1989. The topographic survey (City of Edmonton 1991) completed to support the application for a *Water Act* Licence to Divert and Use Water (**Appendix C**) shows the dimensions and volume for both constructed ponds. At the time of construction, the open water area of the pond on the east side covered about 2,520 m^2, was about 1.5 m deep, and held an estimated volume of 1,673 m^3 of water, while the pond on the west side had an open water area of 3,480 m^2, was about 2.5 m deep, and held an estimated volume of 3,195 m^3 of water. These are measures of the open water only and excluded the shoreline area. Since the ponds were constructed, vegetation growth and natural processes of erosion and siltation have altered the shoreline and depth of the water features. The current depth and volume of water held by the ponds were not measured.

The water levels are maintained through a diversion system that draws water from the NSR and fills the small pond on the west side of the train tracks which is used to settle out sediment. A pump then draws the water through a buried pipeline to the east pond in the Egge's Pond area. A channel connects the east and west ponds. When water levels are high, the west pond drains into a channel that flows through the site, along the stormwater swale west side of 1885 Street and eventually connects to a buried pipe that leads down to the outfall on the NSR. When water levels are normal, the channel is dry and there is little to no water movement in the ponds.

The proposed constructed ponds and stream are anticipated to cover about 2,210 m^2. The water features will be contoured to provide additional shallow areas that mimic natural wetlands. Proposed options to replenish the water in the ponds and maintain consistent levels are under consideration. One option, similarly to the current system, would periodically drawn water from the NSR to maintain the water levels. Alternatively, non-potable water could be introduced to the system. The ponds are expected to also be used to provide interpretive experiences.

The site has several constraints that limit opportunities for development of the IPE infrastructure. The space is confined by the planned underground utilities corridor to the north close to Fort Edmonton and the train tracks on the south and west sides. In addition, creating the desired visitor experience will require the retention of the forested area to visually shield the rest of the FEP.

The main facility that houses exhibits is proposed to be placed within the excavated area of the west pond. Using the existing excavation will allow the cultural hall to be earth-sheltered, covered with vegetation and

rock work to blend into the surroundings. It would appear as if it were a knoll when viewed from the side, or a canyon as visitors enter the space.

Topography and Site Drainage

Much like the rest of the FEP, the topography of study area is relatively flat with a general aspect facing north, towards the NSR. There is a small knoll about 2.5 m in height in the northeast part of the study area. The site drains mostly through the channel that connects the ponds to the outfall and the stormwater system.

Geology and Soils

Thurber Engineering Ltd. (2013) undertook a desktop analysis and field investigation of the FEP. Seventeen test holes were drilled between 8.4 and 10.4 m below existing ground level. Based on data gathered from the closest holes drilled during this study, soils, starting at the surface, consist in a layer of gravel fill (about 0.3 m) over clay fill (about 2.0 m), then silt and sand (about 4.4 m) over grave and sandstone.

Vegetation and Rare Plants

Dominant tree species include jack pine (*Pinus banksiana*), white spruce (*Picea glauca*), balsam poplar (*Populus balsamifera*), and trembling aspen (*Populus tremuloides*). A list of the plant species identified in this area during the Rare Plant Survey (Associated 2015) is provided in **Appendix D**.

The Rare Plant Survey (Associated 2015) found two species of rare plants within the study area. Turned sedge (*Carex retrorsa*) was found along the shallow, slower flowing portion of the channel. Turned sedge has closely packed female spikes and crowded perigynia that bend downwards (Johnson et al. 1995, Kershaw et al. 2001). It is usually found in marshes and slower flowing streams within the parkland and boreal forest regions of Alberta (Johnson et al. 1995, Kershaw et al. 2001). Slender naiad (*Najas flexilis*) was found within the ponds. Slender naiad is a pale green submerged aquatic annual, 30-60 cm long, with 1 mm thick stems, and alternate branches giving the plant a tufted appearance. Slender naiad grows in quiet ponds and streams in the Central Parkland and southern Boreal Forest regions of Alberta (Kershaw et al. 2001).

The concept for the proposed constructed ponds and stream include supplementing the inventory of plants documented as part of this Environmental Impact Assessment with additional work to identify species (upland, shoreline and pond) that have a high assessment value and to preserve and incorporate those into the final development concept. If feasible, the intent is to select species or other ecological components, collect plants, including aquatic and riparian species, and re-established them into the final landscape.

The pond and associated waterway system are anticipated to be a key part of the visitor experience. Once re-established, the ponds and stream will be designed to contribute to enhancing the existing biodiversity of the area and to support associated IPE interpretive and cultural landscape opportunities.

Wildlife and Wildlife Habitat

The study area provides suitable wildlife habitat for a variety of species, including migratory and non-migratory birds, small and large mammals, amphibians, and reptiles. Short-eared owl (*Asio flammeus*), a bird of the open grassland, marshes, and farmland, and barred owl (*Strix varia*), which opts for swamps and dense forest, may occur in the area. The study area may also provide habitat during migration for birds such as bay-breasted warbler (*Dendroica castanea*), which is typically found in mixedwood stands of white spruce and aspen or balsam poplar, and Cape May warbler (*Dendroica tigrina*), which is typically found in coniferous tree species in old forests. Canadian toad (*Anaxyrus hemiophrys*), generally found in river valleys or along the edges of lakes with sandy margins, may also use habitat in the area.

The study area lies within the following sensitive wildlife zones:

- Sharp-tailed Grouse (*Tympanuchus phasianellus*) Survey Area;
- Key Wildlife and Biodiversity Zone; and
- Sensitive Raptor Range (Government of Alberta 2014a).

The study area does have some characteristics that would provide suitable habitat for sharp-tailed grouse and field verification should be completed before tree clearing occurs. Areas designated as Key Wildlife and Biodiversity Zones provide important ungulate overwintering habitat and have high species biodiversity (Government of Alberta 2015c). There is a restricted activity period for new construction activities between **January 15 and April 30**. The noted sensitive raptor range specifically relates to bald eagle (*Haliaeetus leucocephalus*). Setback distances for sensitive raptors' nests, including bald eagle, are 1,000 m regardless of the level of disturbance (type of work) from **March 15 to July 15** (Government of Alberta 2011).

