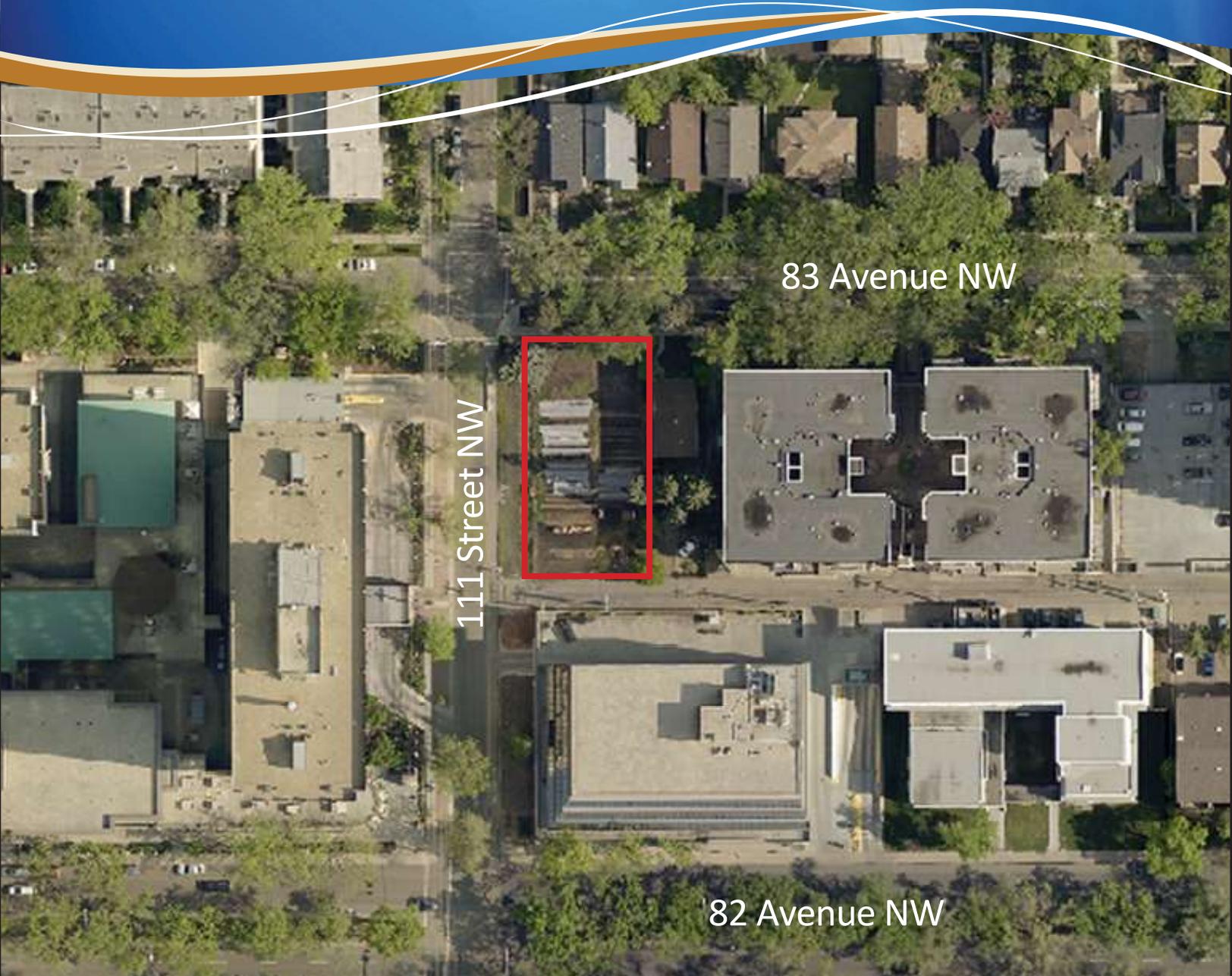


City of Edmonton
Servicing Study for Affordable Housing Sites
Garneau
Final Report

July 2021



Submitted by:
Scheffer Andrew Ltd.
12204 – 145 Street NW
Edmonton, AB T5L 4V7



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Report prepared by:



2021-09-25 ID#71163

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Permit to Practice

This report was prepared by Scheffer Andrew Ltd. ("SAL") for the benefit of the client to whom it is addressed. The information and data contained herein represent SAL's best professional judgement in light of the knowledge and information available to SAL at the time of preparation. SAL accepts no liability whatsoever for any loss or damage suffered by any third party arising from their use of, or reliance upon, this report or any of its contents without the express written consent of SAL and the client.

Executive Summary

This study has been prepared to support the City of Edmonton's Updated Affordable Housing Investment Plan (2019-2022), the City of Edmonton requires a site servicing assessment and cost analysis for the Garneau site (the site). Garneau is being examined as a potential location for construction of affordable housing.

The site is approximately 0.081 ha located in the Garneau neighbourhood on the Southeast corner of 83 Avenue NW and 111 Street NW. The site includes the parcels at 11049 & 11053 83 Avenue NW and legally described as Plan I19, Block 157, Lots 17 and 18.

The study will outline the servicing requirements associated with the development and will be based on the proposed zoning for the Garneau site. The study will provide an assessment and confirmation of the servicing requirements, transportation improvements, onsite earthworks, and other work that may be necessary to develop the site.

Scheffer Andrew Ltd. obtained available information from the appropriate City of Edmonton groups, franchises, or other organizations for the site. The background information provided is summarised in **Section 2 - Methodology** as well as **Appendices A, B and C**.

Site Servicing Analysis and Recommendations

The site is currently zoned as a Medium Rise Apartment Zone (RA8). The site is proposed to include 20-30 studio or one-bedroom units over 6 storeys. Within **Section 3 – Site Servicing Analysis and Recommendations** review is completed for the existing infrastructure, identifying the required service connection locations, discusses earthworks requirements, and other required improvements for the proposed zoning. Supporting information is included in **Appendix D**.

Sanitary

The drainage capacity for RA8 is adequate to service the assumed population. A new 150mm sanitary service is proposed to be provided from the existing 525mm combined sewer main within 111 Street.

Minor Storm

The outflow rate of 35 litres per second per hectare to the combined sewer system is required for this site. A new 100mm storm service is proposed to be provided from the existing 525mm combined sewer main within 111 Street. It is recommended that the storm and sanitary services be installed in the same location so it can be constructed within 1 trench. There is some cost savings when constructing the sanitary and storm within one trench.

Fire Flow and Hydrant Coverage

No upgrades to the existing municipal on-street fire protection infrastructure are proposed for this site as supported by the Infill Fire Protection Assessment (IFPA).

Water Servicing

For site servicing, the existing 20mm water services to the site would need to be abandoned by EPCOR and a new 150mm water service should be installed. This will be installed on the existing waterline within 83 Avenue NW.

Power Service and Street Lighting Requirements

EPCOR has an existing overhead three phase power line in the alley to the east of this lot which provides service to the site. When the builder makes their application to EPCOR for onsite power, EPCOR will specify the service entry point.

Site Access and Surface Improvements

The site access shall be from the abutting lane. Site access will be reviewed further at the development permit stage.

From the site visit the lane condition is poor and there is a possibility that resurfacing could be requested at the time of development. For this reason, a provisional cost to resurface the lane along the property boundary is being recommended.

Site Grading Review

Based on the boreholes from the geotechnical report, topsoil, and clay fill (marginal material) will need to be removed from 0.76-1.52m over the building footprint as this material is not suitable for building or surface construction. For the areas proposed for surface construction the removal of marginal material and import of new clay add additional cost for this site development.

Cost Estimate and Opinion of Probable Costs

Based on the review of the servicing requirements a cost estimate and OPC was prepared to get the site to a state ready for development. The servicing cost are limited up to the private property and does not include onsite servicing. The OPC is shown below. The detailed cost information is included in **Appendix E**.

Garneau - Supportive Housing				
Estimated Land Use Statistics	Area (Ha)	Area (Ac)	Front Feet	# Lots Proposed
Residential Area				
Commercial Area				
Multi-Family (MF) Area	0.081	0.20		1
Arterial Roadway - land dedication				
ER Area				
MR Area				
PUL area				
Total Stage Area - Gross	0.081	0.20	0.0	1
Assessable Area by the Municipality	0.081	0.20		

Description	Recommended OPC Amount	Alternative OPC Amount
Improvements		
Pre-grading & Removals	\$ 11,100	\$ 11,100
Sanitary/ Storm/ Water Site Service to property line	EPCOR - service connection fees \$ 59,365	\$ 59,365
Surface Construction	Provisional cost to repave lane along property \$ 23,000	\$ -
Power Service, including Streetlights	\$ 30,000	\$ -
FAC maintenance	\$ -	\$ -
Traffic Accommodation	\$ 6,000	\$ 6,000
Sub-total Improvements (rounded)	\$ 129,465	\$ 76,465
Contingency - 30%	\$ 39,000	\$ 23,000
Total Construction with Contingency	\$ 168,465	\$ 99,465
Estimated Consulting Fees		
Engineering and Testing	Assumed for Lane reconstruction only as all other items proposed to be constructed by EPCOR \$ 20,000	\$ -
Sub-total Consulting Fees (rounded)	\$ 20,000	\$ -
Servicing Agreement Inspection fees	/ha; min. 3 ha \$ 4,762	\$ 14,286
Sub-total Municipal Fees (rounded)	Assumed for Lane reconstruction only as all other items proposed to be constructed by EPCOR \$ 15,000	\$ -
Estimated Municipal Assessments		
Sanitary Sewer Trunk Charge (SSTC)	per unit \$ 1,246	30.00 \$ 37,380
Sub-total Municipal Assessments (rounded)		\$ 38,000
Estimated External Recoveries and Payments		
No recoveries anticipated	\$ -	\$ -
Sub-total External Recoveries and Payments (rounded)	\$ -	\$ -
TOTAL OPINION OF PROBABLE COST (rounded, incl. contingency, excl. GST)	\$ 242,000	\$ 138,000

Terms of Reference

This report will provide an assessment and confirmation of the servicing requirements, transportation improvements, onsite earthworks, and other work that may be necessary to get the proposed site to a developable condition, including all related development costs. The report will discuss the findings of the analysis, recommendations, and a cost estimate breakdown. This information will be provided to the developer with the intention of providing a high level understanding of the servicing requirements and development costs required to make the site serviceable.

The project scope for the preparation of this report included the following:

Task 2.1: Review of Available Information on Existing Infrastructure and Site conditions.

- Review the information provided and follow up with the appropriate City group, franchises or other organizations as required for clarification or additional information.
- Obtain any reports, studies, engineering drawings, or plans that may be necessary to inform and complete the work. The City will assist, where possible, in obtaining information required by the Consultant to complete the work.

Task 2.2: Site Servicing Analysis and Recommendations

- Provide an assessment of the site's sanitary and minor storm flow generation as well as the water demand and fire flow requirements. Confirm existing networks' capacities with the City of Edmonton Drainage, EPCOR Water and EPCOR Drainage. If the existing drainage networks are found to not have sufficient capacity for the proposed development, recommend improvements to those networks that may be required. It is not expected that the analysis of the system capacity will require computer modelling by the consultant. Confirm, in coordination with EPCOR Water, capacity in the existing water network to accommodate the site's water, fire flow demands and hydrant coverage. If the existing water network is found to not have sufficient capacity for the proposed development, recommend improvements to the network that may be required. If the site is found to have insufficient hydrant coverage, recommend locations for new hydrants.
- Identify how the major storm flow is to be managed, however, estimated onsite major storm retention volumes are not required as part of this scope of work.
- Determine the size of infrastructure needed to service the site and recommend locations for servicing connections.
- Confirm location for power connection and requirements to extend power servicing to site.
- Confirm the location and type of site access to be provided.
- Confirm any adjacent roadway improvements that may be required as part of the site development including, but not limited to, modifications to the adjacent roadway and laneways, potential new auxiliary lanes, turnarounds, and the removal or creation of walkways, sidewalks, curbs, and ramps.
- Advise on any new traffic controls that may be required such as signs or signalization.
- A Traffic Impact Assessment (TIA) is not part of this work.
- Review the geotechnical reports and estimate the amount of earthworks necessary to bring the site to a development ready state capable of supporting structures, roadways, parking lots and underground utilities. It can be assumed that the location of any such structures or onsite infrastructure will remain unknown.

Task 2.4: Fees, Assessments and Over-Expenditures

Provide a breakdown of all anticipated development fees including, but not limited to:

- Servicing Agreement Inspection Fees and Arterial Roadway Administration Fees.
- All anticipated permanent area contributions (PACs), Expansion Assessment (EA) charges, and arterial roadway assessments (ARAs).
- Fees and assessments shall be provided in a breakdown format including a total anticipated amount for each fee and assessment item.
- As applicable, provide any anticipated over expenditure amounts that may be applied to the site for PACs and ARAs.
- Rezoning and Development Permit fees do not need to be included.
- MR is not owing on any site and does not need to be considered.

Task 2.5: Cost Estimate and Opinion of Probable Cost (OPC)

Provide a construction cost estimate and opinion of probable cost (OPC) to get each site to a state ready for development. The construction cost estimate and OPC are high level and intended for feasibility purposes. As such, they should have an accuracy range of +/- 30%

The construction cost estimate shall include, at a minimum, the following:

- A cost estimate for each of the service extensions and improvements that may be required as part of the development.
- Identify any potential rebates or recoveries for the constructed infrastructure, if applicable.
- Quantities, unit rates, and amounts for each item.
- Any anticipated incidental costs that may arise from any of the construction activities including but not limited to landscaping rehabilitation, road repairs, sidewalk removal replacement, streetlight relocation, and any other related construction activities.

The opinion of probable cost (OPC) should include the following:

- Consulting fees for planning, engineering, and testing should be estimated at 15% of the total construction cost.
- If applicable, the Fees, Assessments and Over-Expenditures shall be itemized, and amounts shown in the OPC.
- Include any recoveries for any Over-Expenditures and rebates for eligible water and power infrastructure.

Task 2.6: Report Preparation

Task 2.7: Draft Report 60% Submission and meeting

60% Submission - this should include a *Cover Page* indicating it is the 60% Draft Submission, *Table of Contents*, *Terms of Reference*, *Introduction*, *Methodology*, *Site Servicing Analysis*, and *Fees and Assessment* sections as well as drafts of the figures.

Task 2.8: Draft Report 90% Submission and meeting

90% Submission - This should include further refinement of the 60% submission items, address the comments of the City review of the 60% submission, and a draft of all remaining sections. Inclusion of the appendices is not required with this submission.

Task 2.9: Final Draft Report

This should include further refinement of the 90% submission, address the comments of the City review of the 90% submission, and include all appendices.

Task 2.10: Final Report

The Final Report shall be submitted once the City has agreed all comments have been resolved.

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- Appendix B – Geotechnical Investigation
- Appendix C – Environmental Site Assessments
- Appendix D – Sanitary and Storm Design Calculations
- Appendix E – Construction Costs

1 Introduction

1.1 General

This study has been prepared to support the City of Edmonton’s Updated Affordable Housing Investment Plan (2019-2022), the City of Edmonton requires a site servicing assessment and cost analysis for the Garneau site (the site). Garneau is being examined as a potential location for construction of affordable housing.

The study will outline the servicing requirements associated with the development and will be based on the proposed zoning for the site. The study will provide an assessment and confirmation of the servicing requirements, transportation improvements, onsite earthworks, and other work that may be necessary to develop the site.

The study will determine the costs associated in attaining the site to a fully serviced, developable state. The cost evaluation will include all related development construction costs and involves a review of the applicable fees, assessments, over-expenditures planning and engineering costs, and recoveries or rebates that may be required to be paid as part of this site development.

The cost estimate will be used to help inform the amount of funding required to develop the site. The study report will be provided to the developer and will assist the developer in the detailed design, construction, and other stages of development. The assessment of the on-site requirements such as on-site servicing, surface works, or landscaping is not included in this report.

1.2 Site location

The vacant site is approximately 0.081 ha located in the Garneau neighbourhood on the Southeast corner of 83 Avenue NW and 111 Street NW. The site includes the parcels at 11049 & 11053 83 Avenue NW and legally described as Plan I19, Block 157, Lots 17 and 18.

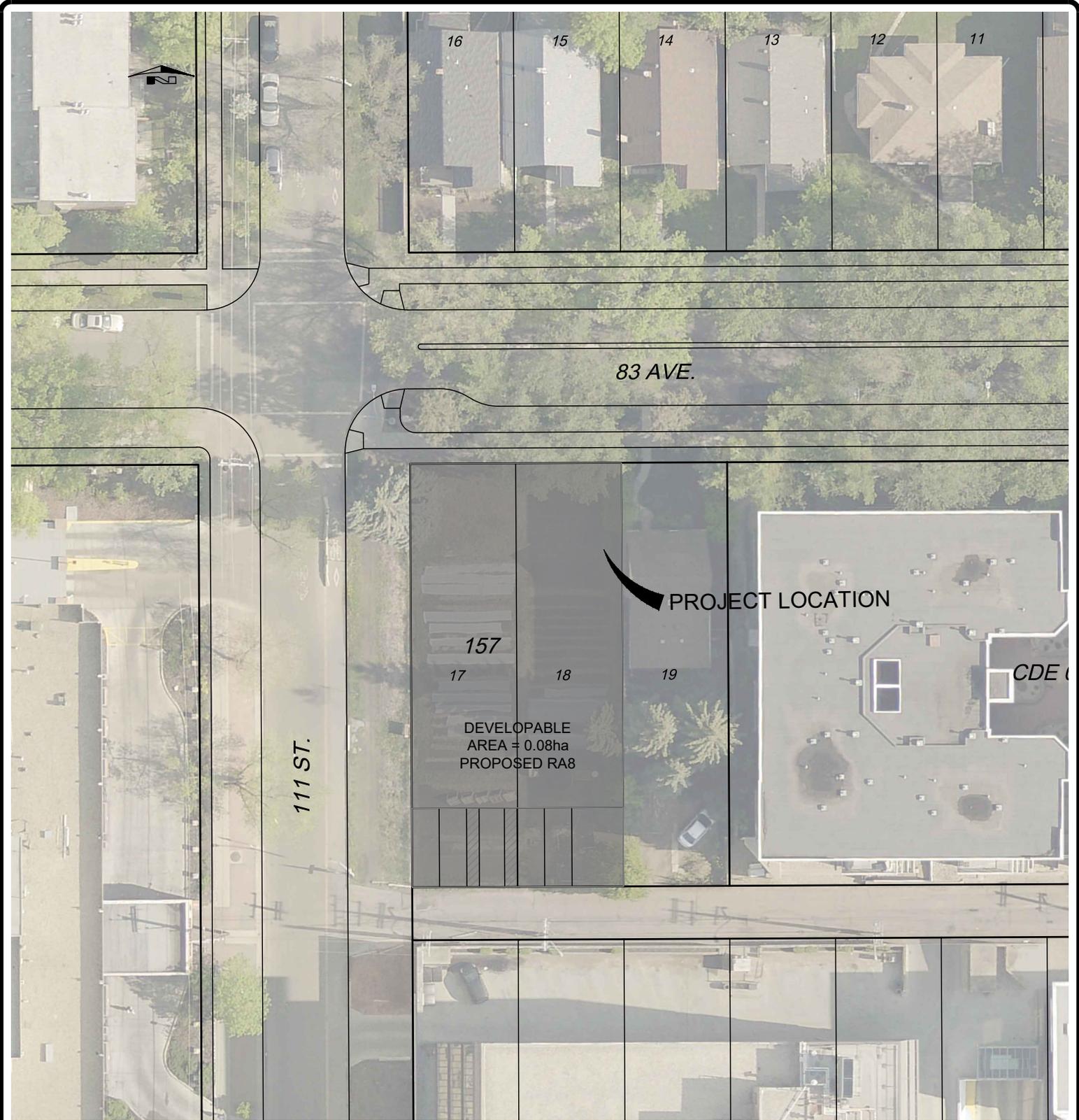
A *Site Plan* is shown on the following page on **Figure 1**.

1.3 Proposed Development

The Garneau site was rezoned July 6, 2021, from RA9 (High Rise Apartment) to RA8 (Medium Rise Apartment). The building development for the proposed site is not yet determined and is generally assumed to be a 6 storey building with 20-30 studio or one bedroom units and no underground parking. The two lots are to be consolidated prior to submission of a development permit.



Garneau 111 Street and 83 Avenue



PROJECT LOCATION
0.081 ha (0.200ac)



FIGURE 1
GARNEAU
SITE PLAN
 SERVICING STUDY
 AFFORDABLE HOUSING SITES
 CITY OF EDMONTON

2 Methodology

Scheffer Andrew Ltd. obtained available information from the appropriate City groups, franchises, or other organizations for this site. The following summarises the information obtained for this Study with additional information shown in **Appendix A**.

2.1 Background Information

2.1.1 Circulation Comments

The City's project team provided a copy of the circulation comments from the rezoning received from various City departments. The comments are outlined below:

2.1.1.1. Planning Coordination – Land Use /Risk

The rezoning site is currently vacant.

The current zoning is the (RA9) High Rise Apartment Zone with the High-Rise Residential Overlay, and Mature Neighbourhood Overlay. Based on the site size (809.821 m²), this zoning would allow for a mixed-use building with the following key characteristics:

- Height: 15.0 - 17.5 m (Approximately 4-5 storeys), FAR:2.3
- Density: 10-23 Dwellings (125-285 dwellings/hectare)

The proposed (RA8) Medium Rise Apartment Zone would allow a mixed-use building with the following key characteristics:

- Height: 23.0 m (Approximately 6 storeys), FAR 3.0-3.3
- Density: At least 6 Dwellings (minimum 75 dwellings/hectare), no maximum

Both the current and proposed zones are of a similar scale and intensity, with the proposed RA8 Zone slightly more intense.

Planning Coordination has reservations about the isolation of the one remaining residential lot to the east of this site.

Further Info. rezoning was approved at Council July 6,2021.

2.1.1.2. Transportation

Access to the site shall be from the abutting lane. Site access will be reviewed at the development permit stage.

There are existing boulevard trees adjacent to the site along 83 Avenue and 111 Street (one blue spruce) that must be protected during construction. For information about tree protection, please refer to the City of Edmonton website (Trees and Construction).

83 Avenue and 111 Street are bike routes. Neighborhood renewal at Garneau is scheduled to begin in 2021.

Further Info City of Edmonton Website: Construction anticipated within 111 Street along proposed site. appears to include painted bike lanes and new sidewalk on east side of road.

2.1.1.1. Drainage

Permanent sanitary and storm servicing for the subject rezoning area is available from the existing sewer system in the area.

Sanitary sewer servicing to the proposed rezoning area is proposed to be provided either from the existing 250mm combined sewer main within 83 Avenue or from the existing 525mm combined sewer main within 111 Street.

Unused sanitary services are to be abandoned upon redevelopment in accordance with the City's Design and Construction Standards. New sewer services off public sewers to property lines must be constructed by EPCOR Drainage Services and construction charges will apply.

Existing Services:

11049 – 83 Avenue NW / Plan I19, Blk 157, Lot 18: 1-150mm sanitary service exist off 83 Avenue NW at 16.3m East of the East Property Line of 111 Street.

11053 – 83 Avenue NW / Plan I19, Blk 157, Lot 17: 1-150mm sanitary service exist off 83 Avenue NW at 5.8m East of the East Property Line of 111 Street.

As per the Drainage Bylaw, if the subject rezoning area is developed for commercial uses, industrial uses, or residential uses other than single family or semi-detached housing, a storm sewer service connection to the property will be required to accommodate storm water from roofs, parking areas, storage areas, paved areas, and courtyards.

Storm sewer services are available, at the owner's cost, through new service connections. Storm sewer servicing to the proposed rezoning area can be provided from the existing 250mm storm sewer main within the lane south of 83 Avenue if feasible or from the existing 525mm combined sewer main within 111 Street would be acceptable.

Onsite stormwater management requirements apply to the proposed development. Onsite stormwater management requirements include storage provisions within the property to accommodate the excess runoff from a 1 in 5 year design rainfall event with an outflow rate of 35 litres per second per hectare to the existing sewer system.

Permanent Area Contributions (PAC) Cost Sharing Assessments and the Sanitary Sewer Expansion Assessment are not applicable to the proposed rezoning area. The requirement to pay the Sanitary Sewer Trunk Charge (SSTC), further to the Drainage Bylaw, will be reviewed at the time of Development Permit or sewer service application.

2.1.1.2. EPCOR – Water

The site is currently serviced by two existing 20mm water services off the existing 200mm water main on 83 Avenue. If these services will not be utilized for servicing the planned development, they must be abandoned back to the water main prior to any on-site excavation.

Existing Services:

11049 – 83 Avenue NW / Plan I19, Blk 157, Lot 18: 1-20mm water service exist off 83 Avenue NW at 16.3m East of the East Property Line of 111 Street.

11053 – 83 Avenue NW / Plan I19, Blk 157, Lot 17: 1-20mm water service exist off 83 Avenue NW at 5.8m East of the East Property Line of 111 Street.

For information on Service abandonments, and the provisioning of a new water service contact EPCOR Infill Water and Sewer Servicing at wass.drainage@epcor.com or at 780-496-5444.

The existing services will not be of sufficient size for the proposed development. The applicant must review the total on-site water demands and service line capacity with a qualified engineer to determine the size of service required and ensure adequate water supply to the proposed development.

There is a significant deficiency in on-street fire flows adjacent to the property. City of Edmonton Standards requires on-street fire flows of 300 l/s for the current zoning. On-street fire flows in the area are well below the required flow rate.

The applicant is required to upgrade approximately 26.0m of existing 200mm watermains to 250mm water mains, tying to the bisecting 406mm water main, on 83 Avenue at the 111 Street intersection, at their expense. This work can be undertaken either under a City of Edmonton servicing agreement or under EPCOR Water Services, Inc.'s New Water Distribution Mains capital program. For more information on the EPCOR New Water program, please contact EPCOR New Water at waterdtinfrastructure@epcor.com.

Prior to the issuance of a Development Permit, the applicant shall submit documentation that demonstrates, to the satisfaction of the Development Officer in consultation with Fire Rescue Services and EPCOR Water Services, that the fire flows and water servicing to the Site will be adequate for the proposed building and construction type and be in accordance with the City of Edmonton Design and Construction Standards. The Development Officer shall verify that any infrastructure upgrades or systems required to ensure these standards are met.

Edmonton Fire Rescue Services (EFRS), Fire Protection Engineer may be able to perform an Infill Fire Protection Assessment (IFPA) at development permit application to potentially alter or lessen on-street fire protection infrastructure upgrades, assuming certain criteria are met. The applicant may request that the City Planner initiate this review.

A new cost share pilot program has started up in 2020 which may assist in offsetting any required infrastructure upgrades for the water system. Information about the Infill Cost Share Program can be found at www.epcor.com/infill-cost-share.

Further Info May 31, 2021: The cost share pilot has been completed and is no longer accepting new applicants. EPCOR has applied to the City for a permanent Infill Fire Protection program that will be structured like the pilot for inclusion in EPCOR's 2022-26 capital plan, however EPCOR will not know if that is approved until late 2021.

Each lot must be serviced with individual and separate water services provided directly to the lots from EPCOR's water main. In reference to our Terms of Service, water services cannot extend from one property to another. To prevent potential cross-lot servicing within the proposed rezoning area, the parcels must be consolidated under one title.

2.1.1.3. EPCOR Power

The required electrical load for the site must be provided by an electrical consultant when service is requested, or EPCOR cannot service the site.

Power servicing is to be in accordance with the City of Edmonton Design and Construction Standards Volume 7 and with EPCOR's Customer Connection Guide.

Please contact Customer Engineering Services at CES@epcor.com for any requests for the modification, relocation, and/or removal of existing EPCOR facilities. For any relocation request, please notify EPCOR at least 4 months before the start of construction and your project shall be reviewed. Any work required to carry out such requests shall be at the expense of the inquiring party. Costs will be provided when a detailed plan is available. Ensure to consult with EPCOR power regarding limits of approach while constructing or working near power lines.

Any damage to EPCOR power facilities caused by the proposed construction shall be repaired or replaced by EPCOR Distribution & Transmission Inc. at the expense of the responsible party.

2.1.1.4. Forestry & Forestry Operations

Forestry is concerned with the possible negative health effects or damage to the publicly owned tree canopy adjacent to this development during all phases of construction including the ground disturbance during excavation, site grading of soils throughout this private land parcel, and any above ground structure that supersedes the existing height of mature tree canopy. Forestry is specifically concerned about the effects of the excavation and how it could negatively affect the health of the City owned trees if roots are damaged or severed. Forestry is concerned about roots being damaged during any sidewalk repair or replacement including changing the hard surface around the trees.

Please be advised that all tree costs associated with pruning, removal, replacement, transplanting of trees or tree damages shall be covered by the Proponent as per the Corporate Tree Management Policy (C456C). Forestry will schedule and carry out all required tree work involved with this project. All requests for tree removal must be discussed with the community league and a community consultation may be required. Any damages or required tree work (i.e., pruning, transplanting, removals, etc.) to the CoE boulevard trees, as a result from any work conducted prior to, during, or after any developmental process of this request is subject to cost, as is borne from the applicant in trust or ownership of the demolition/development permits.

2.1.2 Atco Gas

There are existing ATCO Gas facilities in the area. Drainage for any of ATCO Gas above ground appurtenances must be maintained. If it should be necessary to lower, relocate or make any alterations to the existing facilities and/or appurtenances due to this project, please contact ATCO Gas Distribution. Note all alteration costs will be borne by the developer / owner.

If gas service is required, to avoid delays, the owner / developer should contact an ATCO Gas Service Admin Coordinator at 780-420-7514, or their local ATCO Gas agency office at their earliest convenience to discuss the service contract, gas load requirements, timing details and any associated costs. To avoid delays a minimum notice of 4 months is recommended. Note, each lot / unit is to have a separate service line.

Due to the expansion/addition, the existing service size, meter space, and main size will need to be reviewed by ATCO Gas. It is recommended that the owner contact ATCO Gas Service Admin Coordinator at 780-420-7749 at their earliest convenience with their existing and future gas load and pressure requirements to enable adequate lead time to review if a service or main upgrade is required, the associated costs, and if necessary, proceed with design and installation process.

2.1.3 Existing Utilities Air photo and Lidar.

We obtained from the City the cadastral data for the study area along with utilities, LiDAR, and air photo.

2.1.4 Geotechnical

The Garneau Housing Development Preliminary Geotechnical Investigation was conducted by AECOM for the City of Edmonton dated May 5, 2021, as seen in **Appendix B**.

The purpose of this preliminary geotechnical investigation was to determine the subsurface conditions to support the design of this multi storey housing building, identify potential geotechnical risks at this site, and provide design parameters for the foundation design. It is anticipated that more testholes will be required for the detailed design phase of this project once the building details for this site are confirmed.

Subsurface Conditions: Topsoil was encountered in Testhole #1 to 0.76m. Testhole #2 and 3 encountered clay fill at the surface from 0.61 to 1.52m. Below the Topsoil and clay fill the following materials were encountered: Clay, Clay Till, Sand and Silt, Silt, and Sandstone.

Groundwater Table: Groundwater was encountered at a depth of 10m below existing ground surface.

Frost Penetration: is estimated to be 2.5m.



Site Preparation Building Area: Generally, site preparation should begin by removing all organic material and clay fill, as well as any deleterious material (such as fill debris, high plasticity clay) within the building plan area, exposing the underlying inorganic native clay. Following the initial site stripping and cutting to grade or foundation elevation, the exposed subgrade should be inspected by a geotechnical representative to determine if competent foundation base is present. Based on the information from this investigation, it should be anticipated that a scarification depth of at least 150 mm will be required assuming a foundation depth at an elevation of 665.5 m or below (5.3 mBGS- meters below ground surface). The scarified 150 mm layer below the foundation base should be moisture conditioned to between 0 and 2% above the Optimum Moisture Content (OMC) and recompacted to 98% of the Standard Proctor Maximum Dry Density (SPMDD). Following compaction, the areas should be proof-rolled to identify any loose or soft areas. Any soft areas should be over-excavated and backfilled and compacted to 98%SPMDD using general engineered fill of low to medium plasticity. Imported fill used for construction should be approved by the geotechnical engineer of record.

After completion of subgrade preparation, the building area should be backfilled using either a granular fill or imported low to medium plasticity clay fill. The fill material should be moisture conditioned as required and compacted to 98% SPMDD and placed in lifts of 150 mm compacted thickness.

Suitability of Existing Soil for Fill: The excavation for the housing building foundations and construction of below grade elements will result in an excess of soil. Generally, the soil excavated from the footprint of the building will include topsoil, clay fill and high plasticity clay and clay till. The topsoil should be excavated and stockpiled separately from the underlying clay and clay till and can be used for future landscaping purposes. The surficial clay fill at this site is not considered suitable for use for fill. The existing high plasticity clay is also not considered to be suitable for establishing site grading and backfilling. This clay is excessively moist and will be difficult to compact. It is recommended low to medium plasticity clay fill be imported for grading and backfill. The imported soil used for fill should be compacted to 98% SPMDD, and within $\pm 2\%$ of the OMC. Lifts of backfill material should not exceed 150 mm in compacted thickness. It is recommended that fill material be reviewed and inspected by a qualified geotechnical engineer during construction.

Utility Installation: Utility services required for this housing building should be installed at a minimum depth of 2.5 mBGS (meters below ground surface) to protect against frost. If utilities are founded within the frost penetration depth, insulation should be used to protect the utilities against frost. All utility trenches should be backfilled with low to medium plasticity clay or clay till, as fine-grained soils offer better frost protection than granular soil.

Surface Site Drainage: The final site grade should be properly graded to direct water away from the building and building foundations. A minimum grade of between 2% and 3% should be maintained around the building structure. Ponding of water near building foundations may result in subgrade softening and instability/failure of the overlying structure. Additionally, excess moisture near the building may result in frost heave.

See the geotechnical report for the preliminary foundation recommendations and pavement recommendations.

2.1.5 Environmental

A Phase I Environmental Site Assessment and a Limited Phase II Environmental Site Assessment was prepared by Crimson Environmental Limited February 27, 2021, and April 9, 2021, respectively.

The Phase I noted that the presence of fill on site is considered high, and that no information was available regarding the fill placed when basements were backfilled and that there was a possibility of contamination from adjacent site.

The Phase II completed soil testing and the results of the testing were not indicative of any impact from refined petroleum hydrocarbons, Alberta Tier 1 trace metals or salinity related parameters. No further testing was recommended.

2.1.6 EPCOR Power

Existing power is provided on the City cadastral data for the study area along with shallow utilities. Overhead power poles are located within the lane along the south boundary. The poles are on the south side of the lane.

2.1.7 Site Assessment

A field walk of the site was completed on May 26, 2021. The site is cleared except for a composting area fenced at the back of the site as well as some trees along the property line.



Site visit #1 - Composting area to the south.

From air photos the site was utilized as a community garden, and it does appear that there is excess topsoil over the site. The site is generally level though slightly higher than the surrounding properties.



Site visit #2 – at back of site to the north.

The grade along the property to the east with the existing residential home appears to be level across the property one with areas that are lower on the residential lot side.

The lane at the south of the site is in poor condition and driving access along the lane is limited due to the pole locations.



Site visit #3 – South Lane.

2.1.8 Infill Fire Protection Assessment (IFPA).

Edmonton Fire Rescue Services (EFRS) has reviewed the existing on-street fire protection features for titled lots 11049 83 Avenue NW and 11053 83 Avenue NW. The following assessment was provided.

In accordance with City of Edmonton Design and Construction Standard Volume 4: Water, municipal hydrants serving RA8 sites are required to provide 300 L/s fire flows, the intent of which is to ensure sufficient resources for firefighting. During the subject file circulation, EPCOR Water has identified that fire flows in the surrounding water network are below the required 300 L/s.

Based on the relative risk of this site as determined through the risk-based application of the fire protection standard, the site receives a low risk score and does not require further evaluation.

In conclusion, the subject site is functionally compliant with the municipal standards for fire flows. Therefore, upgrades to existing municipal on-street fire protection infrastructure are not required to support this application.

3 Site Servicing Analysis and Recommendations

This section reviews existing infrastructure, identifying the required service connection locations, discussing earthwork requirements and other required improvements for the proposed site, allowing for 20-30 studio or one-bedroom units over 6 storeys under RA8 zoning.

The calculations presented here are based on the current information as provided by the City of Edmonton at the time of preparing this report. Assumptions have been made for the proposed development of the site. The review and calculations below provide a guideline for development of the site and to assist with the projection of costing. The information provided would need to be reviewed and confirmed at the time of detailed design.

3.1 Sanitary and Storm Flow Generation Requirements

The sanitary and storm flow generations requirements are listed in the headings below.

3.1.1 Sanitary

The zoning for the site was approved July 6, 2021 and has changed from RA9 to RA8 which generally has a lower required sanitary capacity. No concerns were noted regarding the sewer capacity due to the change in zoning.

The site is approximately 0.081 ha. Based on City of Edmonton Standards for this zoning an estimated 488 people/ha results in a population of approximately 39, and a required flow capacity of 0.4 L/s.

At this time, the proposed building layout and number of units is not confirmed. Previous supportive housing buildings included single occupancy and main floor office/program space. For this site it is generally assumed the development will consist of a 6-storey building with 20-30 studio or one-bedroom units and no underground parking. The drainage capacity for RA8 is adequate to service the assumed population.

Based on the required flow a 150mm Sanitary service is adequate for this site. Detailed sanitary design calculations can be found in **Appendix D**.

There are two existing sanitary services to the site. As there is currently no existing homes on the properties the condition of the services can not be confirmed at this time. EPCOR WASS noted that these services have not been utilized for a significant time and are in the range of 100 years old. For this reason, it is recommended a new sanitary service be installed. The existing services are to be capped and abandoned.

Sanitary sewer servicing to the proposed rezoning area is proposed to be provided either from the existing 525mm combined sewer main within 111 Street (option1) or the existing 250mm combined sewer main within 83 Avenue (option2). The potential sanitary service connections can be viewed on **Figure 2**.

The combined sanitary/storm sewers in this area are in the range of four meters in depth and a riser is anticipated to be installed to limit the depth at the property line.

Option 1 is recommended as it puts the storm and sanitary services in the same location so it can be constructed within 1 trench. There is some cost savings when constructing the sanitary and storm within one trench.

3.1.2 Minor Storm

The outflow rate of 35 litres per second per hectare to the combined sewer system is required for this site. This would allow for a discharge of 3 L/s based on the site area of 0.081ha. This discharge is below the minimum allowable orifice size, which is 50 mm diameter, so a minimum 50 mm diameter will be used as per *EPCOR Drainage Services Guidelines for Stormwater Management Requirements for Individual Lot Development Areas between 0.16 ha to 3.0 ha*.

The site is estimated to require 5 cubic meters of storage for the 1-in-5-year rainfall event at the 35L/s/ha release rate.

