

CANADIAN ENVIRONMENTAL
ASSESSMENT AGENCY –
EXECUTIVE SUMMARY
Strathcona Salt Cavern
Storage Project



Prepared for:
ATCO Energy Solutions Ltd.

Prepared by:
Stantec Consulting Ltd.

Project Number: 123511289

July 2014

CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY – EXECUTIVE SUMMARY STRATHCONA SALT CAVERN STORAGE PROJECT

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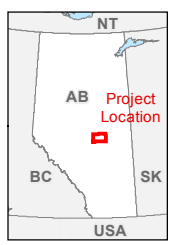
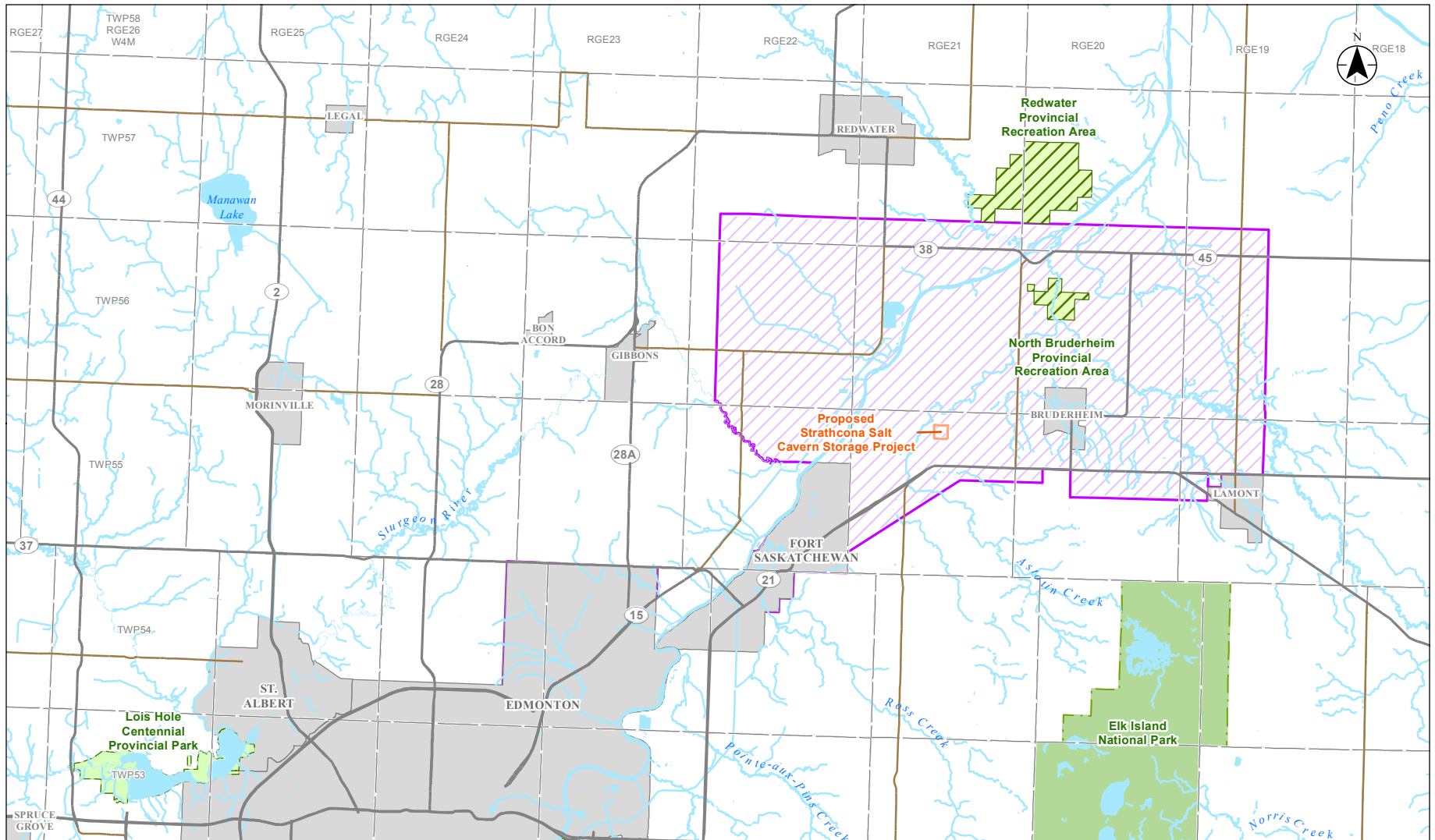
July 2014

1.0 General Information and Contacts

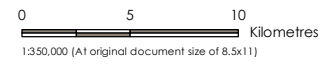
ATCO Energy Solutions Ltd. (AESL) has prepared a project description that complies with the *Prescribed Information for the Description of a Designated Project Regulations* and the *Guide to Preparing a Description of a Designated Project under the Canadian Environmental Assessment Act, 2012*. AESL consulted with the Canadian Environmental Assessment (CEA) Agency about the Project, and as a result the Agency has determined that the Project is considered a designated project under the Canadian Environmental Assessment Act. Under paragraph 14(f) of the Schedule to the *Regulations Designating Physical Activities*, the construction, operation, decommissioning and abandonment of a new liquefied petroleum gas storage facility with a storage capacity of 100,000 m³ or more is a designated physical activity.

AESL builds, owns and operates energy and water-related infrastructure. The company focuses on offering natural gas gathering, processing and storage; natural gas liquids extraction, transportation and services; electric transmission and substations; and industrial water infrastructure solutions to the energy industry. AESL is part of the ATCO Group of Companies, a collection of individual and independent energy, technology, utilities and structures and logistics companies belonging to the broader ATCO Group (ATCO 2014).

AESL is proposing to construct and operate an underground natural gas liquids (NGL) storage facility within the Alberta Industrial Heartland (AIH) region of the Province, near Fort Saskatchewan, Alberta, Province (see Figure 1). The Strathcona Salt Cavern Storage Project (the Project) will include four underground NGL storage caverns, a brine storage pond and associated surface facilities. The NGL products planned for storage in the caverns are ethylene, propane, butane and condensate. The Project facilities are proposed to be developed on land and with mineral rights owned by AESL. Commencement of commercial operation is targeted for Q1 2016 for the first two caverns and Q1 2017 for the second two caverns. Water requirements for the Project will be provided by existing infrastructure, and under an existing water diversion license for the North Saskatchewan River. Third party pipelines will be constructed to transport natural gas liquids (NGL) to the Project.