Fish Habitat and Surface Water Quality

Although the ponds are filled through water diversion from the NSR, fish can be drawn into the ponds by the system. Fish found in Egge's Pond included brook stickleback (*Culaea inconstans*), fathead minnow (*Pimephales promelas*), and lake chub (*Couesius plumbeus*).

Invertebrates found in the area included segmented worms (*Oligochaeta* spp.), leaches (*Hirudinea* spp.), gelatinous bryozoans (*Bryozoa* spp.), backswimmers (*Hemiptera* spp.), waterboatmen (*Hemiptera* spp.), pond snails (*Gastropoda* spp.), water beetles (*Coleoptera* spp.), freshwater shrimp / sideswimmers (*Malacostraca* spp.), damselflies (*Odonata* spp.), dragonflies (*Odonata* spp.), and stoneflies (*Plecoptera* spp.).

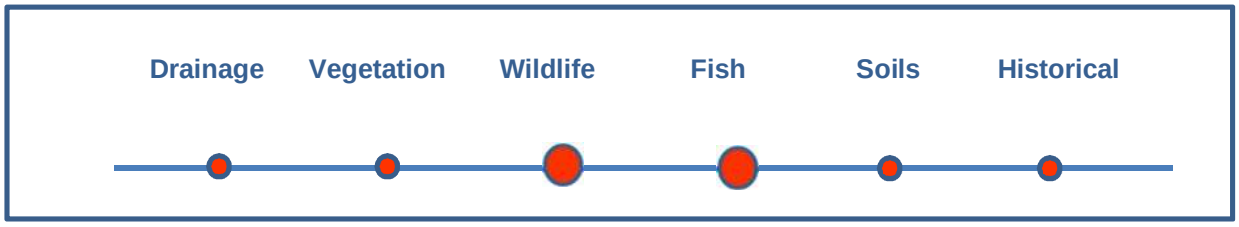
Incidental observations of tiger salamander (*Ambystoma tigrinum*) and wood frog (*Rana sylvatica*) were made during field verification. Both species are widely distributed in the area, and breed from early April to mid June. The young then grow and transform until late August to early September. Salamanders hibernate in burrows, and frogs overwinter beneath leaf litter.

Photo 3 – 1
Open water looking west across the pond

Photo 3 – 2
Open water looking north across the pond

Photo 3 – 3
Open water looking north across pond

3.2.1.1 Project-Specific Impact Assessment and Mitigation Strategies



3.3 IMPACT ANALYSIS

Table 3-2 provides a summary of potential impacts and mitigation strategies from the IPE facilities and associated infrastructure.

Table 3-2
Summary of environmental impacts and mitigation strategies

Environmental Component	Impacts	Mitigation Strategies
Topography and Site Drainage	Erosion and sediment from stormwater runoff eroding soil stockpiles in the construction areas and depositing them into the river.	Implement temporary erosion and sediment control (ESC) measures in the construction site to prevent stormwater runoff from eroding sediment and depositing them into the river. Implement an Environmental Construction Operations (ECO) Plan (to be developed by the Contractor or organization undertaking the work).
Vegetation	Removal of mature trees and loss of shade and habitat structure due to the changes to the Class B sensitivity areas. Potential damage to trees in construction and laydown areas where trees will be retained.	Minimize amount of area disturbed during construction. Evaluate options to replace shade trees as part of the landscaping plan for the IPE. Revegetate the site with native plants that will complement the structure and function of the current habitat. Follow mitigation strategies described in Tree Protection; Hoarding Requirements (City of Edmonton 2008) to protect trees near construction activity. Include in the ECO Plan, protection measures for trees located within 5 m of the construction area. Submit the applicable sections of the ECO Plan to the City of Edmonton Forestry Office for review.

Environmental Component	Impacts	Mitigation Strategies
		Schedule a site meeting with the Forestry Office at a minimum of four weeks before start of construction to review and discuss the sections of the ECO Plan.
	Impacts on habitat in which slender naiad and turned sedge (rare plants) were found in the area near the ponds and man-made creek.	This work will alter the stream and water regime for this site. Transplanting the plants prior to construction or ground disturbance is recommended to prevent a net loss of this species.
	Potential spread of invasive weeds.	Exercise caution to prevent the spread of invasive and non-native plants. Replant areas affected by construction as soon as possible after activities are completed. Monitor restoration work to ensure that revegetation proceeds as anticipated.
Wildlife and Wildlife Habitat	Loss of some wildlife habitat due to selective tree removal.	Plan vegetation clearing activities outside the nesting period (from **February 15 to August 31)** for owls, birds of prey, and migratory birds. Follow the vegetation clearing restrictions provided in Figure 4-18 (Associated 2016).
	Habitat alteration in a Key Wildlife and Biodiversity Zone.	Consult with Alberta Environment and Parks prior to construction activities if they take place during the restricted activity period between **January 15 and April 30** (Government of Alberta 2015c).
	Removal of Class B sensitivity areas.	Survey Class B sensitivity areas for large nests, stick nests, platform nests, and tree cavities during winter months when trees lack leaves and nests are more visible. Consider vegetation selection in the landscape plan to provide functional wildlife habitat that complements the existing features of the study area. Functional wildlife habitat would provide food and cover and contribute to the landscape connectivity along the river valley and with the reserve area to the south.