A 100mm services is proposed for the site. The detailed minor storm design calculations are shown in **Appendix D**.

Circulation comments noted that the storm service could be installed onto the combined sanitary/storm sewer on 111 Street (option 1) or within the Lane (option 2). The potential storm service connection can be viewed on **Figure 2**.

The combined sanitary/storm sewers in this area are in the range of four meters in depth and a riser may be required to limit the depth at the property line. Record Information on the storm line in the lane is not known but as it is being utilized as a catch basin lead it is possible that there is not sufficient depth of cover for a storm service.

Option 1 is recommended as it puts the storm and sanitary services in the same location so it can be constructed within one trench. There is some cost savings when constructing the sanitary and storm within one trench.

3.1.3 Water Demand and Fire Flow Requirements.

The proposed watermain upgrades and water service is shown on **Figure 2**.

3.1.4 Fire Flow and Hydrant Coverage

There is a significant deficiency in on-street fire flows adjacent to the property. City of Edmonton Standards requires on-street fire flows of 300 L/s for the current zoning. On-street fire flows in the area are well below the required flow rate.

To improve the fire flow for this area the water main would be required to be upgraded. 26.0m of existing 200mm water main would need to be upgraded to 250mm water main, tying to the bisecting 406mm water main, on 83 Avenue at the 111 Street intersection. This was estimated by EPCOR to cost \$95,000 to improve.

It was requested that the Edmonton Fire Rescue Services (EFRS), Fire Protection Engineer perform an Infill Fire Protection Assessment (IFPA). This review concluded that the risk score for the site is low and that the upgrades to existing municipal on-street fire protection infrastructure are not required.

No upgrades to the existing municipal on-street fire protection infrastructure are proposed for this site as supported by the Infill Fire Protection Assessment (IFPA).

3.1.5 Water Servicing

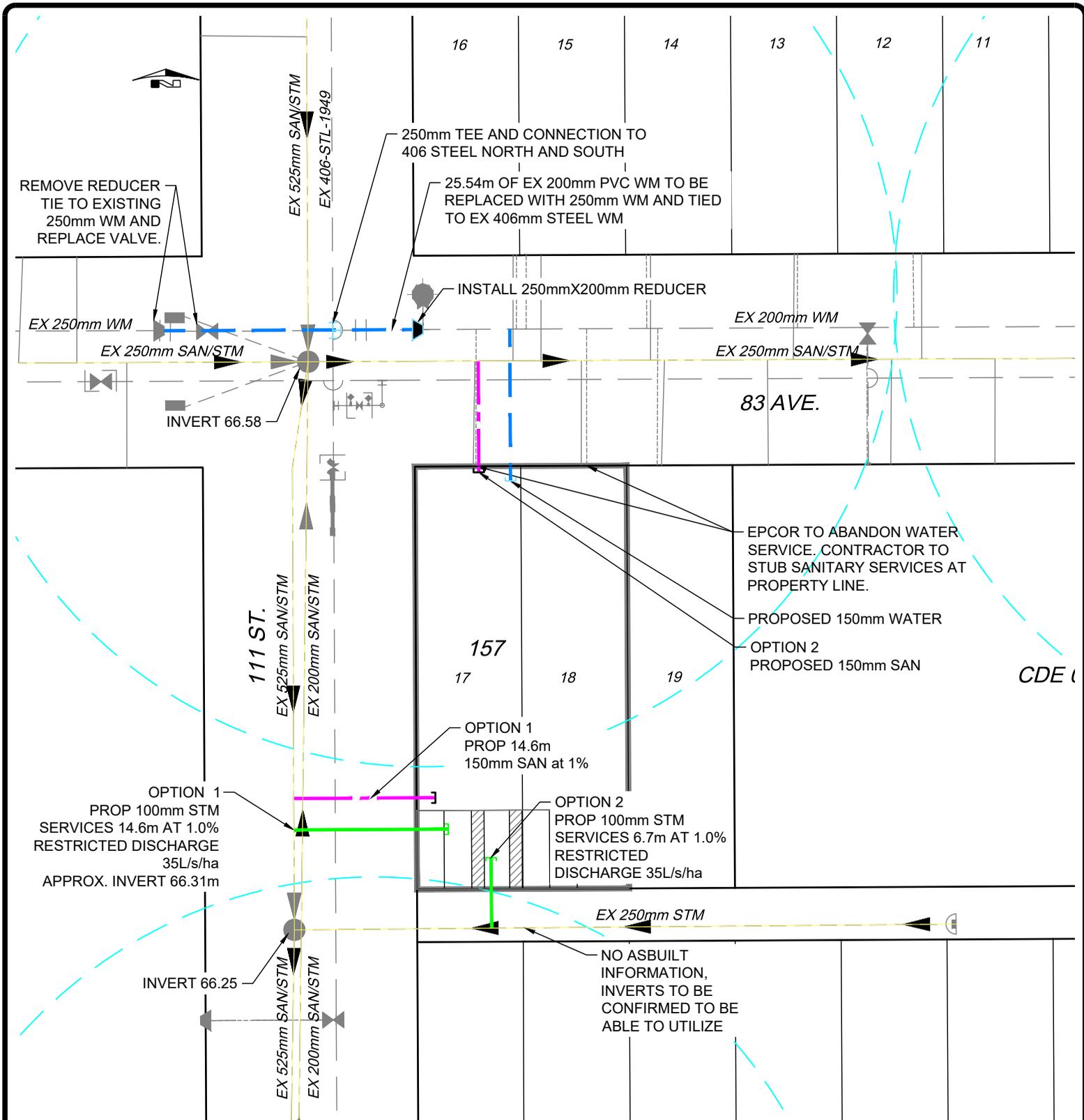
For site servicing, the existing 20mm water services to the site would need to be abandoned by EPCOR and a new 150mm water service should be installed. This will be installed on the existing waterline within 83 Avenue NW. The service location is shown on **Figure 2**.

3.1.1 EPCOR WASS Preliminary Estimate

An estimate request for the deep utility servicing for this site was sent to EPCOR Water Services, WASS Drainage. The estimate is to include installing new sanitary, storm and water services.

The estimate for the noted services with the sanitary and storm invert at 667.2m at property line, water service at 2.6-2.75m depth at property line, is \$59,365.00.

The estimate assumes the services are stubbed to property line – no EPCOR work in private property.



LEGEND

WATERMAIN (WM)

SANITARY SEWER (SAN)

COMBINED SEWER

STORM SEWER (STM)

LEAD AND CATCH BASIN (CB)

PROPOSED



EXISTING



**FIGURE 2
GARNEAU**

SERVICING PLAN

SERVICING STUDY

AFFORDABLE HOUSING SITES

CITY OF EDMONTON

3.2 Power Service Requirements

3.2.1 Existing Power and Streetlight Review:

EPCOR has an existing overhead three phase power line in the lane to the east of this lot which provides service to the site. EPCOR will not confirm or reserve capacity on their system until the builder applies for power. The electrical load we are proposing to add is relatively small and it is highly unlikely that there will be any capacity issues associated with adding this load. It is typically EPCOR's responsibility to upgrade their system, if required, to accommodate new service connections. When the builder makes their application to EPCOR for onsite power, EPCOR will specify the service entry point.

The proposed construction does not impact the existing street lighting infrastructure. We are assuming that none of the existing streetlight's conflict with the proposed site access.

3.2.2 Determine site specific power servicing connections and offsite extensions

The power service entry point is flexible. This lot will likely be serviced from a new overhead pole installed a minimum of 5-10m from the existing overhead pole. The lot will be serviced either from a transformer mounted on EPCOR's pole or pad mounted onsite, depending on the building requirements.

3.2.3 Forecast utility costs and provide cost estimate for developer construction

In general, EPCOR will extend their power infrastructure into the lot and set a transformer (if required) as part of the building's electrical service application. The equipment required and the associated costs are dependent on the building's electrical requirements and will vary from site to site. For the purposes of this report, any work associated with providing power to a "serviced site" will be considered onsite work and is outside the scope of this report. In underground areas, a "serviced" lot will have a conduit stubbed to the property line to allow for the installation of a pad mounted transformer onsite. In areas where the power is overhead, this report will consider a lot serviced if there is a power line adjacent to or across the road/lane from the subject site. The transformer will either be installed on EPCOR's pole or pad mounted onsite.

Without knowing the buildings electrical requirements, EPCOR's cost to provide service to a serviced lot can vary considerably. **A budget of \$0.00 to \$30,000.00 for EPCOR's fee should cover most building scenarios onsite.**

3.3 Atco Gas Service Requirements

Gas service will be from an existing gas line within the lane. The existing gas services will need to be abandoned. Service size and exact locations will be determined by Atco Gas Service Application group once a service application is received.

3.4 Site Access and Road Improvements

As noted in the rezoning comments from transportation the access to the site shall be from the abutting lane. Site access will be reviewed further at the development permit stage.

From the site visit the lane condition is poor and there is a possibility that resurfacing could be requested at the time of development. **For this reason, a provisional cost to resurface the lane**

along the property boundary is being recommended and the alternative is that no resurfacing will be requested.

Building Great Neighborhoods will be constructing in Garneau in 2021 and 2022. Information can be found on the City website https://www.edmonton.ca/transportation/on_your_streets/garneau.

There is construction anticipated within 111 Street along the proposed site, and it appears to include painted bike lanes and a new sidewalk on east side of road.

The neighbourhood improvement would not impact the onsite development.

3.5 Site Grading Review

There is no concept plan for this site at this time and it is currently proposed that the development would include a 6-storey building, 20-30 studio or one bedroom units, and no underground parking. Based on this it is anticipated that the building would cover much of the site with setbacks to the property based on existing RA8 zoning regulations. Additional setbacks are assumed at the back of the building to accommodate surface parking and garbage collection.

Based on the boreholes from the geotechnical report, topsoil and clay fill (marginal material) will need to be removed from 0.76-1.52m over the building footprint as this material is not suitable for building or surface construction.

Building Area: The marginal material, plus additional clay below that elevation would need to be removed for the construction of the building footing. Because of that the marginal material is not an encumbrance for that area.

Surface Construction Area: For the areas proposed for surface construction the removal of marginal material and import of new clay add additional cost for this site development.

The Geotechnical report noted that the clay materials onsite are not suitable for compaction around the building and import of materials would be required. Due to the limited nature of the site, stock piling of clay material would not be possible and import for backfill expected.

An onsite storm system and surface swales can accommodate the surrounding building grading limiting impact to the abutting properties. Retaining walls are not considered required at this time.

The site has some minor removals needed which include the disposal of the compost area and some trees along the property line.

Based on the above the cost to accommodate site cleanup and the surface construction has been added to the OPC.

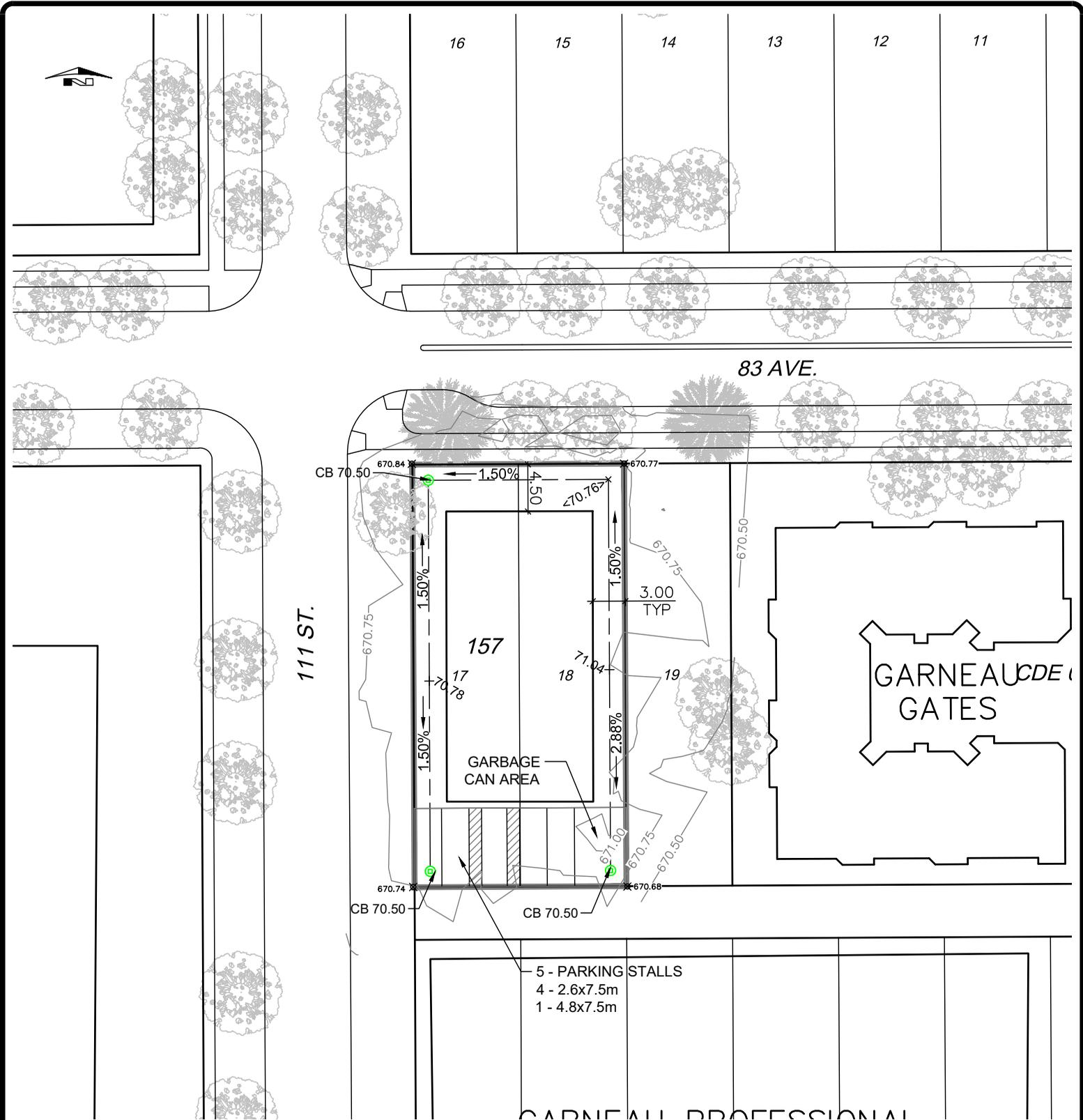


FIGURE 3
GARNEAU
ONSITE EARTHWORKS
 SERVICING STUDY
 AFFORDABLE HOUSING SITES
 CITY OF EDMONTON

MAJOR CONTOUR
 MINOR CONTOUR
 (0.25m INTERVALS)

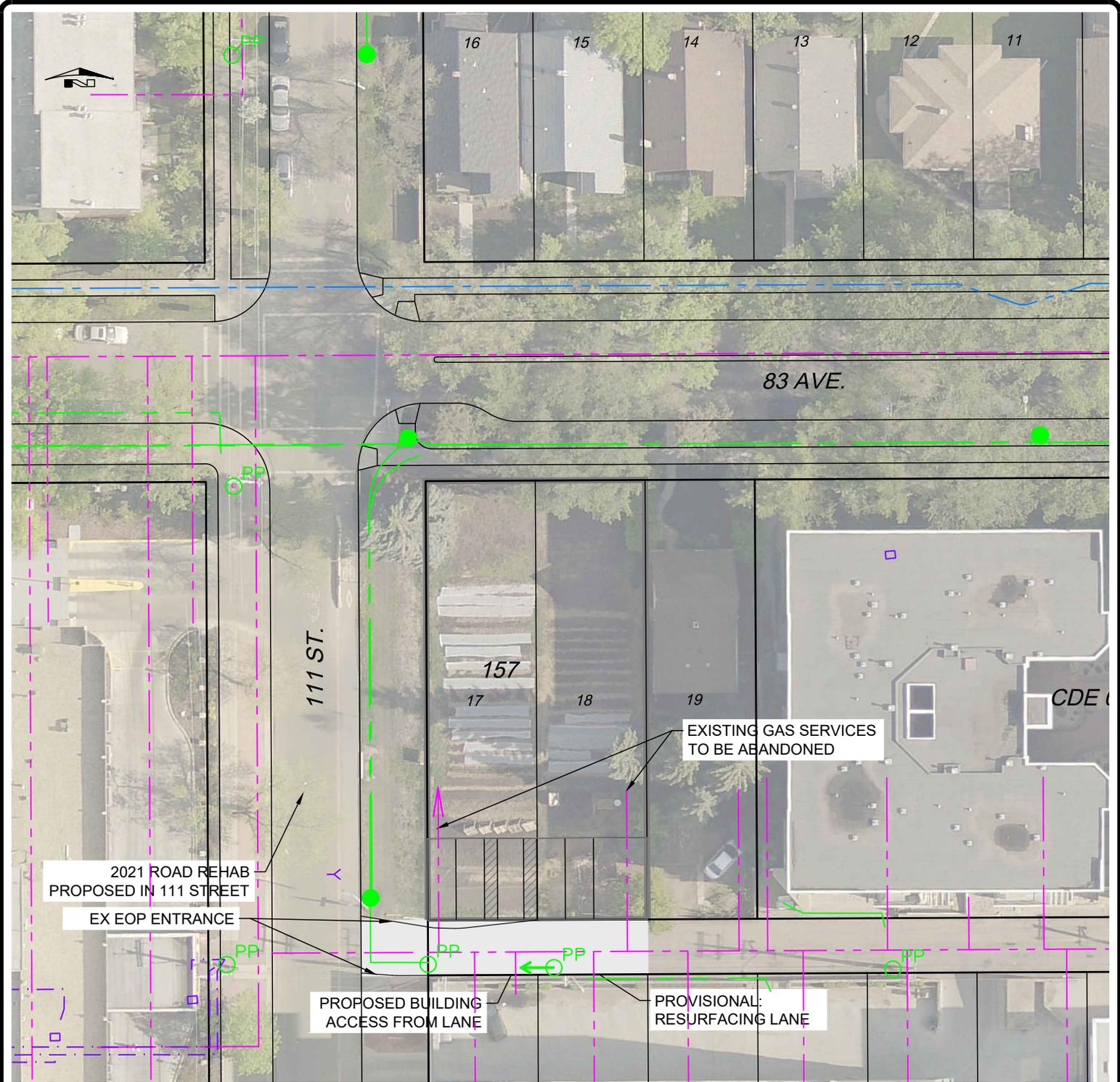
PROPOSED GRADES

EXISTING GRADES
 AT LOT CORNER

OVERLAND DRAINAGE

POSSIBLE RETAINING WALL

PARKING LOT AREA 151m²
 BUILDING AREA 384 m²



LEGEND	EXISTING	PROPOSED
U/G POWER LINE		
LIGHT STANDARD		
O/H POWER LINE		
U/G GAS LINE		ABANDONED GAS
U/G SHAW LINE		PROP. ASPHALT
U/G TELUS LINE		PROP. CONCRETE
U/G TELUS DUCT LINE		PROP. CHAINLINK FENCE
TRAFFIC CONTROL LINE		
EX. POWER POLE/ANCHOR		PROP. NOISE ATTENUATION FENCE
EX. PEDESTAL		

FIGURE 4A
GARNEAU
TRANSPORTATION PLAN
 SERVICING STUDY
 AFFORDABLE HOUSING SITES
 CITY OF EDMONTON

4 Fees and Assessment

Permanent Area Contributions (PAC) Cost Sharing Assessments and the Sanitary Sewer Expansion Assessment are not applicable to the proposed rezoning area. The requirement to pay the Sanitary Sewer Trunk Charge (SSTC), further to the Drainage Bylaw, will be reviewed at the time of Development Permit or sewer service application.

Permanent Area Contribution (PAC)

Storm and Sanitary PACs are not applicable since the property is not within any active PAC basin.

Sanitary Servicing Strategy Expansion Assessment (EA)

Expansion Assessment is not applicable since the property is outside the current Expansion Assessment area.

Arterial Roadway Assessment (ARA)

Arterial Roadway Assessment is not applicable since the property is outside the current ARA Catchment Area.

Sanitary Sewer Trunk Charge (SSTC)

SSTC is applicable to the lot in question. For information purposes the following SSTC rates are for year 2021. SSTC rate depends on the type of development:

- Industrial / Commercial / Institution: \$8,731 per hectare
- One or two Dwelling Residential (no secondary, garden or garage suite): \$1,746 per dwelling
- Two Dwellings Residential (one secondary, garden or garage suite): \$1,746 per dwelling for secondary garden or garage suite \$773
- **Multi Family Residential: \$1,246 per dwelling**

The SSTC charge should be paid when the development permit application is submitted or when a sanitary services connection is applied. Any sewer main extensions required to service the site and any onsite servicing requirements are in addition to the above noted PAC and SSTC assessments and will be at the developer's cost.

Please note that the SSTC rates are subject to adjustment at the end of the year. The final SSTC is based on the prevailing rate at the time the applicant/owner makes payment.

The number of units for this development is not currently known and is assumed to be between 20—30. Based on the above, and an assumption of 30 units the estimated SSTC for this site is **\$37,380**.

Service Agreement Inspection Fees:

If the water upgrades or road resurfacing is completed under a servicing agreement or MIA, there will be an additional inspection fee of \$14,286. A letter of credit (LOC) will also be required for the project. The cost to provide the LOC has not been included here.

5 Cost Estimate and Opinion of Probable Costs

5.1 Cost Estimate

The costs are derived from the proposed servicing analysis noted in **Section 3 – Site Servicing Analysis and Recommendations**. Two options are presented for the recommendations and alternatives proposed. The cost estimate is summarised below, this summary and the detailed cost information is included in **Appendix E**.

Description	Recommended OPC Amount	Alternative OPC Amount
Pre-grading & Removals	\$ 11,100	\$ 11,100
Sanitary/ Strom/ Water Site Service to property line	\$ 59,365	\$ 59,365
Surface Construction	\$ 23,000	\$ -
Power Service, including Streetlights	\$ 30,000	\$ -
Traffic Accommodation	\$ 6,000	\$ 6,000
Sub-total Improvements (rounded)	\$ 129,465	\$ 76,465
Contingency - 30%	\$ 39,000	\$ 23,000
Total Construction with Contingency	\$ 168,465	\$ 99,465

5.1.1 Assumptions

1. The cost estimate is high level and is intended for feasibility purposes and has an accuracy range of +/- 30%
2. Quantities, unit rates and amounts for each item are outlined in Appendix E on separate sheets. The unit rates are based on selected projects in the City of Edmonton and surrounding areas as well as general EPCOR preliminary estimates.
3. The average cost per meter rates assumes that all items are being constructed together with the onsite development work and would not reflect the cost if only one item is completed individually.
4. The grading amounts estimate the removal of topsoil and the import of clay for surface construction assuming a 300mm surface structure.
5. Surface Construction: Includes the repairs for the lane.
6. Underground installation: The construction cost estimate does not include contingency amounts for extra-ordinary unsuitable soil conditions, this is not anticipated based on the geotechnical report. For the item proposed to be installed by EPCOR, EPCOR will provide a quote at the time of development.
7. The site is considered as serviceable for power due to the overhead line east of the site. The cost to provide a power service will be provided by EPCOR at the time of development permit and would be between \$0-30,000. We recommend the maximum amount for this site and the alternative would be no cost.
8. Construction cost estimates are prepared at present day dollars and no inflation allowance has been included.
9. In providing the construction cost estimate, the Project Team understands that the Consultant has no control over: the cost or availability of labour, equipment or materials, market conditions, or the Contractor's method of pricing, and that the Consultant's Estimate is made on the basis of the Consultant's professional judgment

and experience. The Consultant makes no warranty, expressed or implied, that the bids or the negotiated cost of the Work described herein will not vary from the Consultant's estimate.

5.2 Opinion of Probable Costs.

Further to the construction cost estimate and with the fees and assessments reviewed in **Section 4 – Fees and Assessment**, an OPC was prepared. The servicing cost are limited up to the private property and does not include onsite servicing. The OPC is summarized below and included in **Appendix E**.

The current applicable anticipated municipal fees and assessments as outlined in **Section 4 – Fees and Assessment**, were included in the OPC. These fees and assessments are subject to change and would be reconfirmed at the time of development permit and service agreement.

There are currently no expected rebates or recoveries for this site.

Garneau - Supportive Housing				
Estimated Land Use Statistics	Area (Ha)	Area (Ac)	Front Feet	# Lots Proposed
Residential Area				
Commercial Area				
Multi-Family (MF) Area	0.081	0.20		1
Arterial Roadway - land dedication				
ER Area				
MR Area				
PUL area				
Total Stage Area - Gross	0.081	0.20	0.0	1
Assessable Area by the Municipality	0.081	0.20		

Description	Recommended OPC Amount	Alternative OPC Amount
Improvements		
Pre-grading & Removals	\$ 11,100	\$ 11,100
Sanitary/ Storm/ Water Site Service to property line	\$ 59,365	\$ 59,365
Surface Construction	\$ 23,000	\$ -
Power Service, including Streetlights	\$ 30,000	\$ -
FAC maintenance	\$ -	\$ -
Traffic Accommodation	\$ 6,000	\$ 6,000
Sub-total Improvements (rounded)	\$ 129,465	\$ 76,465
Contingency - 30%	\$ 39,000	\$ 23,000
Total Construction with Contingency	\$ 168,465	\$ 99,465
Estimated Consulting Fees		
Engineering and Testing	Assumed for Lane reconstruction only as all other items proposed to be constructed by EPCOR	
Sub-total Consulting Fees (rounded)	\$ 20,000	\$ -
Servicing Agreement Inspection fees	/ha; min. 3 ha	\$ 4,762
Sub-total Municipal Fees (rounded)	Assumed for Lane reconstruction only as all other items proposed to be constructed by EPCOR	
	\$ 15,000	\$ -
Estimated Municipal Assessments		
Sanitary Sewer Trunk Charge (SSTC)	per unit	\$ 1,246
Sub-total Municipal Assessments (rounded)	30.00	\$ 37,380
		\$ 37,380
Estimated External Recoveries and Payments		
No recoveries anticipated	\$ -	\$ -
Sub-total External Recoveries and Payments (rounded)	\$ -	\$ -
TOTAL OPINION OF PROBABLE COST (rounded, incl. contingency, excl. GST)		
	\$ 242,000	\$ 138,000

6 Conclusions

The Servicing Study for Affordable Housing Sites was conducted to determine the feasibility of site servicing for the Garneau RA8 site located on the Southeast corner of 83 Avenue NW and 111 Street NW. Based on the findings in this report this site could be serviced and support the assumed a 6-storey building with 20-30 studio or one bedroom units.

1. **Sanitary:** The drainage capacity for RA8 is adequate to service the assumed population. A new 150mm sanitary service is proposed to be provided from the existing 525mm combined sewer main within 111 Street.
2. **Minor Storm:** The outflow rate of 35 litres per second per hectare to the combined sewer system is required for this site. A new 100mm storm service is proposed to be provided from the existing 525mm combined sewer main within 111 Street. It is recommended that the storm and sanitary services be installed in the same location so it can be constructed within 1 trench. There is some cost savings when constructing the sanitary and storm within one trench.
3. **Fire Flow and Hydrant Coverage:** No upgrades to the existing municipal on-street fire protection infrastructure are proposed for this site as supported by the Infill Fire Protection Assessment (IFPA).
4. **Water Servicing:** For site servicing, the existing 20mm water services to the site would need to be abandoned by EPCOR and a new 150mm water service should be installed. This will be installed on the existing waterline within 83 Avenue NW.
5. **Power Service and Street Lighting Requirements:** EPCOR has an existing overhead three phase power line in the alley to the east of this lot which provides service to the site. When the builder makes their application to EPCOR for onsite power, EPCOR will specify the service entry point.
6. **Site Access and Surface Improvements:** The site access shall be from the abutting lane. Site access will be reviewed further at the development permit stage.

From the site visit the lane condition is poor and there is a possibility that resurfacing could be requested at the time of development. For this reason, a provisional cost to resurface the lane along the property boundary is being recommended.

7. **Site Grading Review:** Based on the boreholes from the geotechnical report, topsoil, and clay fill (marginal material) will need to be removed from 0.76-1.52m over the building footprint as this material is not suitable for building or surface construction. For the areas proposed for surface construction the removal of marginal material and import of new clay add additional cost for this site development.
8. **Cost Estimates and Opinion of Probable Cost:** As outlined in the report it is expected to cost \$138,000 - \$242,000 to get the site to a state ready for development at an accuracy of +/-30%.

7 References

Throughout this project, the following resources were used:

- Geotechnical and Environmental Investigations
- EPCOR Water Services
 - Drainage shape files – Utility information.
 - Preliminary Cost Information
- Google Maps & Google Street view
- The City of Edmonton
 - The City of Edmonton Design and Construction Standards
 - City cadastral data for the study area along with utilities, LiDAR, and air photo Maps,
 - Subdivision and Development Coordination – Rezoning responses
 - Service Fee Information

The noted reports and details of the correspondence from the various departments can be found in Appendix.



Appendix A

Background Information

STAGE 1



Memorandum:

Date: 21 April 2021

LDA File No.: LDA21-0127

To: Harrison Sheremeta, Surplus Land Development

From: Andrew McLellan, Planning Coordination

Application Type: Rezoning, Plan Amendment

Address: 11049 - 83 Avenue NW, 11053 - 83 Avenue NW

Neighbourhood: Garneau

LAND USE / RISK

Land Use has reviewed the proposed rezoning and plan amendment and provides the following comments:

1. The rezoning site is currently vacant.
2. The current zoning is the (RA9) High Rise Apartment Zone with the High Rise Residential Overlay (Appendix 2 Area). Based on the site size (809.821 m²), this zoning would allow for a mixed use building with the following key characteristics:
 - a. Height: 15.0 - 17.5 m (Approximately 4-5 storeys)
 - b. FAR: 2.3
 - c. Density: 10-23 Dwellings (125-285 dwellings/hectare)
3. The proposed (RA8) Medium Rise Apartment Zone would allow a mixed use building with the following key characteristics:
 - a. Height: 23.0 m (Approximately 6 storeys)
 - b. FAR: 3.0 - 3.3
 - c. Density: At least 6 Dwellings (minimum 75 dwellings/hectare), no maximum
4. Both the current and proposed zones are of a similar scale and intensity, with the proposed RA8 Zone slightly more intense.



5. The current High Rise Residential Overlay contains an isolation clause that would restrict redevelopment of the site under the current zoning:

3. *Isolating sites:*

- i. *A proposed development for Residential Uses or residential-related Uses shall not isolate an adjacent Site with a Site Area less than 1800 m².*
- ii. *The Development Officer may vary section 813.3.2(a) having regard to the location, age and nature of the Use or Uses on the Site that would be isolated.*

There is currently one lot with a site area of 404.883 m² to the east of this site containing a Single Detached House that would be isolated between new development on this site and an existing 5 storey residential building to the east of it, all within the same zoning. A variance would need to be sought to this regulation to allow redevelopment under the current zoning.

Under the proposed RA8 Zone, this clause would not apply and this single lot could effectively be isolated without the need for a variance to be considered. While this would technically be allowed, it is not an ideal outcome for these 3 lots. It would be preferred that all 3 lots be redeveloped together and not have a single lot isolated.

However, even if isolated, the single lot would still have redevelopment potential to a greater intensity than a Single Detached House under the current zoning. There are several examples of single lot 3-5 dwelling Multi-unit Housing developments built in this area in recent years and this lot could pursue that as well.

6. The Garneau Area Redevelopment Plan (ARP) is the statutory plan that applies to this site. This site is within Sub Area 1 of the ARP.
- a. The central portion of this Sub Area is a "Special Character Residential Area" under a (DC1) Direct Development Control Provision to ensure the preservation of homes and sensitive architectural treatment of new development in this area. This site is not within this DC1 but is directly to the south of it, with the DC1 Provision existing on the north side of 83 Avenue NW. The majority of the block on the south side of 83 Avenue NW is made up of existing mid-rise and high-rise buildings, and both the current and proposed zones are considered compatible with this Special Character



Residential Area, as the site is separated from it by a 20 m wide roadway.

- b. The land use objectives of Sub Area 1 are:
- To preserve existing single detached housing that is in good condition;
 - To accommodate the demand for housing; and
 - To encourage a mix of unit types including family oriented housing.

As a vacant site, this rezoning would not lead to the demolition of any single detached housing and both the current and proposed zones would accommodate additional housing, including for families which are known to utilize all forms of housing, including Multi-unit Housing.

- c. Three maps (Schedules C, I and Q) in the plan are proposed to be amended to reflect the proposed rezoning. The maps currently direct high-rise development to this site, and they would be revised to direct mid-rise development.
- d. This proposed rezoning conforms with all applicable policies of the ARP. In particular Policy 1.5 which encourages redevelopment up to 6 storeys at this location, citing that “redevelopment at high densities, but of a medium rise is encouraged as this will ensure a choice of housing type while minimizing potential cumulative negative impacts of concentrated high rise development.”
- i. While the map associated with Policy 1.5 is clearly meant to show the area of application of Policy 1.5, it is titled “Stacked Row Housing and Row Housing”, which is contrary to what the policy states, so it is inferred that this title is an error.
7. In The City Plan, the University-Garneau area is identified as one of six Major Nodes strategically located across the city. While there are no specific boundaries identified for these Major Nodes, they are considered to be up to 2 km across. This site, being just 1-2 blocks from the University of Alberta Hospital and under 600 metres from the Health Science/Jubilee LRT Station, is considered within this Major Node. In addition, Whyte Avenue, one block to the south, is considered a Primary Corridor, which can be 3-5 blocks wide.



- a. Both the location within the Major Node and the proximity to a Primary Corridor suggest this site is appropriate for mid-rise or high-rise development. Due to the site size of 809.821 m², it is very unlikely that a high-rise tower could be fit here, and due to the proximity to the low density "Special Character Residential Area", a mid-rise is the best option for this land.
 - b. If the adjacent lot to the east, the one isolated by this rezoning, were added to the redevelopment site, the site size would be 1214.704 m². This is considered just barely big enough to accommodate a high-rise tower, but even then, this would come with significant challenges, especially in ensuring a proper transition to the residential street. A very unique, slim, tower design would be required. It would also not be in conformance with the Garneau Area Redevelopment Plan, though still supported by The City Plan.
8. While Planning Coordination has reservations about the isolation of the one remaining residential lot to the east of this site, it is likely that this application will be supported.

Should you require any additional information please contact Andrew McLellan, Land Use Planner at 780.496.2939 or andrew.mclellan@edmonton.ca.

DRAINAGE

Planning Coordination (Drainage) has reviewed and supports the proposed plan amendment and rezoning from (RA9) High Rise Apartment Zone to (RA8) Medium Rise Apartment Zone as per the zoning map dated March 19, 2021 and has the following comments.

Comments:

1. Permanent sanitary and storm servicing for the subject rezoning area is available from the existing sewer system in the area.



2. Sanitary sewer servicing to the proposed rezoning area is proposed to be provided either from the existing 250mm combined sewer main within 83 Avenue or from the existing 525mm combined sewer main within 111 Street.
3. As per the Drainage Bylaw, if the subject rezoning area is developed for commercial uses, industrial uses, or residential uses other than single family or semi-detached housing, a storm sewer service connection to the property will be required to accommodate storm water from roofs, parking areas, storage areas, paved areas and courtyards.
4. Storm sewer services are available, at the owner's cost, through new service connections. Storm sewer servicing to the proposed rezoning area can be provided from the existing 250mm storm sewer main within the lane south of 83 Avenue if feasible or from the existing 525mm combined sewer main within 111 Street would be acceptable.
5. Onsite stormwater management requirements apply to the proposed development. Onsite stormwater management requirements include storage provisions within the property to accommodate the excess runoff from a 1 in 5 year design rainfall event with an outflow rate of 35 litres per second per hectare to the existing sewer system.

Advisements:

1. Refer to EPCOR Drainage Services, Water and Sewer Servicing (WASS) WASS for existing sewer service information and surface drainage requirements.
2. For any new developments, lot grading plans must be submitted to Development Services. The lot grading plan must demonstrate that the lots drain effectively away from any proposed building and does not negatively impact neighbouring properties.
3. For any new development or redevelopment, mechanical site plans must be submitted to EPCOR Drainage Services for approval.
4. New sewer services off public sewers to property lines must be constructed by EPCOR Drainage Services and construction charges will apply.



5. The owner must submit an Erosion and Sedimentation Control (ESC) Plan specific for these developments for implementation during and after construction in accordance with the City of Edmonton's ESC Guidelines and Field Manual.
6. Unused sanitary services are to be abandoned upon redevelopment in accordance with the City's Design and Construction Standards.
7. Permanent Area Contributions (PAC) Cost Sharing Assessments and the Sanitary Sewer Expansion Assessment are not applicable to the proposed rezoning area.
8. The requirement to pay the Sanitary Sewer Trunk Charge (SSTC), further to the Drainage Bylaw, will be reviewed at the time of Development Permit or sewer service application.

Should you require any questions or concerns please contact Shamim begum, Development Engineer at 780.496.4463 or shamim.begum@edmonton.ca.

TRANSPORTATION

Planning Coordination (Transportation) has reviewed the proposed rezoning and plan amendment and provides the following comments.

ADVISEMENTS:

1. Access to the site shall be from the abutting lane. Site access will be reviewed at the subdivision/development permit stage.
2. There are existing boulevard trees adjacent to the site along 83 Avenue that must be protected during construction. For information about tree protection, please refer to the City of Edmonton website (Trees and Construction).
3. Neighborhood renewal at Garneau is scheduled to begin in 2021.
4. 83 Avenue and 111 Street are bike routes.

Should you require any additional information please contact Shafayat Hossain, Transportation Engineer at shafayat.hossain@edmonton.ca.

TRANSIT



Transit Planning has reviewed the proposed rezoning and plan amendment and provides the following comments:

1. Transit Enclosure 1 shows bus routing and bus stops in the vicinity of the rezoning site.
 - a. Frequent bus service operates on 82 Avenue.
 - b. The site is within 100m walking distance of nearby bus stops on 82 Avenue.
2. The site is roughly 700m walking distance to the Health Sciences/Jubilee LRT Station.
3. Transit Planning has no requirements for this proposed rezoning and plan amendment.

Should you require any additional information please contact Ben Goodenough, Transit Planner at 780-496-4061 or ben.goodenough@edmonton.ca.

EPCOR Water

EPCOR Water Services will support this application. The development must meet Edmonton Design and Construction Standards to the satisfaction of EPCOR Water, Director of Water Distribution and Transmission.

1.0 The site is currently serviced by two existing 20mm water services off the existing 200mm water main on 83 Avenue. If these services will not be utilized for servicing the planned development, they must be abandoned back to the water main prior to any on-site excavation.

2.0 For information on Service abandonments, and the provisioning of a new water service contact EPCOR Infill Water and Sewer Servicing at wass.drainage@epcor.com or at 780-496-5444.

3.0 The existing services will not be of sufficient size for the proposed development. The applicant must review the total on-site water demands and



service line capacity with a qualified engineer to determine the size of service required and ensure adequate water supply to the proposed development.