- Project Area
- Primary Highway
- Secondary Highway
- Watercourse
- Alberta's Industrial Heartland Boundary
- National Park
- Provincial Park
- Provincial Recreation Area/ Natural Area
- Urban Area
- Waterbody



Reference
 ATCO Energy Solutions, Alberta's Industrial Heartland, AltaLIS, Geologic, Parks Division - Alberta Tourism, Parks and Recreation



Coordinate System
 NAD 1983 UTM Zone 12N
 Prepared by CES & AS on 7/22/2014
 Technical Review by CS on 7/22/2014

Client/Project
 Strathcona Salt Cavern Storage Project

Figure No.
 1
Title
 Regional Area

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Project name and contact information are provided below:

Name of the designated project:	Strathcona Salt Cavern Storage Project
Name of the proponent:	ATCO Energy Solutions Ltd.
Address of the proponent:	200, 919 - 11 Ave SW, Calgary, Alberta, T2R 1P3
Chief Executive Officer:	Pat Creaghan, President, ATCO Energy Solutions Ltd.
Principal contact person:	Bob Armstrong Senior Manager, Project Execution ATCO Energy Solutions Ltd. Phone: 403-245-7302 Fax: 403-513-3750 Email: Bob.Armstrong@atcoenergysolutions.com

The Project site, including the underground salt caverns, brine pond, and associated surface infrastructure, are located within the AIH region, 14 km northeast of Fort Saskatchewan and approximately 30 km northeast of Edmonton. The AIH is a joint land use planning and development initiative between five municipalities in the Edmonton Capital Region to attract investment from the chemical, petrochemical, oil, and gas industries to the region. Refer to Figure 1: Regional Area.

Consultation with area stakeholders, including government, regulators, local land owners, occupants and residents, regional associations, Aboriginal peoples and the public formally began in the third quarter of 2013. Specifically, consultation activities have been developed in accordance with AER Directive 56: Energy Development Applications, and have included a public open house and direct resident/landowner consultation and notification. Area consultation will continue over the course of development as required.

See sections 6.0 and 7.0 of this summary for a description of, and the results of any, consultations undertaken with any jurisdictions and other parties, including Aboriginal peoples and the public.

The Project will be subject to various approvals required by the Alberta Energy Regulator (AER) under the *Oil and Gas Conservation Act (OGCA)*, the *Public Lands Act*, the *Environmental Protection and Enhancement Act (EPEA)* and the *Water Act*. The salt caverns, brine pond and/or surface facilities for the Project are subject to the following approvals and licenses:

- OGCA requirements under Directive 56: Energy Development Applications and Schedules:
 - A Schedule 2 application is needed for surface infrastructure, including dehydration, pumps and compression.
- OGCA requirements under Directive 65: Resources Applications for Oil and Gas Reservoirs for scheme approval for the salt cavern storage program

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- AER Directive 51: Injection and Disposal Wells – Well Classifications, Completions, Logging and Testing Requirements:
 - Test wells must be relicensed for the purpose of injection prior to water injection for cavern development.
 - AESL holds active licenses for two brine disposal wells. No amendments to these licenses will be required for the Project.
- EPEA Approval to construct, operate and reclaim the brine pond, to be issued by the AER under the Industrial Approval Application (*Activities Designation Regulation*).
 - EPEA approvals for industrial projects in Alberta related to wastewater quantity and quality, runoff control, and storm water management will also be administered by ESRD under the EPEA Approval required for the Project.
- Approval as per *Water Act*, *Water (Ministerial) Regulation* for the brine pond, which is considered a dam structure under the *Water Act*
- *Water Act* license requirements for water intake and diversion, and approval requirements to remove a wetland:
 - AESL currently holds a water diversion license for the North Saskatchewan River (NSR) for the stated purpose of mining salt caverns, as required under the *Water Act*. No amendments to the license will be required for the Project.
 - In October 2013, AESL received confirmation from ESRD that one of three wetlands on the Project site was being claimed by the Crown for the purposes of the Project. AESL has submitted an application under the *Water Act* requesting approval to remove one of the non-crown claimed wetlands which falls within the Project development area.

The Project is also regulated by zoning and development permit requirements administered by Strathcona County and the Municipal Development Plan, under the *Municipal Government Act*. Preliminary discussions with Strathcona County have occurred regarding the development permit requirements and schedule. Considerations include access, road use, utilities and traffic impact.

Other provincial regulatory requirements that do not require approvals, permits or authorizations will be adhered to by AESL for the Project. These include requirements for noise control, waste control, flaring, incinerating and venting, and emergency preparedness and response.

A number of environmental studies have been completed in the past several years for the region surrounding the Project location. Many of these studies were done to support environmental impact assessments conducted under the CEAA and relevant Alberta provincial regulation for large scale industrial projects. At this time there are no regional environmental studies, as defined by the CEA Agency, being conducted for this area.

Land use in the AIH is addressed by an Area Structure Plan Bylaw (Strathcona County 2001) and Amendment (Strathcona County 2002). The Project site is in the Strathcona Heavy Industrial Policy Area as per the AIH Area Structure Plan Bylaw (Strathcona County 2007) and is zoned as "Heavy Industrial" as specified by Strathcona County.

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Strathcona County has prepared a Municipal Development Plan according to the legislative framework in the *Municipal Government Act* to manage growth, development and sustainability in an orderly manner for the next twenty years (Strathcona County 2007). The Municipal Development Plan includes specific policies that deal with development near the North Saskatchewan River (NSR) and the conservation and quality of water, land, air and natural resources within Strathcona County.

Under the Alberta *Land Stewardship Act*, a regional management plan for the region of the NSR watershed where the Project is located has been developed but not ratified. ESRD has also developed several regional frameworks for this area as part of the Cumulative Effects Management System, including the Water Management Framework for the Industrial Heartland and Capital Region, the Capital Region Air Quality Management Framework, and an Air Management Framework for the Industrial Air Management Area and Capital Region. In addition, the Northeast Capital Industrial Association (NCIA) has developed a Regional Noise Management Plan and Regional Groundwater Management Plan for the area. Refer to Section 3.1 for details on these plans and frameworks.

The ESRD is currently in the first phase of consultation in the development of the North Saskatchewan Regional Plan (NSRP). The North Saskatchewan Region has approximately 85,780 km² (approximately 13%) of Alberta's total land base (ESRD 2012). This region has a large and diverse landscape, a diverse population and a vibrant economy. Industries driving economic activity across the region are growing, and include energy, agriculture, tourism, forestry, and associated services. The purpose of regional planning is to support the numerous policies and strategies that guide natural resource development, support economic growth and protect our environment. Regional plans will integrate these policies and strategies at the regional level and provide the policy direction and clarity for decision makers at the federal, provincial and local levels. Based on Terms of Reference for Developing the NSRP, AESL anticipates that the Project will align with the spirit and intent of the plan.

2.0 Project Information

The Project consists of the construction and operation of four underground salt caverns and associated surface facilities and infrastructure for the storage of NGL products. The NGL products proposed to be stored in the caverns are propane, butane, condensate, and ethylene. Each cavern will be developed to a target size of 120,000 m³ yielding a working storage capacity of approximately 100,000 m³ per cavern.

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The *Regulations Designating Physical Activities* (the Physical Activities Regulations) prescribe in section 14 (f) of the Schedule of Physical Activities that the construction, operation, decommissioning and abandonment of a new liquefied petroleum gas (LPG) storage facility with a storage capacity of 100,000 m³ or more is subject to the review of a Project Description under the *Canadian Environmental Assessment Act* (CEAA). Section 14(f) is as follows:

14. The construction, operation, decommissioning and abandonment of a new:
(f) liquefied petroleum gas storage facility with a storage capacity of 100,000 m³ or more.

The Project, as described, is subject to the review of a Project Description because the NGL products proposed to be stored in the caverns include LPG products (specifically propane, butane and ethylene), and because the aggregate storage capacity of the proposed caverns exceeds 100,000 m³.