Environmental Component	Impacts	Mitigation Strategies
	Reduced available habitat for species that rely on aquatic environments due to draining of ponds.	Consider draining the ponds before or after the breeding season for birds and amphibians (**early April until late August to early September**) to reduce potential impacts or loss of immatures.
Fish and Fish Habitat	Impacts on fish due to draining of the ponds.	Obtain a Fish Research Licence and conduct a fish rescue as required under the *Fisheries(Alberta) Act, prior to* draining the ponds.
Soils	Impacts on the NSR from sediment erosion from soil stockpiles in the construction area during rain events. Transfer soils or contaminants outside of the construction zone.	Implement temporary erosion and sediment control (ESC) measures in construction site including: · locate soil stockpiles away from any natural drainage areas; and · apply proper erosion and sediment control measures to all drainage pathways and ditches and around any soil stockpiles to prevent soils from leaving the construction site. Contaminated soils are not anticipated the be disturbed since construction activities do not involve the railway and streetcar tracks. The contractor will be responsible to prepare and implement an Erosion and Sedimentation Control Plan that provides mitigation methods for controlling the transfer of soils, dust, dirt, water, or other materials from the site. Minimize the area of exposed soil by phasing stripping and grading work and/or ensuring the timely implementation of suitable temporary or permanent soil-stabilizing measures to reduce tracking of soil off-site during construction.
Historical Resources	Potential exposure of historical resources during excavation activities.	Report historical resource finds to Alberta Culture and Tourism.

4 Conclusion and Recommendations

4.1 SUMMARY OF SIGNIFICANT ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Removing trees and other vegetation from areas that provide functional landscape connectivity to habitats beyond the study area can be significant because of the loss of habitat. Although reversible with appropriate restoration, the residual effect will be mid to long-term since returning to baseline conditions will take several years. Ponds also provide valuable habitat that is unique to the FEP, and the loss of this type of habitat also can be significant.

The IPE project is considered to have short-term "**moderate**" environmental impacts because the existing ponds will be drained during construction. The longer term residual impacts should be "**low**" overall following site restoration and landscaping activities. Although one pond will be removed, water features will be retained on the site and streams are expanded. Caution should be exercised in selecting a water source to replenish the water features. For example, introducing treated water may reduce the biodiversity of the ponds by eliminating aquatic invertebrates that are an important food source for many wildlife species. If designed to mimic naturally occurring wetlands, with shallow as well as deeper areas, the new ponds will continue to provide suitable habitat for wildlife and will contribute to the biodiversity of the FEP.

There are several mitigation measures that can be implemented to reduce the short-term impacts of construction activities and minimize longer term residual impacts.

Key mitigation strategies include:

- Minimizing the amount of Class B habitat disturbed during construction of the project, particularly if avoidable such as for laydown and stockpile areas, to reduce the overall impact and maintain the landscape connectivity of the site.
- Clearing trees outside of restricted periods for migratory birds, birds of prey and other sensitive species such as amphibians.
- Ensuring that revegetation and restoration of disturbed areas are suitably reforested/replanted with native vegetation as quickly as possible after the end of construction activities. This will reduce the duration of impacts and minimize opportunities for the establishment of invasive plants.
- Rescuing fish prior to draining the ponds to prevent causing serious harm to fish.
- Implementing an Environmental Construction Operations (ECO) Plan that describes appropriate erosion and sediment control measures to prevent stormwater runoff from eroding sediment and depositing it into the NSR. The ECO Plan should also demonstrate the mitigation strategies that will be implemented to address other potential impacts described in this EIA Report.

Closure

This report was prepared for the Fort Edmonton Management Company to assess potential environmental impacts associated with the proposed Indigenous People's Experience (IPE) development in Fort Edmonton Park (FEP).

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

Respectfully submitted,
Associated Environmental Consultants Inc.

Prepared by:

Julie Lefebvre, MEDes, P. Biol.
Senior Environmental Scientist

Reviewed by:

Sandra Meidinger, P. Biol., R.P. Bio.
Manager, Alberta North

Associated Environmental

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Appendix A – Bylaw 7188 Administrative Review

Sustainable Development
City Planning

City of Edmonton
7th Floor, 10111 - 104 Avenue NW
Edmonton, AB T5J 0J4

Email:
sdrivervalleybylaw@edmonton.ca

February 17th, 2017 Reference No.: 187153896-003

To: Julie Lefebvre

From: Brittany Davey

Subject: BD16-83 Fort Edmonton Park Indigenous People's Experience

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Biodiversity and River Valley Planning have completed our review of the Environmental Impact Assessment Addendum for the Indigenous People's Experience.

This letter is a sign off that the policy requirements of the North Saskatchewan River Valley Area Redevelopment Plan have been satisfied for the concept proposal outlined in the addendum. Please note the proposed development meets the definition of a major facility and requires City Council to deem the proposed location in the River Valley as essential. We look look forward to working out the details in more depth as the project moves forward.

Please adhere to the following conditions and advisements provided by reviewers.

General Conditions:

1) All mitigation measures and commitments outlined by City reviewers must be incorporated into the construction work plan.
2) The proponent is responsible for seeking approval for any other regulatory permits from provincial and federal agencies.
3) Please ensure restoration of the site occurs and meets existing site conditions. All damages to parkland must be restored to COE Construction Standards and City Operations satisfaction.
4) For all laydown/staging areas:
    a) Any laydown/staging area must be fenced with no vehicular or project activity outside of the fenced area.
    b) Noxious weed control should be managed as required within any fenced area and should be the responsibility of the contractor/department during construction.
    c) Use of this area must be managed carefully to prevent any spills or release of contaminants.
    d) Signage must be posted indicating a project contact person and phone number for inquiries.
5) Upon approval of the plan, a site meeting with Forestry will be required to review construction plans and tree protection during construction conflicts (construction work within 5 meters). This meeting will need to be scheduled a minimum 4 weeks in advance of the construction start date. Please be advised that all costs associated with the removal, replacement or transplanting of trees shall be covered by the Proponent as per the Corporate Tree Management Policy (C456A). Forestry will schedule and carry out all required tree work involved with this project. Tree removals should be scheduled prior to February 15, 2017 in order to avoid owl and migratory bird nesting periods.
6) Use of this area must be managed carefully to prevent any spills or release of contaminants.

Sustainable Development
City Planning

City of Edmonton
7th Floor, 10111 - 104 Avenue NW
Edmonton, AB T5J 0J4

Email:
sdrivervalleybylaw@edmonton.ca

7) Please attach this letter for any further City approvals.