4.0 If multiple services are intended to provide service to the subject site, a Caveat of Restrictive Covenant for Check Valve Installation must be registered on title where more than one service is provided to a single lot. Where looping of the water main back to the public system is planned check valves must be installed and maintained at the applicant's expense. Please contact waterlandadmin@epcor.com for more information on the restrictive covenant.

5.0 There is a significant deficiency in on-street fire flows adjacent to the property. City of Edmonton Standards requires on-street fire flows of 300 l/s for the current zoning. On-street fire flows in the area are well below the required flow rate.

6.0 The applicant is required to upgrade approximately 26.0m of existing 200mm water mains to 250mm water mains, tying to the bisecting 406mm water main, on 83 Avenue at the 111 Street intersection, at their expense. This work can be undertaken either under a City of Edmonton servicing agreement or under EPCOR Water Services, Inc.'s New Water Distribution Mains capital program. For more information on the EPCOR New Water program, please contact EPCOR New Water at waterdtinfrastructure@epcor.com.

7.0 Prior to the issuance of a Development Permit, the applicant shall submit documentation that demonstrates, to the satisfaction of the Development Officer in consultation with Fire Rescue Services and EPCOR Water Services, that the fire flows and water servicing to the Site will be adequate for the proposed building and construction type, and be in accordance with the City of Edmonton Design and Construction Standards. The Development Officer shall verify that any infrastructure upgrades or systems required to ensure these standards are met.

8.0 We require a warning on POSSE regarding this deficiency and the necessary construction, plus e-mail confirmation from the City Planner that this warning has been recorded.

Land Development Application Comments

City of Edmonton
6th Floor, Edmonton Tower
10111 104 Avenue NW
Edmonton, AB T5J 0J4



9.0 Edmonton Fire Rescue Services (EFRS), Fire Protection Engineer may be able to perform an Infill Fire Protection Assessment (IFPA) at development permit application to potentially alter or lessen on-street fire protection infrastructure upgrades, assuming certain criteria are met. The applicant may request that the City Planner initiate this review.

10.0 A new cost share pilot program has started up in 2020 which may assist in offsetting any required infrastructure upgrades for the water system. Information about the Infill Cost Share Program can be found at www.epcor.com/infill-cost-share.

11.0 Each lot must be serviced with individual and separate water services provided directly to the lots from EPCOR's water main. In reference to our Terms of Service, water services cannot extend from one property to another. To prevent potential cross-lot servicing within the proposed rezoning area, the parcels must be consolidated under one title.

The applicant/owner will be responsible for all costs associated with providing City standards of water supply including any changes to the existing water infrastructure required by this application.

These comments/conditions are a firm requirement of our support of this rezoning application and will remain valid for two years from date of this reply.

If you have any questions about this reply, please contact Gerald Wildeman at GWildeman@epcor.com

Enclosures:

1. Transit 1



e-Circulation Collated Comments Report

Report Created Date: Apr 21, 2021

City File Number: 388608473-001

LDA Number: LDA21-0127

Applicant File Number:

Agency: LDA - ATCO Pipelines

Reviewed By: Isabel Solis

Outcome of Review: Comments

Completed Date: Mar 29, 2021 13:50

Comments:

ATCO Transmission high pressure pipelines has no objections.

Questions or concerns related to ATCO high pressure pipelines can be forwarded to hp.circulations@atco.com.

Agency: LDA - EPCOR D&T (Distribution & Transmission)

Reviewed By: Mathew Marrazzo

Outcome of Review: Comments

Completed Date: Apr 13, 2021 15:10

Comments:

EPCOR Distribution & Transmission Inc. has reviewed the proposal and has the following conditions:

1. The required electrical load for the site must be provided by an electrical consultant when service is requested or EPCOR cannot service the site.
2. Power servicing is to be in accordance with the City of Edmonton Design and Construction Standards Volume 7 and with EPCORs Customer Connection Guide (Customer Connection Guide).

3. Please contact Customer Engineering Services at CES@epcor.com for any requests for the modification, relocation, and/or removal of existing EPCOR facilities. For any relocation request, please notify EPCOR at least 4 months before the start of construction and your project shall be reviewed. Any work required to carry out such requests shall be at the expense of the inquiring party. Costs will be provided when a detailed plan is available. Ensure to consult with EPCOR power regarding limits of approach while constructing or working in close proximity to power lines.

4. Please visit <https://www.epcor.com/products-services/power/new-power-connection/Pages/default.aspx> to service proposed lot. If you require assistance with your application you may contact Customer Engineering at CES@epcor.com for assistance.

5. Any damage to EPCOR power facilities caused by the proposed construction shall be repaired or replaced by EPCOR Distribution & Transmission Inc. at the expense of the responsible party.

If all the above conditions are met the EPCOR Distribution & Transmission has no objection.

Agency: LDA - EPCOR Drainage WASS (Water and Sewer Servicing)

Reviewed By: Greg Derkach

Outcome of Review: Comments

Completed Date: Apr 19, 2021 10:25

Agency: LDA - Edmonton Police Service

Reviewed By: Paul Looker

Outcome of Review: No Comment

Completed Date: Mar 29, 2021 11:59

Agency: LDA - Forestry & Forestry Operations

Reviewed By: Kirsten Mortensen

Outcome of Review: Comments

Completed Date: Apr 16, 2021 11:18

Comments:

Forestry is concerned with the possible negative health effects or damage to the publicly owned tree canopy adjacent to this development during all phases of construction including the ground disturbance during excavation, site grading of soils throughout this private land parcel, and any above ground structure that supersedes the existing height of mature tree canopy

Forestry is specifically concerned about the effects of the excavation and how it could negatively affect the health of the city owned trees if roots are damaged or severed. Forestry is concerned about roots being damaged during any sidewalk repair or replacement including changing the hard surface around the trees.

Please be advised that all tree costs associated with pruning, removal, replacement, transplanting of trees or tree damages shall be covered by the Proponent as per the Corporate Tree Management Policy (C456C). Forestry will schedule and carry out all required tree work involved with this project. All requests for tree removal must be discussed with the community league and a community consultation may be required.

Any damages or required tree work (i.e. pruning, transplanting, removals, etc.) to the CoE boulevard trees, as a result from any work conducted prior to, during, or after any developmental process of this request is subject to cost, as is borne from the applicant in trust or ownership of the demolition/development permits

Agency: LDA - Housing & Homelessness
Reviewed By: ANDREW MCLELLAN
Outcome of Review: Did Not Respond
Completed Date: Apr 21, 2021 15:27

Agency: LDA - Oil and Gas Liaison
Reviewed By: Kuni Niina
Outcome of Review: No Comment
Completed Date: Apr 13, 2021 09:33

Comments:
Hi Andrew,

I have reviewed the plan amendment and rezoning application LDA21-0127 in the Garneau Neighbourhood from the perspective of ensuring safe on-going operation and maintenance of oil/gas facilities.

Based on my search, there are no abandoned wells, active high-pressure pipelines, or other oil and gas facilities (such as a battery site) within the area of the proposed rezoning. Therefore, I have no comments on this circulation.

Thank you,

Kuni

Kuni Niina, Oil and Gas Liaison Officer, Planning Coordination, Development Services, Urban Form and Corporate Strategic Development, 600, 10111 - 104 Avenue NW Edmonton AB, T5J 0J4, P: 780-496-3460

Agency: LDA - Risk Assessment
Reviewed By: Kenan Handzic
Outcome of Review: No Comment
Completed Date: Apr 14, 2021 17:55

Agency: LDA - Telecommunications - Bell Canada
Reviewed By: ANDREW MCLELLAN
Outcome of Review: Did Not Respond
Completed Date: Apr 21, 2021 15:26

Agency: LDA - Telecommunications - Shaw Cable
Reviewed By: Myra Empey
Outcome of Review: Comments
Completed Date: Mar 29, 2021 15:09

Comments:
shaw has no concerns

Agency: LDA - Telecommunications - Telus Planning
Reviewed By: ANDREW MCLELLAN
Outcome of Review: Did Not Respond
Completed Date: Apr 21, 2021 15:26

Agency: LDA Bylaw - Atco Gas
Reviewed By: TASHA ENGLER
Outcome of Review: Comments
Completed Date: Apr 19, 2021 06:27

Comments:

The Engineering Design Department of ATCO Gas has reviewed the above named plan and has the following conditions:

There are existing ATCO Gas facilities in the area. Drainage for any of ATCO Gas above ground appurtenances must be maintained. If it should be necessary to lower, relocate or make any alterations to the existing facilities and/or appurtenances due to this project, please contact ATCO Gas Distribution Engineer Matthew Henderson (Matthew.Henderson@atco.com, (587)-589-1145) to enable an adequate and timely response by ATCO Gas. Note all alteration costs will be borne by the developer / owner.

If gas service is required, to avoid delays, the owner / developer should contact an ATCO Gas Service Admin Coordinator at 780-420-7514, or their local ATCO Gas agency office at their earliest convenience to discuss the service contract, gas load requirements, timing details and any associated costs. To avoid delays a minimum notice of 4 months is recommended. Note, each lot / unit is to have a separate service line.

Due to the expansion/addition, the existing service size, meter space, and main size will need to be reviewed by ATCO Gas. It is recommended that the owner contact ATCO Gas Service Admin Coordinator at 780-420-7749 at their earliest convenience with their existing and future gas load and pressure requirements to enable adequate lead time to review if a service or main upgrade is required, the associated costs, and if necessary proceed with design and installation process.

Please contact Alberta One-Call at 1-800-242-3447 to have the gas lines located at least 48 hours prior to excavation.

There are abandoned ATCO Gas facilities in the work area. Please contact John Huizinga (780)-420-8048 to confirm status of the gas lines at least 48 hours prior to excavation.

If you have any questions or concerns regarding this reply, please contact Matthew Henderson (Matthew.Henderson@atco.com, (587)-589-1145)



PROVIDING MORE

2000 – 10423 101 St NW
Edmonton, AB
T5H 0E8 Canada

epcor.com

April 19, 2021

LDA 21-0127 (RZ)

TO: Andrew McLellan
Planning Coordination, City Planning
Sustainable Development Department

FROM: Greg Derkach
Infill Water and Sewer Servicing
EPCOR Water Services Inc.

SUBJECT: Proposed Rezoning of RA9 zone to RA8 zone for Plan I19, Blk 157, Lot 17 & 18, located south of 83 Avenue NW and east of 111 Street NW, CAD. 931+36-06, GARNEAU

The Infill Water and Sewer Servicing Section of EPCOR Water Services has reviewed the proposal and have the following comments:

Water and Sewer Service Information

11049 – 83 Avenue NW / Plan I19, Blk 157, Lot 18

- 1-20mm water service and 1-150mm sanitary service exist off 83 Avenue NW at 16.3m East of the East Property Line of 111 Street.

11053 – 83 Avenue NW / Plan I19, Blk 157, Lot 17

- 1-20mm water service and 1-150mm sanitary service exist off 83 Avenue NW at 5.8m East of the East Property Line of 111 Street.

Water and Sewer Servicing Conditions

1. It is required under the EPCOR Drainage Services Bylaw 18100 and EPCOR Water Standards that **each separately titled parcel must be independently serviced with water and sewer services directly off public mains**. A private water and sewer system cannot cross one separately titled parcel to service another and cannot be used to service more than one separately titled parcel.
2. As per the City of Edmonton Drainage Bylaw 18093, no owner shall drain their property in such a manner as to cause or have potential to cause a nuisance, hazard, or damage to their property or to adjacent parcels. EPCOR Drainage Services will determine and specify the location of release of storm water and subsurface drainage to a sewer service, an overland route, or a specific overflow point on or from the parcel. Each separately titled parcel must drain the storm water and subsurface drainage entirely to its own private drainage system.
3. **Mechanical site plans must be submitted to EPCOR Infill Water and Sewer Servicing for any new, replacement or additional buildings and redevelopment of any paved areas on this site.**

4. Construction charges will apply for any new water, sanitary and/or storm services required which will be constructed by the EPCOR Drainage Services from the main to the Property Line.

General

1. Refer to comments from other sections of City Planning regarding sewer main locations, capacities and/or mainline extensions.
2. Also, refer to comments from Water Engineering regarding water main locations, capacities and/or mainline extensions.

If you have any questions about this reply, please contact this office at 780-496-5444.

cc. EPCOR Water Services – ecirc-water@epcor.com



EPCOR Distribution & Transmission Inc.
8743-58 Avenue
Edmonton, Alberta
T6E 5W4 Canada
Phone (780) 412-3679
Fax (780) 412-3250
Mmarrazzo@epcor.com

April 13, 2021

Andrew McLellan
City of Edmonton

File #: LDA21-0127
Subject: **Garneau, 11049 – 83 Ave. NW
Rezoning, ASP Application**

EPCOR Distribution & Transmission Inc. has reviewed the proposal and has the following conditions:

1. **The required electrical load for the site must be provided by an electrical consultant when service is requested or EPCOR cannot service the site.**
2. Power servicing is to be in accordance with the City of Edmonton Design and Construction Standards Volume 7 and with EPCOR's Customer Connection Guide ([Customer Connection Guide](#)).
3. Please contact Customer Engineering Services at CES@epcor.com for any requests for the modification, relocation, and/or removal of existing EPCOR facilities. For any relocation request, please notify EPCOR at least 4 months before the start of construction and your project shall be reviewed. Any work required to carry out such requests shall be at the expense of the inquiring party. Costs will be provided when a detailed plan is available. Ensure to consult with EPCOR power regarding limits of approach while constructing or working in close proximity to power lines.
4. Please visit <https://www.epcor.com/products-services/power/new-power-connection/Pages/default.aspx> to service proposed lot. If you require assistance with your application you may contact Customer Engineering at CES@epcor.com for assistance.
5. Any damage to EPCOR power facilities caused by the proposed construction shall be repaired or replaced by EPCOR Distribution & Transmission Inc. at the expense of the responsible party.

If all the above conditions are met the EPCOR Distribution & Transmission has no objection.

Regards,

Matthew Marrazzo
Engineering Technologist



PROVIDING MORE

2000 – 10423 101 St NW
Edmonton, AB
T5H 0E8 Canada

epcor.ca

April 14, 2021

Your File: LDA21-0127

Our File: 2021-400

TO: Andrew McLellan
Planning Coordination, City Planning
Sustainable Development Department

FROM: Gerald Wildeman
EPCOR Water Distribution and Transmission
EPCOR Water Services

SUBJECT: Proposed Zoning Bylaw Amendment from RA9 zone to RA8 zone for Lots 17 and 18, Block 157, Plan I19, located south of 83 Avenue and east of 111 Street, CAD. 931+32.10 and 931+36.06, GARNEAU

EPCOR Water Services will support this application. The development must meet Edmonton Design and Construction Standards to the satisfaction of EPCOR Water, Director of Water Distribution and Transmission.

- 1.0 The site is currently serviced by two existing 20mm water services off the existing 200mm water main on 83 Avenue. If these services will not be utilized for servicing the planned development, they must be abandoned back to the water main prior to any on-site excavation.
- 2.0 For information on Service abandonments, and the provisioning of a new water service contact EPCOR Infill Water and Sewer Servicing at wass.drainage@epcor.com or at 780-496-5444.
- 3.0 The existing services will not be of sufficient size for the proposed development. The applicant must review the total on-site water demands and service line capacity with a qualified engineer to determine the size of service required and ensure adequate water supply to the proposed development.
- 4.0 If multiple services are intended to provide service to the subject site, a Caveat of Restrictive Covenant for Check Valve Installation must be registered on title where more than one service is provided to a single lot. Where looping of the water main back to the public system is planned check valves must be installed and maintained at the applicant's expense. Please contact waterlandadmin@epcor.com for more information on the restrictive covenant.
- 5.0 There is a significant deficiency in on-street fire flows adjacent to the property. City of Edmonton Standards requires on-street fire flows of 300 l/s for the current zoning. On-street fire flows in the area are well below the required flow rate.

- 6.0 The applicant is required to upgrade approximately 26.0m of existing 200mm water mains to 250mm water mains, tying to the bisecting 406mm water main, on 83 Avenue at the 111 Street intersection, at their expense. This work can be undertaken either under a City of Edmonton servicing agreement or under EPCOR Water Services, Inc.'s New Water Distribution Mains capital program. For more information on the EPCOR New Water program, please contact EPCOR New Water at waterdtinfrastructure@epcor.com.
- 7.0 Prior to the issuance of a Development Permit, the applicant shall submit documentation that demonstrates, to the satisfaction of the Development Officer in consultation with Fire Rescue Services and EPCOR Water Services, that the fire flows and water servicing to the Site will be adequate for the proposed building and construction type, and be in accordance with the City of Edmonton Design and Construction Standards. The Development Officer shall verify that any infrastructure upgrades or systems required to ensure these standards are met.
- 8.0 We require a warning on POSSE regarding this deficiency and the necessary construction, plus e-mail confirmation from the City Planner that this warning has been recorded.
- 9.0 Edmonton Fire Rescue Services (EFRS), Fire Protection Engineer may be able to perform an Infill Fire Protection Assessment (IFPA) at development permit application to potentially alter or lessen on-street fire protection infrastructure upgrades, assuming certain criteria are met. The applicant may request that the City Planner initiate this review.
- 10.0 A new cost share pilot program has started up in 2020 which may assist in offsetting any required infrastructure upgrades for the water system. Information about the Infill Cost Share Program can be found at www.epcor.com/infill-cost-share.
- 11.0 Each lot must be serviced with individual and separate water services provided directly to the lots from EPCOR's water main. In reference to our Terms of Service, water services cannot extend from one property to another. To prevent potential cross-lot servicing within the proposed rezoning area, the parcels must be consolidated under one title.

The applicant/owner will be responsible for all costs associated with providing City standards of water supply including any changes to the existing water infrastructure required by this application.

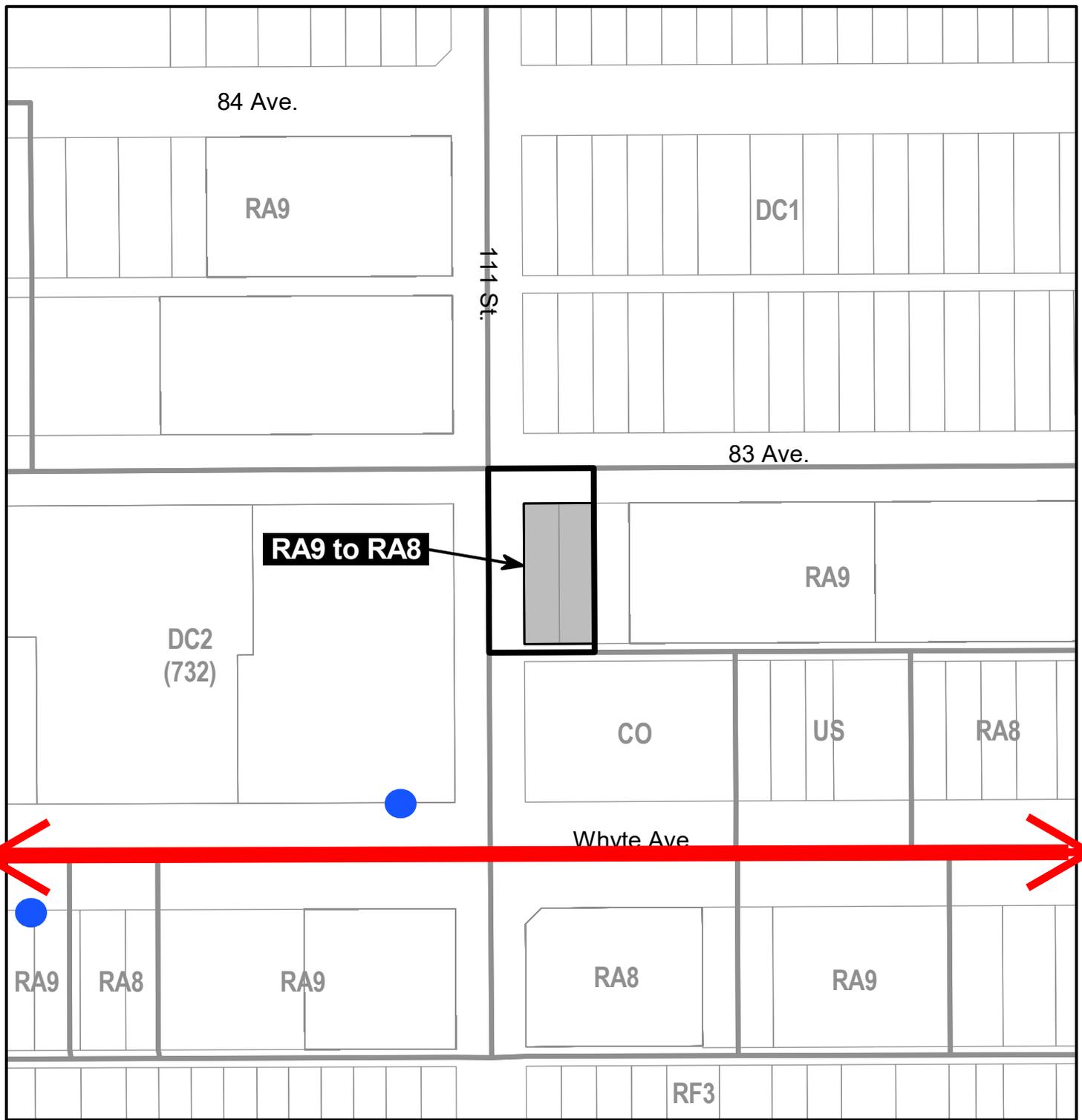
These comments/conditions are a firm requirement of our support of this rezoning application and will remain valid for two years from date of this reply.

If you have any questions about this reply, please contact Gerald Wildeman at (780) 412-7864.

gw

Attachment:

c: EPCOR Infill Water and Sewer Servicing
McCauley Inspectors
EWSI Customer Service
Water DT Infrastructure Inbox



PROPOSED REZONING - Garneau



From: (RA9) High Rise Apartment Zone
To: (RA8) Medium Rise Apartment Zone

FREQUENT BUS ROUTE

BUS STOP



July 12, 2021

Andrew McLellan
6th Floor, Edmonton Tower, 10111 104 Avenue NW
Edmonton, AB T5J 0J4

RE: LDA21-0127, IFPA Request

Edmonton Fire Rescue Services (EFRS) has reviewed the existing on-street fire protection features for titled lots 11049 83 Avenue NW and 11053 83 Avenue NW. The following assessment is provided.

In accordance with City of Edmonton Design and Construction Standard Volume 4: Water, municipal hydrants serving RA8 sites are required to provide 300 L/s fire flows, the intent of which is to ensure sufficient resources for firefighting. During the subject file circulation, EPCOR Water has identified that fire flows in the surrounding water network are below the required 300 L/s.

Based on the relative risk of this site as determined through the risk-based application of the fire protection standard, the site receives a low risk score and does not require further evaluation.

In conclusion, the subject site is functionally compliant with the municipal standards for fire flows. Therefore, upgrades to existing municipal on-street fire protection infrastructure are not required to support this application.

PERMIT TO PRACTICE CITY OF EDMONTON	
RM SIGNATURE: 	Cameron Bardas
RM APEGA ID #:	68272
DATE:	2021/JUL/12
PERMIT NUMBER: P005038 The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	



Prepared by:
Kael Griswold, P.Eng.

2021/JUL/12

Reviewed by:
Cameron Bardas, P.Eng.

cc: Gerald Wildeman, EPCOR Water Distribution and Transmission.
Kelly Sizer, City of Edmonton.
Hafsah Navarro-Henry, City of Edmonton.
Brendan Pinches, City of Edmonton.

Carignan, Tammy

From: Cunha, Jason <JCunha@epcor.com>
Sent: May 31, 2021 2:13 PM
To: Carignan, Tammy
Cc: Watermark Infrastructure
Subject: RE: LDA21-0127- Supportive housing development

Hi Tammy,

I'd expect in the region of \$95,000. Please note this is a high-level estimate.

Servicing costs are from WASS. Large diameter water services are not invoiced from our fee scheduled but are invoiced on a project specific estimate basis.

For the cost share pilot, apologies as it appears your LDA incorrectly had our old response template used for that. The cost share pilot has been completed and is no longer accepting new applicants. EPCOR has applied to the City for a permanent Infill Fire Protection program that will be structured similar to the pilot for inclusion in EPCOR's 2022-26 capital plan, however we will not know if that is approved until late 2021.

Thanks,

Jason Cunha, P.Eng.
Manager, Engineering and Infill Development
Water Distribution and Transmission
EPCOR Water Services, Inc.

From: Carignan, Tammy <t.carignan@schefferandrew.com>
Sent: Monday, May 31, 2021 1:37 PM
To: Watermark Infrastructure <waterdinfrastructure@epcor.com>; Water Infill Cost Share <WaterInfillCostSharing@epcor.com>
Subject: LDA21-0127- Supportive housing development

Notice: External Email

Use caution when opening links, attachments, and when prompted to enter User IDs, Passwords or Confidential Information.

Please report any suspicious email to the EPCOR Service Desk.

Hello, we are working for the City to determine the cost for developing a site in Garneau for use as a supportive housing site. located at the corner of 83 ave and 111 Street. I'm hoping to get some information this week.

Water Infrastructure:

There is a requirement for this site to construct some watermain to get the required fire flow at this corner and the LDA noted it could be constructed by EPCOR – see attached. I would like to get a high-level cost estimate to construct the watermain by EPCOR for budgeting purposes.

We are also looking to install new services:

- Water 150mm – website service connection fees do not include this amount – do you have that cost or do I get that from WASS?

Infill Cost sharing:

There was a comment that this may qualify for cost sharing. We are replacing an existing waterline and upgrading the waterline to provide fire flow for all the residents at this corner which seems to fit the requirements. I had a few questions.

- Is there a minimum cost before it is considered?
- How much of the cost can be cost shared?
- It appears there could be a chance that you do not get chosen for cost sharing, that there is a priority and first come first serve basis is this correct?

Thanks

Tammy Carignan, P. Eng. | Engineering Operations Manager

Direct: 780-732-7792 | Cell: 780-952-9893

Office: 780-732-7800 | Fax: 780-732-7878

Scheffer Andrew Ltd. | Planners & Engineers

12204 – 145 Street NW Edmonton, AB T5L 4V7 | www.schefferandrew.com

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CP-008872 Garneau Housing Development Preliminary Geotechnical Investigation – Final

City of Edmonton

Project number: 60655308 (501)
C-Release No: 4000107835

May 05, 2021

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("AECOM") for the benefit of the Client ("Client") in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations, and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
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Appendix B.	General Statement; Normal Variability of Subsurface Conditions; Explanation of Field and Laboratory Test Data; Modified Unified Soil Classification System; Testhole Logs
Appendix C.	Laboratory Test Results

1. Introduction

1.1 General

AECOM Canada Ltd. (AECOM) was retained by the City of Edmonton (CoE) to conduct a preliminary geotechnical site investigation to support the Garneau Housing project. It is understood that the CoE intends to develop the two lots at 11053 and 11049 – 83 Avenue Northwest for the purposes of constructing a multi storey housing building. The CoE indicated this housing project could reach a height of up to 23 metres (m). At the time of writing of this report, the layout of the housing building had not yet been determined. The purpose of this preliminary geotechnical investigation was to determine the subsurface conditions to support the design of this multi storey housing building, identify potential geotechnical risks at this site, and provide design parameters for the foundation design. It is anticipated that more testholes will be required for the detailed design phase of this project. The testhole locations of the testholes drilled during this geotechnical investigation are illustrated on **Figure 1** in **Appendix A**. Testhole logs are included in **Appendix B** and laboratory test results are included in **Appendix C**.

1.2 Scope of work

The scope of work for this intrusive geotechnical investigation includes the following:

- Planning and co-ordination of the field drilling program, which included site reconnaissance, safety planning, utility coordination and clearances, coordination of AECOM subcontractors, and logistics planning (site access, mobilization, staging, and demobilization of equipment).
- Performing a geotechnical desktop study, which included a review of available geological maps.
- Executing the geotechnical field investigation, which included drilling three testholes within the site limits of the proposed housing building. These testholes were drilled to depths of between 6.25 and 14.94 metres below ground surface (mBGS).
- Installation of a standpipe piezometer in one testhole to monitor groundwater conditions.
- Measuring groundwater levels in the standpipe after completion of the field drilling program.
- Performing laboratory testing on soil samples for soil classification and to determine engineering properties of selected soil samples collected during the field investigation.
- Completing a geotechnical investigation report, which includes:
 - Description of geotechnical investigation methodology.
 - Geological desktop study.
 - Description of the subsurface conditions.
 - General site recommendations and site suitability.
 - Foundations recommendations, including radon has mitigation recommendations.
 - Recommendations for pavement structures.
 - Recommendations for further site investigation.
 - Conclusion on the results of the geotechnical investigation.

2. Methodology

2.1 Safety Planning

The safety planning for this geotechnical investigation took into consideration AECOM and the CoE safety practices and procedures. The CoE Prime Contractor OH&S Orientation was completed prior to conducting field work. The Project Hazard Assessment for the site shared by the CoE was reviewed by AECOM. An AECOM Safe Work Plan was completed and submitted for review by the CoE. Daily Tailgate Meetings and Task Hazard Assessments were completed prior to conducting all field operations which included utility locating, borehole drilling and groundwater monitoring. All safety planning complied with COVID-19 safety recommendation set by the government of Alberta and the CoE.

2.2 Site Reconnaissance

Prior to the commencement of the intrusive investigation, a site reconnaissance was conducted by AECOM on March 23, 2021 to assess general site access conditions, identify the suitability of the proposed testhole locations, and review the locations of the buried and overhead utilities. Utility coordination and clearances included contacting Alberta One-Call and using a private locator to clear borehole locations. Maverick Inspection Ltd. was contracted by AECOM to clear the borehole locations of utilities.

2.3 Surficial Geology

A surficial geological map (Map 601, Surficial Geology of Alberta, M.M Fenton, et. al, 2013.) provided by the Alberta Geological Survey was reviewed prior to conducting the geotechnical investigation. The surficial geology in the study area is expected to include primarily glaciolacustrine deposits.

Glaciolacustrine deposits include either deposited sediments consisting of rhythmically fine sand, silt, clay, and till, or littoral sediments consisting of well-sorted silty sand, pebbly sand, and minor gravel.

2.4 Bedrock Geology

The bedrock geology in this study area is a part of the Horseshoe Canyon Formation (marked as KHC in Map 600, Bedrock Geology of Alberta, Prior G.J et al, 2013), which is comprised of fine-grained sandstone, interbedded with siltstone and bentonitic mudstone. The Horseshoe Canyon Formation was formerly known as the Edmonton formation. The bedrock is expected to be non-marine to locally marginal marine. Coal seams and bentonite beds of variable thickness are common throughout the formation.

2.5 Field Investigation

Three testholes were advanced within the site limits of the proposed Garneau Housing project site. The three testholes, TH21-01, TH21-02, and TH21-03, were drilled to depths of 14.94 mBGS, 6.25 mBGS and 14.94 mBGS respectively, on March 25, 2021. The testholes were drilled with a 150 millimetre (mm) diameter solid stem auger using a truck mounted drill rig from Canadian Geological Drilling Ltd. One 25-mm diameter polyvinyl chloride (PVC) monitoring well was installed in testhole TH21-01 to monitor groundwater conditions.

Testholes were logged in the field and the soil was classified according to the Modified Unified Soil Classification System (MUSCS) for soils. Standard Penetration Tests (SPTs) were conducted at approximate 1.5 m intervals in all drilled testholes. Disturbed samples from all testholes were collected at regular intervals for laboratory testing. Undisturbed Shelby tube samples were also collected. Testhole Logs along with an Explanation of Field and Laboratory Test Data and the MUSCS for soils are provided in **Appendix B**.

Testhole locations were surveyed by the CoE after completion of drilling on March 25, 2021. The location of each testhole is presented on **Figure 1** in **Appendix A**. **Table 2-1** below summarizes the details pertaining to each testhole.

Table 2-1: Summary of Testhole Details

Testhole	Location	Depth (mBGS)	Coordinates Northing ¹	Coordinates Easting ¹	Elevation ¹ (mASL)	Monitoring Well Installed (Y/N)
TH21-01	11049 - 83 Ave NW	14.94	5931893.3	32002.1	670.8	Y
TH21-02	11053 - 83 Ave NW	6.25	5931878.8	31996.9	670.8	N
TH21-03	11053 - 83 Ave NW	14.94	5931861.5	31992.2	670.8	N

¹ Coordinates and elevations surveyed by CoE and presented in NAD83 3TM. Elevations in this table are provided as Metres Above Sea Level (mASL).

2.6 Laboratory Testing Program

Soil samples collected during the site investigation were tested in AECOM's materials testing laboratory in Calgary, Alberta. The laboratory testing included the determination of moisture contents, Atterberg Limits, and grain size distributions, and soil chemical properties. For soil chemical testing, selected samples were sent to ALS Environmental in Calgary for determination of pH, soluble sulphates, resistivity, and chloride contents. The test results are shown on the testhole logs, and are presented separately in **Appendix C**. Laboratory testing consists of the following:

Table 2-2: Summary of Laboratory Testing

Laboratory Test	Number of Tests	Data Location
Moisture content determination	49	Testhole Logs and Appendix C
Atterberg limits determination on selected soil samples	4	Testhole Logs and Appendix C
Grain Size Analysis on selected samples	3	Testhole Logs and Appendix C
Soil Chemical Testing	2	Testhole Logs and Appendix C

3. Subsurface Conditions

3.1 Topsoil

Topsoil was encountered at the ground surface in testhole TH21-01 and was 760 mm thick. The topsoil was silty, contained some clay, and contained trace sand. The topsoil also contained some rootlets and was moist, and dark brown in colour.

3.2 Clay Fill

Clay fill was encountered at the ground surface in testholes TH21-02 and TH21-03, and varied in thickness of between 0.61 m and 1.52 m. The clay fill was silty and sandy to containing some sand, and occasionally contained some gravel. The clay fill was also noted to be of high plasticity, and contained some wood debris, trace coal, trace brick debris, trace silt layers and trace rootlets. The clay fill was damp to wet, and brown to dark brown in colour.

One SPT was completed in the clay fill and was 6 blows per 300 mm of penetration, indicating the clay fill was firm. Moisture contents were determined on three clay fill samples and the results varied from 15.2% to 30.9%.

3.3 Clay

Clay was encountered in all testholes and the thickness varied between 1.53 m and 1.68 m. The clay was silty and contained some sand. Occasionally, the clay contained some to trace silt pockets and trace coal. The clay was moist and brown in colour. The clay was noted to be of high plasticity.

SPT N-values for the clay ranged from 10 to 15 blows per 300 mm of penetration, indicating the clay was stiff to very stiff. Moisture contents were determined on six samples and varied from 23.3% to 30.0%. Two Atterberg Limits tests were completed on the clay and the results are summarized in **Table 3-1** below.

Table 3-1: Summary of Atterberg Limits Test Results for Clay

Testhole	Sample Number	Depth (mBGS)	MUSCS	Moisture (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
TH21-01	3	1.52 – 1.83	CH	25.2	71.4	21.1	50.3
TH21-03	3	1.52 – 1.83	CH	27.4	67.1	21.9	45.2

3.4 Clay Till

Clay till was encountered in all testholes below the clay layer and varied in thickness between 2.74 m and 3.04 m. The clay till was silty and sandy to containing some sand. Occasionally, the clay till contained trace gravel, some sand and silt laminations, trace to some oxidation and trace coal. The clay till was moist to wet, and brown in colour. The clay till was noted to of high plasticity.

SPT N-values for the clay till ranged from 3 to 24 blows per 300 mm of penetration, indicating the clay till was soft to very stiff. Moisture contents were determined on 12 clay till samples and the results varied from 19.7% to 36.7%.

3.5 Sand and Silt

Sand and silt was encountered in testhole TH21-01 below the silt layer. The thickness of the sand and silt was 3.96 m. The sand and silt contained trace clay and was fine grained. The sand and silt was damp and brown in colour. Moisture contents were determined on six samples and the results varied from 10.3% to 21.6%. One grain size analysis was completed on the sand and silt and the results are summarized in **Table 3-2** below.

Table 3-2: Summary Grain Size Analyses Test Results for Sand and Silt

Testhole	Sample Number	Depth (mBGS)	MUSCS	Moisture (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
TH21-01	13	9.14 – 9.45	SM-ML	12.6	0.0	46.2	46.1	7.7

3.6 Silt

Silt was encountered in all testholes below the clay till layer and varied in thickness between 0.46 m and 5.03 m. Testhole TH2-02 was terminated in the silt. The silt was sandy and contained some clay. The silt was damp and light brown to brown in colour. The silt was noted to be of low plasticity.

SPT N-values for the silt ranged from 15 to 32 blows per 300 mm of penetration, indicating the silt was compact to dense. Moisture contents were determined on 11 silt samples and the results varied from 7.5% to 25.9%. Two Atterberg Limits tests and two grain size analyses were completed on the silt and the results are summarized in **Table 3-3** below.

Table 3-3: Summary of Atterberg Limits Test and Grain Size Analyses Test Results for Silt

Testhole	Sample Number	Depth (mBGS)	MUSCS	Moisture (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
TH21-01	9	6.10 – 6.40	ML	11.4	0.0	23.8	59.9	16.3	19.9	18.6	1.3
TH21-03	8	5.33 – 5.79	CL-ML	17.1	-	-	-	-	25.1	20.6	4.5
TH21-03	12	8.38 – 8.84	ML	17.8	0.5	21.3	65.9	12.3	-	-	-

3.7 Sandstone

Weathered sandstone was encountered in testholes TH21-01 and TH21-03. Both testholes TH21-01 and TH21-03 were terminated in the sandstone layer. The sandstone was silty and poorly lithified. The sandstone was damp and grey in colour.

SPT N-values for the sandstone ranged from 71 to 81 blows per 300 mm of penetration, indicating the sandstone was very dense. Moisture contents were determined on 11 sandstone samples and the results varied from 13.7% to 21.0%.

3.8 Groundwater

Groundwater levels were measured upon completion of drilling on March 25, 2020 and 19 days after on April 13, 2021. The results of the groundwater measurements are summarized in **Table 3-4**.

Table 3-4: Summary of Groundwater Measurements

Testhole	Testhole Elevation (mASL)	Depth of Standpipe (mBGS)	Upon Completion of Drilling March 25, 2021 (mBGS)	Groundwater Depth During Monitoring Event on April 13, 2021 (mBGS)	Groundwater Elevation During Monitoring Event on April 13, 2021 (mASL)
TH21-01	670.826	14.94	Trace groundwater at bottom of testhole	10.84	660.0
TH21-02	670.819	-	Trace groundwater at bottom of testhole	-	-
TH21-03	670.762	-	Trace groundwater at bottom of testhole	-	-

- No monitoring wells installed in testholes TH21-02 and TH21-03.