The storage caverns will be developed on land adjacent to an existing salt cavern natural gas storage facility, owned and operated by ATCO Pipelines. All Project facilities are proposed to be developed on land, and with mineral rights, owned by AESL. Two of the four caverns are targeted for commercial operation in the first quarter of 2016. The remaining two are targeted for commercial operation in the first quarter of 2017. Third-party infrastructure will connect the Project to markets and local utilities. This infrastructure will be constructed, owned and operated by third parties

The facilities and infrastructure required for the Project are identified in Table 1. New AESL facilities required for the Project are identified in section A. Existing AESL infrastructure that will be used in the Project development, and information on third party infrastructure which connects the Project to markets and local utilities, are provided in sections B and C of Table 1, respectively.

Table 1 Components of Proposed Development

Component	Description
A. New AESL Facilities	
Salt caverns and injection wells	Four offset wells (which will fall within the Project scope once they are converted from test wells to injection wells for cavern development, beginning in Q4 2014) Four underground caverns to be developed in the Upper Lotsberg salt formation, approximately 1800 m below surface Target cavern size – 120,000 m ³ Working cavern storage capacity - approximately 100,000 m ³
Brine pond	Storage pond Capacity- approximately 700,000 m ³
Brine pump house	Piping, pumps, degasification facilities
NGL product handling facilities	Piping, pumps, dehydration units

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Table 1 Components of Proposed Development

Component	Description
Cavern washing pipelines	Water and brine pipelines connecting new cavern wells to existing AESL cavern washing facilities
B. Existing AESL Infrastructure	
Cavern washing facility	Water pumps, tank, and piping for water and brine
Brine disposal wells	Two disposal wells completed in the Nisku disposal formation
Water intake and pipeline system	Water intake on the North Saskatchewan River, pumps, and pipeline system
C. New Third Party Infrastructure	
NGL pipelines	Three pipelines of approximately 11 km connecting the Project site to the Petrogas terminal Metering facilities to be located on the Project site
Ethylene pipeline	Approximately 3 km of pipeline connecting the Project site to the existing Ethylene Distribution System pipeline network owned by AltaGas Transmission and Extraction Limited Partnership and operated by NOVA Chemicals Metering facilities to be located on the Project site
Utilities	Natural gas and electricity utility service to the Project site provided by the local franchised utility operators

The physical works for the Project, as identified in section A of Table 1, will be constructed, owned and operated by AESL. The Project includes the following:

- Development of four salt caverns in the Lotsberg formation, which is located approximately 1,800 m below surface. Once developed, each cavern will have an approximate total volume of 120,000 m³, and will have a working NGL product storage capacity of approximately 100,000 m³. Working storage capacity is limited by the sump at the bottom of each cavern, which is taken up by brine fluid, preventing the full cavern volume from being utilized for storage of NGL product.
- Four water injection wells for cavern development (these will be initially drilled as test wells and will subsequently be converted into water injection wells following AER approval).
- A brine (i.e. salt water) pond and brine pump house which will be used in the operation of the storage caverns.
 - The brine pond will hold approximately 700,000 m³ of brine with a nominal depth of 8 m and will occupy an area of approximately 103,000 m² (10.3 ha). As brine is displaced into the pond from the caverns, it will flow through a de-gassifier to ensure no NGL products enter the brine pond.
 - The brine pump house will be constructed on the berm of the brine pond and will be used to withdraw NGL products from the caverns. The brine pump house will contain approximately 560 kW of electrically driven pumps capable of moving up to 1,325 m³ per hour of brine into the caverns.

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- NGL product handling facilities, consisting of pumps and product processing equipment, and related auxiliary facilities required for the delivery of NGL products into and out of the storage caverns.
 - Pumps and product processing equipment include: electrically driven pumps (approximately 8950 kW) for injecting the NGL products into the caverns; filtration and separation equipment to condition the products withdrawn from the caverns; and dehydrators to remove any water from the products prior to delivery to the pipeline systems. The pumps are anticipated to be housed in two buildings of approximately 200 m² each. The design capacity is 330 m³ per hour for each of the NGL products.
 - Auxiliary facilities will consist of an office, maintenance, electrical and control building. This will be at least one and no more than four separate buildings.
- New pipelines, approximately 800 m long for fresh water, and shorter pipelines for brine, to connect the cavern washing facility and brine disposal wells to the new salt cavern wells, and to be used in the development and future operation of the caverns.

Water for the Project, including the cavern washing activities will be sourced from the North Saskatchewan River through existing industrial water system, owned and operated by AESL under existing water diversion licenses.

Brine generated by the cavern washing activities will be disposed of through two existing brine disposal wells, owned and operated by AESL. These wells are expected to fully support the development of the caverns for the Project. No amendments to the existing Water Act Approvals are required to support the development of the caverns for the Project.

Permanent structures will consist of office, maintenance, electrical and control buildings, two pump buildings, surface piping, treating facilities, pipelines for underground water, brine and on-site product, and four underground storage caverns.

During construction, temporary structures will be required for construction offices, equipment storage, workforce muster points and various other functions. The temporary structures will be similar to those typically used on large construction sites (e.g. integrated workforce trailer systems). All temporary structures will be removed from the site once construction is complete.

Construction, operation and decommissioning activities will be performed in relation to the Project. These activities are summarized below:

- Construction of the Project will include:
 - Cavern development through injection of fresh water into the previously drilled wells to dissolve the salt and create a brine solution which is pushed out of the cavern by the injected fresh water. The brine will be disposed through existing disposal wells into a deep secure formation. This process occurs continuously for 40 to 50 weeks until the desired cavern size is achieved.

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- Construction of the brine pond and brine pump house. Topsoil and subsoil will be removed from the proposed pond area and stockpiled. The area will be excavated and berms will be constructed to create the desired brine pond volume. Dewatering will be required during the excavation of the pond. Two layers of high density polyethylene (HDPE) liner will be installed over the excavated pond, between which a leak detection system will be installed. The leak detection system will be comprised of a network of weeping tile piping connected to sumps. A secondary system will be used to control groundwater level beneath the bottom liner. The brine pump house will be constructed in conjunction with the brine pond.
- Construction of the fresh water and brine pipelines by excavating the required trench, installing the piping, and backfilling. Once construction is complete, this disturbed area will be restored.
- Construction of the product handling facility, including infilling of one wetland following approval under the Water Act. Once the site has been prepared, buried utilities will be installed, followed by above ground piping and facilities, building foundations, pumping and treating equipment, and office, maintenance, electrical and control buildings.
- Operation of the facility is anticipated to be at least 25 years. The main facilities associated with operations are pumps, separators and dehydrators that will transfer the NGL products into or out of the storage caverns to meet customer requirements. Maintenance activities on these associated facilities will be ongoing throughout operation.
- Decommissioning of the salt caverns and associated facilities and infrastructure will include removing all major buildings and equipment and returning the project site to an equivalent pre-development land capability. The storage caverns will be filled with brine and the wells will be abandoned as per AER requirements.