Please call me at 780-442-3261 if you or the proponent has any questions.

Regards,
Brittany Davey

Appendix B – Historical Resources Act Approval

Alberta Culture and Tourism

HRA Number: 4725-16-0029-001
September 22, 2016

Historical Resources Act Approval

Proponent: Fort Edmonton Park Management Company
P.O Box 2359, Edmonton, AB T5J 2R7
Contact: Mr. Bill Demchuk

Agent: Associated Environmental Consultants, Inc.
Contact: Sarina Loots

Project Name: **Fort Edmonton Park Indigenous People's Experience**

Project Components: Cultural / Entertainment Facility

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

Lands Affected: All New Lands

Proposed Development Area:

MER	RGE	TWP	SEC	LSD List
4	25	52	23	3,4

Documents Attached:

Document Name	Document Type
Figure of Footprint	Illustrative Material

Alberta Culture and Tourism

STANDARD REQUIREMENTS UNDER THE *HISTORICAL RESOURCES ACT*: REPORTING THE DISCOVERY OF HISTORIC RESOURCES

If development proponents and/or their agents become aware of historic resources during the course of development activities, they are required, under Section 31 of the *Historical Resources Act*, to report these discoveries to the Heritage Division of Alberta Culture and Tourism. This requirement applies to all activities in the Province of Alberta.

1.0 REPORTING THE DISCOVERY OF ARCHAEOLOGICAL RESOURCES

The discovery of archaeological resources is to be reported to Eric Damkjar, Head, Archaeology, at 780-431-2346 (toll-free by first dialing 310-0000) or eric.damkjar@gov.ab.ca.

2.0 REPORTING THE DISCOVERY OF PALAEONTOLOGICAL RESOURCES

The discovery of palaeontological resources is to be reported to Dan Spivak, Head, Resource Management, Royal Tyrrell Museum of Palaeontology, at 403-820-6210 (toll-free by first dialing 310-0000) or dan.spivak@gov.ab.ca.

3.0 REPORTING THE DISCOVERY OF HISTORIC PERIOD SITES

The discovery of historic period sites is to be reported to Brenda Manweiler, Manager, Historic Places Research and Designation Program, at 780-431-2309 (toll-free by first dialing 310-0000) or brenda.manweiler@gov.ab.ca. Please note that some historic period sites may also be considered Aboriginal traditional use sites.

4.0 REPORTING THE DISCOVERY OF ABORIGINAL TRADITIONAL USE SITES

The discovery of any Aboriginal traditional use site that is of a type listed below is to be reported to Valerie Knaga, Director, Aboriginal Heritage Section, at 780-431-2371 (toll-free by first dialing 310-0000) or valerie.k.knaga@gov.ab.ca.

Aboriginal Traditional Use sites considered by Alberta Culture and Tourism to be historic resources under the *Historical Resources Act* include:

Historic cabin remains;
Historic cabins (unoccupied);
Cultural or historical community camp sites;

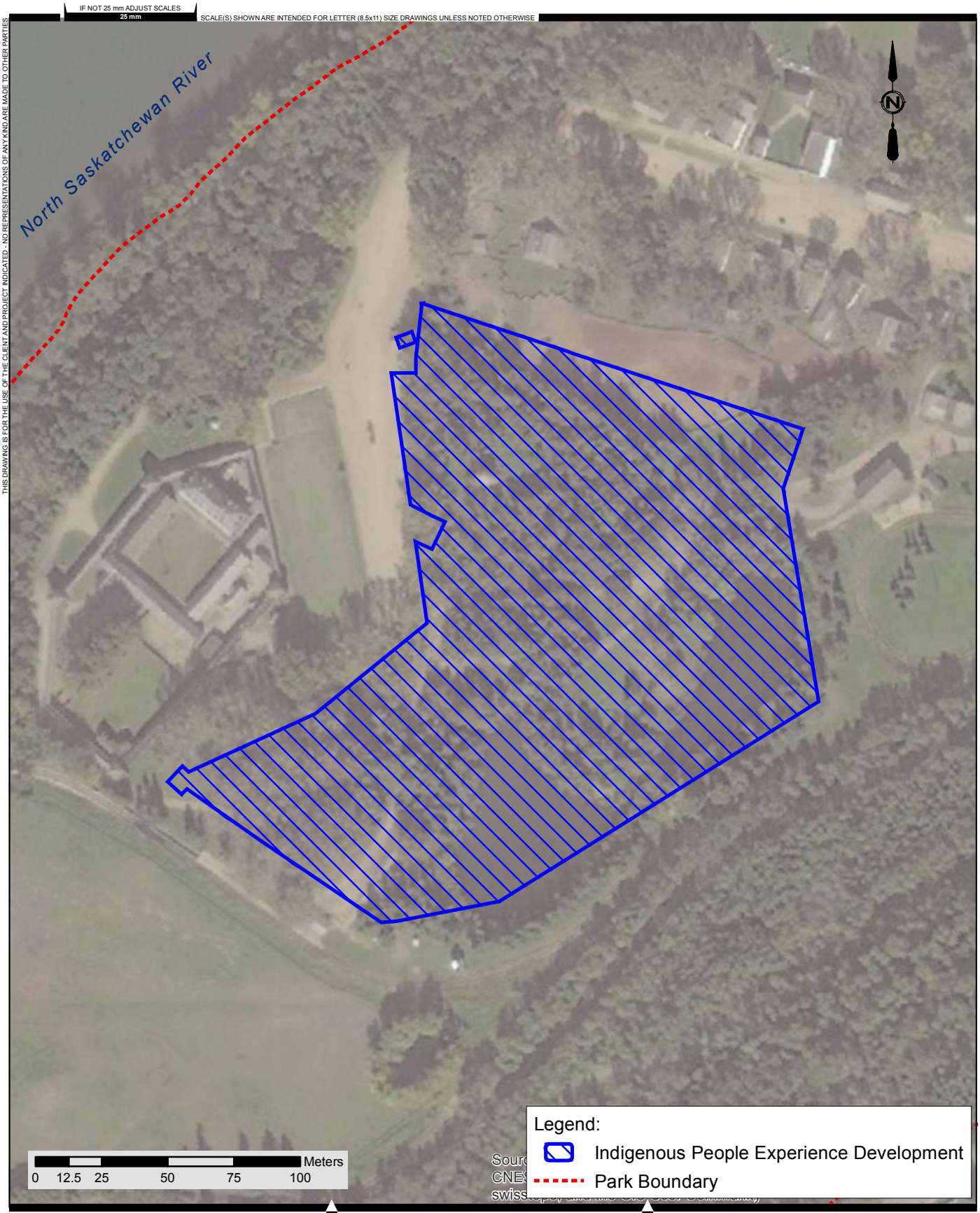
Ceremonial sites/Spiritual sites;
Gravesites;
Historic settlements/Homesteads;
Historic sites;
Oral history sites;
Ceremonial plant or mineral gathering sites;
Historical Trail Features; and,
Sweat/Thirst/Fasting Lodge sites