Measured groundwater depths are also shown on the testhole logs in **Appendix B**. It should be noted that the groundwater levels in **Table 3-4** are relatively short term and may not be representative of stable groundwater conditions. Groundwater levels can vary in response to seasonal factors and precipitation. The groundwater conditions at the time of construction may vary from those recorded in this investigation.

Decommissioning of the standpipe piezometers was not included in the scope of this investigation. It is recommended that this standpipe be decommissioned in compliance with industry standards during construction.

3.9 Frost Susceptibility

The surficial soils encountered at this site consist of clay fill (CH), clay (CH) and clay till (CH). The qualitative frost susceptibility of a soil is typically assessed using guidelines developed by Casagrande (1932) on the basis of the percentage by weight of the soil finer than 0.02 mm and plasticity index. This classification system has been adapted by the U.S. Army Corps of Engineers and the Canadian Foundation Engineering Manual (CFEM, 2006). Soils are classified as F1 through F4 in order of increasing frost susceptibility and loss of strength during thaw. The soil units encountered at the sites and their frost group classifications are summarized in **Table 3-5**.

Table 3-5: Frost Susceptibility

Soil Unit	MUSC	Finer than 0.02 mm (%)	Plasticity Index (%)	Frost Group
Clay Fill, Clay, Clay Till	CH	-	-	F3 - F4

Generally, the surficial soils at this site were classified in the F3-F4 frost group, which indicates the surficial soils are highly susceptible to frost.

3.10 Frost Penetration

The clay deposits at this site are highly susceptible to frost action. The depth of frost penetration for soils can be determined using the CFEM (4th Edition) guidelines. The depth of frost penetration for a 30-year return period corresponds to an estimated Design Freezing Index of 1996 degree Celsius days (°C-days). The depth of frost penetration for the soil encountered at the Garneau Housing site is summarized in **Table 3-6**.

Table 3-6: Frost Penetration Depth

Soil Unit	Frost Penetration Depth (m)
Clay	2.5 ¹

¹ The Frost Penetration depth may be reduced by using insulation as designed by the insulation supplier or manufacturer.

The frost penetration depth provided above is based on a uniform soil type with no insulation cover. In areas covered with turf or snow cover, the depth of frost penetration will be less. Conversely, if well graded granular backfill is used, the depth of frost penetration will be greater. The depth of frost penetration is dependent on the in-situ moisture content, relative density, grain and pore sizes, and permeability of the soil. As a result, frost penetration is expected to vary across the site as the subsurface materials and temperatures vary. The depth of frost penetration will also increase in snow-cleared paved areas such as roads.

3.11 Soil Chemical Testing

Chemical testing was conducted on select samples to determine pH, resistivity, soluble chloride concentration and total sulphate ion content. The degree of corrosiveness and corrosion potential for sulphate attack are provided in **Table 3-7** below in accordance with the Handbook of Corrosion Engineering (Roberge, P. R., 2000) and the Canadian Standards Association Guidelines (CSA, 2018).

Table 3-7: Soil Chemistry Summary

Testhole	Sample Number	Depth (mBGS)	Resistivity (ohm-cm)	Chloride Concentration (mg/L)	Total Sulphate Ion Content (%)	pH	Corrosion Potential	Sulphate Attack
TH21-01	7	4.57 – 4.88	1640	23	<0.050	7.66	Highly Corrosive	Low
TH21-03	10	6.86 – 7.32	1550	59	<0.050	7.56	Highly Corrosive	Low

Based on the above test results, the degree of corrosivity is expected to be highly corrosive at this site. The potential for sulphate attack in concrete is expected to be low at this site.

3.12 Seismic Site classification

Based on criteria from the National Building Code of Canada, corrected SPT-N values and undrained shear (S_u) strength can be used to determine the seismic classification of a site. The seismic classification of a site is rated from A through F, in order of increasing seismic sensitivity. Sites classified in the A group consist of hard rock, while sites classified in the E group consist of soft soils. Testhole TH21-01 and TH21-03 was used for the seismic site classification. The soil stratigraphy at this site consisted of clay, clay till, silt and sandstone. Testholes TH21-01 and TH21-03 were not advanced to a depth of 30 mBGS; therefore, the following assumptions were made regarding the soil stratigraphy to determine seismic classification.

- The sandstone in testholes TH21-01 and TH21-03 continues to a depth of 30 mBGS
- The average SPT of 76 blows per 300 mm of penetration in Testholes TH21-01 and TH21-03 was representative of the bedrock encountered
- SPT tests spanning 2 layers will be representative of where a majority of the SPT test spans

The proposed project location is generally rated in the D category for seismic classification, indicating moderately high sensitivity to seismic activity. The site seismic classification could be confirmed with more certainty from a detailed geotechnical investigation with a testhole extending to at least 30 mBGS and completing seismic cone penetrations tests to measure the shear wave velocity versus depth. If highly weathered bedrock is present, a 30 mBGS testhole to confirm site seismic classification may not be necessary.

3.13 Liquefaction Potential

Soil liquefaction is a process where soils may suddenly, and drastically lose their strength in response to seismic activity or earthquake loadings. Soils that are most susceptible to liquefaction include:

- Loose and cohesionless soils (sands, gravels, and silts)
- Saturated soils
- Unconsolidated soils
- Soils containing a high fines content (Poorly drained soils)

During the investigation, sand and silt was encountered near the surface in TH21-01 at 7.6 mBGS and silt was encountered in all testholes at variable depths. Liquefaction assessments are generally recommended if loose or saturated sands are encountered, or sand containing a large percentage of fines is present. The fines content within one sand sample in TH21-01 at the proposed housing site was 53.8%, which is considered a high fines content.

The liquefaction potential of the sands was assessed following the procedure outlined by the CFEM (2006), Screening Guide for Rapid Assessment of Liquefaction Hazard at Highway Bridge Sites (Technical Report MCEER-98-0005, dated June 16, 1998), and Youd et al. (2001). Three key parameters are required for assessing a site for liquefaction: the $(N_1)_{60}$ value, the peak horizontal acceleration, and the design earthquake magnitude. The peak horizontal ground acceleration for the site was obtained using the NBCC (2015) seismic hazard value interpolator from the Natural Resources Canada website. The peak horizontal ground acceleration was found to be 0.1g, where g is the acceleration of gravity. The largest magnitude earthquake that was recorded near Edmonton, AB between the years 1627 and 2015 had a magnitude of 6. An earthquake magnitude of 6 was therefore used as the design earthquake. The magnitude of earthquake was obtained from the Earthquake Canada Website which includes maps showing the historic locations and magnitudes of earthquakes in Canada.

Based on our assessment, the factor of safety against liquefaction is greater than 1.5, which indicates a low hazard risk with respect to liquefaction.

4. General Construction Recommendations

4.1 Site Suitability

The site is considered suitable for the proposed housing building provided that the geotechnical risks identified during this investigation are understood and recommendations in this report are followed. It is understood that the proposed housing building could reach a height of up to 23 metres. Shallow foundations founded within 5.3 mBGS at this site may be problematic for heavily loaded structures and the proposed housing building would likely need to be supported on deep foundations rather than shallow foundations. Shallow foundations are suitable if founded below 5.3 mBGS. Based on the soil conditions encountered during this geotechnical investigation, the primary geotechnical risks with the proposed site include:

- The near surface clay fill, clay and clay till encountered at this site was soft to stiff, with the moisture content of this clay varying from 15.2% to 36.7%. This moisture content is considered high relative to the native clay and clay till typically found in the Edmonton area. This clay will have a low bearing capacity if certain shallow foundation types are selected and will be prone to excessive consolidation settlement if a heavily loaded structure is constructed on this clay.
- The presence of sandy and silty soils was noted in TH21-01 and TH21-03. Groundwater depth was measured at 10.84 mBGS in TH21-01 within the sand layer. Wet or saturated sandy and silty soil conditions typically are prone to sloughing. For mid to high rise housing construction, a deep excavation is typically required. Sloughing soils within the deep excavation may result in ground loss and induce settlement of nearby infrastructure if not controlled during construction.
- The presence of wet to saturated sand and silty soils may be problematic during installation of deep foundations, such as cast-in-place piles. (If continuous flight auger piles are used, sloughing soils may not be a problem.)
- The presence of high plasticity clay within the subsurface was noted in TH21-01, TH21-02 and TH21-03, which may prone to swelling and shrinkage if exposed during construction for foundation placement.
- The presence of highly frost susceptible soils due the naturally high moisture content of the surficial clay, which may be problematic for pavement structures.
- Fill may have been placed at this site during demolition of the previous structure. This fill may include poorly compacted soil or include debris and deleterious materials, which is not suitable for a foundation base.
- Sand and silt soils have the potential for liquefaction under seismic loading. (Edmonton, AB is not known to have a high frequency of seismic activity, but the risk of liquefaction should not be completely ignored.)

In order to mitigate the risks, the recommendations provided in this section should be followed. It should be noted that the recommendations provided in this report are preliminary and are subject to review and revision during the detailed design phase. At the time of submission of this geotechnical investigation report, specific details of the housing project such as building type, building size, foundation type, foundation elevation, and building loadings have not been yet known. Once this information is confirmed, a detailed geotechnical investigation is recommended. This section provides general construction recommendations. Foundation and pavement recommendations are discussed in **Section 5** and **Section 6** respectively.

4.2 Site preparation – Building Area

Generally, site preparation should begin by removing all organic material and clay fill, as well as any deleterious material (such as fill debris, high plasticity clay) within the building plan area, exposing the underlying inorganic native clay. Following the initial site stripping and cutting to grade or foundation elevation, the exposed subgrade should be inspected by a geotechnical representative to determine if competent foundation base is present. Based on the information from this investigation, it should be anticipated that a scarification depth of at least 150 mm will be required assuming a foundation depth at an elevation of 665.5 m or below (5.3 mBGS). The scarified 150 mm layer below the foundation base should be moisture conditioned to between 0 and 2% above the Optimum Moisture Content (OMC) and recompacted to 98% of the Standard Proctor Maximum Dry Density (SPMDD). Following compaction, the areas should be proof-rolled to identify any loose or soft areas. Any soft areas should be over-excavated and backfilled and compacted to 98%SPMDD using general engineered fill of low to medium plasticity. Imported fill used for construction should be approved by the geotechnical engineer of record.

After completion of subgrade preparation, the building area should be backfilled using either a granular fill or imported low to medium plasticity clay fill. The fill material should be moisture conditioned as required and compacted to 98% SPMDD and placed in lifts of 150 mm compacted thickness.

Full-time monitoring will be required by experienced geotechnical personnel to ensure that suitable fill material is placed to the proper moisture content and compaction standards within the building area.

4.3 Trenching and Excavation

A deep excavation would likely be required if the proposed housing project will be a mid to high-rise structure. All excavations should be in accordance with the provisions of the Occupation Health and Safety Regulations (OHS). The excavation walls should be sloped or adequately shored. Given the surrounding developments at this site, shoring will likely be the methodology implemented to ensure a safe excavation. The appropriate required side slopes will depend on the soil type, depth of excavation, drainage method, the amount of groundwater seeping into the excavation, and the time interval the excavation is left open.

The Alberta Occupational Health and Safety code (Section 442) classifies soils into three groups:

- a) Hard and compact – hard in consistency, very dense, appears to be dry, no signs of water seepage, can be penetrated only with difficulty by a small, sharp object, and is extremely difficult to excavate with hand tools.
- b) Likely to crack or crumble – has been excavated before, stiff in consistency, compact, damp appearance, signs of water seepage, can be penetrated with moderate difficulty with a small sharp object, and moderately difficult to excavate with hand tools.
- c) Soft, sandy or loose – firm to very stiff in consistency, loose, appears to be wet, can be easily excavated with hand tools, becomes unstable when disturbed.

The OHS indicates that if an excavation contains more than one soil type, the soil type with the least stability will govern. Based on the testholes from this geotechnical investigation, the soils encountered at the site are classified as soft, sandy or loose. Part 32 of the Alberta OHS code indicates that excavations with this soil type must have slopes of the excavation sloped from the bottom of the excavation at an angle of not less than 45 degrees measured from the vertical. However, based on AECOM's experience with temporary cut slopes, the OHS code guidelines for sloped excavations may be too steep in certain situations. AECOM recommends that temporary cut slopes within excavations of less than 3.0 m in depth within clay or sand have side slopes cut no steeper than 1.5H:1V. Temporary cut slopes exceeding 3.0 m in excavations of up to a maximum depth of 5.0 m within clay or sand should have side slopes cut no steeper than 2.0H:1V. Excavations exceeding 5.0 m in depth should have a geotechnical slope stability analysis be completed to determine a safe slope inclination. Flatter short term cut slopes may be required in zones where groundwater seepage is encountered. Alternatively, shoring may be implemented if the excavation cannot be sloped.

If the excavation for the building construction will be sloped, the slopes should be checked regularly for signs of sloughing, especially if loose sand pockets are observed or after inclement weather conditions. It

should be noted that sand and silt layers/pockets were encountered within the clay till in this investigation. The amount of time an excavation is left open should be minimized as stability decreases over time. If there are signs of movement, the side slopes should be unloaded by benching the upper portion of the crest of the slope to relieve overburden pressure. The temporary cut slopes should also be protected against surface runoff and heavy rainfall. Small earth falls from the side slopes are a potential source of danger to workers and must be guarded against.

Existing underground utilities in the excavation area should be exposed by hand digging or hydro-vacuumed. No mechanical excavation should be undertaken within 1 m of anticipated location of existing utilities.

Fill should only be placed over dry, clean, stiff, unfrozen soils. The site soils are susceptible to softening and deterioration if left exposed in an excavation; therefore, traffic on the excavation base should be minimized, and construction should commence immediately after the excavation is complete. The time the excavation is left open should be minimized.

Temporary surcharge loads, such as construction materials or excavated soil and spoil piles, should not be allowed within 1.5 m or a distance equal to the depth of the excavation, whichever is greater, of an unsupported excavated face. Vehicles delivering materials should be kept back from faces by at least 3.0 m or a distance equal to the depth of the excavation, whichever is greater, of an unsupported excavated face.

The method of excavation and safe support of excavations, selecting suitable slopes for excavations, selecting temporary shoring system, protection of the existing infrastructure and maintaining stability of the excavation slopes are the responsibility of the contractor.

4.4 Dewatering

Groundwater was measured during the geotechnical investigation to be at 10.83 mBGS. It should be noted that groundwater typically varies in response to seasonal factors and precipitation. The groundwater conditions at the time of construction may vary from those recorded in this investigation. Groundwater during construction will be encountered during construction by seepage from wet sand and silt seams and pockets through clay and clay till layers. Groundwater accumulations should be handled by sumps and wells, or combination of these methods such that water can be pumped away.

The contractor is responsible for temporary dewatering of the excavation during construction. The contractor will be responsible for maintaining stability of the slopes or shoring system as well as protection of any existing infrastructure located near the temporary excavations.

4.5 Suitability of Existing Soil for Fill

The excavation for the housing building foundations and construction of below grade elements will result in an excess of soil. Generally, the soil excavated from the footprint of the building will include topsoil, clay fill and high plasticity clay and clay till. The topsoil should be excavated and stockpiled separately from the underlying clay and clay till and can be used for future landscaping purposes. The surficial clay fill at this site is not considered suitable for use for fill. The existing high plasticity clay is also not considered to be suitable for establishing site grading and backfilling. This clay is excessively moist and will be difficult to compact. It is recommended low to medium plasticity clay fill be imported for grading and backfill. The imported soil used for fill should be compacted to 98% SPMDD, and within $\pm 2\%$ of the OMC. Lifts of backfill material should not exceed 150 mm in compacted thickness. It is recommended that fill material be reviewed and inspected by a qualified geotechnical engineer during construction.

4.6 Structural Fill Placement

Structural fill should be used under foundations, or any other settlement sensitive structures. Structural fill should consist of well-graded crushed gravel with less than 10% fines (silt and clay), and a maximum particle size of 20 mm.

The structural fill should be compacted to 100% of the SPMDD, and within $\pm 2\%$ of the OMC. Lifts of backfilled material should not exceed 150 mm in compacted thickness. The compacted lift thickness may be increased to 200 mm depending on the quality of structural fill (low fines). This increase in lift thickness should be approved by the geotechnical engineer of record during construction. The structural fill should extend on each side of the foundation a minimum distance of 500 mm.

Structural fill should comply with the CoE Designation 3, Class 20, or approved equivalent. The gradation for the Designation 3, Class 20 is provided in **Table 4-1** below.

Table 4-1: Recommended Gradation for Structural Fill (City of Edmonton, Complete Streets Design and Construction Standards, Aggregate Designation 3, Class 20)

Metric Sieve (mm)	Percent Passing by Mass (%)
20.0	100
16.0	84 - 95
12.5	60 - 90
10.0	50 - 84
5.0	37 - 62
2.0	26 - 50
1.25	19 - 43
0.63	14 - 34
0.40	11 - 28
0.315	10 - 25
0.160	6 - 18
0.080	2 - 10

4.7 Utility Installation

Utility services required for this housing building should be installed at a minimum depth of 2.5 mBGS to protect against frost. If utilities are founded within the frost penetration depth, insulation should be used to protect the utilities against frost. All utility trenches should be backfilled with low to medium plasticity clay or clay till, as fine-grained soils offer better frost protection than granular soil.

5. Preliminary Foundation Recommendations

Strip footings and raft foundations are feasible for lightly and moderately loaded structures respectively, which can be expected for low rise housing buildings. The feasibility of shallow footings or raft foundations is expected to be limited to non-critical structures where some settlement and/or differential settlement could be tolerated. With the requirements of providing a sufficient soil cover for frost penetration for shallow and raft foundations, which would require relatively deep excavations, dewatering and concrete form works, pile foundations are likely to be more cost effective than footings or rafts.

The soil conditions commencing at depths of 2.5 to 6 mBGS are generally favorable for pile foundations if heavily loaded structures such as a mid to high rise building will be selected to construct the housing building. However, silts and sand encountered below the groundwater level may present some concerns if not properly addressed. The feasible pile types that could be considered include straight shaft cast-in-place piles and driven steel piles; however, the suitability of driven steel may not be feasible due to vibrations during pile installations. The vibrations may affect and damage the existing nearby structures at this site. Continuous flight auger-cast piles (CFA) may also be considered for the site due to the sandy conditions noted within the subsurface. Based on the testholes from this investigation, belled concrete piles are also not considered to be suitable at the site, due to the presence of very dense sandstone at approximate depths of 10.3 mBGS and 11.6 mBGS and forming the bell in the sandstone would be difficult to construct. Therefore, straight shaft cast-in-place piles are considered more practical to be used for this site. Construction of straight shaft concrete piles will need to incorporate contingencies for proper installation including temporary steel casings, groundwater handling, and concrete by tremie methods.

The final selection of foundations for the proposed housing building should be determined when the building type, building size, and foundation elevations are determined, and based on results from a detailed site investigation.

5.1 Subgrade Preparation for Shallow Foundations

The presence of high plasticity clay within the subsurface complicates the subgrade requirements at this site for shallow foundations. Generally, high plasticity clay below building foundations should be removed to eliminate the risk of consolidation settlement of the building that could occur over several years after construction of the building is complete. However, this may not be reasonably practical in some instances where the termination depth of high plasticity clay is significant, or the presence of high plasticity clay is variable below the building foundation. Additionally, the amount of high plasticity clay that is required to be removed will depend on the foundation elevations, size of the building, and the building loading. Raft foundations are generally suitable foundation types when compressible or weak soils (high plasticity clay) are present within the subsurface. It is recommended the replacement depth of high plasticity clay be determined during the detailed design phase, when the building size, type, and elevation of the foundation is known. If the foundation base is founded within 5 mBGS, a significant amount of high plasticity clay will be required to be removed. Depending on the building information, consolidation testing may be recommended during the detailed design phase to assist in the decision to determine the replacement depth of high plasticity clay below the foundation. The replacement depth should also be confirmed during construction with a geotechnical inspection from the geotechnical engineer of record.

5.2 Strip Footings

Strip footings can be used for lightly loaded structures for low rise housing building if founded on competent soils (compact silt) and where some settlement and/or differential settlement can be tolerated. The elevation of competent soil is expected to be at 665.5 m and below. Strip footings founded at a higher elevation may be possible if some ground improvements or soil replacement is completed at this site prior to placement of the strip footing. In all instances, strip footings should be founded at least below the seasonal frost depth. The minimum footing widths should be 600 mm for strip footings. Footings supporting heated structures should have a minimum soil cover of 1.5 m below the finished ground level to provide adequate protection against frost. For unheated structures, exterior and interior footings should be founded at a minimum depth of 2.5 m below the floor slab level or frost mitigation measures installed (such as insulation) to minimize potential of frost effects on footings.

The estimated ultimate bearing capacities for typical strip is provided in **Table 5-1** for footings founded on compact native silt compacted to 100% SPMD within $\pm 2\%$ of the OMC. For working stress design, a factor of safety of 3 should be applied to the ultimate bearing capacity. For ULS design, a resistance factor of 0.5 should be used on the ultimate bearing capacities to obtain the factored bearing capacity.

Table 5-1: Ultimate Bearing Capacities for 0.6 m Wide Strip Footing

Foundation Elevation (mASL)	Ultimate Bearing Capacity (kPa)	Factored Ultimate Bearing Capacity (kPa) ¹
665.5 – 655.9	400	200

¹Assumed Friction Angle ($\phi = 27^\circ$), groundwater assumed to be below footing base due to subsurface drainage. The above ultimate bearing capacity would be reduced by 50% if groundwater is present at the footing base.

The estimated total settlement for the foundations discussed in **Table 5-1** is expected to be less than 25 mm if the applied load does not exceed 125 kPa. More detailed settlement estimates should be established from a detailed investigation once the building size, foundation elevation, and building type are determined.

5.3 Raft Foundations

5.3.1 General

Raft foundation are feasible for moderately loaded structures such as a mid-rise housing building. If raft foundations are selected to construct the housing building, it is recommended that raft foundations be founded at an elevation of at least 665.5 m (5.3 mBGS) or below. Raft foundations may be designed using a factored ultimate bearing capacity and subgrade reaction modulus values summarized in **Table 5-2**.

Table 5-2: Bearing Capacity and Subgrade Reaction for Raft Foundations

Raft Foundation Base Elevation (m)	Ultimate Bearing Capacity (kPa)	Factored Ultimate Bearing Capacity (kPa) ¹	Subgrade Reaction Modulus (kN/m ³)
665.5 – 655.9	600	300	15,000

¹ A resistance factor of 0.5 is applied Ultimate Limits State design

For serviceability limits states design, the total settlement is expected to be less than 25 mm if the applied load does not exceed 150 kPa and subgrade preparation recommendations provided in this report are followed, with a minimum scarification depth of 150 mm. The total settlement of a raft foundation, if selected, should be determined during the detailed design phase when the building type, building size and foundation elevation are known. A major portion of the total settlement of the raft foundation will be due to the recompression of the base heave which would occur during the excavation. This settlement will mostly occur through loading during construction rather than long term settlement if founded at this depth, assuming the proposed housing building will have a basement and walls.

Differential settlements are typically 50% to 75% of the total settlement noted above if rafts are supported with relatively uniform subgrade soil. Differential settlements could be highly variable if the building structure is supported on more than one type of subgrade soils.

Rafts foundation slabs should be adequately reinforced to allow the structure to settle uniformly and maintain structural integrity. Flexible connections should be provided from the structure to all connected piping to accommodate differential settlements. It is anticipated that where pipe connections enter the building, additional settlement will occur due to the greater thickness of overlying backfill. It is recommended that fillcrete or lean mix concrete be placed beneath the piping within the trench zone at the entrance into the building excavation. A granular layer of 150 mm thick should be placed if silt is encountered below the raft base to obtain a stable base during construction.

5.3.2 Subgrade Protection

The base of the raft excavation should be thoroughly cleaned of all loosened or disturbed soil prior to pouring concrete. The prepared subgrade should be inspected by a qualified geotechnical engineer to confirm that the prepared subgrade is acceptable prior to pouring mud slab concrete. After completion of the inspection, a lean concrete pad (mud slab) about 75 mm to 100 mm thick is recommended to protect the bearing surface from disturbance during the time period between excavation completion and casting of the raft foundation. High plasticity clay, if encountered, has the potential to swell if left exposed to weather conditions. A mud slab is therefore highly recommended to protect the exposed subgrade from weather. If a satisfactory bearing surface cannot be attained, a 150 mm thick layer of well graded 20 mm minus crushed gravel should be placed and compacted to a minimum of 100% of SPMDD.

5.3.3 Subgrade Friction

Friction between the subgrade and raft foundation can be calculated as follows:

$$F = \sigma_v \tan (0.66 \phi')$$

Where:

F = Friction between base of building and subgrade
 σ_v = Applied vertical stress below the foundation base
 ϕ' = Internal friction angle (use 27° for silt)

5.3.4 Buoyant Uplift

Raft foundations may be prone uplift forces. Based on groundwater observations completed on April 13, 2021, the depth of the groundwater table was 10.8 mBGS (Elev. 660.0 m). However, it is possible that higher short-term water levels will be encountered after periods of increased precipitation. It is therefore recommended for a preliminary design groundwater level of 4 m above observed ground water levels of 6.8 mBGS (Elev. 664.0 m) be used. Further groundwater monitoring is required to confirm the depth of the groundwater on site during the detailed design phase.

The magnitude of hydrostatic uplift forces applied to below grade structures should be calculated, assuming that the groundwater table is at 6.8 mBGS (Elev. 664.0 m). The hydrostatic pressure may be calculated using the following equation:

$$P_w = \gamma_w H_w$$

Where:

P_w = Hydrostatic pressure (kPa)
 γ_w = Unit weight of water (9.8 kN/m³)
 H_w = Depth below top of water table (m)

Buoyancy forces should be determined using the following equation:

$$U = \gamma_w V_s$$

Where:

U = Hydrostatic uplift force (kN)
 γ_w = Unit weight of water (9.8 kN/m³)
 V_s = Volume of structure below the groundwater table (m³)

Buoyant uplift forces may be resisted by the mass of the structure, or by extending the base of the raft beyond the walls of the structure (assuming the housing building will have below grade basement walls), such that the mass of the soils above the projection are used to resist uplift forces.

If an extended base is considered, uplift resistance due to the weight of the soil above the raft foundation may be determined as follows:

$$R_{ss} = AWH\gamma'$$

Where

R_{ss} = Total allowable resistance due to weight of soil (kN)

A = Perimeter of walls (m)

W = Width of projected base slab beyond walls (m)

H = Height between top-of-slab and ground surface (m)

γ' = Submerged unit weight of soil (kN/m³)

Uplift resistance due to shearing through the soil may be assumed to have a triangular distribution as determined by the following equation:

$$R_s = (k_o\gamma'd\tan\phi')/FS$$

Where:

R_s = Allowable shearing resistance (kPa)

k_o = Coefficient of earth pressure at rest (0.5)

γ' = Submerged unit weight of soil (kN/m³)

d = Depth below final ground level (m)

ϕ' = Friction angle of backfill (assume 20° for cohesive fill and 30° for granular fill)

FS = Factor of Safety (minimum of 2.0)

5.4 Cast-in-Place (CIP) Concrete Piles

5.4.1 CIP Concrete Pile Design Parameters

Straight shaft drilled CIP concrete piles designed based only shaft friction or on a combination of shaft friction plus end bearing resistance is another foundation alternative considered suitable for the proposed housing building if a high-rise structure will be constructed. The use of casing may be required for cast-in-place concrete piles due to presence of water bearing sand and silt overlying the sandstone.

The ultimate capacity of straight shaft CIP concrete piles may be determined from the following equation:

$$Q_u = q_s P_s L + q_t A_t$$

Where:

Q_u = ultimate capacity of the pile (kN)

q_s = ultimate skin friction between the pile and soil (kPa)

q_t = ultimate end bearing (kPa)

P_s = perimeter of the pile section (m)

= $\pi \times d$, where π is 3.14 and d is the diameter of the pile in metres

L = effective pile embedment length (accounting for depth of frost, height of fill, etc.)

A_t = cross sectional area of the pile (m²)

= $\pi d^2/4$, where π is 3.14 and d is the diameter of the pile

For limit states design, a resistance factor of 0.4 should be applied on the ultimate pile load capacity to obtain the factored pile load capacity. For working stress design, a factor of safety of 2 and 3 should be applied on ultimate skin friction and ultimate end bearing, respectively, to obtain allowable skin friction and allowable end bearing.

The axial capacity of CIP piles may be determined using parameters provided in **Table 5-3** and the above equation.

Table 5-3: Ultimate Design Parameters for CIP Concrete Piles

Elevation (m)	Soil Type	Ultimate Skin Friction (kPa) ¹
670.8 – 668.3	Clay (within Frost Depth)	-
668.3 – 665.0	Clay, Clay Till	30
665.0 – 659.1	Silt/Sand	50
659.1 – 655.9	Sandstone	100

¹A resistance factor of 0.4 should be applied to determine the factored ultimate skin friction in compression for limit states

The pile design parameters in **Table 5-3** are considered applicable for downward (compressive) static loads. All piles should have a minimum diameter of 400 mm.

End bearing piles may be founded a minimum 1.5 m within the sandstone (below a depth of 11.6 m). The ultimate bearing pressure at this depth can be taken as 1500 kPa. For Ultimate Limit States (ULS) design, a resistance factor of 0.4 should be applied to the ultimate bearing pressure to obtain the factored end bearing pressure. The design may consider end bearing in addition to shaft friction as provided above in order to determine the total pile capacity.

5.4.2 CIP Concrete Pile Design and Construction Recommendations

The subsurface stratigraphy at the site generally consists of clay overlying clay till, overlying sand and silt, underlain by sandstone at an approximate elevation of 659 m. The groundwater was recorded at 660.0 m; however, the water level is expected to fluctuate seasonally. The sand layers are expected to be saturated and slough into the pile installation holes. Due to some presence of wet and saturated sand and silt layers, sloughing of overburden soils should be expected in the pile installation hole; therefore, the contractor should be prepared to control seepage and sloughing and maintaining clean pile holes by using a full-length temporary casing. The casing should be properly seated on/into the sandstone at elevation 659 m to seal the pile hole and reduce seepage and sloughing. The overburden thickness at the pile locations may be variable; therefore, the contractor should have sufficient length of casing available on site.

The following recommendations should be considered when designing and constructing the CIP concrete piles:

- Skin friction should be neglected within either the zone of seasonal frost penetration to account for the effects of soil desiccation and frost heave or the depth of fill if present, whichever is greater. (Fill may have been placed at this site during demolition of the previous structure).
- Piles should be founded at a sufficient depth to resist uplift pressures due to frost. An uplift adfreeze pressure of 65 kPa for fine grained soils frozen to concrete should be considered for the maximum frost penetration depth of 2.5 m. The minimum embedment depth to resist uplift due to frost will be a function of the pile shape, pile size and the applied dead load on the pile. For example, ignoring the effects of self-weight of the pile and applied dead load on the pile, a 400 mm diameter CIP concrete pile will require installation to approximately 6 mBGS to adequately resist uplift pressures due to frost.
- Shaft resistance of CIP concrete piles should be designed using the parameters provided in **Table 5-3**.
- A minimum pile spacing of 3 times the shaft diameter is recommended for straight shaft piles.
- Piles within three shaft diameters should not be drilled or poured consecutively within the same 48-hour period to allow the concrete in the adjacent piles to set.
- The contractor should be prepared to control seepage and sloughing and maintain clean pile holes. Temporary steel casing may be required to prevent excessive seepage and sloughing into the pile holes during excavation and pouring of concrete. Based on observations provided on the testhole logs, silt and sand lenses and corresponding seepage may be encountered at any depth. The contractor should bring enough casing to case the entire pile hole should the need arise.
- The contractor should evaluate means and methods to install/extract casing.

- The foundation contract should have provisions for lengthening the pile, casing, and steel cage if required due to site subsurface conditions.
- End bearing of CIP piles may only be considered if bases can be thoroughly cleaned of all loosened material and dewatered prior to pouring concrete. The base should be inspected by qualified personnel. End bearing will not be applicable if pile bases are not properly cleaned and inspected prior to placement of concrete.
- To avoid segregation of the concrete, a tremie tube should be used when placing concrete. The tremie tube should be watertight, and the outlet of the tremie tube should be at least 1 m below the concrete surface during pouring.
- Concrete should be poured immediately after drilling of the pile hole to reduce the risk of groundwater seepage and soil sloughing.
- Monitoring of the pile installation by qualified personnel is recommended to verify that the piles are installed in accordance with design assumptions. Inspection should be carried out before casting the pile.
- The presence of cobbles and boulders and boulder could impede the installation of drilled CIP piles. Cobbles and boulders were not encountered during this geotechnical investigation. However, the native clay till in Edmonton, AB is noted to occasionally contain cobbles and boulders. Hard drilling may be expected if cobbles and boulders are encountered and may require rock coring or chiselling with alternative heavy construction equipment.

5.4.3 Pile Caps

Pile caps and grade beams are usually required to transfer the loads onto the tops of the piles. If the bases of the pile caps and grade beams are located within the frost penetration depth, precautions should be taken to prevent heaving of the pile cap due to frost. The recommended construction procedure for reducing heave effect under the pile cap involves placement of crushable non-degradable void filler (such as Beaver Plastic Frost Cushion or equivalent) of at least 150 mm in thickness under the pile cap. The pile should be designed to withstand the upward heave forces equal to the crushing strength of the void form.

The void form is not required if pile caps and grade beams are located with a minimum soil cover of 1.5 m along the exterior perimeter of heated buildings for protection against frost heave.

5.4.4 Lateral Loading

Vertical piles will be subjected to horizontal loads in addition to vertical loads; their lateral capacity should be checked by a proper analysis (i.e. L-Pile Analysis). Short term lateral loads may be imposed by construction, by seismic forces or by wind. Long term forces may be those acting on supports of an above ground conveyance structure at bends and intermediate supports.

Design of laterally loaded piles is generally governed by Serviceability Limit States limiting the top of pile movement to within tolerable limits.

Lateral load capacity of piles will depend upon the pile stiffness and geotechnical engineering properties of the native soil or fill material within the upper few metres of the pile. Lateral pile capacity can be determined using commercially available software such as L-Pile. The analysis using this software provides estimates of the lateral displacements, bending moments, shear forces and soil reaction along the depth of the piles, and it requires input pertaining to soil properties, pile properties, and applied loads on the pile.

Lateral pile capacity can also be calculated in structural analysis using horizontal subgrade modulus to determine spring constants along the depth of the soil. This assumes a linear relationship between load and displacement. The soil response is modelled by linear springs represented by the horizontal subgrade modulus (k_s). The subgrade reaction modulus for lateral pile deflections should only be used when the expected pile deflection is less than 1% of the pile diameter, as recommended by the Canadian Foundation Engineering Manual (4th Edition). P (Static Soil Reaction) – Y (Pile Deflection) method may be

used if larger deflections are expected for lateral static, cyclic or even transient loads. This section includes lateral pile capacities using the subgrade reaction method only.

If lateral deflections are the limiting factor in the overall pile design, it is recommended to conduct full-scale lateral pile load tests to verify the horizontal subgrade modulus value for this site.

For cohesive soils (clay and clay till) k_s can be estimated using the following equation:

$$k_s = 67 S_u / D$$

Where:

S_u = undrained shear strength of the soil (kN/m^2); and
D = pile diameter (m)

The undrained shear strengths to be used in determining the horizontal subgrade modulus (k_s) were estimated based on field SPT test results and are summarized in **Table 5-4**.

Table 5-4: Undrained Shear Strength of Soil Units

Soil Type	Elevation (m)	Undrained Shear Strength, S_u (kPa)
Clay/Clay Till	670.8 – 668.3	15 to 40
Silt/Silt and Sand	668.3 – 665.0	-

For cohesionless soils (sand, silt, and sand and gravel), k_s can be estimated using the following equation:

$$k_s = n_h z/d \text{ (MN/m}^3\text{)}$$

where:

z = Pile embedment depth (m)
d = Pile diameter (m)

The values for the factor n_h for cohesionless soils are summarized in the table below.

Table 5-5: Values of n_h for Cohesionless Soils

Soil Condition	$n_h \text{ (MN/m}^3\text{)}$	
	Above Groundwater Table	Below Groundwater Table
Loose	2.5	1.5
Compact	7.0	4.5
Dense	18.0	11.0

¹ Values excerpted from Evaluation of Coefficient of Subgrade Reaction (Terzaghi, 1955).

Calculations for the coefficient of horizontal subgrade reaction along the length of the pile, used in determining lateral pile deformations will likely only include the cohesionless soil parameters described above.

5.4.5 Tension Loading

The piles will be subject to uplift forces due to frost heave, tensile forces due to lateral loading, overturning movements due to wind, etc. The piles should be designed to resist these uplift forces. The resistance to uplift will be provided by pile self-weight, applied dead loads, and uplift skin resistance. Factors such as seasonal frost depth, heating and insulation, and soil type should be taken into account while designing the pile against uplift.

The resistance to uplift may be calculated using ultimate skin friction parameters provided in **Table 5-3** of this report. A resistance factor of 0.3 should be applied on ultimate parameters to obtain factored uplift parameters. This resistance factor is in accordance with the CFEM (2006).

5.4.6 Frost design considerations for Cast-in-Place Piles

All foundations are expected to be for a heated structure. For piles that are placed outside the area of a heated building, some precautions should be taken to avoid frost heaving and frost jacking of piles. Frost heave on the underside of pile caps/grade beams and adhesion freezing forces (adfreeze) along the pile shaft and sides of pile caps/grade beams within the seasonal frost zone should be considered in pile design if founded within the frost depth. The proposed housing building will likely include a heated basement or below grade parkade. CIP piles will therefore likely be installed below the seasonal frost penetration depth. Assuming a pile length of at least 6 m and pile diameter of 400 mm, adhesion freezing forces (adfreeze) may be neglected. However, this should be determined once the details of the housing building are known, such as the depth of the basement.

5.5 Grade Supported Floor Slab

If a grade supported floor slab is to be considered, recommendations for subgrade preparation have been provided in **Section 4.2**. The recommended subgrade preparation and the possible placement of low to medium plasticity engineered clay fill may still result in floor movements of approximately 15 to 25 mm or greater, depending on the depth and quality of fill placement and compaction. Using granular fill can reduce the floor movements. The use of high plasticity clay soil as engineered fill within the buildings is not recommended due to potential of swelling with increasing moisture content.

The above noted movements are typically gradual but can often result in floor cracking or distortion with time. This movement can be reduced by placement of low to medium plasticity clay fill or granular fill to provide more uniform subgrade condition and reduce the risk of slab differential movement.

The near surface clay subgrade possesses a high potential for volume change if allowed to remain in contact with water for extended periods of time. Measures should be taken to ensure water is not allowed to pond on the subgrade during and after construction as detrimental swelling may occur. It is also recommended that the exposed subgrade is not allowed to dry out during construction prior to slab placement.