Solid, liquid, gaseous or hazardous wastes that may be generated during these Project activities are described below:

- There will be no continuous air emissions. Intermittent emissions from dehydration activities will be captured and incinerated on site;
- Small volumes of hydrocarbons, de-gassed from the brine prior to storage may be required infrequently. These volumes will be small and will be flared on site following AER Directive 60: Upstream Petroleum Industry Flaring, Incinerating and Venting;
- Solution mining waste water (water with high concentrations of dissolved sodium chloride) and hydrocarbon residue from the cavern washing control fluid will be disposed of through two existing licensed disposal wells;
- Small amounts of process wastewater will be generated by the NGL process dehydrators and will be temporarily stored on site then disposed of at a licensed disposal facility;
- Domestic sewage from an office located on site will be collected in a septic holding tank and disposed of at a licensed disposal facility;
- Domestic and shop waste will be disposed of through contracted waste disposal;
- Recyclables (wood, paper, metal) will be disposed of through contracted recycling;

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- Any hazardous waste generated will be disposed of through a licensed disposal company; and
- Waste oil will be disposed of through a licensed recycler.

A storm water management plan will be developed for the Project area to allow for surface water to be collected and managed in accordance with the brine pond approval conditions. Storm water and high level groundwater beneath the brine pond will be directed to an onsite wetland for management.

The anticipated Project schedule is provided in Table 2.

Table 2 Project Schedule

Key Project Phase	Proposed Project Schedule
Prepare site (grading and leveling)	Q3 to Q4 of 2014
Convert test wells to injection wells	Q4 2014 to Q4 2015
Construct cavern washing pipelines and surface facilities	Q3 2014 to Q1 2016
Construct brine pond and pump house	Q3 2014 to Q4 2015
Begin commercial operation	Q1 2016
Decommission and abandon	2040 or later

3.0 Project Location

The Project site is within the AIH region, 14 km northeast of Fort Saskatchewan and approximately 30 km northeast of Edmonton. The coordinates of the centroid of the project area are as follows:

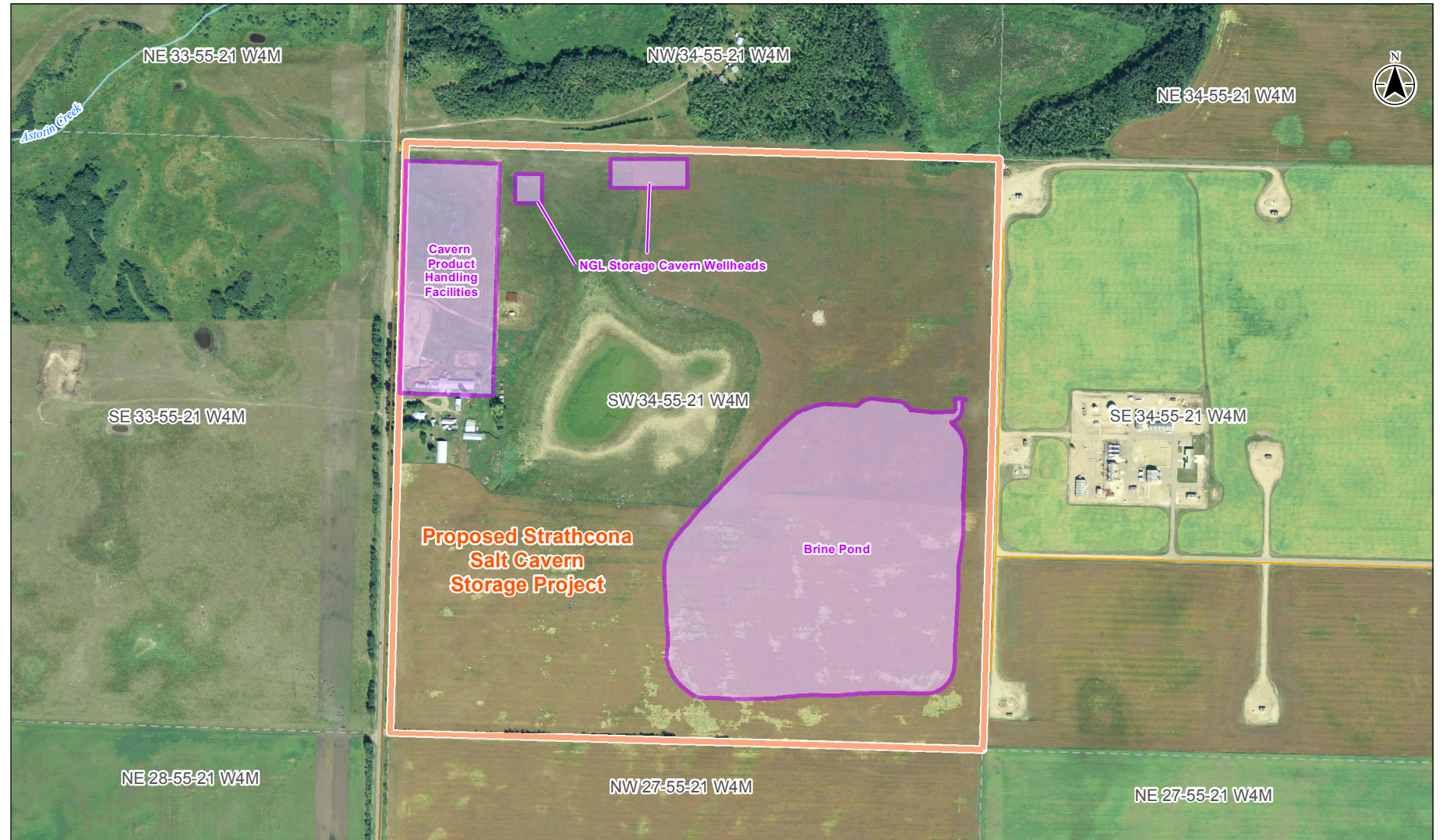
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Northing: 5962380.709959

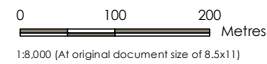
Latitude: 53° 47' 33.244"

Longitude: -113° 2' 37.396"

Refer to Figure 2: Site Plan for the Project’s overall location as well as the spatial relationship of the Project components.



- Site Plan - Proposed Facility
- Project Area
- Secondary Highway
- Local Road
- Watercourse



Reference
 ATCO Energy Solutions, AltaLS, CanVec, GeoLogic, Parks
 Division - Alberta Tourism, Parks and Recreation



Coordinate System
 NAD 1983 UTM Zone 12N
 123511289-0007
 Prepared by CES & AS on 7/22/2014
 Technical Review by CS on 7/22/2014

Client/Project
 Strathcona Salt Cavern Storage Project

Figure No.
2
 Title
Site Plan

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The main Project site is located at SW 34-55-21 W4M. All new operating surface facilities and wellheads for the Project will be located at this site. Two of the underground salt caverns will be developed in SW 34-55-21 W4M and two caverns will be developed in NW 34-55-21 W4M.

AESL holds Special Mineral Lease agreements for the south half of NW 34-55-21 W4M and all of SW 34-55-21 W4M to develop caverns and conduct storage operations in the Lotsberg formation under these lands. AESL holds the surface rights for SW 34-55-21 W4M and the surface rights for NW 34-55-21 W4M are privately held.