5.0 FURTHER SALVAGE, PRESERVATIVE OR PROTECTIVE MEASURES

If previously unrecorded historic resources are discovered, proponents may be ordered to undertake further salvage, preservative or protective measures or take any other actions that the Minister of Alberta Culture and Tourism considers necessary.

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR LETTER (8.5x11) SIZE DRAWINGS UNLESS NOTED OTHERWISE



P:\2016813\300_Indigenous_People\Working_Dwgs\010_GIS\ArcMap\Templates\Layout_8.5x11_Portrait.mxd
DATE: 9/2/2016, Stephanie Tik

Associated Engineering

THE CITY OF Edmonton

AE PROJECT No.	2016-8133
SCALE	1:2,000
APPROVED	
DATE	2016 SEPTEMBER
REV	
DESCRIPTION	ISSUED FOR APPLICATION

FIGURE No. 1

FORT EDMONTON PARK
INDIGENOUS PEOPLE EXPERIENCE

SITE LOCATION

Alberta Culture and Tourism

Heritage Division
Old St. Stephen's College
8820 – 112 Street
Edmonton, Alberta T6G 2P8
Canada
Telephone: 780-431-2300
www.alberta.ca

Via e-mail: debbie.cashion-kalinowski@edmonton.ca

February 16, 2016

HRM Project File: 4725-15-0018
Permit File: 2015-186
OPaC HR Appl: 008021125

Debbie Cashion-Kalinowski
City of Edmonton
12th Flr, CN Tower
10004, 104 Ave NW
Edmonton AB
T5J 2R7

Dear Ms. Cashion-Kalinowski:

SUBJECT: *HISTORICAL RESOURCES ACT* APPROVAL WITH CONDITIONS
4725-15-0018-002
CITY OF EDMONTON
FORT EDMONTON PARK - UTILITY UPGRADES
LSDs 2 - 10, SECTION 23, TOWNSHIP 52, RANGE 25, W4M
HISTORIC RESOURCES IMPACT ASSESSMENT - FINAL REPORT

Acting on behalf of City of Edmonton (Proponent) and in accordance with Section 37(2)(a)(b) of the *Historical Resources Act,* Circle CRM Group Inc.:

- carried out a Historic Resources Impact Assessment for the Fort Edmonton Park - Utility Upgrades (Project); and,
- provided Alberta Culture and Tourism with copies of a final report summarizing the assessment, *Final Report Historical Resources Impact Assessment City of Edmonton Fort Edmonton Park - Utility Upgrades* (Permit: 2015-186).

HISTORIC RESOURCES IMPACT ASSESSMENT

Terms of Reference

The terms of reference for the Historic Resources Impact Assessment were outlined in the Schedule "A" of the letter dated August 26, 2015. These requirements included a targeted Historic Resources Impact Assessment for archaeological resources of high potential landforms in areas with minimal previous disturbance.

ARCHAEOLOGICAL RESEARCH PERMIT NO. 2015-186

Under Archaeological Research Permit No. 2015-186, Circle CRM Group Inc. conducted an assessment of lands with high archaeological potential. The field assessment consisted of a pedestrian traverse, intensive examination of fortuitous exposures, shovel testing and an auger testing program.

RESULTS

Previously Recorded Historic Resources: One archaeological site (FjPj-68) had been previously recorded within the proposed Project footprint. FjPj-68 yielded minimal cultural material and no further studies are required.

Newly Recorded Historic Resources: Circle CRM Inc. Inc. did not identify any new historic resources during the conduct of the impact assessment.

HISTORICAL RESOURCES ACT APPROVAL WITH CONDITIONS

Based upon the results of the Historic Resources Impact Assessment, *Historical Resources Act* approval is granted to the Proponent for the Project, as illustrated on the attached plan and subject to the requirements outlined in the attached Schedule.

Conditions of Approval

The attached Schedule outlines Alberta Culture and Tourism's requirements for the proposed footprint of the Project. These requirements involve construction monitoring in targeted areas. The Proponent is granted *Historical Resources Act* approval to proceed with development of the remainder of the project on the understanding that the required construction monitoring will be conducted.

Should you require additional information or have any questions concerning this approval, contact George Chalut, Land Use Planner, at 780-431-2329 (toll-free by first dialing 310-0000) or george.chalut@gov.ab.ca.

I would like to thank representatives of the City of Edmonton for their cooperation in our endeavour to document the Province's historic resources.

Sincerely,

David Link, PhD
Assistant Deputy Minister

Attachments

Alberta Culture and Tourism

ATTACHMENT 1

STANDARD REQUIREMENTS UNDER THE *HISTORICAL RESOURCES ACT*: REPORTING THE DISCOVERY OF HISTORIC RESOURCES

If proponents and/or their agents become aware of historic resources during the course of development activities, they are required, under Section 31 of the *Historical Resources Act*, to report these discoveries to the Heritage Division of Alberta Culture and Tourism. This requirement applies to all activities in the Province of Alberta.