Slab-on-grade floors should rest on at least 300 mm thick of compacted structural fill as specified in **Section 4.6**. The structural fill should be compacted to 98% of SPMDD and placed in lifts not exceeding 150 mm in compacted thickness. For the structural design purposes the compacted structural fill and clay soils underneath a subgrade modulus of 20 MPa/m can be used.

The floor slab should be reinforced along with proper joints to be provided to prevent shrinkage cracks.

If possible, water lines should not be placed beneath slab-on-grade floors. Wastewater lines should be of rigid plastic with cemented joints. Wastewater lines with butt joints and flexible rubber connections should not be permitted.

Non-load bearing partitions resting on slab-on-grade floors should be designed such that floor movements can be accommodated. An allowance of 15 mm to 30 mm should be considered for the swelling potential of the underlying clay soils. For interior walls that do not have some flexibility, consideration should be given to supporting these walls on independent foundations.

5.6 Lateral Earth Pressures

Buried structures resisting lateral earth pressures such as foundation walls and below grade elements should be designed to resist lateral earth pressures in at-rest conditions. The earth pressure acting on below grade structures depends on many factors including the structure stiffness, the construction methodology, the extent and direction of any movement of the soil, the nature and extent of backfill, and the groundwater conditions. For rigid walls such as foundation walls, the at-rest earth pressure coefficient (K_0) should be used.

The lateral earth pressure can be calculated using the following equation:

$$P = K (\gamma' H + q) + \gamma_w H_w$$

Where:

- P = lateral earth pressure (kPa);
- K_o = at rest coefficient of earth pressure using K_o from **Table 5-6**;
- γ = bulk unit weight of backfill free draining gravel (21 kN/m³);
- H = depth below final design grade (m);
- q = any surcharge pressure at ground level (kPa);
- γ' = effective unit weight of backfill soil below groundwater level (11.2 kN/m³);
- H_w = height of groundwater above the foundation base to top of wall (m); and,
- γ_w = unit weight of water (9.81 kN/m³)

Compaction of backfill material behind walls should be done in a controlled manner to avoid higher earth pressures against the sides of the foundation wall. A minimum surcharge of 12 kPa should be included in the design to account for compaction induced pressures.

Where traffic or other live loads may operate near the rigid wall, the horizontal pressure due to the live load should be superimposed on the static earth pressures.

The equation above assumes the use of native or imported granular fill compacted to approximately 95% of SPMDD and horizontal ground behind the buried wall. If the ground surface slopes away from the wall, design coefficient of at rest earth pressure should be re-evaluated.

The parameters required for calculation of the lateral earth pressure assuming horizontal ground surface behind the wall are summarized in **Table 5-6**.

Table 5-6: Lateral Earth Pressure Coefficients for the Foundation Walls

Backfill Type	γ (kN/m ³)	Friction Angle, Φ	Coefficient of at-rest Earth Pressure, K_o
General Engineered Fill (Low to Medium plasticity clay)	18	25	0.577
Structural Fill	21	34	0.441
Clay/Clay Till (Low to Medium Plasticity)	18	25	0.577
Clay/Clay Till (High Plasticity)	18	21	0.642
Silt	19	30	0.500
Sand and Silt	19	30	0.500

5.7 Subsurface Drainage

If foundations are founded below the groundwater table, placement of a sub-drain (weeping tile system) below the base of foundation will be required to provide drainage and reduce potential adfreeze forces. The design groundwater level should be taken as 6.8 mBGS (Elev. 664.0 m). The design water level should be confirmed during the detailed design phase with additional groundwater readings over several different seasons. The drainage system must maintain the groundwater level at or below the base of the foundation.

Permanent structures founded below the groundwater table should either be designed to resist the potential hydraulic uplift pressures, or alternatively should have a subsurface drainage system below the foundation or around the perimeter walls to drain water away from the foundations.

A higher groundwater table would be expected during spring and upon melting of snow. A subsurface drainage system may be provided to prevent buildup of hydrostatic uplift pressures on the base of the foundation during periods of high groundwater. The recommended approach for permanent subsurface drainage where required is to provide a gravel drainage layer around the perimeter walls and below the base of foundation to collect water. The subgrade should be sloped to drain subsurface water towards permanent drains and sumps. The collected water should be directed to the site drainage system or to a sump for collection and discharge. A minimum thickness of between 300 mm and 1000 mm of free draining gravel with less than 5% passing sieve No. 200 should be used under the base of foundations and behind the walls, respectively. It is recommended that a non-woven geotextile be placed directly over the prepared subgrade and at the interface around perimeter wall drainage layer to provide separation between the subgrade and drainage gravel layer and to prevent clogging of the gravel. It is recommended that further monitoring of groundwater levels to be carried out after completion of the site grading works to measure the depth of groundwater below the finished grade.

5.8 Sulphate Attack and Corrosion

The potential for sulphate attack on concrete in contact with subsurface soils or groundwater at this site was rated as low (**Table 3-6**) at this site. It is highly recommended additional sulphate testing be completed on imported fill used for construction at this site. While the potential for sulphate attack at this site was rated as low, all concrete in contact with soil at this site should be designed for an exposure class of S-3, as presented in **Table 5-7** to account for potential soil variability.

Table 5-7: Requirements for Concrete Subjected to Sulphate Attack

Class of Exposure	Degree of Exposure	Water-Soluble Sulphate (SO ₄) in Soil Sample, %	Sulphate (SO ₄) in Groundwater Samples, mg/L	Minimum Specified Compressive Strength, MPa	Maximum Water / Cementing Materials Ratio	Cementing Materials to be Used	Air Content Category
S-1	Very Severe	Over 2.0	Over 10,000	35 at 56 days	0.40	HS, HSb, HSLb or HSe	1 or 2
S-2	Severe	0.20 – 2.0	1,500 – 10,000	32 at 56 days	0.45	HS, HSb, HSLb or HSe	1 or 2
S-3	Moderate	0.10 – 0.20	150 – 1,500	30 at 56 days	0.50	MS, MSb, MSe, MSLb, LH, LHb, HS, HSb, HSLb, HSe	1 or 2

The recommendations stated above for the subsurface concrete may require further addition and/or modifications due to structural, durability, service life, or other considerations which are beyond the geotechnical scope.

Measured resistivity value of the soil was 1550 ohm-cm and 1640 ohm-cm as shown in **Table 3-6**, which indicates the subsurface soil is expected to be extremely corrosive to highly corrosive. It is therefore recommended that all metals, if any, in contact with subsurface soils should be designed for a corrosive environment.

5.9 Radon Gas Mitigation Recommendations

The National Building Code (2019 Alberta Edition) has requirements for Radon gas control for newly constructed buildings. Radon gas is a radioactive gas that originates from the ground surface and poses several health risks to humans if exposed to it in high concentrations. Radon gas may travel through bedrock, soil, and groundwater.

Radon gas emission from the surface is very common throughout various regions of Canada but is especially common in Alberta. The City of Edmonton is located in an area with a high hazard rating for

Radon gas potential. It is therefore highly recommended that the recommendations from this report and the National Building Code be followed to limit the amount of Radon gas that is able to enter the proposed Garneau Housing buildings and other buildings in the project area.

Radon gas may enter buildings by various routes, but primarily enters buildings through the foundations or floor slabs of a building. In particular, Radon gas may enter through openings or cracks in the foundations, conduits or pipes, sumps, or through windows and doors. The following requirements were outlined in the building code to reduce the amount of Radon gas entering the building foundations:

- A Polyethylene soil gas barrier is required under the slab between the ground and the building
- The Slab perimeter must be sealed to the walls
- All penetrations through the slab must be sealed
- Granular fill and perforated pipes are required underneath the slab of the building
- A rough-in for Radon extraction to either performance or prescriptive requirements must be installed

For radon gas collection systems located below floor slabs (non-grade supported), it is recommended that the radon gas collection be surrounded by at least 100 mm thick washed gravel, as specified in **Table 5-8**.

Table 5-8: Recommended Gradation for Radon Gas Collection (City of Edmonton, Complete Streets Design and Construction Standards, Aggregate Designation 6, Class 20)

Metric Sieve (mm)	Percentage Passing by Mass
20	100
14	90 to 100
10	45 to 75
5.0	0 to 15
2.5	0 to 5

It is also recommended that a non-woven geotextile filter fabric be placed at the interface between the granular fill and the subgrade to prevent migration of fines within the granular fill.

The above gravel is not intended for structural fill or to be used as a levelling course base for floor slabs. In situations where slab on grade or grade supported floor slabs are used, the structural and building designer will need to design the radon gas collection system to prevent loadings being placed directly on the radon collection system.

5.10 Surface Site Drainage

The final site grade should be properly graded to direct water away from the building and building foundations. A minimum grade of between 2% and 3% should be maintained around the building structure. Ponding of water near building foundations may result in subgrade softening and instability/failure of the overlying structure. Additionally, excess moisture near the building may result in frost heave.

6. Pavement Recommendations

The Garneau Housing project may include light-duty and heavy-duty pavement structures. At the time of writing this report, the preferred pavement structure type and anticipated traffic loading has not yet been known. This section includes recommendations for a light-duty and a heavy-duty pavement structure.

6.1 Subgrade Preparation – Pavement Area

Subgrade preparation at this site is recommended prior to placement of gravel and asphalt pavement. Subgrade preparation should consist of stripping all organic material, uncontrolled fill, and frozen subgrade from the existing grade to expose a competent unfrozen bearing stratum. Other soft, excessively moist, or deleterious materials should be removed as well. The near surface soil encountered during the investigation includes topsoil, clay fill and high plasticity clay. Compaction records of the clay fill were not made available to AECOM, therefore is considered to be uncontrolled. Additionally, the presence of organics, brick, wood debris and potential hydrocarbon staining within the clay fill indicate that the clay fill is not a suitable bearing stratum. The high plasticity clay is poor for use as a pavement structures bearing stratum, as these soils have the potential to swell and are typically more frost susceptible.

Following the stripping of the surficial topsoil and clay fill at this site, an additional 150 mm of the existing high plasticity clay should be removed and replaced with medium to low plasticity clay fill. Prior to placement of low to medium plasticity clay fill, the exposed sub-grade at the bottom of the replacement should be moisture conditioned to within $\pm 2\%$ of the OMC and compacted to 98% of the SPMDD. The final subgrade should be proof-rolled to identify any loose or soft areas. Soft areas should be over-excavated and backfilled with low to medium plastic clay fill and compacted to 98% SPMDD and within $\pm 2\%$ of the OMC, or as recommended by the City of Edmonton design and constructions standards.

6.2 Fill Placement, Compaction, and Grading

If fills are used to establish site grading, these fills should consist of low to medium plasticity clay or well-graded, granular soils. The fill for the proposed pavement should be compacted to 98% of the SPMDD and within $\pm 2\%$ of the OMC. Fills should be free of organics, deleterious and frozen materials. Granular fill for the base course should be compacted to 100% of SPMDD at the 0 to 3 percent of OMC. A layer of non-woven geotextile fabric is recommended between granular fill and the existing clay soil to prevent migration of fines from traffic that may cause pumping of the clay subgrade. Placement of the fill should not be completed during winter months. The final subgrade should be crowned or sloped to promote positive drainage.

6.3 Pavement Structure Design

The preliminary pavement design provided in this report was based methodology from the Alberta Transportation Pavement Design Manual (1997), which is based on design information from the American Association of State Highway and Transportation Officials (AASHTO). The pavement design parameters were obtained from the CoE Complete Streets Design and Construction Standards and Alberta Transportation Pavement Manual. The primary design parameters used for the pavement structure design include the Equivalent Single Axle Loading (ESAL) value and subgrade modulus (M_R). Site specific data like EASLs will need to be re-evaluated by AECOM when this information is made available to confirm the optimum pavement structure.

Traffic loading for light-duty and heavy-duty pavement design in this report was obtained from **Table 1.2.5** of the City of Edmonton Complete Streets design and Construction Standards. The light-duty traffic loading was assumed as a Residential Minor Collector roadway truck route with no bus. The heavy-duty traffic loading was assumed as a Residential Major connector with Truck and Bus Route from.

A summary of the pavement design parameters for heavy and light duty pavement structures are provided in **Table 6-1** and **Table 6-2** below respectively.

Table 6-1: Light Duty Pavement Design Parameters

Parameters	Design Values	Remarks
Subgrade Modulus (M_R)	30 MPa	Value estimated based on subgrade conditions. The City of Edmonton 2018, Complete Streets Design and Construction Standards, Table 1.2.1 recommended subgrade modulus of 30 MPa for CI and CH soils.
Traffic Loading	1.8×10^5 ESALs	Estimated using CoE Complete Street Design and Construction Standards Table 1.2.5
Design Life	20 years	From Alberta Transportation Pavement Design Manual
Reliability	85%	From CoE Complete Street Design and Construction Standards
Initial Serviceability	4.2	From Alberta Transportation Pavement Design Manual
Terminal Serviceability	2.5	From Alberta Transportation Pavement Design Manual
Standard Deviation	0.45	From Alberta Transportation Pavement Design Manual
Structural Number	80 mm	Minimum Required Structural Number

Table 6-2: Heavy Duty Pavement Design Parameters

Parameters	Design Values	Remarks
Subgrade Modulus (M_R)	30 MPa	Value estimated based on subgrade conditions. The City of Edmonton 2018, Complete Streets Design and Construction Standards, Table 1.2.1 recommended subgrade modulus of 30 MPa for CI and CH soils.
Traffic Loading	3.6×10^5 ESALs	Estimated using CoE Complete Street Design and Construction Standards Table 1.2.5
Design Life	20 years	From Alberta Transportation Pavement Design Manual
Reliability	85%	From CoE Complete Street Design and Construction Standards
Initial Serviceability	4.2	From Alberta Transportation Pavement Design Manual
Terminal Serviceability	2.5	From Alberta Transportation Pavement Design Manual
Standard Deviation	0.45	From Alberta Transportation Pavement Design Manual
Structural Number	87 mm	Minimum Required Structural Number

Due to presence of firm high plasticity clay at this site near the surface, resilient subgrade modulus of 30 MPa was selected for the design of the light and heavy-duty pavement structure.

The result of this geotechnical investigation indicates that the ground conditions are suitable for the light-duty and heavy-duty pavement structures provided proper subgrade preparation is undertaken. **Table 6-3** and **Table 6-4** below summarize the recommended pavement structures for light-duty and heavy-duty pavement structures respectively.

Table 6-3: Light-Duty Pavement Structure

Description	Pavement Structure Material	Pavement Structure Thickness (mm)	Remarks
Light-Duty Pavement Structure	Asphalt Concrete Pavement	100	20 mm-B Asphalt should be placed in two layers. The first layer should be 60 mm and compacted to 94% of Maximum Theoretical Density (MTD) followed by placement of 10mm-LT of 40 mm compacted to 94% of MTD (CoE Complete Streets Design and Construction Standards).
	Crushed Granular Base Course over Non-woven geotextile	300	Designation 3, Class 20 granular material compacted to 100% of SPMDD within $\pm 3\%$ of OMC.
	Prepared Subgrade	150	Refer to Section 6.1 for Subgrade Preparation. If the existing exposed subgrade cannot be compacted to 98% of SPMDD, additional subgrade preparation may be required.
Total Pavement Structure above prepared subgrade		400	

Table 6-4: Heavy-Duty Pavement Structure

Description	Pavement Structure Material	Pavement Structure Thickness (mm)	Remarks
Heavy-Duty Pavement Structure	Asphalt Concrete Pavement	100	20 mm-B Asphalt should be placed in two layers. The first layer should be 60 mm and compacted to 94% of Maximum Theoretical Density (MTD) followed by placement of 10 mm-LT 40 mm compacted to 94% of MTD (CoE Complete Streets Design and Construction Standards)
	Crushed Granular Base Course over Non-woven geotextile	335	Designation 3, Class 20 granular material compacted to 100% of SPMDD within $\pm 3\%$ of OMC
	Prepared Subgrade	150	Refer to Section 6.1 for Subgrade Preparation. If the existing exposed subgrade cannot be compacted to 98% of SPMDD, additional subgrade preparation may be required.
Total Pavement Structure above prepared subgrade		435	

The crushed granular base course should be Designation 3, Class 20 granular material in accordance with CoE Complete Streets Design and Construction Standards.

A non-woven filter fabric should be provided between the base of the granular fill and subgrade to prevent migration of fine materials into the granular fill.

7. Conclusion

The site is considered suitable for the proposed housing building provided that the geotechnical risks identified during this investigation are understood and recommendations in this report are followed. At the time of submission of this geotechnical report, the building type, building size, foundation type, and foundation elevations have not been yet known. Depending on the size of the building and the foundation depth, strip footings, a raft or deep foundations are likely the most suitable foundation type for this project. A detailed site investigation is recommended to confirm the bearing capacity and estimate the settlement of the selected foundation type. A detailed geotechnical investigation may also be an opportunity to confirm the site seismic classification of this site with a 30 mBGS testhole and seismic cone penetration test to measure the shear wave velocity profile versus depth. The detailed site investigation should be completed once the building details are confirmed.

Appendix A

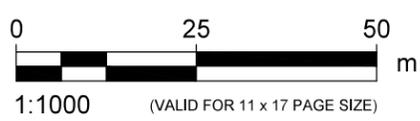
Testhole Location Plan

Last saved by: NGUYENB(2021-05-02) - Last Plotted: 2021-05-02
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Project Management Initials: Designer: Checked: Approved:
15-00-00-PP-0001.DWG



LEGEND:

- TESTHOLE LOCATION
- MONITORING WELL LOCATION
- LOT EXTENTS



Issue Status: FINAL

Garneau Housing
Preliminary Geotechnical Investigation
City of Edmonton
Project No.: 60655308 Date: 2021-05-05

TESTHOLE LOCATION PLAN

Appendix B

**General Statement; Normal Variability of Subsurface Conditions;
Explanation of Field and Laboratory Test Data;
Modified Unified Soil Classification System;
Testhole Logs**

AECOM Canada Ltd.**General Statement; Normal Variability Of Subsurface Conditions**

The scope of the investigation presented herein is limited to an investigation of the subsurface conditions as to suitability of the site for the proposed project. This report has been prepared to aid in the general evaluation of the site and to assist the design engineer in the conceptual design for the area. The description of the project presented in this report represents the understanding by the geotechnical engineer of the significant aspects of the project relevant to the design and construction of the subdivision, infrastructure and similar. In the event of any changes in the basic design or location of the structures, as outlined in this report or plan, AECOM should be given the opportunity to review the changes and to modify or reaffirm in writing the conclusions and recommendations of this report.

The analysis and recommendations represented in this report are based on the data obtained from the test holes drilled at the locations indicated on the site plans and from other information discussed herein. This report is based on the assumption that the subsurface conditions everywhere on the site are not significantly different from those encountered at the test locations. However, variations in soil conditions may exist between the test holes and, also, general groundwater levels and condition may fluctuate from time to time. The nature and extent of the variations may not become evident until construction. If subsurface conditions, different from those encountered in the test holes are observed or encountered during construction or appear to be present beneath or beyond the excavation, AECOM should be advised at once so that the conditions can be observed and reviewed and the recommendations reconsidered where necessary.

Since it is possible for conditions to vary from those identified at the test locations and from those assumed in the analysis and preparation of recommendations, a contingency fund should be included in the construction budget to allow for the possibility of variations which may result in modifications of the design and construction procedures.

EXPLANATION OF FIELD & LABORATORY TEST DATA

The field and laboratory test results, as shown for each hole, are described below.

1. NATURAL MOISTURE CONTENT

The relationship between the natural moisture content and depth is significant in determining the subsurface moisture conditions. The Atterberg Limits for a sample should be compared to its natural moisture content and plotted on the Plasticity Chart in order to determine the soil classification.

2. SOIL PROFILE AND DESCRIPTION

Each soil stratum is classified and described noting any special conditions. The Modified Unified Classification System (MUCS) is used. The soil profile refers to the existing ground level at the time the hole was done. Where available, the ground elevation is shown. The soil symbols used are shown in detail on the soil classification chart.

3. TESTS ON SOIL SAMPLES

Laboratory and field tests are identified by the following and are on the logs:

- N - Standard Penetration Test (SPT) Blow Count. The SPT is conducted in the field to assess the in-situ consistency of cohesive soils and the relative density of non-cohesive soils. The N value recorded is the number of blows from a 63.5 kg hammer dropped 760 mm which is required to drive a 51 mm split spoon sampler 300 mm into the soil.
- SO₄ - Water Soluble Sulphate Content. Expressed in percent. Conducted primarily to determine requirements for the use of sulphate resistant cement. Further details on the water-soluble sulphate content are given in Section 6.
- γ_D - Dry Unit Weight. Usually expressed in kN/m³.
- γ_T - Total Unit Weight. Usually expressed in kN/m³.
- Q_U - Unconfined Compressive Strength. Usually expressed in kPa and may be used in determining allowable bearing capacity of the soil.

- C_u - Undrained Shear Strength. Usually expressed in kPa. This value is determined by either a direct shear test or by an unconfined compression test and may also be used in determining the allowable bearing capacity of the soil.
- C_{PEN} - Pocket Penetrometer Reading. Usually expressed in kPa. Estimate of the undrained shear strength as determined by a pocket penetrometer.

The following tests may also be performed on selected soil samples and the results are given on separate sheets enclosed with the logs:

- Grain Size Analysis
- Standard or Modified Proctor Compaction Test
- California Bearing Ratio Test
- Direct Shear Test
- Permeability Test
- Consolidation Test
- Triaxial Test

4. SOIL DENSITY AND CONSISTENCY

The SPT test described above may be used to estimate the consistency of cohesive soils and the density of cohesionless soils. These approximate relationships are summarized in the following tables:

Table 1 Cohesive Soils

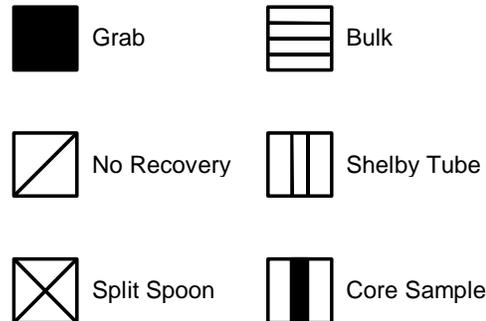
N	Consistency	C _u (kPa) approx.
0 - 1	Very Soft	<10
1 - 4	Soft	10 - 25
4 - 8	Firm	25 - 50
8 - 15	Stiff	50 - 100
15 - 30	Very Stiff	100 - 200
30 - 60	Hard	200 - 300
>60	Very Hard	>300

Table 2 Cohesionless Soils

N	Density
0 - 5	Very Loose
5 - 10	Loose
10 - 30	Compact
30 - 50	Dense
>50	Very Dense

5. SAMPLE CONDITION AND TYPE

The depth, type, and condition of samples are indicated on the logs by the following symbols:



6. WATER SOLUBLE SULPHATE CONCENTRATION

The following table, from CSA Standard A23.1-14, indicates the requirements for concrete subjected to sulphate attack based upon the percentage of water-soluble sulphate as presented on the logs. CSA Standard A23.1-14 should be read in conjunction with the table.

Table 3 Requirements for Concrete Subjected to Sulphate Attack*

Class of exposure	Degree of exposure	Water-soluble sulphate (SO ₄) [†] in soil sample, %	Sulphate (SO ₄) in groundwater samples, mg/L [‡]	Water soluble sulphate (SO ₄) in recycled aggregate sample, %	Cementing materials to be used ^{§††}	Performance requirements ^{§,§§}		
						Maximum expansion when tested using CSA A3004-C8 Procedure A at 23 °C, %		Maximum expansion when tested using CSA A3004-C8 Procedure B at 5 °C, % ^{†††}
						At 6 months	At 12 months ^{††}	At 18 months ^{‡‡}
S-1	Very severe	> 2.0	> 10 000	> 2.0	HS ^{**} , HSb, HSLb ^{***} or HSe	0.05	0.10	0.10
S-2	Severe	0.20–2.0	1500–10 000	0.60–2.0	HS ^{**} , HSb, HSLb ^{***} or HSe	0.05	0.10	0.10
S-3	Moderate (including seawater exposure*)	0.10–0.20	150–1500	0.20–0.60	MS, MSb, MSe, MSLb ^{***} , LH, LHb, HS ^{**} , HSb, HSLb ^{***} or HSe	0.10		0.10

*For sea water exposure, also see Clause 4.1.1.5.

[†]In accordance with CSA A23.2-3B.

[‡]In accordance with CSA A23.2-2B.

[§]Where combinations of supplementary cementing materials and portland or blended hydraulic cements are to be used in the concrete mix design instead of the cementing materials listed, and provided they meet the performance requirements demonstrating equivalent performance against sulphate exposure, they shall be designated as MS equivalent (MSe) or HS equivalent (HSe) in the relevant sulphate exposures (see Clauses 4.1.1.6.2, 4.2.1.1, and 4.2.1.3, and 4.2.1.4).

^{**}Type HS cement shall not be used in reinforced concrete exposed to both chlorides and sulphates, including seawater. See Clause 4.1.1.6.3.

^{††}The requirement for testing at 5 °C does not apply to MS, HS, MSb, HSb, and MSe and HSe combinations made without portland limestone cement.

^{‡‡} If the increase in expansion between 12 and 18 months exceeds 0.03%, the sulphate expansion at 24 months shall not exceed 0.10% in order for the cement to be deemed to have passed the sulphate resistance requirement.

^{§§}For demonstrating equivalent performance, use the testing frequency in Table 1 of CSA A3004-A1 and see the applicable notes to Table A3 in A3001 with regard to re-establishing compliance if the composition of the cementing materials used to establish compliance changes.

***Where MSLb or HSLb cements are proposed for use, or where MSe or HSe combinations include Portland-limestone cement, they must also contain a minimum of 25% Type F fly ash or 40% slag or 15% metakaolin (meeting Type N pozzolan requirements) or a combination of 5% Type SF silica fume with 25% slag or a combination of 5% Type SF silica fume with 20% Type F fly ash. For some proposed MSLb, HSLb, and MSe or HSe combinations that include Portland-limestone cement, higher SCM replacement levels may be required to meet the A3004-C8 Procedure B expansion limits. Due to the 18-month test period, SCM replacements higher than the identified minimum levels should also be tested. In addition, sulphate resistance testing shall be run on MSLb and HSLb cement and MSe or HSe combinations that include Portland-limestone cement at both 23 °C and 5 °C as specified in the table.

†††If the expansion is greater than 0.05% at 6 months but less than 0.10% at 1 year, the cementing materials combination under test shall be considered to have passed.

7. SOIL CORROSIVITY

The following table, from the Handbook of Corrosion Engineering (Roberge, 1999) indicates the corrosivity rating can be obtained from the soil resistivity, presented on the logs.

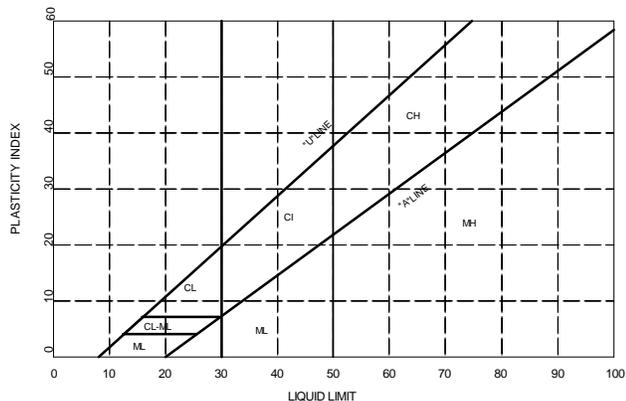
Table 4 Corrosivity Ratings Based on Soil Resistivity

Soil Resistivity (ohm-cm)	Corrosivity Rating
>20,000	Essentially non-corrosive
10,000 – 20,000	Mildly corrosive
5,000 – 10,000	Moderately corrosive
3,000 – 5,000	Corrosive
1,000 – 3,000	Highly corrosive
<1,000	Extremely corrosive

8. GROUNDWATER TABLE

The groundwater table is indicated by the equilibrium level of water in a standpipe installed in a testhole or test pit. This level is generally taken at least 24 hours after installation of the standpipe. The groundwater level is subject to seasonal variations and is usually highest in the spring. The symbol on the logs indicating the groundwater level is an inverted solid triangle (▼).

MAJOR DIVISION		LOG SYMBOLS	UCS	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA			
COARSE GRAINED SOILS	GRAVELS (MORE THAN HALF COARSE GRAINS LARGER THAN 4.75 mm)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, LITTLE OR NO FINES	$C_u \cdot \frac{D_{60}}{D_{10}} > 4$ $C_c - \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1$ to 3			
			GP	POORLY GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS			
		GRAVELS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% ATTEBERG LIMITS BELOW 'A' LINE W_p LESS THAN 4			
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	ATTEBERG LIMITS ABOVE 'A' LINE W_p MORE THAN 7			
	SANDS (MORE THAN HALF COARSE GRAINS SMALLER THAN 4.75 mm)	CLEAN SANDS (LITTLE R NO FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u \cdot \frac{D_{60}}{D_{10}} > 6$ $C_c - \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1$ to 3			
			SP	POORLY GRADED SANDS, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS			
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% ATTEBERG LIMITS BELOW 'A' LINE W_p LESS THAN 4			
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	ATTEBERG LIMITS ABOVE 'A' LINE W_p MORE THAN 7			
			FINE GRAINED SOILS	SILTS (BELOW 'A' LINE NEGLIGIBLE ORGANIC CONTENT)	$W_L < 50$	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW) WHENEVER THE NATURE OF THE FINE CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER 'F'. E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY
					$W_L > 50$	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS	
CLAYS (ABOVE 'A' LINE NEGLIGIBLE ORGANIC CONTENT)	$W_L < 30$	CL		INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS				
	$30 < W_L < 50$	CI		INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS				
	$W_L > 50$	CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS				
ORGANIC SILTS & CLAYS (BELOW 'A' LINE)	$W_L < 50$	OL		ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY				
	$W_L > 50$	OH	ORGANIC CLAYS OF HIGH PLASTICITY					
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOUR OR ODOUR, AND OFTEN FIBROUS TEXTURE			
BEDROCK			BR	SEE REPORT DESCRIPTION				
FILL			FILL	SEE REPORT DESCRIPTION				

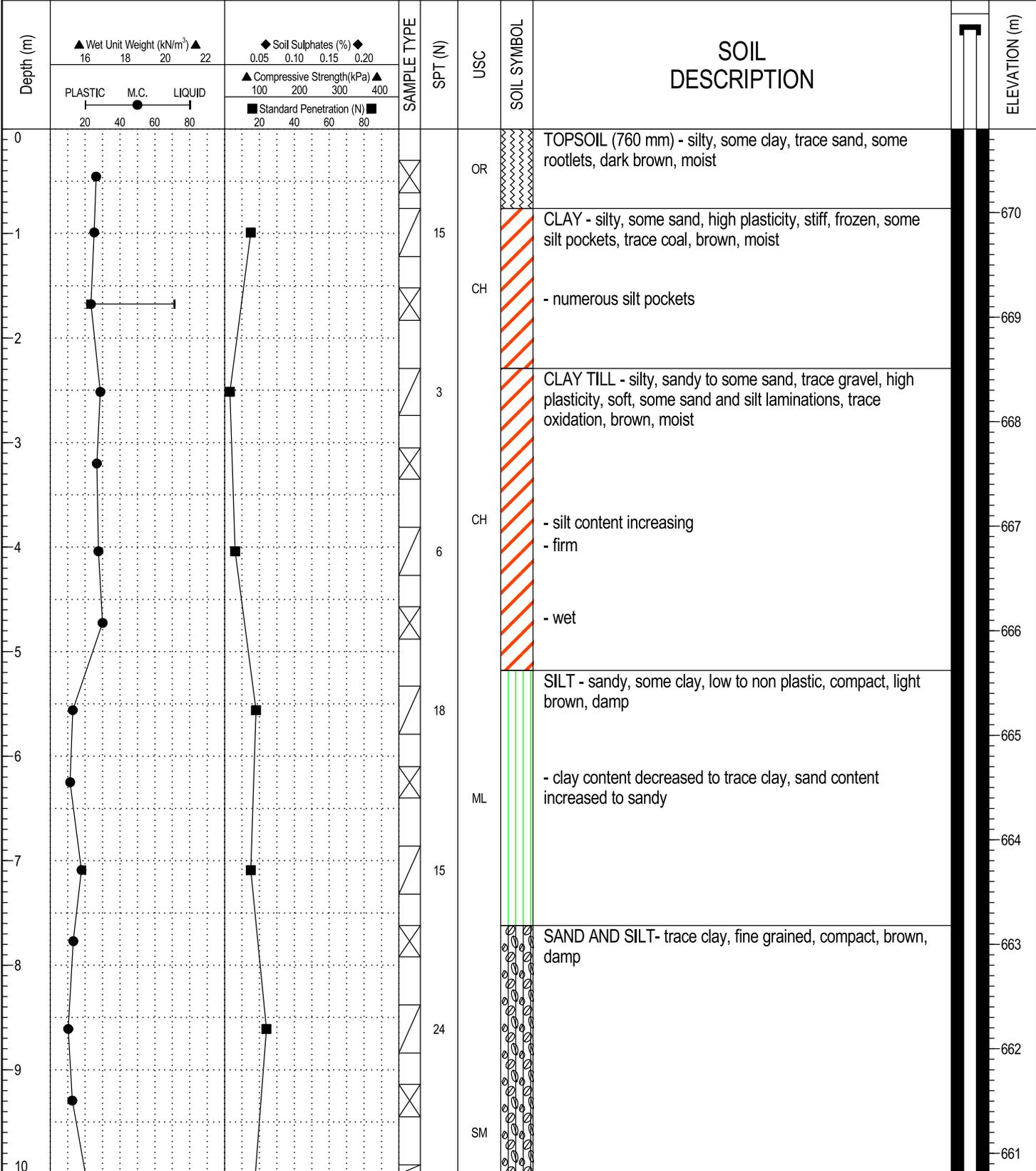


NOTE:
 1. BOUNDARY CLASSIFICATION POSSESSING CHARACTERISTICS OF TWO GROUPS ARE GIVEN GROUP SYMBOLS, E.G. GW-GC IS A WELL GRADED GRAVEL MIXTURE WITH CLAY BINDER BETWEEN 5% AND 12%

SOIL COMPONENTS					
FRACTION		SIEVE SIZE (mm)		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
		PASSING	RETAINED	PERCENT	IDENTIFIER
GRAVEL	COARSE	75	19	50 - 35	AND
	FINE	19	4.75		
SAND	COARSE	4.75	2.00	35 - 20	Y
	MEDIUM	2.00	0.425		
	FINE	0.425	0.080		
SILT (non-plastic) or CLAY (plastic)		0.080		20 - 10	SOME
				10 - 1	TRACE
OVERSIZE MATERIALS					
ROUNDED OR SUB-ROUNDED COBBLES 75 mm TO 300 mm BOULDERS >300 mm			ANGULAR ROCK FRAGMENTS ROCKS > 0.75 m3 IN VOLUME		

MODIFIED UNIFIED SOIL CLASSIFICATION SYSTEM

Garneau Housing	11049 - 83 Ave NW	BOREHOLE NO: TH21-01
Integrated Infrastructure Services	3TM ZONE: N5931893.3 E32002.1	PROJECT NO: 60655308
START DATE: 2021/03/25	METHOD: Solid Stem Augers	ELEVATION: 670.8 m
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Drive Sample <input type="checkbox"/> Auger Sample <input type="checkbox"/> No Recovery <input type="checkbox"/> A Casing <input type="checkbox"/> Cored Sample	
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND	



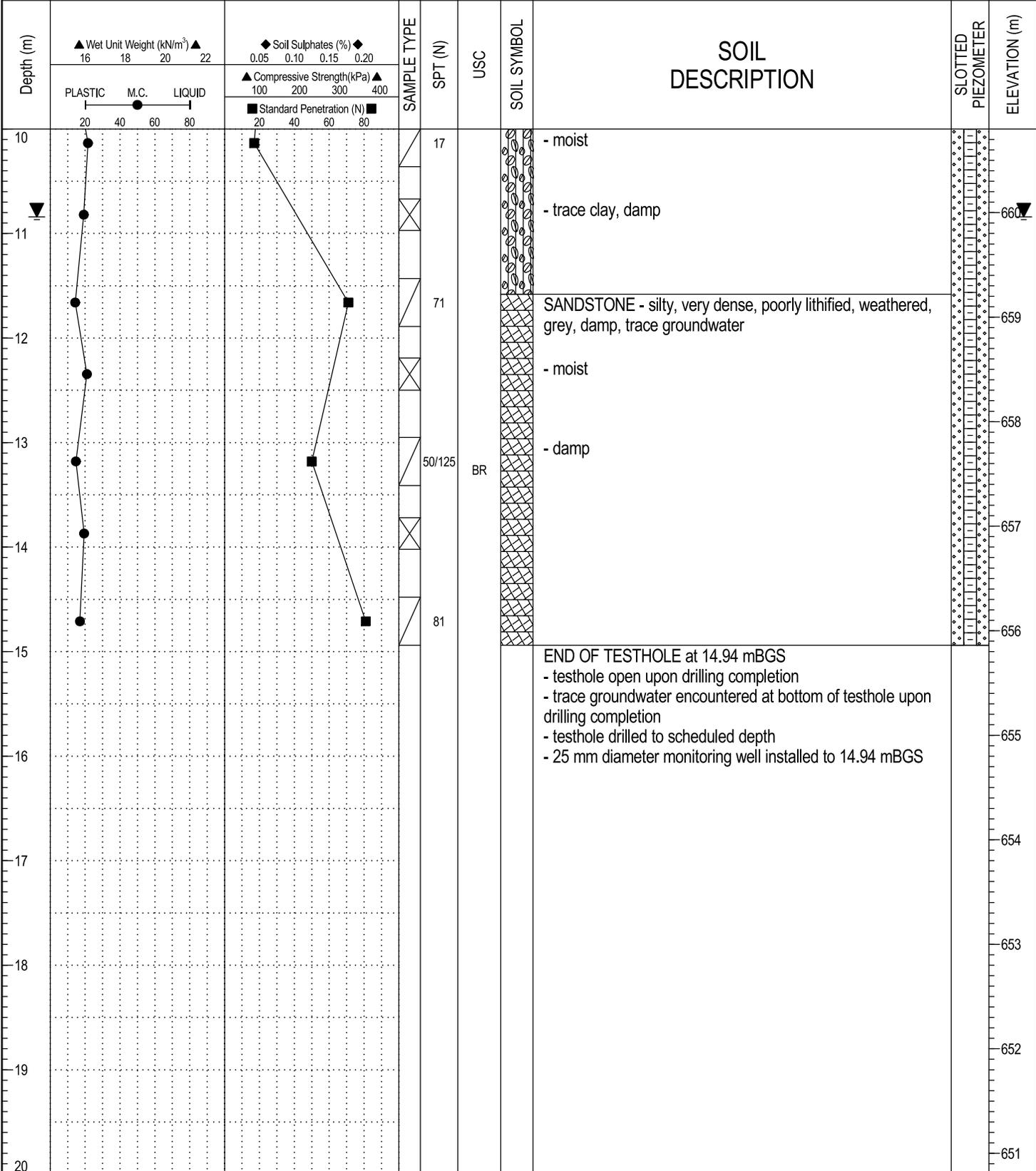
STANDPIP 60655308 - GARNEAU HOUSING (COE TEMPLATE).GPJ EDMONTON.GDT 5/2/21



Integrated Infrastructure Services
Engineering Services Section

LOGGED BY: AT	COMPLETION DEPTH: 14.94 m
REVIEWED BY: FA	COMPLETION DATE: 2021/03/25
Fig. No: 2	Page 1 of 2

Garneau Housing	11049 - 83 Ave NW	BOREHOLE NO: TH21-01
Integrated Infrastructure Services	3TM ZONE: N5931893.3 E32002.1	PROJECT NO: 60655308
START DATE: 2021/03/25	METHOD: Solid Stem Augers	ELEVATION: 670.8 m
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Drive Sample <input type="checkbox"/> Auger Sample <input type="checkbox"/> No Recovery <input type="checkbox"/> A Casing <input type="checkbox"/> Cored Sample	
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND	