There are currently six permanent residences occupied within 1.5 km of the Project site.

The nearest First Nation Reserve is the Alexander First Nation (Treaty Six) on Indian Reserves 134, 134A and 134 B (located west of Morinville, AB), located 51 km west of the Project. The Project site has been privately owned since the early 1900s, and is not used for traditional purposes by Aboriginal peoples.

The closest federal land is Elk Island National Park, approximately 13 km southeast of the Project.

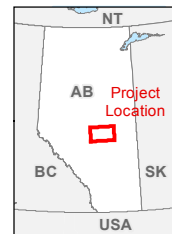
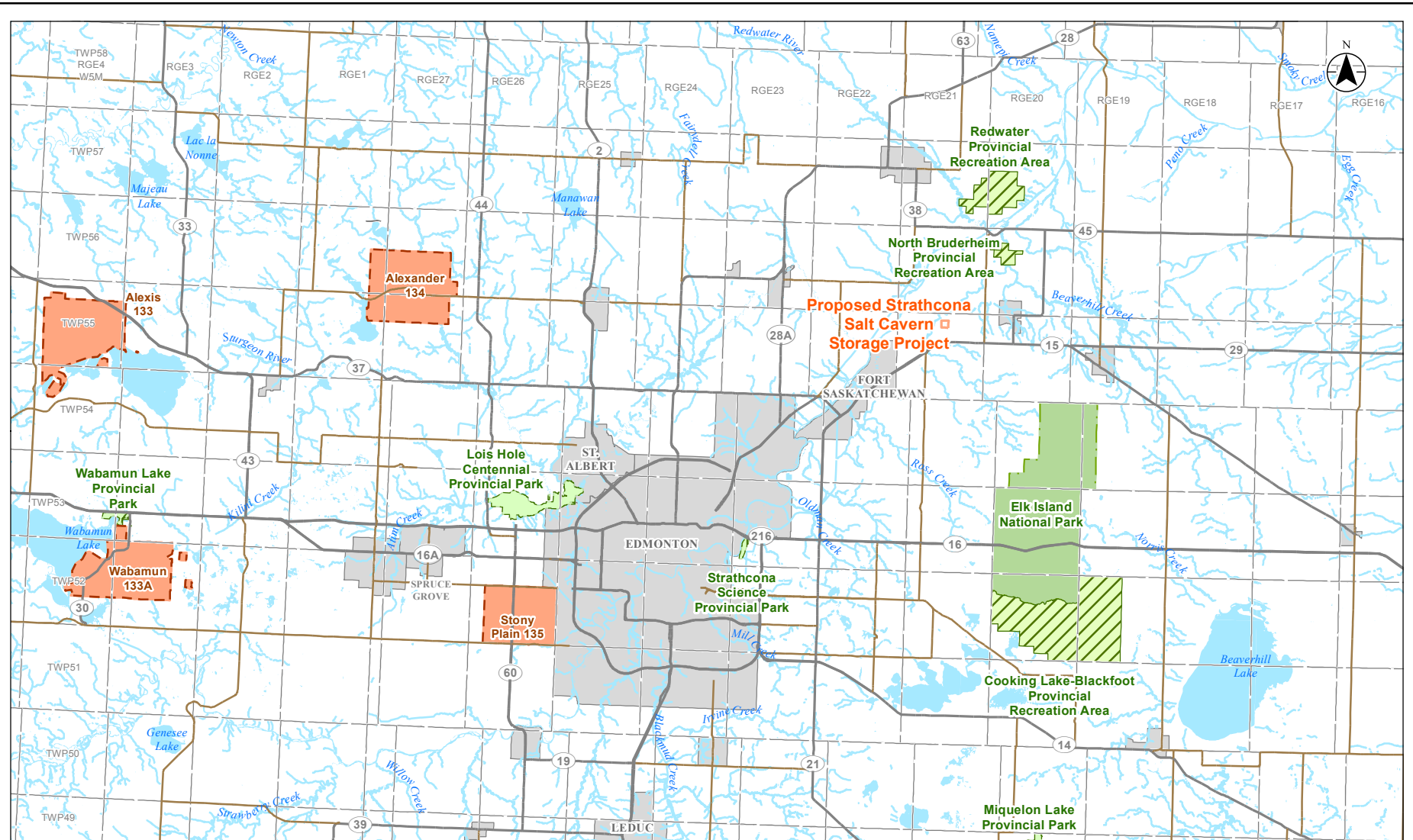
Refer to Figure 3: First Nations and Local Communities for a map of the regional area.

4.0 Federal Involvement

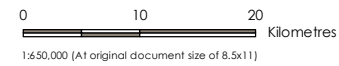
The Project does not include any proposed or anticipated federal financial support. There will be no federal lands used for the purpose of carrying out the Project, nor will there be any granting of interest in federal land (i.e. easement, right-of-way, transfer of ownership). Outside of the *Regulations Designating Physical Activities* under the *Canadian Environmental Assessment Act*, there are no federal legislative or regulatory requirements (including any federal permits, licenses or other authorizations) applicable to the Project.

5.0 Environmental Effects

The Project site, including the footprint for the underground salt caverns, brine pond and associated surface infrastructure is located within the AIH, northeast of Fort Saskatchewan. It is part of the Strathcona Heavy Industrial Policy Area as defined by the AIH Area Structure Plan Bylaw (Strathcona County 2007) and zoned as "Heavy Industrial" by Strathcona County. The closest major water body is the North Saskatchewan River, approximately 5 km west of the Project site.



- Project Area
- Primary Highway
- Secondary Highway
- Watercourse
- First Nations Reserve
- National Park
- Provincial Park
- Provincial Recreation Area/
Natural Area
- Urban Area
- Waterbody



Reference
 ATCO Energy Solutions, AltaLIS, GeoLogic, Parks
 Division - Alberta Tourism, Parks and Recreation

Stantec **ATCO Energy Solutions**

Coordinate System
 NAD 1983 UTM Zone 12N
 Prepared by CES & AS on 7/22/2014
 Technical Review by CS on 7/22/2014

Client/Project
 Strathcona Salt Cavern Storage Project

Figure No.
3
 Title
First Nations and Local Communities

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Land use in this area includes a mix of agricultural, (both cropland and pasture), light to heavy industry, and low density residential housing. Lands within and adjacent to the proposed salt caverns and the brine pond are predominantly cropland with some industrial development, including oil and gas infrastructure. The Shell Scotford Complex, which is comprised of a refinery, upgrader, and chemicals manufacturing plant, is situated immediately west of the Project site. ATCO Pipelines' Salt Cavern natural gas storage facility is located immediately east of the Project site.

The Project is located in the Dry Mixedwood Natural Subregion of the Boreal Forest Natural Region and the Central Parkland Natural Subregion of the Parkland Natural Region of Alberta (Alberta Tourism Parks and Recreation 2012).