1.0 REPORTING THE DISCOVERY OF ARCHAEOLOGICAL RESOURCES

The discovery of archaeological resources is to be reported to Eric Damkjar, Head, Archaeology, at 780-431-2346 (toll-free by first dialing 310-0000) or eric.damkjar@gov.ab.ca.

2.0 REPORTING THE DISCOVERY OF PALAEONTOLOGICAL RESOURCES

The discovery of palaeontological resources is to be reported to Dan Spivak, Head, Resource Management, Royal Tyrrell Museum of Palaeontology, at 403-820-6210 (toll-free by first dialing 310-0000) or dan.spivak@gov.ab.ca.

3.0 REPORTING THE DISCOVERY OF HISTORIC PERIOD SITES

The discovery of historic period sites is to be reported to Brenda Manweiler, Manager, Historic Places Research and Designation Program, at 780-431-2309 (toll-free by first dialing 310-0000) or brenda.manweiler@gov.ab.ca. Please note that some historic period sites may also be considered Aboriginal traditional use sites.

4.0 REPORTING THE DISCOVERY OF ABORIGINAL TRADITIONAL USE SITES

The discovery of any Aboriginal traditional use site that is of a type listed below is to be reported to Valerie Knaga, Director, Aboriginal Heritage Section, at 780-431-2371 (toll-free by first dialing 310-0000) or valerie.k.knaga@gov.ab.ca.

Aboriginal Traditional Use sites considered by Alberta Culture and Tourism to be historic resources under the *Historical Resources Act* include:

Historic cabin remains;
Historic cabins (unoccupied);
Cultural or historical community camp sites;

ATTACHMENT 1

STANDARD REQUIREMENTS UNDER THE *HISTORICAL RESOURCES ACT*: REPORTING THE DISCOVERY OF HISTORIC RESOURCES

Ceremonial sites/Spiritual sites;
Gravesites;
Historic settlements/Homesteads;
Historic sites;
Oral history sites;
Ceremonial plant or mineral gathering sites;
Historical Trail Features; and,
Sweat/Thirst/Fasting Lodge sites

5.0 FURTHER SALVAGE, PRESERVATIVE OR PROTECTIVE MEASURES

If previously unrecorded historic resources are discovered, proponents may be ordered to undertake further salvage, preservative or protective measures or take any other actions that the Minister of Alberta Culture and Tourism considers necessary.

Alberta Culture and Tourism

OPaC Historic Resources Appl: 008021125

HISTORICAL RESOURCES ACT APPROVAL WITH CONDITIONS

CITY OF EDMONTON
FORT EDMONTON PARK - UTILITY UPGRADES
WATER SUPPLY, ELECTRICAL / UTILITY, WASTE MANAGEMENT

HISTORIC RESOURCES MANAGEMENT PROJECT FILE: 4725-15-0018-002

SCHEDULE

For the purposes of this Schedule City of Edmonton shall be referred to as the "Proponent" and Fort Edmonton Park - Utility Upgrades shall be referred to as the "Project".

The following *Historical Resources Act* approval is based upon the results of the Historic Resources Impact Assessment carried out by Circle CRM Group Inc. under Archaeological Research Permit No. 15-186 and reported upon in *Final Report Historical Resources Impact Assessment City of Edmonton Fort Edmonton Park - Utility Upgrades*.

Part I provides the Proponent with *Historical Resources Act* approval for components of the Project while Part II outlines the terms and conditions attached to this approval.

I. *HISTORICAL RESOURCES ACT* APPROVAL

Historical Resources Act approval is granted to the Proponent for the Project, as illustrated on the attached plan.

II. CONDITIONS OF APPROVAL

Historical Resources Act approval is granted on the understanding that a construction monitoring program will occur, as outlined below.

1.0 ARCHAEOLOGICAL RESOURCES

The potential for the Project to affect archaeological resources is high.

February 17, 2016

1.1 Historic Resources Requirements

Pursuant to Section 37(2) of the *Historical Resources Act*, additional studies are to be conducted on behalf of the Proponent by an archaeologist qualified to hold an archaeological research permit within the Province of Alberta. A permit must be issued by Alberta Culture and Tourism prior to the initiation of any archaeological field investigations. Please allow ten working days for the permit application to be processed.

1.1.1 Alberta Regulation 254/2002

Archaeological investigations conducted under permit in Alberta are subject to the conditions stated within Alberta Regulation 254/2002, *Archaeological and Palaeontological Research Permit Regulation*, conditions set forth in the approved permit, and any other conditions that the Minister of Alberta Culture and Tourism imposes under Section 30 of the *Historical Resources Act*.

1.1.2 Contacting the Archaeological Survey

For further information regarding the acquisition of an archaeological research permit and/or consulting archaeologists' obligations under Alberta Regulation 254/2002, please contact Martina Purdon, Head, Regulatory Approvals & Information Management, at 780-431-2331 (toll-free by first dialing 310-0000) or martina.purdon@gov.ab.ca.

1.1.3 Coverage

A construction monitoring program must be undertaken in the following targeted locations:
1) Target Area 2 (Shovel Test Area 8) within LSD 4-23-52-25-W4M
2) Target Area 8 (Shovel Test Area 5) within LSD 6-23-52-25-W4M
3) Target Area 15 (Shovel Test Area 3) within LSD 7-23-52-25-W4M

Should significant archaeological resources be encountered during the conduct of the monitoring program contact Eric Damkjar at 780-431-2346 (toll-free by first dialing 310-0000) or eric.damkjar@gov.ab.ca. It may then be necessary for Alberta Culture and Tourism to issue further instructions regarding these resources.

1.1.4 Timing

No excavation activities are to take place in the targeted areas until a professional consulting archaeologist is on-site to monitor construction activities.

1.2 Reporting the Results of Archaeological Resources Studies

1.2.1 Submission of Archaeological Site Inventory Data Forms

The Proponent's consulting archaeologist is required to submit site inventory data forms for each archaeological site recorded or re-examined during the conduct of the required studies. The discovery of a site must be reported within 30 days following the date of discovery. Site data forms are to be submitted within 30 days of the date on which the permit period ends or prior to the submission of any interim report or the final report, whichever comes first.