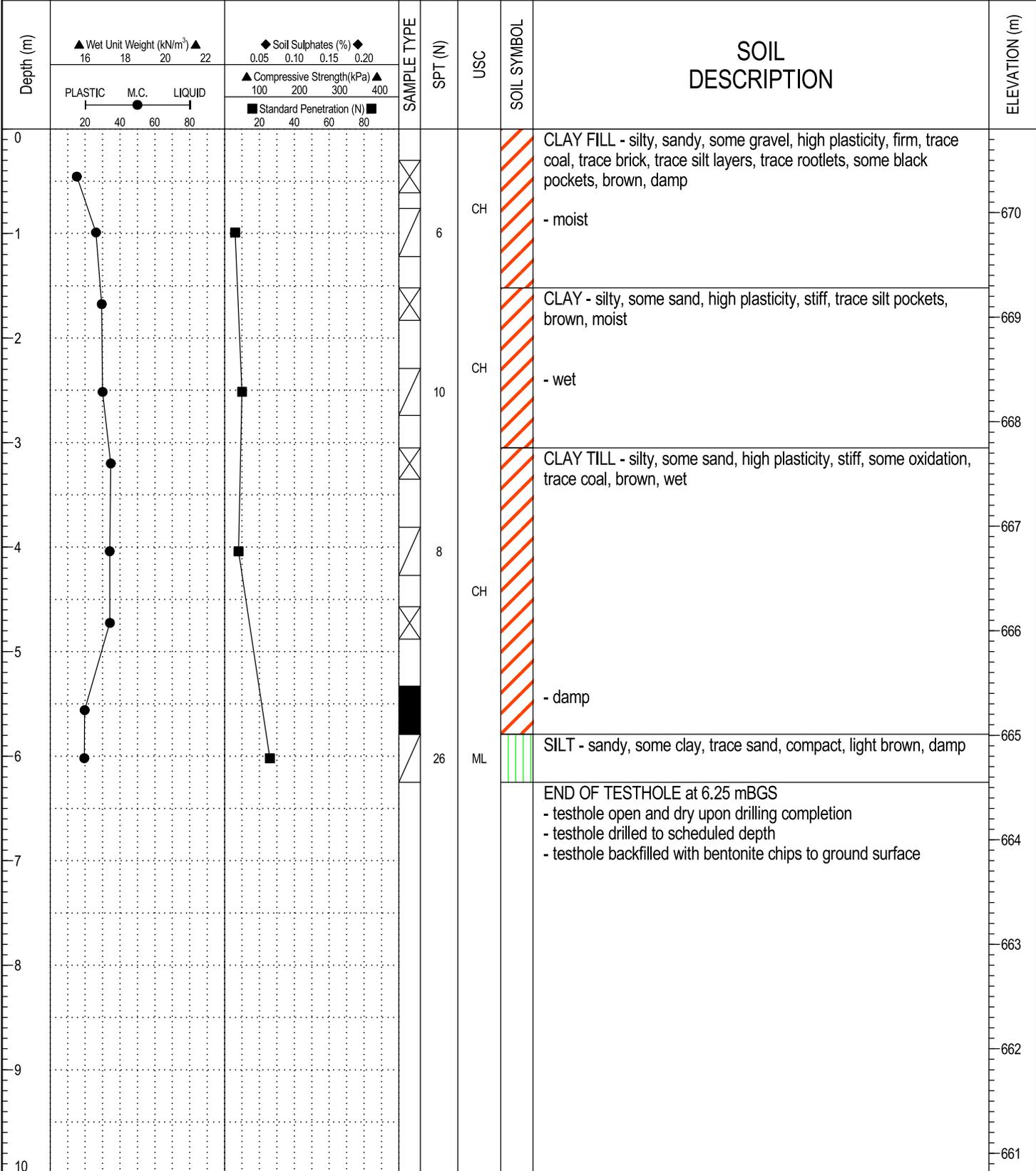
STANDPIP 60655308 - GARNEAU HOUSING (COE TEMPLATE).GPJ EDMONTON.GDT 5/2/21



Integrated Infrastructure Services
Engineering Services Section

LOGGED BY: AT	COMPLETION DEPTH: 14.94 m
REVIEWED BY: FA	COMPLETION DATE: 2021/03/25
Fig. No: 2	Page 2 of 2

Garneau Housing	11053 - 83 Ave NW	BOREHOLE NO: TH21-02
Integrated Infrastructure Services	3TM ZONE: N5931878.8 E31996.9	PROJECT NO: 60655308
START DATE: 2021/03/25	METHOD: Solid Stem Augers	ELEVATION: 670.8 m
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Drive Sample <input type="checkbox"/> Auger Sample <input type="checkbox"/> No Recovery <input type="checkbox"/> A Casing <input type="checkbox"/> Cored Sample	
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND	



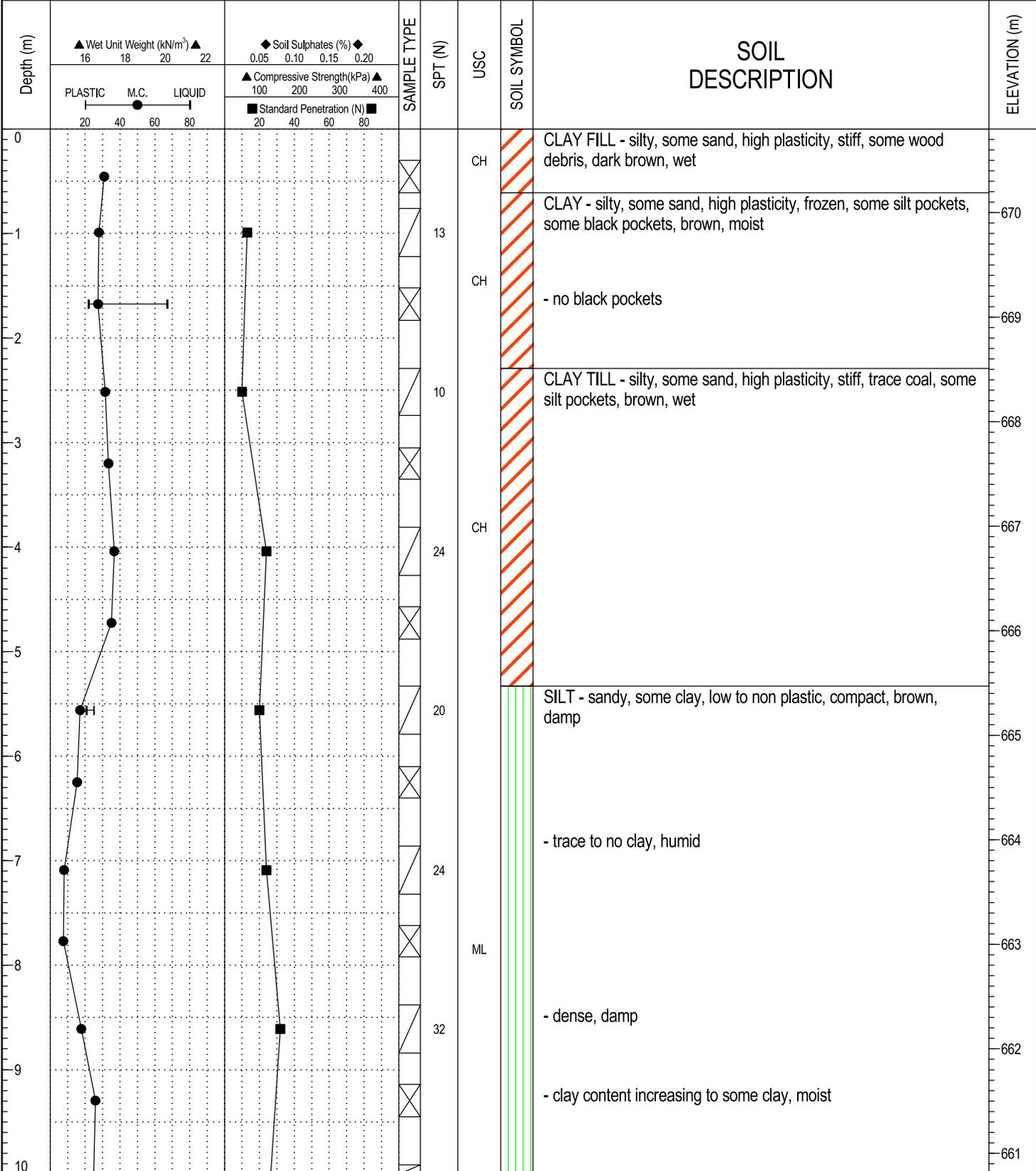
STANDPIP 60655308 - GARNEAU HOUSING (COE TEMPLATE).GPJ EDMONTON.GDT 5/2/21



Integrated Infrastructure Services
Engineering Services Section

LOGGED BY: AT	COMPLETION DEPTH: 6.25 m
REVIEWED BY: FA	COMPLETION DATE: 2021/03/25
Fig. No: 2	Page 1 of 1

Garneau Housing	11053 - 83 Ave NW	BOREHOLE NO: TH21-03
Integrated Infrastructure Services	3TM ZONE: N5931861.5 E31992.2	PROJECT NO: 60655308
START DATE: 2021/03/25	METHOD: Solid Stem Augers	ELEVATION: 670.8 m
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Drive Sample <input type="checkbox"/> Auger Sample <input type="checkbox"/> No Recovery <input type="checkbox"/> A Casing <input type="checkbox"/> Cored Sample	
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND	



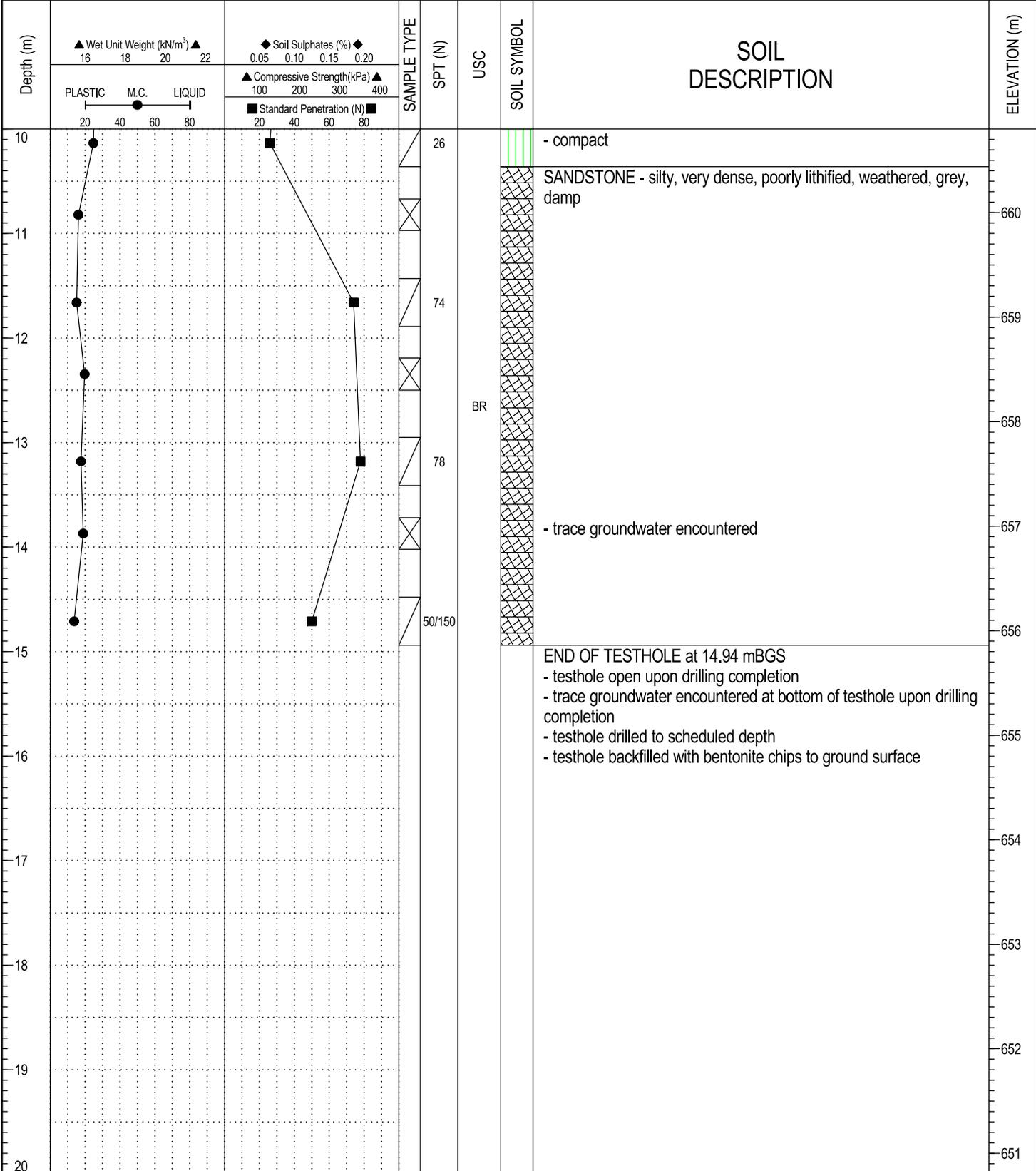
STANDPIP 60655308 - GARNEAU HOUSING (COE TEMPLATE).GPJ EDMONTON.GDT 5/2/21



Integrated Infrastructure Services
Engineering Services Section

LOGGED BY: AT	COMPLETION DEPTH: 14.94 m
REVIEWED BY: FA	COMPLETION DATE: 2021/03/25
Fig. No: 2	Page 1 of 2

Garneau Housing	11053 - 83 Ave NW	BOREHOLE NO: TH21-03
Integrated Infrastructure Services	3TM ZONE: N5931861.5 E31992.2	PROJECT NO: 60655308
START DATE: 2021/03/25	METHOD: Solid Stem Augers	ELEVATION: 670.8 m
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> Drive Sample <input checked="" type="checkbox"/> Auger Sample <input type="checkbox"/> No Recovery <input type="checkbox"/> A Casing <input type="checkbox"/> Cored Sample	
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND	



STANDPIP 60655308 - GARNEAU HOUSING (COE TEMPLATE).GPJ EDMONTON.GDT 5/2/21



Integrated Infrastructure Services
Engineering Services Section

LOGGED BY: AT	COMPLETION DEPTH: 14.94 m
REVIEWED BY: FA	COMPLETION DATE: 2021/03/25
Fig. No: 2	Page 2 of 2

Appendix C

Laboratory Results

WATER CONTENT (ASTM D2216)

CLIENT:	City of Edmonton							
PROJECT:	Garneau Housing							
JOB No.:	60655308							
DATE :	March 29, 2021				TECHNICAN : CK/GU			
HOLE No.	21-01							
DEPTH								
SAMPLE No.	1	2	3	4	5	6	7	8
TARE No.								
WT. SAMPLE WET + TARE	518.0	577.8	566.3	240.0	613.9	378.2	605.3	593.8
WT. SAMPLE DRY + TARE	412.8	464.0	461.7	189.4	487.4	299.2	468.7	527.6
WT. TARE	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
WATER CONTENT W%	26.3%	25.2%	23.3%	28.7%	26.7%	27.6%	30.0%	12.9%
HOLE No.	21-01							
DEPTH								
SAMPLE No.	9	10	11	12	13	14	15	16
TARE No.								
WT. SAMPLE WET + TARE	505.0	523.8	511.5	566.6	448.0	652.8	788.1	546.0
WT. SAMPLE DRY + TARE	454.5	446.4	453.3	514.9	399.3	539.1	663.3	479.3
WT. TARE	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
WATER CONTENT W%	11.4%	17.9%	13.2%	10.3%	12.6%	21.6%	19.2%	14.3%
HOLE No.	21-01				21-02			
DEPTH								
SAMPLE No.	17	18	19	20	1	2	3	4
TARE No.								
WT. SAMPLE WET + TARE	713.8	774.2	880.8	724.2	614.7	339.1	654.4	621.7
WT. SAMPLE DRY + TARE	592.1	676.5	740.0	620.9	535.2	271.5	508.4	481.4
WT. TARE	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
WATER CONTENT W%	21.0%	14.7%	19.4%	17.0%	15.2%	26.2%	29.5%	30.0%
HOLE No.	21-02					21-03		
DEPTH								
SAMPLE No.	5	6	7	8	9	1	2	3
TARE No.								
WT. SAMPLE WET + TARE	608.5	625.6	600.5	549.4	352.6	465.1	430.7	674.0
WT. SAMPLE DRY + TARE	455.1	469.9	450.7	461.1	297.3	358.4	339.6	531.8
WT. TARE	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
WATER CONTENT W%	34.7%	34.1%	34.2%	19.7%	19.5%	30.9%	27.9%	27.4%

WATER CONTENT (ASTM D2216)

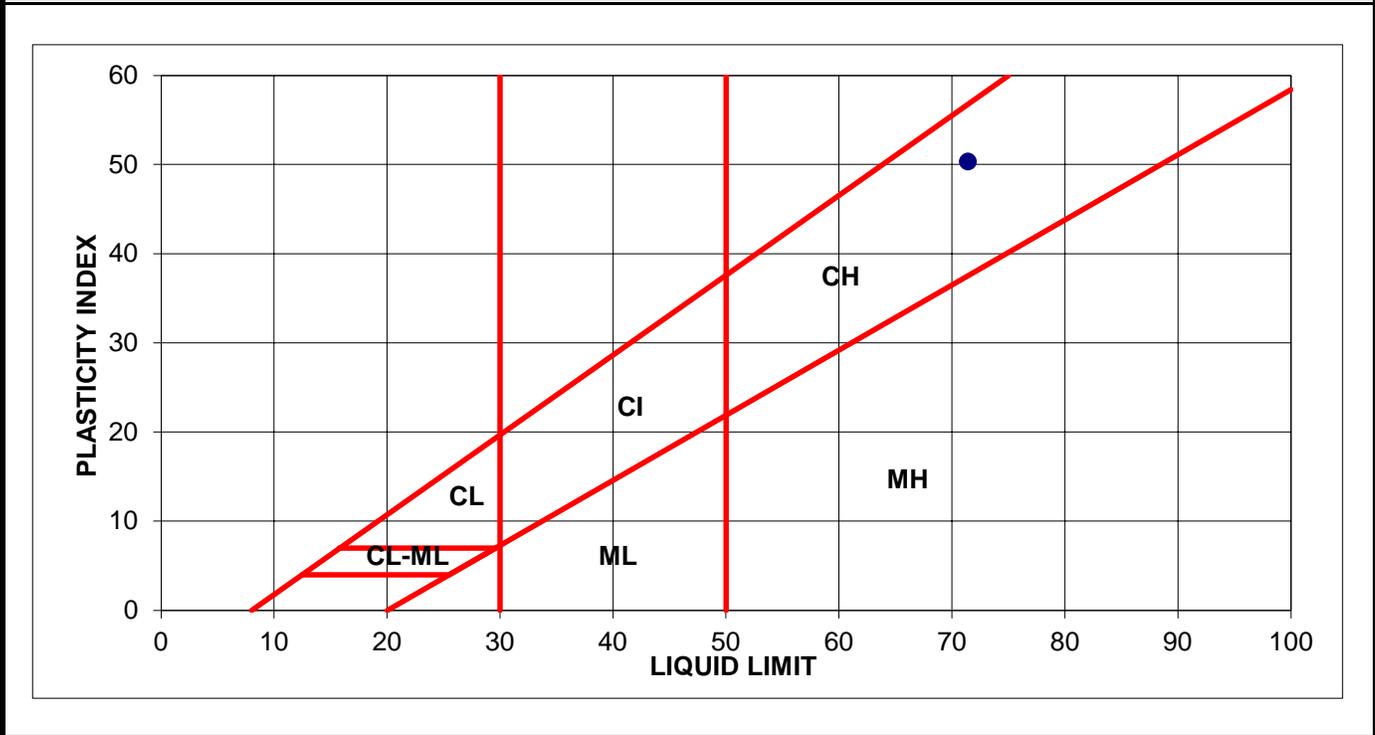
CLIENT:	City of Edmonton							
PROJECT:	Garneau Housing							
JOB No.:	60655308							
DATE :	March 29, 2021				TECHNICAN : CK/GU			
HOLE No.	21-03							
DEPTH								
SAMPLE No.	4	5	6	7	8	9	10	11
TARE No.								
WT. SAMPLE WET + TARE	525.8	671.7	553.3	598.6	488.0	490.4	451.2	491.2
WT. SAMPLE DRY + TARE	402.9	506.7	408.3	446.4	418.5	426.7	419.2	458.0
WT. TARE	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
WATER CONTENT W%	31.5%	33.4%	36.7%	35.1%	17.1%	15.4%	7.9%	7.5%
HOLE No.	21-03							
DEPTH								
SAMPLE No.	12	13	14	15	16	17	18	19
TARE No.								
WT. SAMPLE WET + TARE	691.0	800.7	684.7	828.8	745.2	779.1	752.5	754.4
WT. SAMPLE DRY + TARE	588.5	638.6	551.5	715.7	649.3	653.2	641.6	636.6
WT. TARE	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
WATER CONTENT W%	17.8%	25.9%	24.7%	16.1%	15.1%	19.7%	17.6%	18.9%
HOLE No.	21-03							
DEPTH								
SAMPLE No.	20							
TARE No.								
WT. SAMPLE WET + TARE	723.9							
WT. SAMPLE DRY + TARE	638.4							
WT. TARE	13.2							
WATER CONTENT W%	13.7%							
HOLE No.								
DEPTH								
SAMPLE No.								
TARE No.								
WT. SAMPLE WET + TARE								
WT. SAMPLE DRY + TARE								
WT. TARE								
WATER CONTENT W%								

ATTERBERG LIMITS (ASTM D4318)

CLIENT :	City of Edmonton	SAMPLE:	3
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	GU
LOCATION :			
TESTHOLE:	21-01		
DATE :	April 26, 2021		

LIQUID LIMIT					
Trial No.	1				
Number of Blows	23				
Container Number					
Wt. Sample (wet+tare)(g)	50.52				
Wt. Sample (dry+tare)(g)	35.38				
Wt. Tare (g)	14.39				
Wt. Dry Soil (g)	21.0				
Wt. Water (g)	15.1				
Water Content (%)	72.1%				

AVERAGE VALUES		PLASTIC LIMIT			
Liquid Limit	71.4	Trial No.	1		
Plastic Limit	21.1	Container Number			
Plasticity Index	50.3	Wt. Sample (wet+tare)(g)	23.88		
SAMPLE DESCRIPTION		Wt. Sample (dry+tare)(g)	21.78		
Classification: CH		Wt. Tare (g)	11.82		
		Wt. Dry Soil (g)	10.0		
		Wt. Water (g)	2.1		
		Water Content (%)	21.1%		

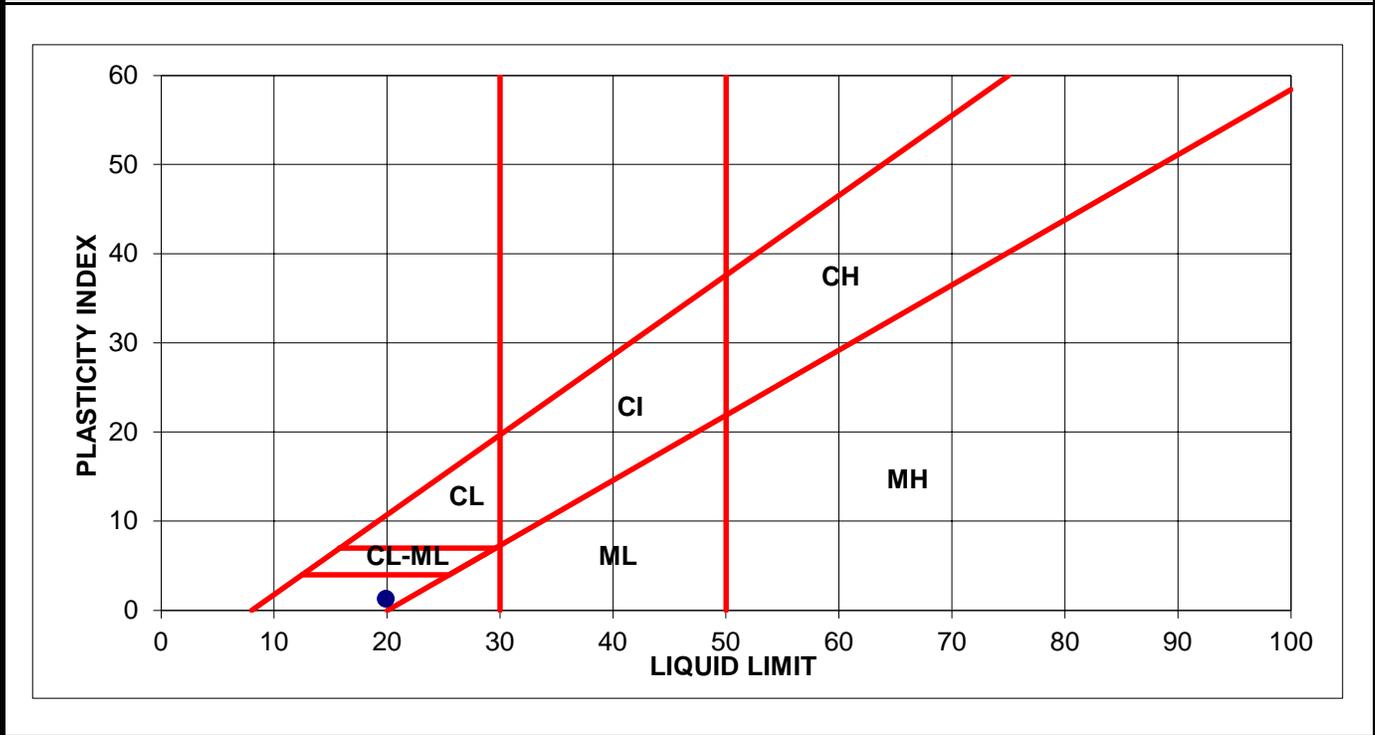


ATTERBERG LIMITS (ASTM D4318)

CLIENT :	City of Edmonton	SAMPLE:	9
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	GU
LOCATION :			
TESTHOLE:	21-01		
DATE :	March 31, 2021		

LIQUID LIMIT					
Trial No.	1				
Number of Blows	30				
Container Number					
Wt. Sample (wet+tare)(g)	62.40				
Wt. Sample (dry+tare)(g)	54.88				
Wt. Tare (g)	16.22				
Wt. Dry Soil (g)	38.7				
Wt. Water (g)	7.5				
Water Content (%)	19.5%				

AVERAGE VALUES		PLASTIC LIMIT			
Liquid Limit	19.9	Trial No.	1		
Plastic Limit	18.6	Container Number			
Plasticity Index	1.3	Wt. Sample (wet+tare)(g)	31.36		
SAMPLE DESCRIPTION		Wt. Sample (dry+tare)(g)	28.31		
Classification: ML		Wt. Tare (g)	11.90		
		Wt. Dry Soil (g)	16.4		
		Wt. Water (g)	3.1		
		Water Content (%)	18.6%		

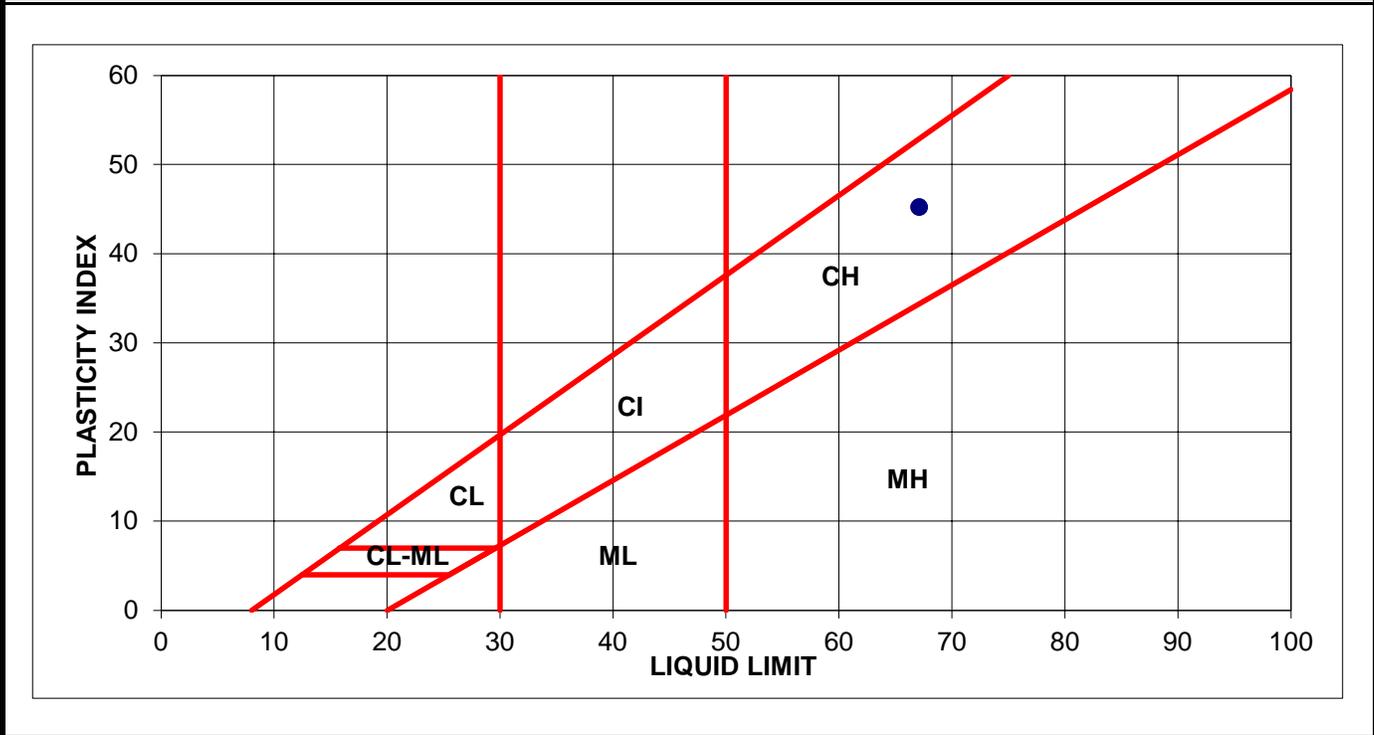


ATTERBERG LIMITS (ASTM D4318)

CLIENT :	City of Edmonton	SAMPLE:	3
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	CK
LOCATION :			
TESTHOLE:	21-03		
DATE :	March 31, 2021		

LIQUID LIMIT					
Trial No.	1				
Number of Blows	30				
Container Number					
Wt. Sample (wet+tare)(g)	41.58				
Wt. Sample (dry+tare)(g)	29.83				
Wt. Tare (g)	11.93				
Wt. Dry Soil (g)	17.9				
Wt. Water (g)	11.8				
Water Content (%)	65.6%				

AVERAGE VALUES		PLASTIC LIMIT			
Liquid Limit	67.1	Trial No.	1		
Plastic Limit	21.9	Container Number			
Plasticity Index	45.2	Wt. Sample (wet+tare)(g)	29.32		
		Wt. Sample (dry+tare)(g)	26.97		
		Wt. Tare (g)	16.22		
		Wt. Dry Soil (g)	10.8		
		Wt. Water (g)	2.4		
		Water Content (%)	21.9%		

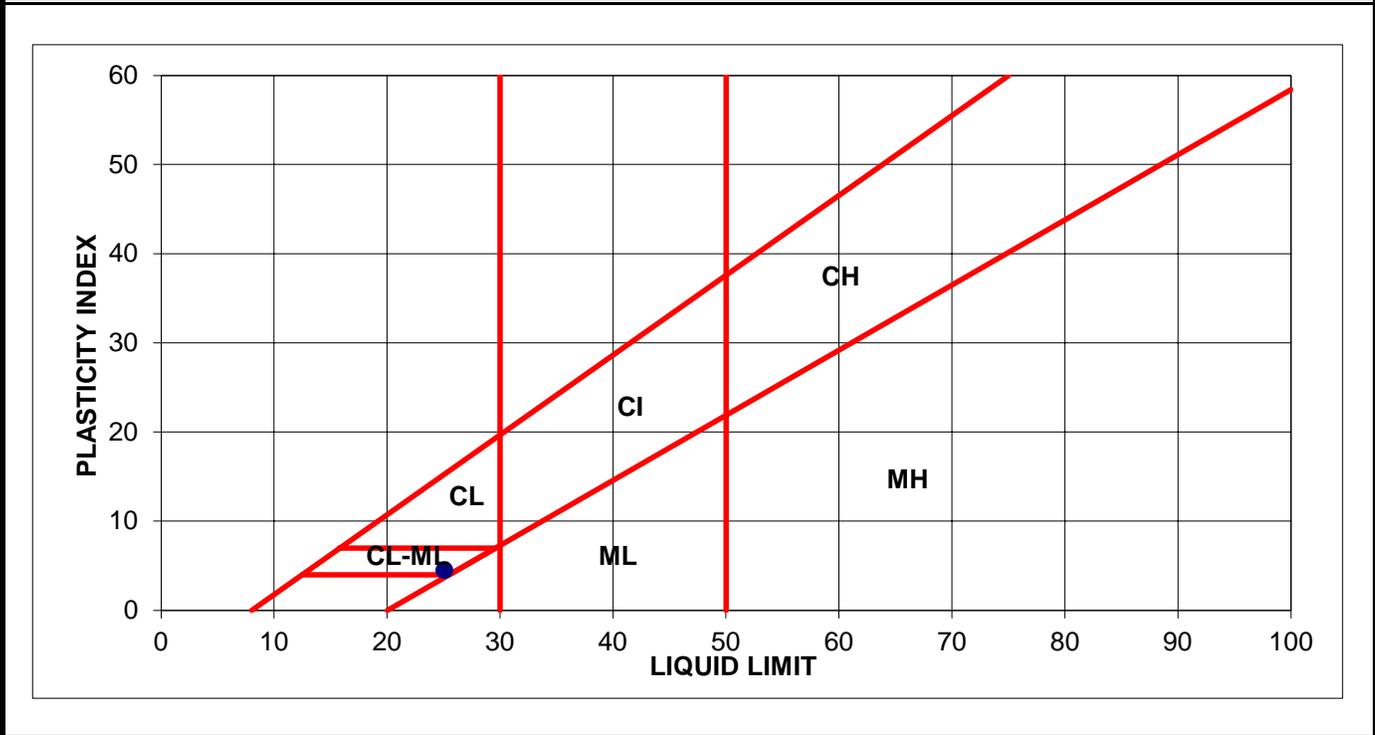


ATTERBERG LIMITS (ASTM D4318)

CLIENT :	City of Edmonton	SAMPLE:	8
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	GU
LOCATION :			
TESTHOLE:	21-03		
DATE :	March 31, 2021		

LIQUID LIMIT					
Trial No.	1				
Number of Blows	18				
Container Number					
Wt. Sample (wet+tare)(g)	63.45				
Wt. Sample (dry+tare)(g)	53.63				
Wt. Tare (g)	15.97				
Wt. Dry Soil (g)	37.7				
Wt. Water (g)	9.8				
Water Content (%)	26.1%				

AVERAGE VALUES		PLASTIC LIMIT			
Liquid Limit	25.1	Trial No.	1		
Plastic Limit	20.6	Container Number			
Plasticity Index	4.5	Wt. Sample (wet+tare)(g)	34.73		
		Wt. Sample (dry+tare)(g)	30.85		
		Wt. Tare (g)	11.97		
		Wt. Dry Soil (g)	18.9		
		Wt. Water (g)	3.9		
		Water Content (%)	20.6%		



GRAIN SIZE ANALYSIS (ASTM D422)

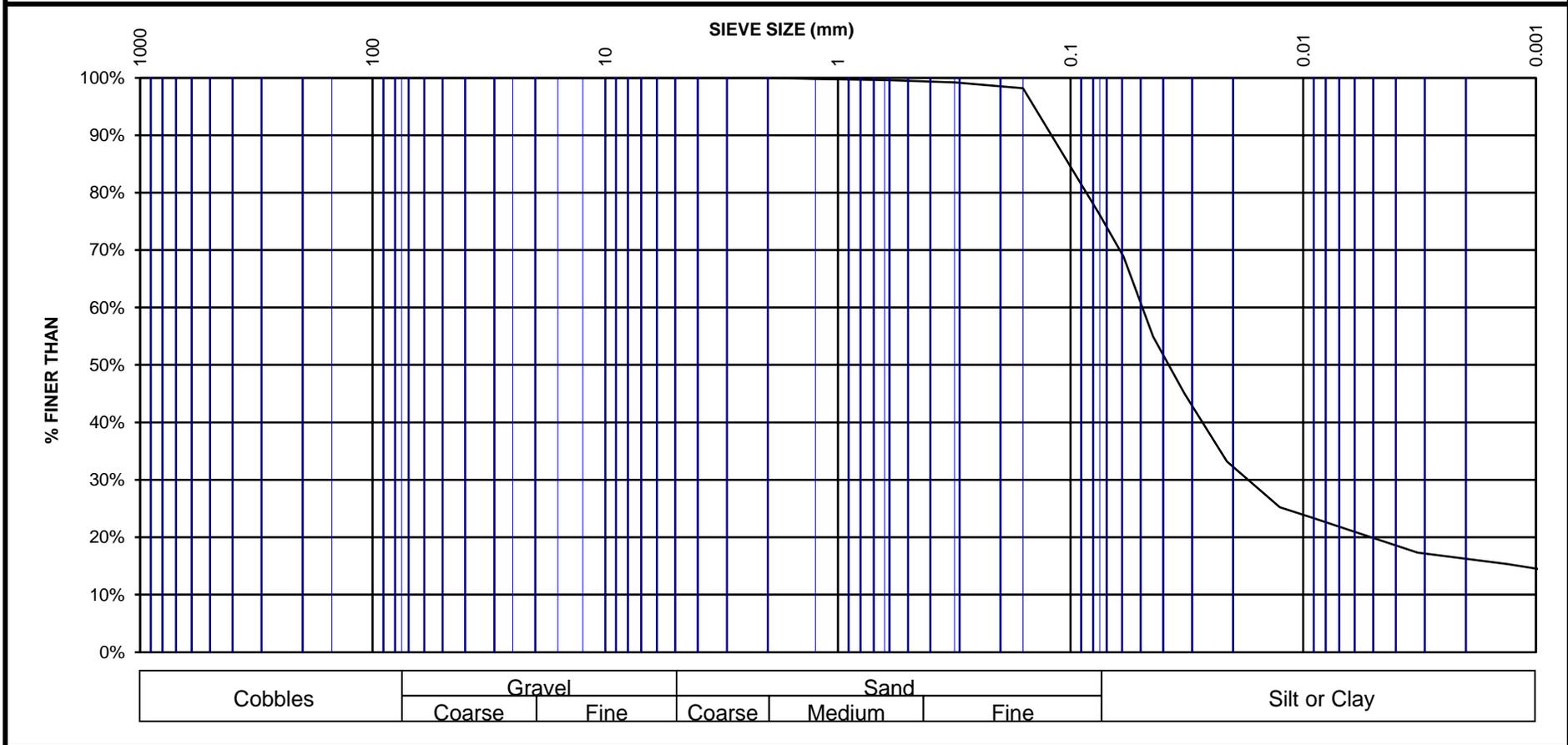
CLIENT :	City of Edmonton	SAMPLE:	9
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	GU
LOCATION :			
TESTHOLE:	21-01		
DATE :	March 30, 2021		