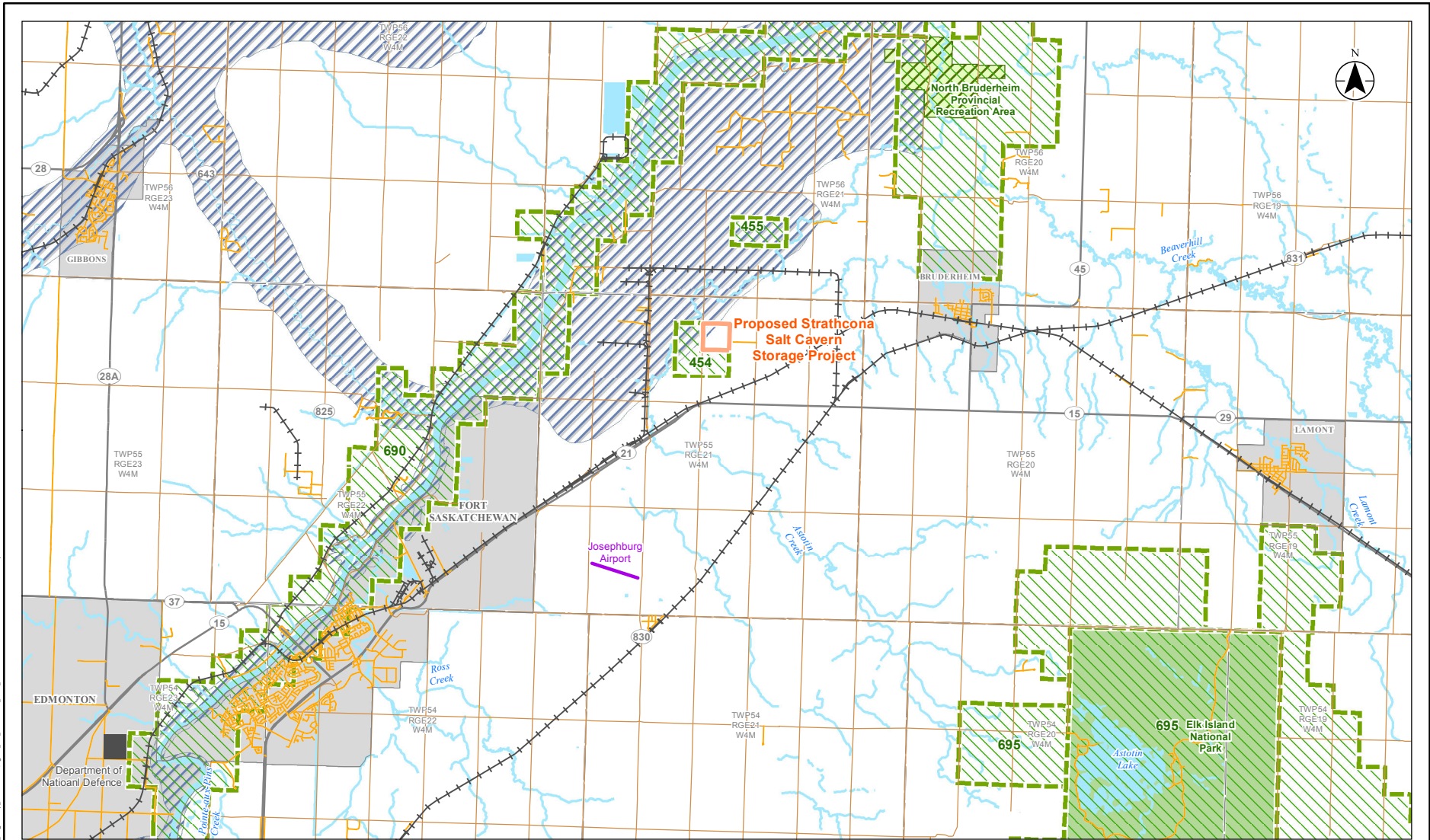
The Project area is located within the North Saskatchewan River watershed in an area of relatively flat topography with localized depressional features. Notable environmental features in the vicinity of the Project include: the North Saskatchewan River valley, which is considered a Key Wildlife and Biodiversity Zone; numerous wetland features across the Project area and north and east of the site, and Astotin Creek, located immediately west of the Project area.

Locally, the Project area is underlain by glacial till and surficial sand, primarily in the northwest corner of the lands. The preglacial Beverly Channel, which has been infilled with sand and gravel deposits (Empress Formation), is the most widely used aquifer in this area. The surficial sediments beneath the site consist of aeolian and/or glaciolacustrine sand. Soils in the area are predominantly Black Chernozemic soils, but also include areas of less productive Dark Gray Chernozemic soils and Brunisolic soils. There are also pockets of Solonetzic soils, across this area, which are often high in salts.

AESL has reviewed existing environmental and land use information for the Project area and the surrounding region, and has conducted a number of relevant studies, including a hydrogeological assessment, and a wetland assessment in July, 2013. A field level soil and terrain assessment will be conducted in early July, 2014.

The Project area is composed mainly of agricultural land with several disturbed depressional areas and one farmyard located in the west central portion of the quarter section, which has since been removed. Given the extensive existing disturbance across and in the vicinity of the Project area and the agricultural ground cover, these lands are considered to have low habitat value for wildlife, and limited potential to support rare plant species.

Refer to Figure 4: Environmentally Sensitive Areas, Federal Lands and Airports.



- Project Area
- Primary Highway
- Secondary Highway
- Local Road
- Railway
- Runway
- Watercourse
- Environmentally Sensitive Area
- Federal Military Land
- Waterbody
- Key Wildlife and Biodiversity Zone
- National Park
- Provincial Park
- Provincial Recreation Area/ Natural Area
- Urban Area
- Waterbody

0 2.5 5
Kilometres
1:175,000 (At original document size of 8.5x11)

Reference
ATCO Energy Solutions, AltaLIS, CanVec, GeoLogic, Parks
Division - Alberta Tourism, Parks and Recreation

Stantec **ATCO Energy Solutions**

Coordinate System
NAD 1983 UTM Zone 12N
123511289-0005
Prepared by CES & AS on 7/23/2014
Technical Review by CS on 7/23/2014

Client/Project
Strathcona Salt Cavern Storage Project

Figure No.
4
Title
**Environmentally Sensitive Areas,
Federal Lands and Airports**

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The potential effects of the Project on the surrounding environment are generally well understood given the existing land uses and the activities required to develop the Project. AESL will follow industry best practices for all phases of project development and will implement project specific mitigation where required. A summary of the relevant best practices and mitigation measures proposed by AESL for each environmental component are provided below.

5.1 SOILS AND TERRAIN

AESL will conduct a field level soil and terrain assessment across the Project area prior to development and in support of regulatory applications. The information from the field survey will be used to develop a project specific conservation and reclamation (C&R) plan that will follow relevant best practice for soil conservation in agricultural areas. The C&R plan will be prepared in accordance with AER's Guide to Content for Industrial Approvals (2014), as part of the AESL's application to AER for approval under the EPEA. In addition, AESL will comply with applicable soil stripping and setback restrictions surrounding the identified wetlands on site.