1.2.2 Submission of Final Report

The final report must be submitted within 180 days after the expiration of the permit or upon completion of a required monitoring program, whichever comes first. Copies of the final report are to be submitted by the Proponent's consulting archaeologist to the Archaeological Survey, Historic Resources Management Branch, Heritage Division, Alberta Culture and Tourism, Old St. Stephen's College, 8820 – 112 Street, Edmonton, Alberta, T6G 2P8.

2.0 FURTHER SALVAGE, PRESERVATIVE OR PROTECTIVE MEASURES

Based upon the results of the Historic Resources Impact Assessment, the Proponent may be ordered to undertake further salvage, preservative or protective measures or take any other actions that the Minister responsible for the *Historical Resources Act* considers necessary.

3.0 PRE-EMINENCE OF *HISTORICAL RESOURCES ACT* REQUIREMENTS

Should conditions included within this Schedule be at variance with any instructions associated with the *Listing of Historic Resources* and/or the permit application(s), the conditions of the Schedule take precedence. Following instructions as outlined in this Schedule should result in the granting of *Historical Resources Act* approval and/or the issuance of requirements regarding further historic resources studies in a timely manner.

4.0 COMPLIANCE IS MANDATORY

These conditions shall be considered directions of the Minister of Alberta Culture and Tourism under the *Historical Resources Act*. The Proponent and agents acting on behalf of the Proponent are required to become knowledgeable of the conditions. Failure to abide by the conditions will result in *Historical Resources Act* approval being delayed or not granted.

NO.	DATE	ENG.	BY	SUBJECT
D	2014APR11	AM	NS	SCHEMATIC DESIGN
C	2014MAR14	AM	NS	SCHEMATIC DESIGN
B	2014FEB12	AM	NS	SCHEMATIC DESIGN
A	2014JAN28	AM	NS	SCHEMATIC DESIGN

REVISIONS

DRAWING REDUCED TO HALF SIZE

Associated Engineering

PROJECT No.	20123701
SCALE	1:1000
DRAWN	N. SCHERER
DESIGNED	A. MILLER

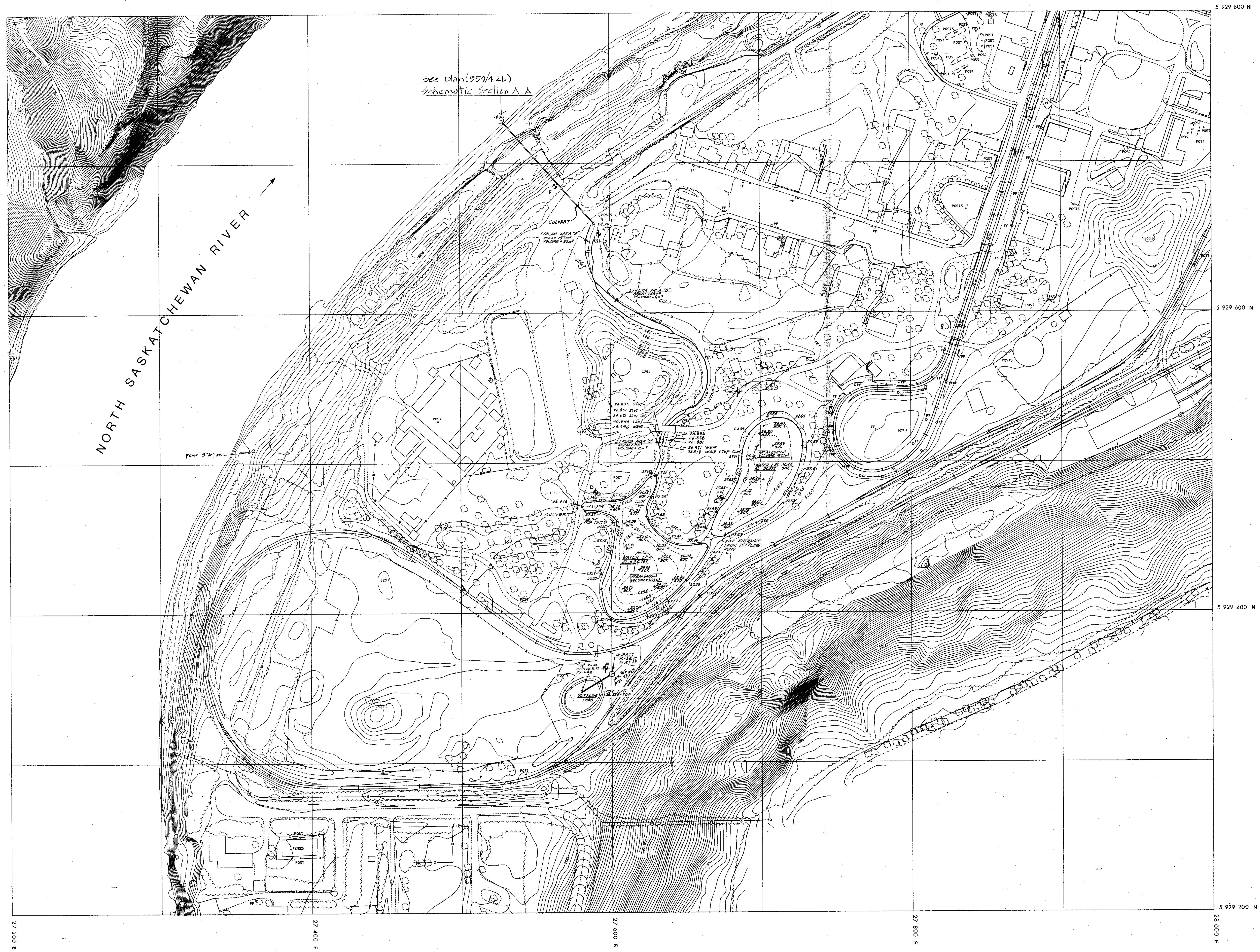
THE CITY OF Edmonton

CONSTRUCTION IMPACT AREA WEST

FORT EDMONTON PARK UTILITY REPLACEMENT

DRAWING NUMBER	REV. NO.	SHEET
FIGURE 19-2	D	1 / 2

Appendix C – Egge's Pond Topographic Survey



ADDITIONAL POND & STREAM SURVEY 91-10-23 J.R.K.