TOTAL DRY WEIGHT OF SAMPLE	SIEVE NO. (µm)	SIZE OF OPENING		WEIGHT RETAINED (g)	PERCENT RETAINED	PERCENT FINER THAN	REMARKS
		APPROX. INCHES	mm				
Before Washing	150,000	6	150.0		0%	100%	
Wet + Tare	75,000	3	75.0		0%	100%	
Dry+Tare 538.5	50,000	2	50.0		0%	100%	
Tare 100.0	40,000	1 1/2	40.0		0%	100%	
Wt. Dry 438.5	25,000	1	25.0		0%	100%	
Moisture Content	20,000	3/4	20.0		0%	100%	
Wet + Tare	16,000	5/8	16.0		0%	100%	
Dry+Tare	12,500	1/2	12.5		0%	100%	
Tare	10,000	3/8	10.0		0%	100%	
MC (%)	5,000	0.185	5.0		0%	100%	
Passing							
After Washing	2,000	0.0937	2.0		0%	100%	
Wt. Dry+Tare	1,250	0.0469	1.25	0.9	0%	99.8%	
Tare	630	0.0234	0.63	1.8	0%	99.6%	
Wt. Dry	315	0.0116	0.315	3.5	1%	99.2%	
Tare No.	160	0.0059	0.160	7.9	2%	98.2%	
	75	0.00295	0.075	104.4	24%	76.2%	
	PAN						
HYDROMETER DATA	READING	TIME (min)	DIAMETER (mm)	TEMP. (°C)	CORR. READING	PERCENT FINER THAN	REMARKS
Wt Dry+Tare 538.5	39	0.5	0.059	21	35	68.8%	
Wt Tare 100.0	32	1	0.044	21	28	54.9%	
Wt Dry 438.5	27	2	0.032	21	23	45.0%	
Sample Size : 50	21	5	0.021	21	17	33.2%	
Wt Retained 2 mm: 0.0	17	15	0.013	21	13	25.2%	
% Passing 2 mm: 100.0%	16	30	0.009	21	12	23.3%	
Specific Gravity : 2.70	15	60	0.006	21	11	21.3%	
Hydrometer No.: 43-9856	14	120	0.005	21	10	19.3%	
Solution (g/L) : 40	13	240	0.003	21	9	17.3%	
	12	1440	0.001	21	8	15.3%	
	12	2880	0.001	21	7	14.4%	

GRAIN SIZE ANALYSIS (ASTM D422)

CLIENT :	City of Edmonton	SAMPLE:	9
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	GU
LOCATION :			
TESTHOLE:	21-01		
DATE :	March 30, 2021		

Gravel = 0.0% Sand = 23.8% Silt = 59.9% Clay = 16.3%



GRAIN SIZE ANALYSIS (ASTM D422)

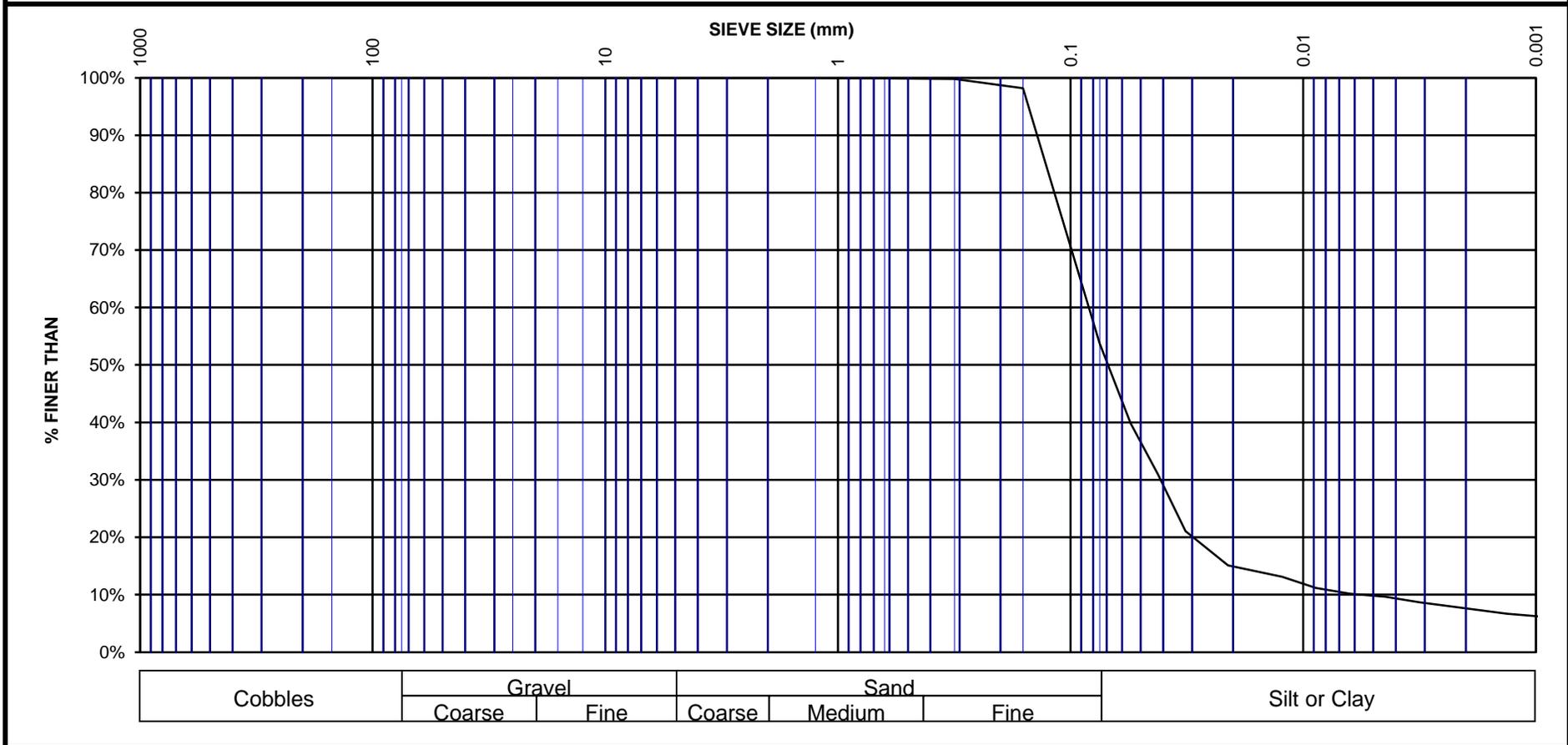
CLIENT :	City of Edmonton	SAMPLE:	13
PROJECT :	Garneau Housing	DEPTH :	30-31'
JOB No. :	60655308	TECHNICIAN :	CK
LOCATION :			
TESTHOLE:	21-01		
DATE :	April 14, 2021		

TOTAL DRY WEIGHT OF SAMPLE	SIEVE NO. (µm)	SIZE OF OPENING		WEIGHT RETAINED (g)	PERCENT RETAINED	PERCENT FINER THAN	REMARKS
		APPROX. INCHES	mm				
Before Washing	150,000	6	150.0		0%	100%	
Wet + Tare	75,000	3	75.0		0%	100%	
Dry+Tare 460.7	50,000	2	50.0		0%	100%	
Tare 100.0	40,000	1 1/2	40.0		0%	100%	
Wt. Dry 360.7	25,000	1	25.0		0%	100%	
Moisture Content	20,000	3/4	20.0		0%	100%	
Wet + Tare	16,000	5/8	16.0		0%	100%	
Dry+Tare	12,500	1/2	12.5		0%	100%	
Tare	10,000	3/8	10.0		0%	100%	
MC (%)	5,000	0.185	5.0		0%	100%	
Passing							
After Washing	2,000	0.0937	2.0		0%	100%	
Wt. Dry+Tare	1,250	0.0469	1.25		0%	100%	
Tare	630	0.0234	0.63	0.4	0%	99.9%	
Wt. Dry	315	0.0116	0.315	0.7	0%	99.8%	
Tare No.	160	0.0059	0.160	6.5	2%	98.2%	
	75	0.00295	0.075	166.6	46%	53.8%	
	PAN						
HYDROMETER DATA	READING	TIME (min)	DIAMETER (mm)	TEMP. (°C)	CORR. READING	PERCENT FINER THAN	REMARKS
Wt Dry+Tare 460.7	44	0.5	0.055	23	40	39.8%	
Wt Tare 100.0	35	1	0.042	23	31	30.9%	
Wt Dry 360.7	25	2	0.032	23	21	21.0%	
Sample Size : 100	19	5	0.021	23	15	15.1%	
Wt Retained 2 mm: 0.0	17	15	0.012	23	13	13.1%	
% Passing 2 mm: 100.0%	15	30	0.009	23	11	11.1%	
Specific Gravity : 2.70	14	60	0.006	23	10	10.1%	
Hydrometer No.: 43-9856	14	120	0.004	23	10	9.7%	
Solution (g/L) : 40	13	240	0.003	23	9	8.7%	
	11	1440	0.001	21	7	6.7%	
	11	2880	0.001	21	6	6.2%	

GRAIN SIZE ANALYSIS (ASTM D422)

CLIENT :	City of Edmonton	SAMPLE:	13
PROJECT :	Garneau Housing	DEPTH :	30-31'
JOB No. :	60655308	TECHNICIAN :	CK
LOCATION :			
TESTHOLE:	21-01		
DATE :	April 14, 2021		

Gravel = 0.0% Sand = 46.2% Silt = 46.1% Clay = 7.7%



GRAIN SIZE ANALYSIS (ASTM D422)

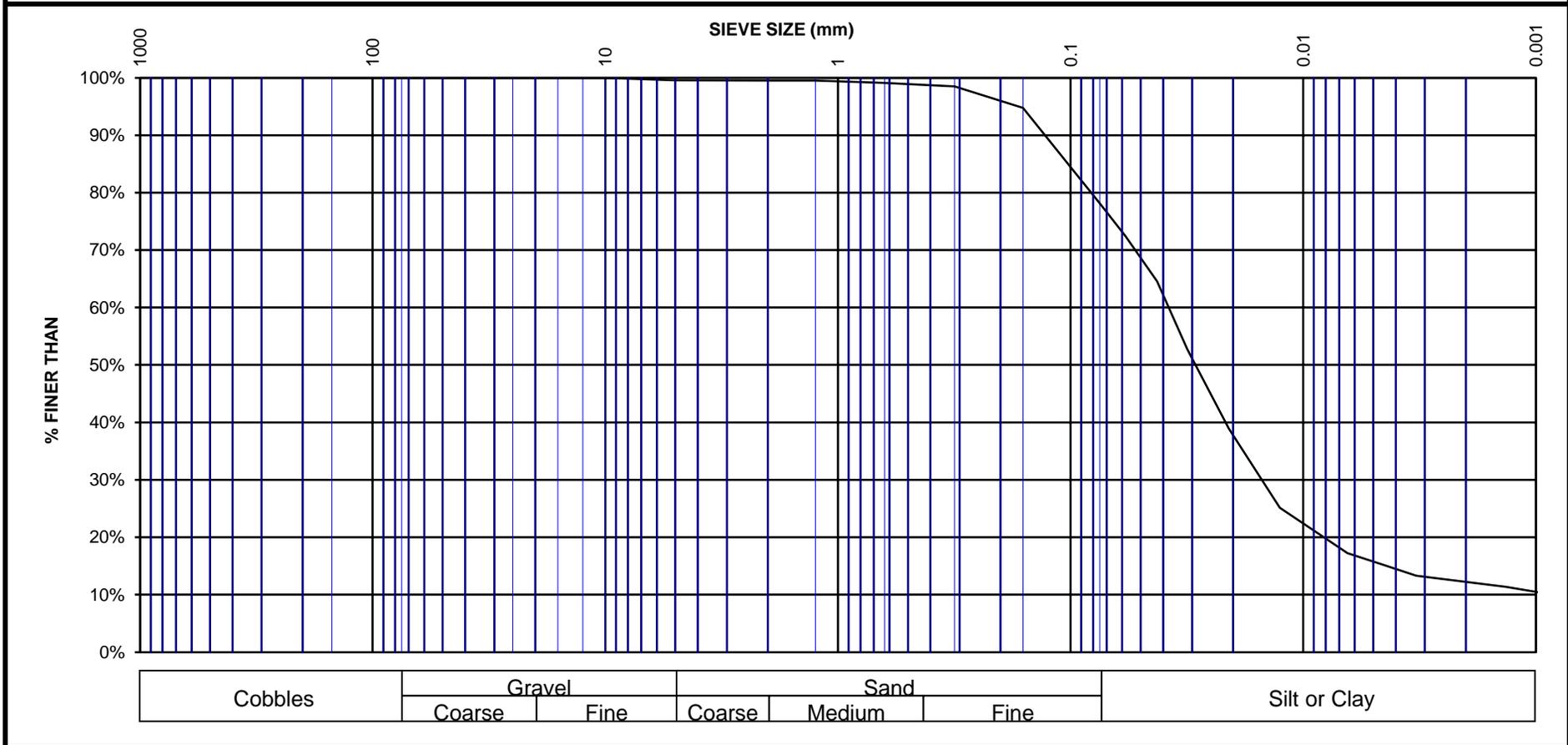
CLIENT :	City of Edmonton	SAMPLE:	12
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	GU
LOCATION :			
TESTHOLE:	21-03		
DATE :	March 30, 2021		

TOTAL DRY WEIGHT OF SAMPLE	SIEVE NO. (µm)	SIZE OF OPENING		WEIGHT RETAINED (g)	PERCENT RETAINED	PERCENT FINER THAN	REMARKS
		APPROX. INCHES	mm				
Before Washing	150,000	6	150.0		0%	100%	
Wet + Tare	75,000	3	75.0		0%	100%	
Dry+Tare 673.3	50,000	2	50.0		0%	100%	
Tare 100.0	40,000	1 1/2	40.0		0%	100%	
Wt. Dry 573.3	25,000	1	25.0		0%	100%	
Moisture Content	20,000	3/4	20.0		0%	100%	
Wet + Tare	16,000	5/8	16.0		0%	100%	
Dry+Tare	12,500	1/2	12.5		0%	100%	
Tare	10,000	3/8	10.0		0%	100%	
MC (%)	5,000	0.185	5.0	2.6	0%	99.5%	
Passing							
After Washing	2,000	0.0937	2.0	2.8	0%	99.5%	
Wt. Dry+Tare	1,250	0.0469	1.25	2.8	0%	99.5%	
Tare	630	0.0234	0.63	5.1	1%	99.1%	
Wt. Dry	315	0.0116	0.315	8.5	1%	98.5%	
Tare No.	160	0.0059	0.160	30.2	5%	94.7%	
	75	0.00295	0.075	124.9	22%	78.2%	
	PAN						
HYDROMETER DATA	READING	TIME (min)	DIAMETER (mm)	TEMP. (°C)	CORR. READING	PERCENT FINER THAN	REMARKS
Wt Dry+Tare 673.3	41	0.5	0.058	21	37	72.4%	
Wt Tare 100.0	37	1	0.042	21	33	64.5%	
Wt Dry 573.3	31	2	0.031	21	27	52.7%	
Sample Size : 50	24	5	0.021	21	20	38.9%	
Wt Retained 2 mm: 2.8	17	15	0.013	21	13	25.1%	
% Passing 2 mm: 99.5%	15	30	0.009	21	11	21.2%	
Specific Gravity : 2.70	13	60	0.006	21	9	17.2%	
Hydrometer No.: 43-9856	12	120	0.005	21	8	15.3%	
Solution (g/L) : 40	11	240	0.003	21	7	13.3%	
	10	1440	0.001	21	6	11.3%	
	10	2880	0.001	21	5	10.3%	

GRAIN SIZE ANALYSIS (ASTM D422)

CLIENT :	City of Edmonton	SAMPLE:	12
PROJECT :	Garneau Housing	DEPTH :	
JOB No. :	60655308	TECHNICIAN :	GU
LOCATION :			
TESTHOLE:	21-03		
DATE :	March 30, 2021		

Gravel = 0.5% Sand = 21.3% Silt = 65.9% Clay = 12.3%





AECOM Canada Ltd.
ATTN: Chris Keeley
Suite 300, 48 Quarry Park Blvd SE
Calgary AB T2C 5P2

Date Received: 29-MAR-21
Report Date: 07-APR-21 17:03 (MT)
Version: FINAL

Client Phone: 403-254-3301

Certificate of Analysis

Lab Work Order #: L2571396
Project P.O. #: NOT SUBMITTED
Job Reference: CITY OF EDMONTON - GARNEAU - 60655308
LAB TESTING
C of C Numbers:
Legal Site Desc:

Comments: Total Sulphate Ion Content results are <0.2% for all samples. Water Soluble Sulphate Ion Content test is not required unless Total Sulphate Ion Content result is greater than 0.2%. Water Soluble Sulphate Ion Content analyses have been removed.

Inayat Dhaliwal
Account Manager

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ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2571396-1 CITY OF EDMONTON - GARNEAU - TH21-01 #7 Sampled By: N/A on 29-MAR-21 Matrix: SOIL							
Miscellaneous Parameters							
% Saturation	65.5		1.0	%	01-APR-21	01-APR-21	R5418837
Chloride (Cl)	23		20	mg/L		05-APR-21	R5419380
Resistivity	1640		1.0	ohm cm		01-APR-21	R5418438
Sulfur (as SO4)	170		6.0	mg/L		04-APR-21	R5420347
Total Sulphate Ion Content	<0.050		0.050	%	01-APR-21	01-APR-21	R5418713
pH in Saturated Paste	7.66		0.10	pH		01-APR-21	R5418571
Salinity in mg/kg							
Chloride (Cl)	15		13	mg/kg		07-APR-21	
Sulfur (as SO4)	111		3.9	mg/kg		07-APR-21	
L2571396-2 CITY OF EDMONTON - GARNEAU - TH21-03 #10 Sampled By: N/A on 29-MAR-21 Matrix: SOIL							
Miscellaneous Parameters							
% Saturation	36.1		1.0	%	01-APR-21	01-APR-21	R5418837
Chloride (Cl)	59		20	mg/L		05-APR-21	R5419380
Resistivity	1550		1.0	ohm cm		01-APR-21	R5418438
Sulfur (as SO4)	1530		6.0	mg/L		04-APR-21	R5420347
Total Sulphate Ion Content	<0.050		0.050	%	01-APR-21	01-APR-21	R5418713
pH in Saturated Paste	7.56		0.10	pH		01-APR-21	R5418571
Salinity in mg/kg							
Chloride (Cl)	21.4		7.2	mg/kg		07-APR-21	
Sulfur (as SO4)	551		2.2	mg/kg		07-APR-21	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-PASTE-COL-CL	Soil	Chloride in Soil (Paste) by Colorimetry	CSSS, APHA 4500-CI E
A soil extract produced by the saturated paste extraction procedure is analyzed for Chloride by Colourimetry.			
PH-PASTE-CL	Soil	pH in Saturated Paste	CSSS Ch. 15
A soil extract produced by the saturated paste extraction procedure is analyzed by pH meter.			
RESISTIVITY-PASTE-CL	Soil	PASTE RESISTIVITY	ASTM G57-95A
This analysis is carried out using procedures adapted from ASTM G57-95a (2001) "Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method". In summary, 200 to 500 grams of sample is mixed with deionized water as required to create a saturated paste. The sample is then placed directly into a four electrode resistivity soil box and measured for resistivity using a resistivity meter.			
SAL-MG/KG-CALC-CL	Soil	Salinity in mg/kg	Manual Calculation
SAT-PCNT-N-CL	Soil	% Saturation	CSSS Ch. 15
Saturation Percentage (SP) is the total volume of water present in a saturated paste (in mL) divided by the dry weight of the sample (in grams), expressed as a percentage, as described in "Soil Sampling and Methods of Analysis" by M. Carter.			
SO4-PASTE-ICP-CL	Soil	Sulphate (SO4)	CSSS CH15/EPA 6010D
A soil extract produced by the saturated extraction procedure is analyzed for sulfate by ICPOES.			
SO4-T-CSA-A23-ED	Soil	Total Sulphate Ion Content	CSA INTERNATIONAL A23.2-3B
Total sulphate content is determined by mixing soil with water then hydrochloric acid, and digesting just below boiling point, for 15 minutes. Analysis by ion chromatography follows.			
NOTE: the CSA-A23 method states that for a total sulphate ion content greater than 0.2%, soluble sulphate ion content shall be determined on the basis of a water extraction. This water extraction requires the total sulphate ion content result to calculate the correct ratio for the water extraction.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2571396

Report Date: 07-APR-21

Page 1 of 2

Client: AECOM Canada Ltd.
 Suite 300, 48 Quarry Park Blvd SE
 Calgary AB T2C 5P2

Contact: Chris Keeley

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-PASTE-CL	Soil							
Batch	R5418571							
WG3512199-9 IRM		SAL-STD10						
pH in Saturated Paste			7.29		pH		6.94-7.54	01-APR-21
WG3512199-8 LCS								
pH in Saturated Paste			7.02		pH		6.7-7.3	01-APR-21
RESISTIVITY-PASTE-CL	Soil							
Batch	R5418438							
WG3511814-2 IRM		SAL-STD10						
Resistivity			106.0		%		70-130	01-APR-21
WG3511814-1 LCS								
Resistivity			96.4		%		70-130	01-APR-21
SAT-PCNT-N-CL	Soil							
Batch	R5418837							
WG3512087-3 IRM		SAL-STD10						
% Saturation			93.3		%		70-130	01-APR-21
WG3512087-1 MB								
% Saturation			<1.0		%		1	01-APR-21
SO4-T-CSA-A23-ED	Soil							
Batch	R5418713							
WG3512100-3 CRM		ED-634A_CEMENT						
Total Sulphate Ion Content			84.0		%		80-120	01-APR-21
WG3512100-2 LCS								
Total Sulphate Ion Content			99.7		%		70-130	01-APR-21
WG3512100-1 MB								
Total Sulphate Ion Content			<0.050		%		0.05	01-APR-21

Quality Control Report

Workorder: L2571396

Report Date: 07-APR-21

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Chain of Custody (COC) / Analytical Request Form



L2571396-COFC

COC Number: 14 -

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Report To		Report Format / Distribution			Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)										
Company: AECOM Canada Ltd. (acct# 10482)		Select Report Format: <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days)										
Contact: Chris Keeley		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT										
Address: 48 Quarry Park Blvd. SE, Suite 300 Calgary, AB T2C 5P2		<input type="checkbox"/> Criteria on Report - provide details below if box checked			E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT										
Phone: 403.254.3301		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge										
		Email 1 or Fax Chris.Keeley@aecom.com			Specify Date Required for E2,E or P:										
		Email 2 alex.tam2@aecom.com			Analysis Request										
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										
Same as Report To <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX													
Copy of Invoice with Report <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Email 1 or Fax Kristen.Tackney@aecom.com													
Company: AECOM Canada Ltd.		Email 2													
Contact: Kristen.Tackney@aecom.com															
Project Information		Oil and Gas Required Fields (client use)													
ALS Quote #:		Approver ID:		Cost Center:											
Job #: City of Edmonton - Garneau - 60655308.Lab Testing		GL Account:		Routing Code:											
PO / AFE:		Activity Code:													
LSD:		Location:													
ALS Lab Work Order # (lab use only)		ALS Contact: Nelson Kwan		Sampler: N/A											
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	CL-PASTE-COL-CL	PH-PASTE-CL	RESISTIVITY-PASTE-CL	SAL-MG/KG-CALC-CL	SAT-PCNT-CL	SO4-PASTE-ICP-CL	SO4-S-CSA-A23-ED	SO4-T-CSA-A23-ED	Number of Containers
	City of Edmonton - Garneau - TH21-01 #7			29-Mar-21	-	Soil	R	R	R	R	R	R	R	R	1
	City of Edmonton - Garneau - TH21-03 #10			29-Mar-21	-	Soil	R	R	R	R	R	R	R	R	1
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report (client Use)													
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input type="checkbox"/> No		Please report sulphate results in % for SO4-T/S CSA method and results in mg/L for SO4 via paste, salinity package. Please report resistivity in ohm-cm. Please report chlorides in mg/kg & mg/L													
Are samples for human drinking water use? <input type="checkbox"/> Yes <input type="checkbox"/> No															
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)													
Released by: <i>Chris Keeley</i>		Date: Mar. 29/21		Time: 14:00		Received by: <i>[Signature]</i>		Date: 3/29		Time: 15:30		FINAL SHIPMENT RECEPTION (lab use only)			
												Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>			
												Ice packs Yes <input type="checkbox"/> No <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>			
												Cooling Initiated <input type="checkbox"/>			
												INITIAL COOLER TEMPERATURES °C			
												FINAL COOLER TEMPERATURES °C			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY / YELLOW - CLIENT COPY

NA-FM-0326a v09 From 04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Brian Nguyen, P.Eng.
Geotechnical Engineer
T: 780-486-7676
E: Brian.Nguyen@aecom.com

AECOM Canada Ltd.
101-18817 Stony Plain Road NW
Edmonton, AB T5S 0C2
Canada

T: 780.486.7000
F: 780.486.7070
aecom.com



Appendix C

Environmental Site Assessments

STAGE 1

Phase I Environmental Site Assessment
11049 - 83 Avenue NW &
11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

Prepared by

CRIMSON Environmental Limited

PO Box 24 - #314 – 222 Baseline Road

Sherwood Park, Alberta, T8H 1S8

Telephone: 780.719.4959

The Association of Professional Engineers and Geoscientists of Alberta
Permit to Practice P08305

for

The City of Edmonton

Engineering Services Section

Integrated Infrastructure Services

Business Planning & Support Branch

11004 - 190 Street NW

Edmonton, Alberta

T5S 0G9

Project Number: CEL-37544B

February 27, 2021

EXECUTIVE SUMMARY

CRIMSON Environmental Limited (CRIMSON) was retained by the City of Edmonton to conduct a Phase I Environmental Site Assessment (ESA) of two vacant parcels of land situated in the city's Garneau Neighbourhood. The municipal addresses for the subject properties are 11049 - 83 Avenue NW and 11053 - 83 Avenue NW, Edmonton, Alberta (Figures 1 and 2). The legal description for the subject site is Lots 17 and 18, Block 157, Plan I19.

The objective of this assessment was to identify potential environmental concerns associated with the current and/or historical activities at the subject properties. Immediately adjacent properties were also evaluated during the assessment for potential impacts to the subject properties.

This report summarizes the scope of work, methodology and the findings of the investigation.

The findings of this assessment indicate that the subject property has an agricultural and/or residential history of at least 100 years. Environmental liabilities associated with properties with such extensive histories are often difficult to discern based on currently available information. The potential for these liabilities should not be easily dismissed and further assessment is often warranted. Based on the findings of this assessment, it is CRIMSON's opinion that there is a likelihood of environmental impairments associated with the current and/or historical land uses of the subject properties and/or adjacent lands. Several items of concerns are provided in the following discussion:

1. The presence of fill material on-site is considered to be high. Based on the construction details of similar buildings in the general area of the subject site, it is CRIMSON's opinion that the former residences likely contained basements. These basements would have been backfilled at the time of demolition or soon afterwards. No information related to the source of the fill materials or the fill quality present on-site has been obtained by or provided to CRIMSON during this assessment. However, based on the size of the building footprint, it is CRIMSON's opinion that a significant volume of soil would have been required in order to complete the required backfill;
2. Two sites listed as "waste generators" were reported to be present within approximately 30 metres of the subject site. The closest property listed is the EPCOR Energy property located at 11044 - 82 Avenue NW. The site is situated approximately 30 metres southeast of the subject site. The second site was reported as Westcorp Property Management Inc. and listed at 8210 -111 Street NW. The site is located approximately 40 metres southwest of the subject properties. Both properties are reported to possess an "Unclassified Dangerous Substance/Product." It is recommended that inquiries be made with the owners of both properties to determine the nature, volume and use of the substances;

3. With respect to historical land use on-site and adjacent to the subject properties, the results of the assessment indicate the potential for small amounts of herbicides and/or pesticides to be present on-site. It is recommended that the City of Edmonton be contacted to determine whether or not the use of these types of chemicals is permitted on the subject site. It should be noted that no evidence of the large scale storage or use of these products was noted during this assessment;
4. No monitoring or testing for radon gas was completed during this investigation. There is a potential for radon to present anywhere in Alberta and future testing would be required to confirm its presence or absence.

Based on the results of the assessment, it is recommended that a Phase II Environmental Site Assessment be completed for the property.

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- Appendix B – Correspondence
- Appendix C – Land Titles
- Appendix D – Photographs

1.0 INTRODUCTION

CRIMSON Environmental Limited (CRIMSON) was retained by the City of Edmonton to conduct a Phase I Environmental Site Assessment (ESA) of two vacant parcels of land situated in the city's Garneau Neighbourhood. The municipal addresses for the subject properties are 11049 - 83 Avenue NW and 11053 – 83 Avenue NW, Edmonton, Alberta (Figures 1 and 2). The legal description for the subject site is Lots 17 and 18, Block 157, Plan I19.

The objective of this assessment was to identify potential environmental concerns associated with the current and/or historical activities at the subject properties. Immediately adjacent properties were also evaluated during the assessment for potential impacts to the subject properties.

This report summarizes the scope of work, methodology and the findings of the investigation.

1.1 Scope of Work

The scope of work for this project was determined based on a request from the client and was summarized in CRIMSON's proposal dated January 13, 2021. The scope of work for the project included the following tasks:

- Obtain and review records of land ownership and land use from Alberta Land Titles;
- Obtain and review select aerial photographs of the subject properties and immediately adjacent properties;
- Obtain and review pertinent information from municipal and provincial regulatory agencies regarding the environmental status of the subject properties;
- Complete a visual inspection of the subject properties and immediately adjacent properties;
- Complete interviews with current land owner (if available) to resolve questions or uncertainties which may arise from the above investigative steps and to obtain information related to the environmental state of the subject properties; and
- Prepare a report documenting the findings of the Phase I ESA.

Authorization to proceed with the Phase I ESA was received from the client prior to commencement.

1.2 Methodology

This investigation was completed following the recommended procedures outlined in the Canadian Standards Association (CSA) Publication *Z768-01 Phase I Environmental Site Assessment* (2016), the *Alberta Environmental Site Assessment Standard* (2016) provided by Alberta Environment and Parks (AEP) as well as the City of Edmonton's *Environmental Site Assessment Guidebook* (2016).

The investigation was completed between February 5 and 27, 2021. The information contained in this report, including all conclusions and recommendations, is subject to the limitations presented in Section 10.

2.0 SITE DESCRIPTION

The subject site (also referred to as the subject properties) includes two vacant parcels of land situated at 11049 - 83 Avenue NW and 11053 – 83 Avenue NW, Edmonton, Alberta (Figures 1 and 2). The legal description for the subject properties is Lots 17 and 18, Block 157, Plan I19 and the properties are situated within the city's Garneau Neighbourhood. Based on historical data, the subject properties have recently been utilized for agricultural purposes. However, private residences are reported to have been present on-site from at least the mid-1920s to approximately 2004.

With respect to adjacent properties, the site is surrounded by a mix of residential and/or commercial structures. A private residence is situated immediately east of the subject site followed by the Garneau Gates apartment building. 83 Avenue NW is located immediately north of the subject site followed by several private residences. 111 Street NW is situated immediately west of the subject site followed by the Windsor Park Plaza apartment building. Residential properties are also located northwest and northeast of the subject properties. An alley way is located immediately south of the subject site followed by the Garneau Professional Centre office building. Several commercial properties are located on the ground floor of the complex including a restaurant, health care facilities and a pharmacy. A commercial property is also situated southwest of the subject properties and immediately south of the Windsor Park Plaza apartment building. This facility includes hair and beauty salons and several restaurants. A site plan including adjacent land uses is provided on Figure 4 (Appendix A).

The topography of the subject properties was generally flat with surface water runoff controlled by the site grading and the City of Edmonton's municipal storm sewer system.

The closest water body to the site is the North Saskatchewan River which is located approximately 1 kilometre north and west of the subject properties.

The subject properties and the residential properties to the east and northwest of the subject site are currently zoned RA9 (High Rise Apartment Zone). The private residences to the north and northeast of the site are currently zoned DC1 (Direct Development Control Provision). The Windsor Park Plaza building situated to the west of the subject properties across 111 Street NW is currently zoned DC2 (Site Specific Development Control Provision) and the Garneau Professional Centre office building is currently zoned CO (Commercial Office Zone). The on-site and surrounding land-use zonings are provided in Figure 3 (Appendix A).

2.1 Geology

As indicated by Kathol and McPherson (1975), the surficial geology in the general area of the subject properties is reported to be comprised of glacio-lacustrine deposits. These deposits are reported to consist of clay, silt and sand with minor gravel. River Terrace deposits and erosional features are also reported to be present in the area west and northwest of the subject site near the North Saskatchewan River.

The upper bedrock underlying the subject properties is reported to be the Cretaceous aged Horseshoe Canyon Formation (also known as the Edmonton Formation). The bedrock is reported to be comprised of highly variable layers of sandstone, siltstone and mudstone as well as laterally continuous coal deposited in a non-marine to marginal marine environment (AGS, 2013).

2.2 Hydrogeology

The local hydrogeology of the Edmonton Area is generally dominated by the presence of the North Saskatchewan River and/or the presence of fluvial sands and gravels of the subsurface Empress Formation.

The AEP Groundwater Information System was consulted for information that may be available regarding water wells present on-site or near the subject properties. No water wells are reported to be present on-site or within 500 metres of the subject properties. A water well plan is provided on Figure 6 in Appendix A.

3.0 RECORDS REVIEW

3.1 Land Titles

Government of Alberta Land Title documentation for the subject properties was obtained for the periods between 1904 and 2021 (Lot 17) as well as 1918 and 2021 (Lot 18). The land titles search indicated the both lots are currently owned by the City of Edmonton. With the possible exception of the St. John’s Institute, no other past commercial or industrial ownership of the subject properties was noted. No other historical land titles were provided by the Government of Alberta. All of the land titles provided to CRIMSON have been included for reference purposes in Appendix C.

Table 1 – Historical Land Title Summary		
Legal Description	Occupancy Date(s)	Registered Owner(s)
Lot 17, Block 157, Plan I19	2020 - 2021	The City of Edmonton
	1980 – 2020	St. John’s Institute
	1961 - 1980	Alice Cowan
	1921 - 1961	Harold Wales Cowan
	1912 - 1921	Ellesworth C. McLaughlin
	1906 - 1912	James Y. Mitchell
	1904 - 1906	Laurent Garneau
Lot 18, Block 157, Plan I19	2020 - 2021	The City of Edmonton
	1982 – 2020	St. John’s Institute
	1977 – 1982	Richard Michael Kane & Jo-Ann Kane
	1977	Darlene E. Leickner
	1975 - 1977	Edward Beverly Branch & Mary Ette Branch
	1971 - 1975	Charles H. Benet & Sandra L. Benet
	1964 - 1971	Albert Peter Lena & Anne Elizabeth Lena
	1964	Anne Elizabeth Lena & James Lawrence Lyndon
	1947 - 1964	Chloe Lyndon
	1926 - 1947	Margaret Kerber
	1923 - 1926	Jessie Foy
	1921 - 1923	Waldron W. Browne
	1921	James McNaughton
	1918 - 1921	Peter A. McNaughton

3.2 Alberta Environment and Parks (AEP)

Alberta Environment and Park's (AEP) Freedom of Information & Protection of Privacy (FOIP) Office was contacted to obtain public information regarding "Responsive Records Pertaining to Spills, Releases or Site Contamination." A routine disclosure request was also made for the subject properties. With respect to both requests, documentation received from the department indicated that a search of AEP's holdings did not identify any related records. Copies of the responses received are provided in Appendix B.

In addition to the above noted requests, CRIMSON consulted the AEP Environmental Site Assessment Repository (ESAR) website for publically available records. The results of the search are provided on Figure 5 in Appendix A and indicated that no records were available for the subject properties or for any other immediately adjacent properties within 50 metres of the subject site.

As previously noted a review of the AEP groundwater information system was also completed during this assessment. The results of the search are provided on Figure 6 in Appendix A and indicated that no water wells are situated on-site or within 500 metres of the subject properties.

AEP's Approval Viewer was also consulted to obtain information related to any approvals, licenses, registrations, authorizations, permits and/or certificates issued by AEP for the subject properties under the Water Act and/or the Environmental Protection and Enhancement Act. No information was available.

3.3 Alberta Energy Regulator – Abadata Database

Available AER information was consulted through the Abacus Datagraphics Ltd. Abadata Database. The available information is provided on Figure 7 in Appendix A and indicates there are no reported spills, oil wells or high/medium pressure pipelines present on or within 250 metres of the subject site.

The closest medium or high pressure pipeline to the subject properties is reported to be situated approximately 270 metres to the southwest. The license number is AB00020954-4 and the pipeline is reported to contain natural gas. A copy of the Abadata information sheet is provided in Appendix B.

3.4 Alberta Energy Regulator – Coal Mine Map Viewer

Available AER information was consulted through the AER Coal Mine Map Viewer. The available information is provided on Figure 8 in Appendix A and indicates there are no coal mines present on or within 300 metres of the subject site.