5.2 VEGETATION AND WETLANDS

Following the wetland assessment, three wetlands were identified on the Project site. In October 2013, AESL received confirmation from ESRD that one of these three wetlands was being claimed by the Crown for the purposes of the Project. AESL has submitted an application under the Alberta *Water Act* requesting approval to remove one of the non-crown claimed wetlands which falls within the Project development area. The crown-claimed wetland is proposed to be used as a basin for onsite storm water collection. The third wetland will not be disturbed by the Project. AESL will mitigate any potential adverse environmental effects associated with the wetlands by implementing the following mitigation measures:

- For the wetland to be removed, the topsoil will be salvaged and the wetland will be filled with an appropriate material.
- Where possible, activities will take place outside Environment Canada's Restricted Activity Period for migratory birds. Where any activities are required during this period, a breeding bird survey will be conducted before commencing any activities in the affected wetlands.
- A wetland compensation program will be implemented to mitigate the loss of the identified wetland. AESL will work with ESRD and Strathcona County to develop an appropriate wetland compensation program to offset the loss of wetland function.

AESL will also incorporate wetland mitigation measures into its C&R plan. The C&R plan will be prepared as a requirement of AESL's application for approval under the EPEA.

Following the wetland compensation program, the Project will not result in adverse effects on wetlands in the region.

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5.3 WILDLIFE

The primary mitigation to limit potential adverse environmental effects on wildlife and to ensure compliance with the *Migratory Birds Convention Act* will be to conduct vegetation clearing outside the migratory bird restricted activity period of May 1 to August 20 in upland areas and April 20 to August 25 in wetlands. If vegetation clearing is required during either of these periods, a pre-construction survey for active nests will be completed by an avian biologist prior to clearing activities and any required action or protocols will be taken to comply with legislation, including the Migratory Birds Convention Act.

The Project area does not support high suitability bird habitat. Wildlife observations conducted during the wetland assessments found no provincially or federally listed species (as under the *Alberta Wildlife Act* and the *Species at Risk Act*, and as per the Committee on the Status of Endangered Wildlife in Canada). The Project will result in impacts to two existing wetlands on site (one to be removed and another to be used as a stormwater basin). Both of these wetlands have been previously affected by agricultural practices and consequently, are considered to provide marginal habitat for migratory birds.

AESL has consulted with ESRD and Canadian Wildlife Service on the potential for brine ponds to affect wildlife. The pond will be designed with measures that will minimize impacts to wildlife, including deterring birds from using the pond, for roosting, nesting, foraging or resting. It will be fenced around the perimeter to limit access to terrestrial animals. The brine pond will be lined with double high density polyethylene liners that will extend from the interior of the pond. The remainder of the pond berm top will have gravel surfacing suitable for pedestrian and light vehicle access. The lack of a vegetated margin on the edge of the pond and on top of the pond berm will deter nesting and feeding activity by waterfowl. It is anticipated that birds will be preferentially attracted to the more suitable habitat provided by either the natural wetland that will be retained on the project site, or to the extensive wetlands associated with Astotin Creek. No adverse effects on birds have been observed by operators of similar brine ponds associated with cavern storage facilities in the area, so a bird deterrent system is not anticipated to be required.

As a result, the brine pond is not expected to adversely affect wildlife, including birds. AESL will conduct increased monitoring of the brine pond for the first two years of its operation to determine if migratory birds and other wildlife are affected. Additional mitigation measures will be implemented by AESL if necessary to minimize any observed impacts.

Given the level of industrial development in the area and with the implementation of the mitigation measures described above, the Project is not expected to result in adverse environmental effects on wildlife and wildlife habitat.

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5.4 GROUNDWATER

AESL is incorporating relevant data from the hydrogeological site assessment into the design of the brine pond, including the installation of an impervious liner, primary and secondary leak detection, and groundwater monitoring. AESL will also follow codified practice in the design and drilling of the salt cavern injection wells, including installation of surface casing across the base of groundwater protection. As a result, the Project is not anticipated to have an adverse environmental effect on local groundwater resources.

5.5 SURFACE WATER AND AQUATIC RESOURCES

There were no aquatic species, as defined under SARA, observed on the Project site during the wetland assessment. Additionally, there is no high suitability habitat for aquatic species in the Project area, given its current agricultural and industrial land use.

The closest permanent water body which supports fish, fish habitat or aquatic life is located approximately 400 m from the closest site perimeter. Stormwater and high level groundwater under the brine pond will be diverted to the onsite wetland. There are no surface waterbodies or watercourses present on the Project site, with the exception of three Class IV seasonal wetlands and two livestock sewage lagoons. The lagoons will be removed during construction of the Project. AESL has submitted a *Water Act* application for the proposed infilled wetland and will provide compensation for the loss of wetland function, as prescribed by ESRD.

Most of the Project site drains naturally toward the central wetland which will be used as a stormwater management facility for the Project. Grading will take place as necessary to achieve positive drainage of all developed areas to drain towards this existing wetland. Discharge from the wetland is not expected to occur as it is large enough to contain the 100-year 24-hour rainfall event, even when the water level is at the wetland boundary.

Additionally, no overflow of the brine pond would be generated by a rainfall event which could otherwise impact surface or groundwater runoff. The brine pond is built to a capacity in excess of the maximum amount of brine it would be required to contain. Brine can also be pumped from the pond to the disposal wells to manage the brine level in the pond.

Because there are no permanent or fish bearing water bodies on the Project site, and because one of the site wetlands has sufficient capacity to function as a stormwater management facility, the Project is not expected to interact with fish, fish habitat or aquatic life. Because the Project is not expected to interact with aquatic life, the Project is not expected to adversely affect fish or fish habitat, as defined in the *Fisheries Act*, or aquatic species at risk, as defined under SARA.

Given that there are no water bodies that support aquatic life in the immediate vicinity of the Project, the Project is not expected to interact with aquatic life.

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Wastewater quantity and quality, runoff control, and stormwater management will be regulated by ESRD under the EPEA Approval to be granted for the Project.

With the implementation of the project design measures proposed by AESL, and anticipated approval conditions, the Project is not expected to have adverse environmental effects of surface water or aquatic resources.

5.6 AIR QUALITY

The Project area is within the Fort Saskatchewan Air Zone that is characterized by a strong industrial base of oil refineries, chemical manufacturing, and power generation. Future industrial activity in the region is also expected to include terminalling and processing of NGLs and additional bitumen upgrading.

There will be no continuous air emissions associated with the Project. Intermittent air emissions as a result of the Project will consist of products of combustion and will be minor and limited to:

- Small volumes of hydrocarbons, de-gassed from the brine prior to storage in the brine pond. Recovery of hydrocarbons from the brine will be required infrequently and only in upset conditions. Hydrocarbon volumes will be small and will be flared on site. Flaring of degassed hydrocarbons will follow AER's Directive 60: Upstream Petroleum Industry Flaring, Incinerating and Venting; and

Emissions from dehydration activities will be captured and incinerated on site and managed in accordance with guidance from the AER and the Canadian Association of Petroleum Producers (CAPP). The Project is not expected to result in additional adverse environmental effects on air quality relative to baseline conditions.

5.7 NOISE

The Project work will contribute to noise levels in the area during the construction and operation phases. AESL conducted a noise impact assessment for the Project in accordance with AER Directive 38 Noise Control and is in the process of assessing the results.

All noise emissions from the Project will comply with AER Directive 38. Compliance with Directive 38 will be demonstrated through conformance with the Regional Noise Model developed through the Northeast Capital Industrial Association (NCIA), in collaboration with the AER. The Project also will comply with Strathcona County noise bylaws, and any potential conditions within the Development Permit issued by the County for the Project.