AS BUILT PLANS Aug. 9 '89 DR

Revisions CKD

Edmonton PARKS AND RECREATION

FORT EDMONTON PARK

TOPOGRAPHIC SURVEY

As build plans for lake, stream & outlet

Drawn	Supervisor	Date: JUNE 2, 1988	Drawing No. 559/4 1b
Design	Director	Scale: 1:1 000	
Checked	Manager	File No. 19	
	General Manager		

Appendix D - Vegetation in Area of Egge's Pond

Table D-1 provides a list of plant species found in the area of Egge's Pond (Associated 2015).

Scientific Name	Common Name
Acer negundo	Manitoba maple
Achillea millefolia	Common yarrow
Actaea rubra	Baneberry
Agropyron trachycaulum var. trachycaulum	Slender wheat grass
Alisma plantago-aquatica	Broad-leaved water plantain
Alnus tenuifolia	River alder
Amelanchier alnifolia	Saskatoon
Anemone cylindrica	Long-fruited anemone
Aquilegia brevistyla	Blue columbine
Aster ciliolatus	Fringed aster
Aster hesperius	Western willow aster
Aster laevis	Smooth aster
Aster puniceus	Purple-stemmed aster
Aulacomium palustre	Tufted moss
Betula papyrifera	White birch
Bidens cernua	Nodding beggar-ticks
Brachythecium rivulare	Waterside feather moss
Bromus inermis	Smooth brome
Bryum argenteum	Silver bryum
Calamagrostis canadensis	Marsh reed grass
Calamagrostis inexpansa	Northern reed grass
Campanula rotundifolia	Common harebell
Caragana arborescens	Common caragana
Carex aquatilis	Water sedge
Carex atherodes	Awned sedge

Scientific Name	Common Name
Carex bebbii	Bebb's sedge
Carex crawfordii	Crawford's sedge
Carex disperma	Two-seeded sedge
Carex praticola	Meadow sedge
Carex retrorsa	Turned sedge
Carex utriculata	Beaked sedge
Carex viridula	Green sedge
Ceratodon purpureus	Fire moss
Ceratophyllum demersum	Hornwort
Cirsium arvense	Canada thistle
Cornus stolonifera	Red osier dogwood
Corylus cornuta	Beaked hazelnut
Drepanocladus aduncus	Common hook moss
Eleocharis palustris	Creeping spike-rush
Epilobium palustre	Marsh willowherb
Equisetum arvense	Common horsetail
Festuca rubra	Creeping red fescue
Fragaria virginiana	Strawberry
Galium boreale	Northern bedstraw
Galium trifidum	Small bedstraw
Galium triflorum	Sweet-scented bedstraw
Geum aleppicum	Yellow avens
Glyceria grandis	Tall manna grass
Helodium blandowii	Blandow's feather moss
Hippuris vulgaris	Common mare's-tail
Hypnum lindbergii	Clay pigtail moss
Impatiens capensis	Spotted forget-me-not
Lathyrus ochroleucus	Creamy peavine
Lemna minor	Common duckweed
Linum vulgare	Toadflax

Scientific Name	Common Name
Lysimachia thrysiflora	Tufted loosestrife
Maianthemum canadense	Wild lily-of-the-valley
Myriophyllum exalbescens	Spiked water-milfoil
Najas flexilis	Slender naiad
Petasites sagittatus	Arrow-leaved colt's-foot
Phalaris arundinacea	Canary reed grass
Picea glauca	White spruce
Pinus banksiana	Jack pine
Plagiomnium ellipticum	Marsh magnificent moss
Plantago major	Common plantain
Platanthera hyperborea	Northern green bog orchid
Poa palustris	Fowl bluegrass
Poa pratensis	Kentucky bluegrass
Populus balsamifera	Balsam poplar
Populus tremuloides	Trembling aspen
Potamogeton friesii	Fries' pondweed
Potamogeton richardsonii	Richardson's pondweed
Potentilla palustris	Marsh cinquefoil
Prunus virginiana	Chokecherry
Pylaisella polyantha	Stocking moss
Pyrola asarifolia	Common wintergreen
Pyrola minor	Lesser wintergreen
Ranunculus sceleratus	Celery-leaved buttercup
Rorippa islandica	Marsh yellow cress
Rosa acicularis	Prickly rose
Salix bebbiana	Bebb's willow
Salix discolor	Pussy willow
Salix exigua	Sandbar willow
Salix lasiandra	Western shining willow
Salix lucida	Shining willow

Scientific Name	Common Name
Salix lutea	Yellow willow
Salix petiolaris	Basket willow
Salix planifolia	Plane-leaved willow
Salix pyrifolia	Balsam willow
Scirpus microcarpus	Small-fruited bulrush
Scirpus validus	Common great bulrush
Shepherdia canadensis	Canada buffalo-berry
Smilacina stellata	Star-flowered false Solomon's-seal
Solidago canadensis	Canada goldenrod
Sonchus arvensis	Perennial sow-thistle
Sorbus scopulina	Mountain ash
Sparganium angustifolium	Narrow-leaved bur-reed
Spirodella polyrhiza	Larger duckweed
Stellaria longifolia	Long-leaved chickweed
Stellaria media	Common chickweed
Symphoricarpos albus	Common snowberry
Tanacetum vulgare	Common tansy
Taraxacum officinale	Common dandelion
Trifolium hybridum	Alsike clover
Typha latifolia	Common cattail
Viburnum edule	Low-bush cranberry
Viburnum opulus	High-bush cranberry
Vicia americana	American vetch
Zygadenus elegans	White death-camas