Given the presence of numerous industrial facilities in the area, planned installation of noise abatement measures as required, and AESL's commitment to comply with the requirements of AER Directive 38, the Project is not expected to contribute to ambient noise levels in the area.

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5.8 HISTORICAL RESOURCES

The Project area does not have Historic Resource Values, and given its distance from the NSR and that it has been under agricultural land use for more than 40 years the potential for intact and significant historical resources is low. AESL will apply for a Historical Resources Assessment clearance from Alberta Culture. AESL will implement the recommendations from Alberta Culture prior to construction of the Project.

Numerous previous Historical Resources Impact Assessments have been conducted in the region of the Project, none of which identified significant historical resource sites. Additionally, the Project area is composed of lands highly disturbed by agriculture and industrial activities. It is unlikely that intact, previously unrecorded historic resource sites will be impacted by the Project.

5.9 POSSIBLE EFFECTS ON FISH AND FISH HABITAT, LISTED AQUATIC SPECIES AND MIGRATORY BIRDS, FEDERAL LANDS OR ABORIGINAL PEOPLES

Any potential adverse effects of the Project are expected to be avoided through planning, design and mitigation measures. There are no water bodies in the Project area that support listed aquatic species. The Project area is comprised of disturbed lands, currently supporting agriculture and industrial activities. This area does not support high suitability habitat for wildlife, including migratory birds. AESL will also mitigate potential Project effects on migratory birds associated with the brine pond and the onsite wetlands, as described above.

As per the Project environment, Project assessments, design plans and mitigation measures described in section 5.0 of this summary, the Project is not expected to result in adverse effects on fish or fish habitat, as defined in subsection 2(1) of the *Fisheries Act*, aquatic species as defined under subsection 2(1) of the *Species at Risk Act*, or migratory birds as defined under subsection 2(1) of the *Migratory Birds Convention Act*.

The Project is not expected to interact with Elk Island National Park or other federal lands, and it is not expected to have impacts outside of Alberta.

The Project will not require access to, use of, or the exploration, development, and production of resources or lands currently used for traditional purposes by Aboriginal peoples and as such the Project is not expected to adversely affect Aboriginal peoples, cultures or communities.

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6.0 Consultation with Aboriginal Groups

Reference to “Aboriginal groups” is inclusive of both First Nations and Métis groups.

AESL has identified four First Nations within 100 km of the Project (Table 3) and will work with these and any other First Nations as appropriate to address their interests. Based on ATCO experience working with Treaty 6 First Nations and First Nation consultation efforts of recently proposed projects in the Alberta Industrial Heartland region, AESL has identified Alexander First Nation and Saddle Lake Cree Nation as potentially interested in the Project.

Table 3 First Nations near the Project

First Nation	Distance from Project Site	Address
Alexander First Nation	NW 51 km	Box 3480, Morinville, AB T8R 1S3
Saddle Lake Cree Nation	NE 91 km	Box 696, Saddle Lake, AB T0A-3T0
Enoch Cree Nation	SW 60 km	#440, PO Box 543, Enoch, AB T7X 3Y3
Paul First Nation	West 90 km	PO Box 30, Duffield, AB T0E 0N0

The Métis Nation of Alberta is divided into six regions within which there are eight Métis communities. AESL has identified two of these, Métis Nation Region 2 in central eastern Alberta and Métis Nation Region 4 in central western Alberta, as potentially interested in the Project (Table 4).

Table 4 Interested Métis Communities near the Project

Metis Nation	Address
<i>Metis Nation of Alberta</i>	<i>#100, 11738 Kingsway Ave, Edmonton, AB T5G 0X5</i>
Metis Nation of Alberta - Region 2	PO Box 6497, Bonnyville, AB T9H 2H1
Metis Nation of Alberta - Region 4	11724 - 95 Street, Edmonton, AB T5G 1L9

AESL held an open house on October 3, 2013 to provide Project information and seek input from interested parties. In addition to landowners and industry, one Aboriginal group (Saddle Lake Cree Nation) was present at the open house. No concerns were brought forward.

AESL is in the process of submitting a First Nations Consultation (FNC) Assessment Request to the Government of Alberta for their consultation intensity recommendation for the Project. Once a response is provided, AESL will follow the recommendation of the Government of Alberta.

AESL has submitted packages for the notification of the Project to the Aboriginal groups identified in Tables 2 and 3. These packages included information regarding the scope of the

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Project, Project location, Project schedule, participant consultation, AESL Project contacts and information specific to the ATCO companies' existing presence and operations in the AIH, information on emergency response, and the AER information packages as required by AER Directive 56.

Ongoing engagement activities with Aboriginal groups regarding the Project will occur throughout development.

7.0 Consultations Undertaken with Jurisdictions, the Public and Other Parties

AESL has consulted with the following stakeholders regarding the Project.

Table 5 Other Jurisdictions Consulted Regarding the Project

Provincial Government	Alberta Energy Regulator (AER) Alberta Environment and Sustainable Resource Development (ESRD)
Municipal Government	Strathcona County
Local Landowners, Occupants and Residents	All Landowners, occupants and residents within 1.5 km radius of the Project site at SW 34-55-21-W4M
Regional Associations	Alberta Industrial Heartland Association (AIHA)

AESL consulted with the Alberta Energy Regulatory (AER) and the Industrial Approvals Branch of Alberta Environment and Sustainable Resource Development (ESRD) and provided information on the proposed Project scope and schedule. AESL proposed a regulatory approach to comply with requirements and sought confirmation regarding the regulatory processes and requirements applicable to the Project to ensure compliance as the Project progresses.

In mid-July 2013, AESL mailed a Project Information Package to landowners, mineral rights holders, occupants and residents within a 1.5 km radius of the Project site boundary. The Project Information Package included information regarding the scope of the Project, Project location, Project schedule, participant consultation, AESL Project contacts and information specific to the ATCO companies' existing presence and operations in the AIH, information on emergency response, and the AER information packages as required by AER Directive 56. The materials distributed by mail were also made available on AESL's website.

Throughout July to September 2013, AESL conducted personal consultations with all land interest holders, including occupants, residents, landowners and caveat holders within 800 m of the Project site boundary. The purpose of these consultations was to explain the proposed Project, answer questions and address concerns. AESL representatives recorded all participant concerns and feedback, and provided additional information where it was requested. AESL documented these communications and no objections were raised.

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AESL held a Project open house in the hamlet of Josephburg on October 3, 2013. It was attended by 56 people. In addition to open-house invitations sent to stakeholders, the open house was advertised in two local weekly distribution newspapers: the Fort Saskatchewan Record; and the Lamont Leader. These advertisements provided contact information for AESL and encouraged those unable to attend the open house to share their questions or concerns about the Project, or request further information, by contacting AESL directly.

Early consultation activities also included discussions with municipal, provincial and federal government officials. Meetings were held with representatives from Strathcona County, the Canadian Environmental Assessment Agency (CEA Agency), ESRD and the AER, each of which are responsible for administering legislation applicable to the Project. The purpose of these meetings was to inform these parties about the Project scope and seek guidance regarding regulatory processes applicable to the Project.

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