3.5 Alberta One Call

A request to locate underground utilities was completed for the subject properties through Alberta One Call Corporation (Ticket Number: 20210401310). The locate sheet indicates that there are no active underground utilities on the subject properties. However, two abandoned natural gas pipelines were identified on-site. In addition, low pressure natural gas pipelines, electrical lines, water lines, sewer lines and/or fiber optic lines are expected to be present in the general area of the subject site. A copy of the locate sheet is provided in Appendix B.

3.6 Alberta Health Services

Alberta Health Services (AHS) was contacted during this investigation. The response received from the department indicated that after a search of the AHS files, there were no records found. The correspondence received is provided in Appendix B.

3.7 EPCOR - Drainage

EPCOR's Drainage Services Department was requested to complete a search of their records for compliance with Sewer, Drainage, Water Services and Wastewater Treatment Bylaws. Documentation received from the department indicated that the properties have not been inspected and that no records were available. The correspondence received is provided in Appendix B

3.8 City of Edmonton

3.8.1 Waste Management Services

The City of Edmonton Waste Management Services was contacted to obtain any information it may possess concerning the presence of landfill in the area of the subject properties. Documentation received from the department indicated a search of the department's records did not identify a former landfill or dump site on or within a 500 metre radius of the subject properties. The correspondence received is provided in Appendix B.

3.8.2 Planning and Development – Current Planning Service Centre

The Complaints and Investigation Section of the City of Edmonton's Current Planning Service Centre was contacted to obtain any information it may possess concerning any adverse environmental conditions and non-compliance issues at the subject properties. Documentation received indicated there are no infractions against the subject properties that concern the office and/or the bylaws that the department is charged with enforcing. The correspondence received is provided in Appendix B.

3.8.3 Emergency Response Department – Fire Prevention Branch

The Fire Prevention Branch of the City of Edmonton’s Emergency Response Department was contacted to obtain any information it may possess concerning any previous emergency responses, adverse environmental conditions, storage tanks and non-compliance issues at the subject properties. The response received indicated the department had no records regarding the presence/absence of underground storage tanks, leaks, site contamination or remediation. The correspondence received is provided in Appendix B.

3.8.4 Geo-Environmental Information Services - Integrated Infrastructure Services

The Geo-Environmental Information Services branch of the City of Edmonton’s Integrated Infrastructure Services Department was contacted to obtain any information it may possess concerning any previous environmental assessments or geotechnical assessment of the subject properties or adjacent properties. The response received indicated that one Phase I ESA report was available for the subject properties. The report was completed in 2020 by Pinchin Ltd. and concluded the following:

“Based on the results of the Phase I ESA completed by Pinchin, nothing was identified that is likely to result in potential subsurface impacts at the Site. As such, no subsurface investigation work (Phase II ESA) is recommended at this time.”

All other reports listed were for properties situated at locations greater than 100 metres from the subject site and were not obtained or reviewed during this assessment.

3.9 Alberta Safety Codes Authority

The Alberta Safety Codes Authority (ASCA) was contacted to obtain any information their office may possess concerning the presence of petroleum storage tanks at the subject properties. Documentation received from the ASCA indicated that no records of storage tanks were available for the subject properties. The correspondence received from ASCA is provided in Appendix B.

3.10 Previous Environmental Site Assessments

With the exception of the Phase I ESA report completed by Pinchin Ltd. and mentioned in Section 3.8.4, no previous environmental site assessment reports of the subject properties or immediately adjacent properties were obtained by or provided to CRIMSON during the course of this investigation.

3.11 Previous Geological and/or Geotechnical Reports

No geological or geotechnical reports were obtained by or provided to CRIMSON during the course of this investigation.

3.12 Other Public or Private Records

Fire insurance maps from the 1913 and 1925 were viewed online from the City of Edmonton’s Archives. Neither document contained any relevant information related to the subject site. The fire insurance map from 1953 is not available online and could not be reviewed by CRIMSON due to Covid-19 restrictions. However, information contained in the 2020 Phase I ESA report completed by Pinchin indicated that the 1953 fire insurance map lists the subject properties and adjacent properties within 200 metres of the subject site as residential dwellings.

No other site plans, reverse directories, building plans, permit records, production records, maintenance records, site utility drawings, emergency response plans, spill reports, spill plans, environmental monitoring data, waste management records, storage tank inventories or environmental audit reports were made available or reviewed by CRIMSON during the course of this investigation.

3.13 Historical Aerial Photography

A review of aerial photographs available from Google Earth and the City of Edmonton Archives (online) was conducted. Additional photographs were obtained from the City of Edmonton’s Integrated Infrastructure Services Department (2020) and Ecolog ERIS (1998). The purpose was to determine the general type of historical activities undertaken on the subject properties. A total of fourteen photographs were reviewed during the course of this investigation. Copies of the aerial photographs from 1924, 1930, 1948, 1952, 1957, 1965, 1978, 1988, 1998, 2004, 2008, 2012, 2017 and 2020 are provided in Appendix D. The following table provides a summary of the findings of CRIMSON’s review:

Table 2. Historical Aerial Photograph Summary		
Year	Approximate Scale	Summary of Findings
1924	1:20,000	The subject site and immediately adjacent properties within 50 metres appear to be utilized for residential purposes. The quality of the aerial photograph is poor.
1930	1:12,000	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.

Table 2. Historical Aerial Photograph Summary (Continued)

Year	Approximate Scale	Summary of Findings
1948	1:20,000	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
1952	1:20,000	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
1957	1:8,500	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
1965	1:6,000	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
1978	1:5,000	The Windsor Park Plaza apartment building is present west of the subject site. The residential properties previously situated northwest of the subject properties across 111 Street NW and 83 Avenue NW have been removed. No other significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
1988	1:15,000	The Garneau Professional Centre office building is present south of the subject site and residential buildings are present northwest of the subject properties across 111 Street NW and 83 Avenue NW. The property currently occupied by the Garneau Gates apartment building is vacant.
1998	1:10,000	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
2004	As Shown	The Garneau Gates apartment building is present east of the subject properties. No other significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
2008	As Shown	The residential building previously on-site haven been removed. No other significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
2012	As Shown	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
2017	As Shown	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.
2020	As Shown	No significant changes in land use of the subject properties or immediately adjacent properties are evident from the previous photograph.

3.14 Ecolog ERIS Report

An Ecolog ERIS report was requested from ERIS Environmental Risk Information Services. The report searches all Alberta databases (federal, provincial and private) for registered locations within a 300-metre radius of the subject site. The results of the database search confirmed the following information:

- Two adjacent sites are listed with ESAR. However, both properties are greater than 50 metres from the subject properties;
- Twelve fuel storage tanks are listed. The closest site listed is Knox Met Manor which is situated more than 100 metres east of the subject properties;
- A total of 48 waste generators are listed within 300 metres of the subject properties. The closest waste generator is listed as the EPCOR Energy property located at 11044 - 82 Avenue NW. The site is situated approximately 30 metres southeast of the subject site. A second site registered as Westcorp Property Management Inc. is also listed at 8210 -111 Street NW. The site is located approximately 40 metres southwest of the subject properties. Both properties are reported to possess an “Unclassified Dangerous Substance/Product;”
- One property is listed as a hazardous waste receiver. That property is reported as the University of Alberta Hospital which is situated approximately 300 metres west of the subject properties; and
- One site registered with the National PCB Inventory was reported. The property owned by the Government of Alberta and is situated more than 150 metres west of the subject properties at 8215 - 112 Street NW;

A copy of the database report is provided in Appendix B.

3.15 National Pollutant Release Inventory

The Environment and Climate Change Canada’s National Pollutant Release Inventory (NPRI) was consulted by CRIMSON in order to obtain publicly accessible information related to the inventory of pollutants released, disposed of and sent for recycling by facilities near the subject site (Figure 9). The results of CRIMSON inquiry indicated that the available information was limited to the University of Alberta’s heating plant facility which is situated more than 500 metres west of the subject site.

4.0 SITE VISIT

A site visit of the property was conducted by Mr. Douglas Pankewich of CRIMSON on February 16, 2021. The visit consisted of a visual inspection of the exterior of the subject properties and the on-site buildings. The purpose of the site visit was to observe the current uses of the property, note any remaining evidence of past uses of the property and identify any on-site activities of concern. CSA Z768-01 states that activities of concern include the use, treatment, storage, disposal and generation of hazardous materials, landfilling, and storage of wastewater. Adjacent property land use, the presence/absence of storage tanks and containers, odours and other items of concern (if any) were also noted.

CRIMSON's observations made during the site visit are provided in Section 6.0.

5.0 INTERVIEWS

No interviews were completed during this assessment. No representative of the City of Edmonton with relevant knowledge of the site was identified to CRIMSON and no adjacent property owners were reached during the assessment.

6.0 FINDINGS OF THE INVESTIGATION

6.1 General Site Conditions

A description of the property is provided in Section 2.0 of this report. A small amount of solid waste (litter) was observed to be present on-site. This included, but is not limited to, beverage cans, packaging materials, paper and plastic. The site was observed to be covered with snow at the time of the site visit and a detailed assessment of the surface conditions was therefore not possible.

6.2 Storage Tanks and Containers

No on-site evidence of above ground storage tanks (ASTs), underground storage tanks (USTs) or other containers was observed by the assessor. In addition and with respect to adjacent properties within 100 metres of the subject site, no evidence of ASTs, USTs or containers was noted during the course of the investigation.

With regards to regulatory searches, no information was received from the PTMAA, the City of Edmonton ERD or any other agency that indicated the presence of ASTs or USTs on-site.

6.3 Chemical Storage

No evidence of chemical storage was observed to be present by the assessor on-site or on any adjacent property within 100 metres of the subject properties.

6.4 Non-Hazardous Wastes (Solid and Liquid)

No evidence of large scale chemical storage was noted to be present on-site or on any adjacent property within 100 metres of the subject properties. A small amount of solid waste (litter) was observed to be present on-site. This included, but is not limited to, beverage cans, packaging materials, paper and plastic.

6.5 Hazardous Materials and Biological Wastes

No evidence of hazardous materials and/or biological wastes was observed to be present by the assessor on-site or on any adjacent property within 100 metres of the subject properties. Given the site's use as a community garden, the presence of some biological plant-based wastes is expected on-site. In addition, the 2020 Pinchin Ltd. Phase I ESA indicated the presence of small amounts of solid fats, cooking oil or grease on the property. These materials were not observed to be present by CRIMSON at the time of the site visit.

6.6 Unidentified Substances

No unidentified substances were observed to be present on-site during the site visit.

6.7 Odours

No strong, pungent, or noxious odours were observed by the assessor during the site visit.

6.8 Water & Wastewater

The subject properties are located within an area serviced by the City of Edmonton's municipal potable water distribution system. No other on-site water sources or groundwater wells were noted to be present on-site.

As previously noted, a review of the AEP Groundwater Information System was completed during this assessment. The results of the search are provided on Figure 6 in Appendix A and indicated that no domestic water wells are situated on-site or within 500 metres of the subject properties.

It should also be noted that no septic fields, wastewater disposal fields, excavations, pits, sumps, lagoons, wastewater receptors, grease traps, oil/water separators, ditches, watercourses, wetlands or standing water bodies were noted to be present on-site.

6.9 Polychlorinated Biphenyls (PCBs)

No PCB containing equipment was observed by the assessor at the time of the site visit. However, overhead power lines were observed to be present south the of the subject property. The observed infrastructure included at least one transformer. Transformers have historical been known to contain PCBs.

It should also be noted that two properties potentially utilizing PCBs were identified in the ECOLOG ERIS database report. One site is operated by the Government of Alberta and the second was the University of Alberta Hospital. Both properties are situated at distances that are greater than 150 metres from the subject properties.

6.10 Asbestos Containing Building Materials

No Asbestos Containing Building Materials (ACBMs) were confirmed to be present on the property during the site visit. The subject properties are currently vacant. ACBMs are likely present in at least some of the adjacent building near the subject properties. This includes the private residence situated to the immediately east.

6.11 Lead

No materials containing lead were noted to be present on the property during the site visit. The subject properties are currently vacant. Lead based materials are likely present in at least some of the adjacent building near the subject properties. This includes the private residence situated to the immediately east.

6.12 Ozone-Depleting Materials

No ozone depleting materials were noted to be present on the property during the site visit. The subject properties are currently vacant.

6.13 Urea Formaldehyde Foam Insulation

No Urea Formaldehyde Foam Insulation (UFFI) was noted to be present on the property during the site visit. The subject properties are currently vacant.

6.14 Radon

No monitoring or testing for radon gas was completed during this investigation. There is a potential for radon to present anywhere in Alberta and future testing would be required to confirm its presence or absence.

6.15 Gas, Oil Wells and Pipelines

No gas or oil wells or pipelines were observed on-site or on immediately adjacent properties during the investigation. This is consistent with AER information obtained through the Abadata database. However, two abandoned low pressure natural gas lines were noted to be present on-site during the underground utility locate completed through the Alberta One Call Corporation system. Several other low pressure natural gas pipelines are believed to be present in the area immediately adjacent to the property.

6.16 Mercury

No equipment or materials containing mercury were noted to be present on the property during the site visit. The subject properties are currently vacant. Mercury based materials are likely present in at least some of the adjacent building near the subject properties. This includes the private residence situated to the immediately east.

6.17 Pesticides and Herbicides

No large scale use of herbicides and/or pesticides were reported or observed during this assessment. However, given the site's current agricultural land use, the presence of small amounts of herbicides and pesticides cannot be ruled out without further evaluation.

6.18 Fill Materials

Aerial photographs and on-site observations indicated that the private residences previously present on-site have been removed. Based on the construction details of similar buildings in the general area of the subject site, it is CRIMSON's opinion that the former residences likely contained basements. These basements would have been backfilled at the time of demolition or soon afterwards. No information related to the source of the fill materials or the fill quality present on-site has been obtained by or provided to CRIMSON during this assessment. However, based on the size of the building footprint, it is CRIMSON's opinion that a significant volume of soil would have been required in order to complete the necessary backfill.

6.19 Air Quality

No sources of regulated air emissions were observed on-site by the assessor during the course of the investigation. The subject properties are currently vacant.

6.20 Mould

No mould was observed on-site by the assessor. The subject properties are currently vacant.

6.21 Electromagnetic Fields

Above ground and/or underground electrical transmission lines are confirmed to be present in the general area of the subject properties. Therefore, there is a potential for electromagnetic fields to be present on-site.

6.22 Radioactive Materials and Equipment

No radioactive materials or equipment were observed on-site by the assessor during the course of this investigation. The subject properties are currently vacant.

6.23 Hydraulic Equipment

No hydraulic equipment was observed on-site by the assessor during the course of this investigation. The subject properties are currently vacant.

6.24 Stressed Vegetation

No stressed vegetation was observed by the assessor during the course of this investigation. However, it should be noted that the site visit was completed in February and stressed vegetation is difficult to discern at the time of the year. In addition, the subject site was covered in snow at the time of the site visit.

6.25 Fire

No evidence of previous fires was observed on-site by the assessor during the course of this investigation. In addition, no information was provided by the City of Edmonton's Emergency Response Department concerning any previous emergency responses.

7.0 CONCLUSIONS & RECOMMENDATIONS

The findings of this assessment indicate that the subject property has an agricultural and/or residential history of at least 100 years. Environmental liabilities associated with properties with such extensive histories are often difficult to discern based on currently available information. The potential for these liabilities should not be easily dismissed and further assessment is often warranted. Based on the findings of this assessment, it is CRIMSON's opinion that there is a likelihood of environmental impairments associated with the current and/or historical land uses of the subject properties and/or adjacent lands. Several items of concerns are provided in the following discussion:

1. The presence of fill material on-site is considered to be high. Based on the construction details of similar buildings in the general area of the subject site, it is CRIMSON's opinion that the former residences likely contained basements. These basements would have been backfilled at the time of demolition or soon afterwards. No information related to the source of the fill materials or the fill quality present on-site has been obtained by or provided to CRIMSON during this assessment. However, based on the size of the building footprint, it is CRIMSON's opinion that a significant volume of soil would have been required in order to complete the required backfill;
2. Two sites listed as "waste generators" were reported to be present within approximately 30 metres of the subject site. The closest property listed is the EPCOR Energy property located at 11044 - 82 Avenue NW. The site is situated approximately 30 metres southeast of the subject site. The second site was reported as Westcorp Property Management Inc. and listed at 8210 -111 Street NW. The site is located approximately 40 metres southwest of the subject properties. Both properties are reported to possess an "Unclassified Dangerous Substance/Product." It is recommended that inquiries be made with the owners of both properties to determine the nature, volume and use of the substances;
3. With respect to historical land use on-site and adjacent to the subject properties, the results of the assessment indicate the potential for small amounts of herbicides and/or pesticides to be present on-site. It is recommended that the City of Edmonton be contacted to determine whether or not the use of these types of chemicals is permitted on the subject site. It should be noted that no evidence of the large scale storage or use of these products was noted during this assessment;
4. No monitoring or testing for radon gas was completed during this investigation. There is a potential for radon to present anywhere in Alberta and future testing would be required to confirm its presence or absence.

Based on the results of the assessment, it is recommended that a Phase II Environmental Site Assessment be completed for the property.

8.0 QUALIFICATIONS OF THE ASSESSOR

This report was completed by Mr. Douglas Pankewich of CRIMSON Environmental Limited. Mr. Pankewich has over twenty five years of professional and project management experience as an environmental geologist in both the private and public sectors. He has worked on over 500 projects including Phase I, II, and III ESAs, contaminant delineation investigations, hydrogeological investigations and remediation projects for both soil and groundwater. Mr. Pankewich is a graduate of Laval University and the University of Québec at the National Institute for Scientific Research. He holds undergraduate degrees in Geology and Geological Engineering as well as a Master of Sciences degree in Earth Sciences.

9.0 REFERENCES

1. Alberta Environment and Parks. *Alberta Environmental Site Assessment Standard*, 2016;
2. Alberta Geological Survey. Map 600. *Bedrock Geology Map of Alberta*. Edmonton, Alberta. March, 2013;
3. City of Edmonton. *Environmental Site Assessment Guidebook*. Edmonton, Alberta. March, 2016;
4. CSA International Standard Z768-01. *Phase I Environmental Site Assessment*. Toronto, Ontario. 2016;
5. Kathol and McPherson. *Urban Geology of Edmonton*. Alberta Research Council. Bulletin 32. Edmonton, Alberta. 1975; and
6. Pinchin Ltd. *Phase I Environmental Site Assessment 11049 and 11053 - 83 Avenue NW, Edmonton, Alberta*. Project Number: 270194.000. February 10, 2020.

10.0 STATEMENT OF LIMITATIONS

Subject to the following conditions and limitations, the investigation described in this report has been conducted in a manner consistent with a reasonable level of care and skill normally exercised by members of the health, safety and environmental consulting profession currently practicing under similar conditions in the area:

1. This report has been prepared for the exclusive use of the City of Edmonton. The report is intended to provide an assessment of known or potential environmental concerns and liabilities associated with past and current practices of the subject properties;
2. The report is based on data and information collected from available records, personal interviews and a site investigation conducted by CRIMSON personnel. CRIMSON has relied in good faith on information provided by individuals and sources noted in this report. We accept no responsibility for any deficiency, misstatements, or inaccuracy contained in this report as a result of omissions, misstatements, or fraudulent acts of persons interviewed;
3. The site investigation is based solely on the site conditions at the site at the time of the field investigation as described in this report;
4. The service provided by CRIMSON in completing the investigation is intended to assist the Client with a business decision. The liability of this site is not transferred to CRIMSON as a result of such services, and CRIMSON does not make recommendations regarding the purchase, sale or investment of the property;
5. The scope of the investigation described in this report has been limited by the budget set for the investigation in our contract. The scope of the investigation has been reasonable having regard to that budget constraint;
6. The investigation described in this report has relied upon information provided by third parties concerning the history of the site. Except as stated in this report, we have not made an independent verification of such historical information;
7. The investigation described in this report has been made in the context of existing government regulations generally promulgated at the date of this report. The investigation did not take account of any government regulations not in effect or not generally promulgated at the date of this report;
8. Where indicated or implied in this report, or where mandated by the condition of the site and its attendant structures, the conclusions of this report are based on visual observation of the site and a limited amount of sampling. The conclusions of this report do not apply to any areas of the site not available for inspection or areas not sampled;
9. The investigation was limited in scope. As such, the potential remains for the presence of unknown, unidentified, or unforeseen surface or subsurface contamination. If further evidence suggests potential contamination, a follow-up investigation including sampling and analysis would be recommended; and
10. This report is intended for the exclusive use of the company, organization or individual to whom it is addressed. It may not be used or relied upon in any manner whatsoever, or for any purpose whatsoever, by any other party. The Consultant makes no representation of fact or opinion of any nature whatsoever to any person or entity other than the company, organization or individual to whom this report is addressed.

11.0 CLOSURE

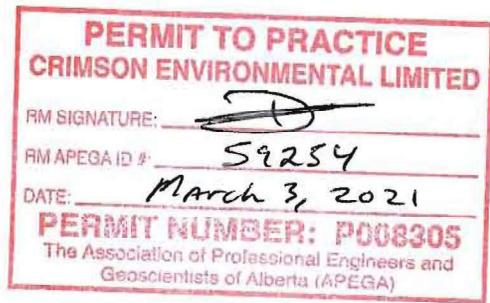
We trust that this report meets with your current requirements. Should you have any questions or concerns please do not hesitate to contact the undersigned.

Respectfully Submitted,

CRIMSON Environmental Limited



Douglas Pankewich, M.Sc., P.Gcol., P.Eng.
Geological Engineer



Appendix A

Figures



Approximate
Site Location



Scale
30 metres

Reference: The City of Edmonton, 2021 & Goggle, 2021.

*Scale provided is approximate.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Location Plan

Figure 1

Scale: As Shown

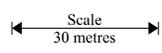
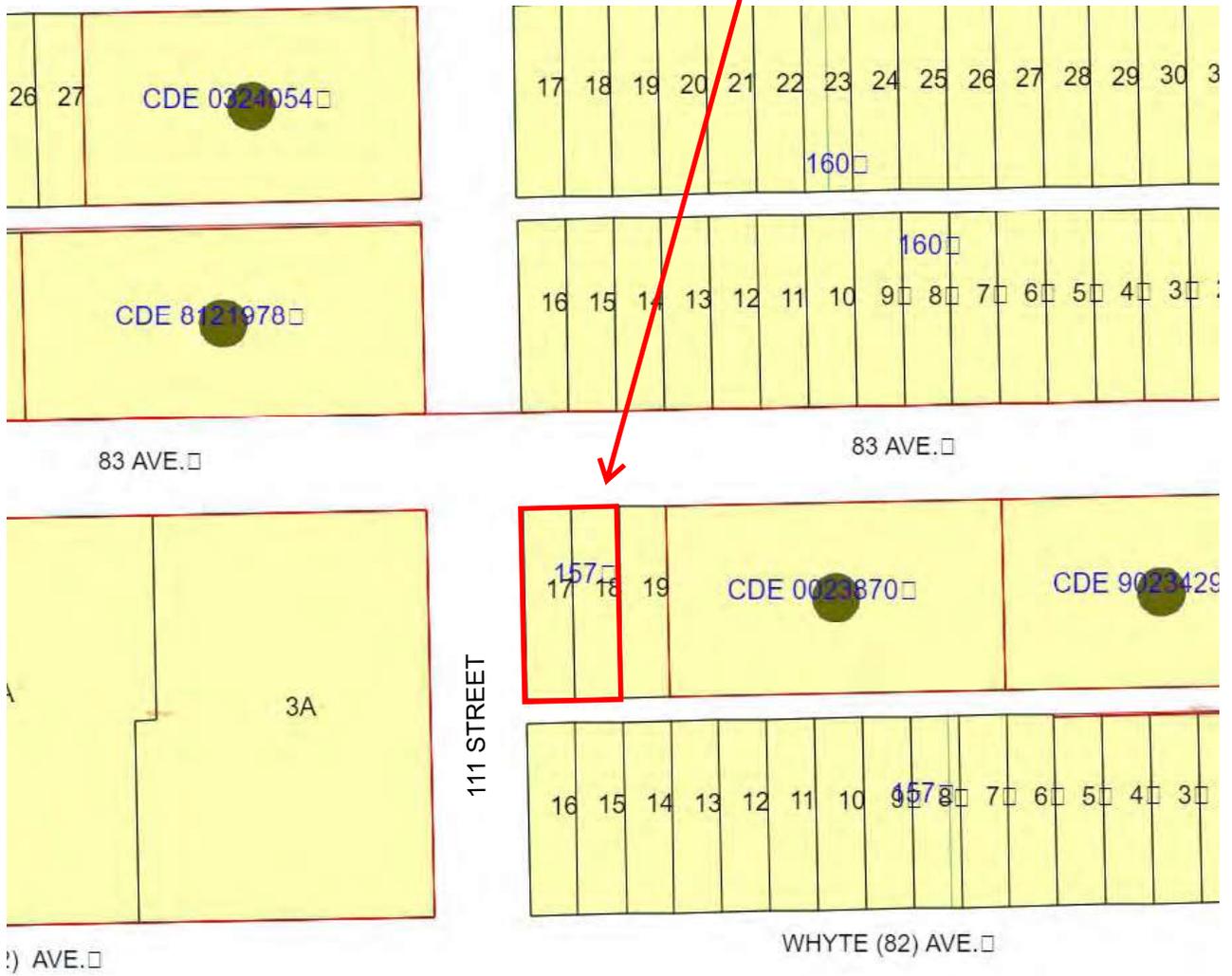
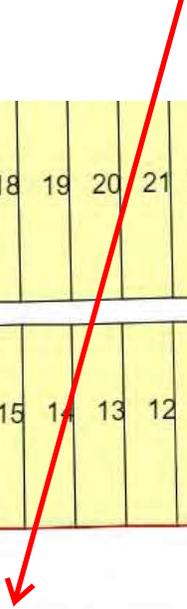
11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

February, 2021

CEL-37544B



Approximate Site Location

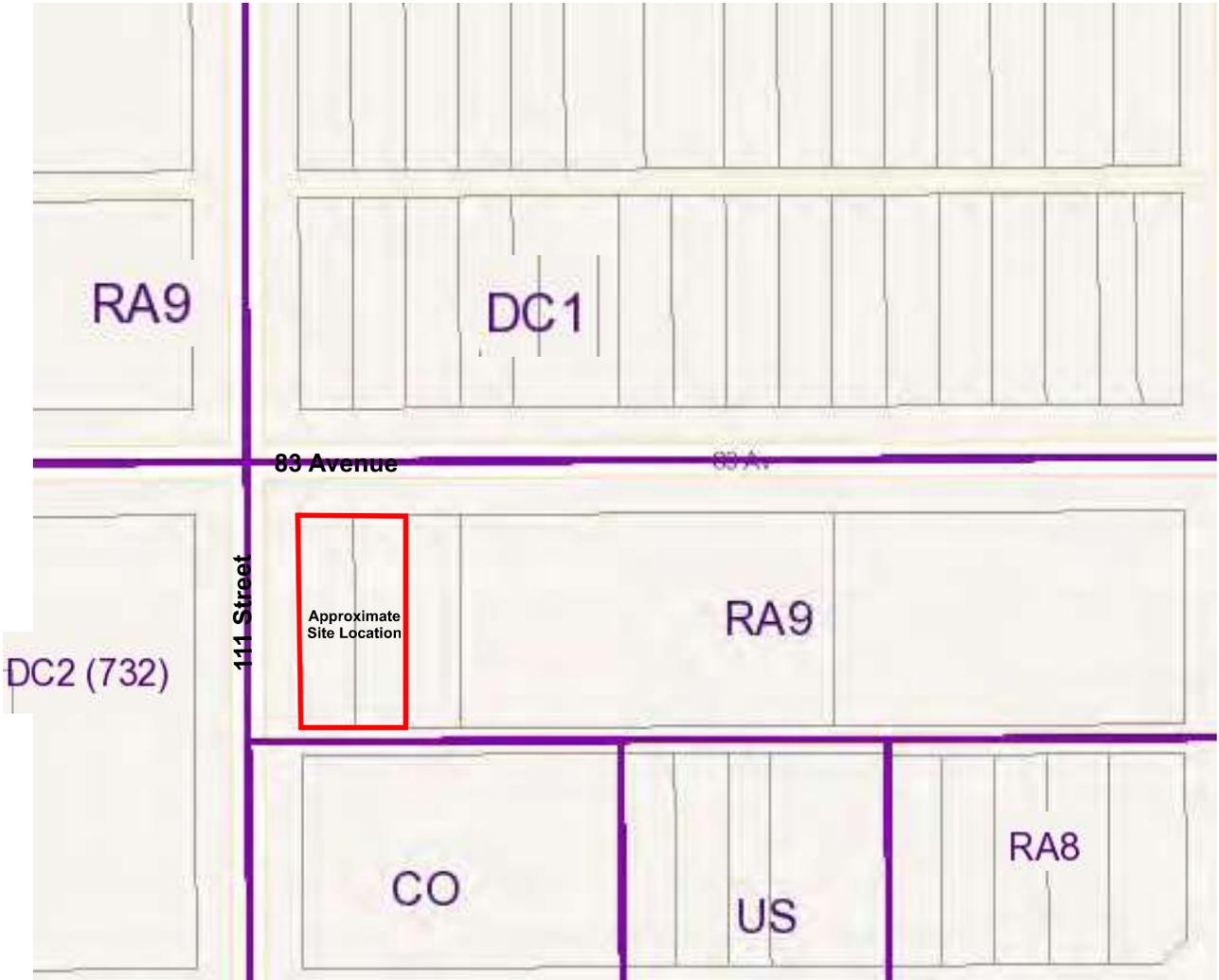


Reference: Government of Alberta, 2021.
 *Scale provided is nominal. Scale provided is that of the figure.
 **This figure is not intended for design or construction purposes. Property lines are approximate.



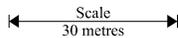
CRIMSON
 ENVIRONMENTAL
 LIMITED

Site Survey Plan	Figure 2
	Scale: As Shown
11049 & 11053 - 83 Avenue NW Lots 17 & 18, Block 157, Plan I19 Edmonton, Alberta	February, 2021
	CEL-37544B



Legend

- CO = Commercial Office Zone
- DC1 = Direct Control Development Provision
- DC2 (732) = Site Specific Development Control Provision
- RA8 = Medium Rise Apartment Zone
- RA9 = High Rise Apartment Zone
- US = Urban Services Zone



Reference: The City of Edmonton, 2021.

*Scale provided is nominal. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Zoning Plan	Figure 3
	Scale: As Shown
11049 & 11053 - 83 Avenue NW Lots 17 & 18, Block 157, Plan 119 Edmonton, Alberta	February, 2021
	CEL-37544B



Reference: The City of Edmonton, 2021.

*Scale provided is approximate. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Plan

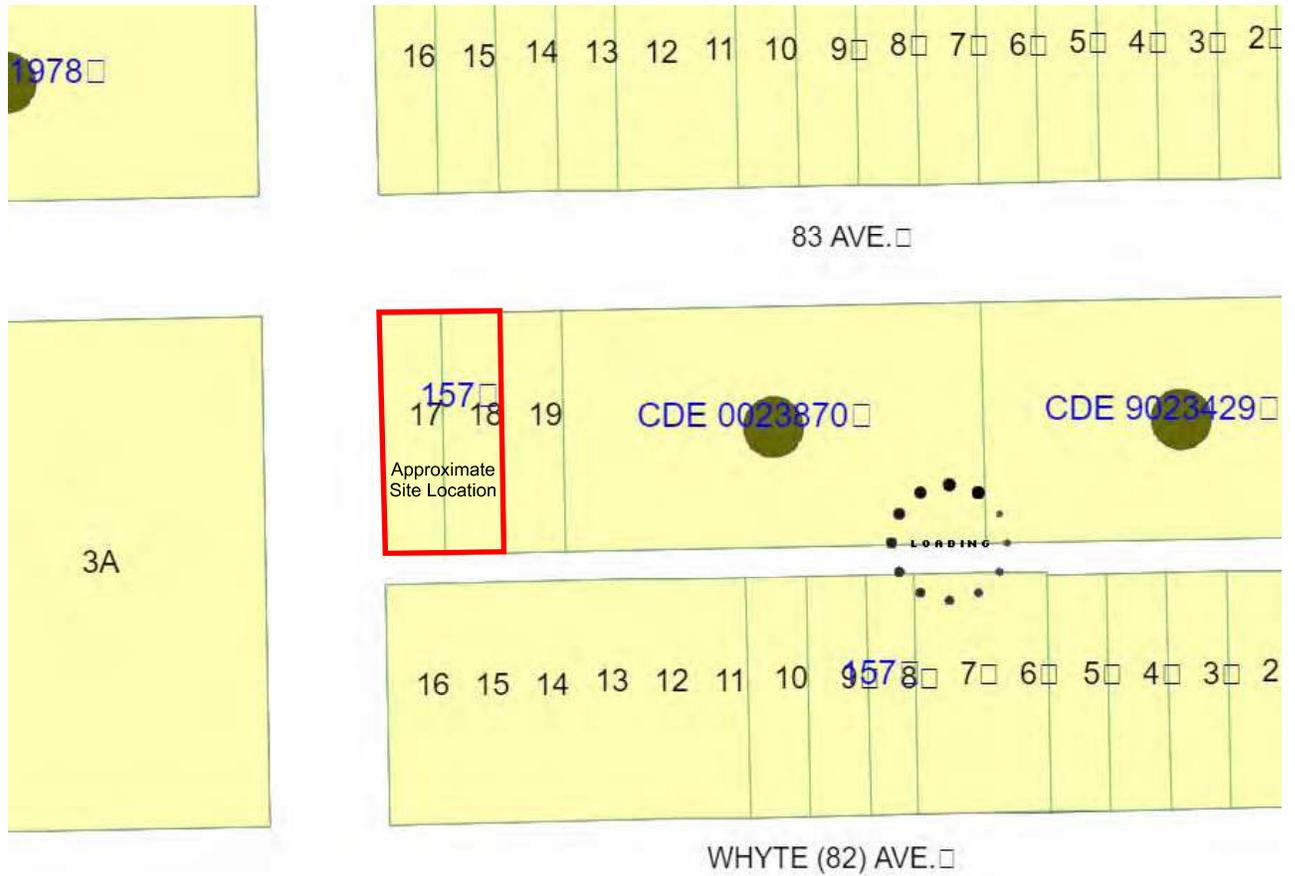
11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

Figure 4

Scale: As Shown

February, 2021

CEL-37544B



Reference: Government of Alberta, 2021.

*Scale provided is approximate. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

ESAR Plan

Figure 5

Scale: As Shown

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

February, 2021

CEL-37544B



Approximate
Site Location



Scale
300 metres

Reference: Government of Alberta, 2021.

*Scale provided is approximate. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

Groundwater Information System
Water Well Plan

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

Figure 6

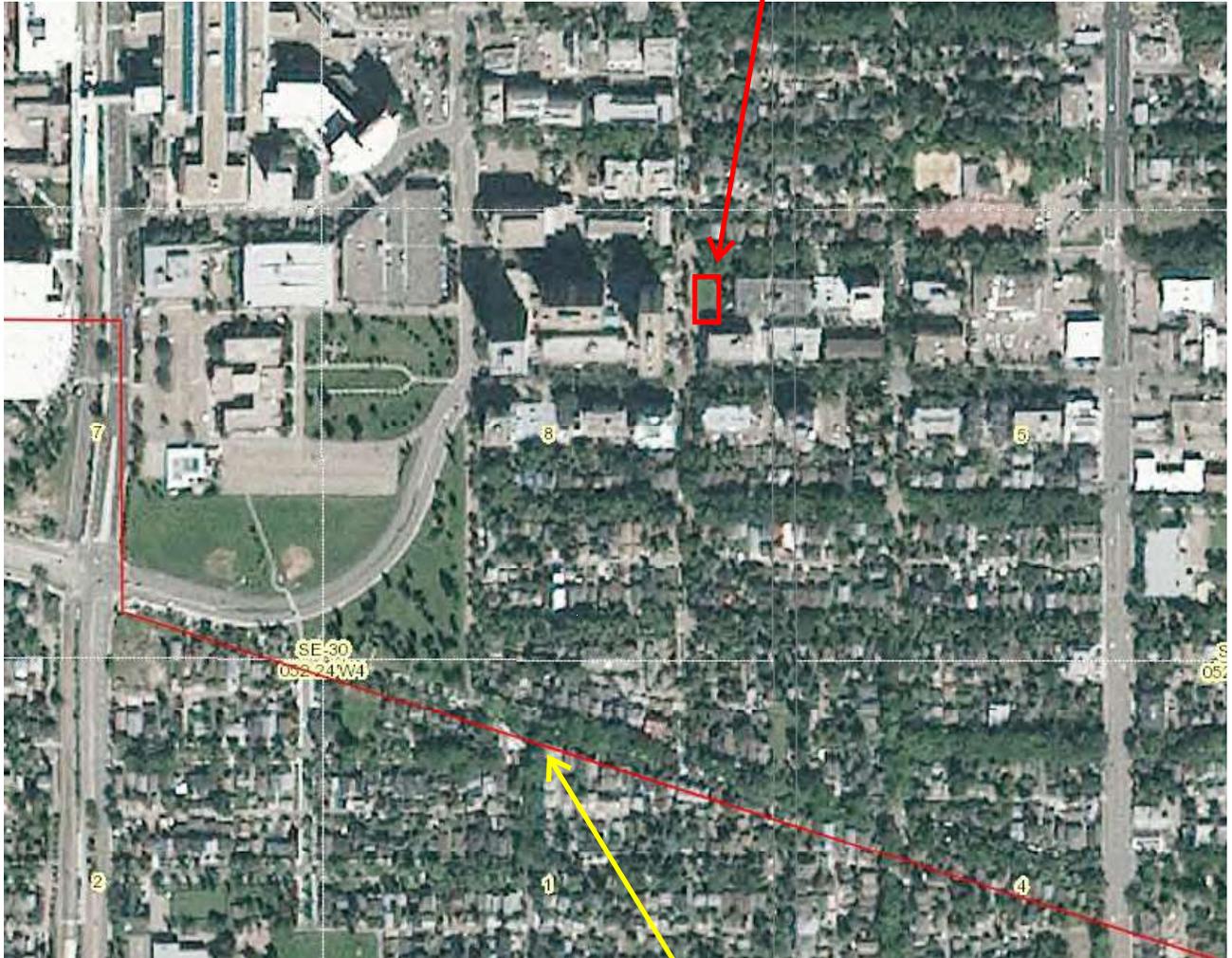
Scale: As Shown

February, 2021

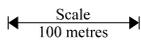
CEL-37544B



Approximate
Site Location



ATCO Gas & Pipelines Ltd.
Licence # AB00020954-4
Natural Gas Pipeline



Reference: Government of Alberta & Abacus Datagraphics Inc. 2021.

*Scale provided is approximate. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

AER Information Plan

Figure 7

Scale: As Shown

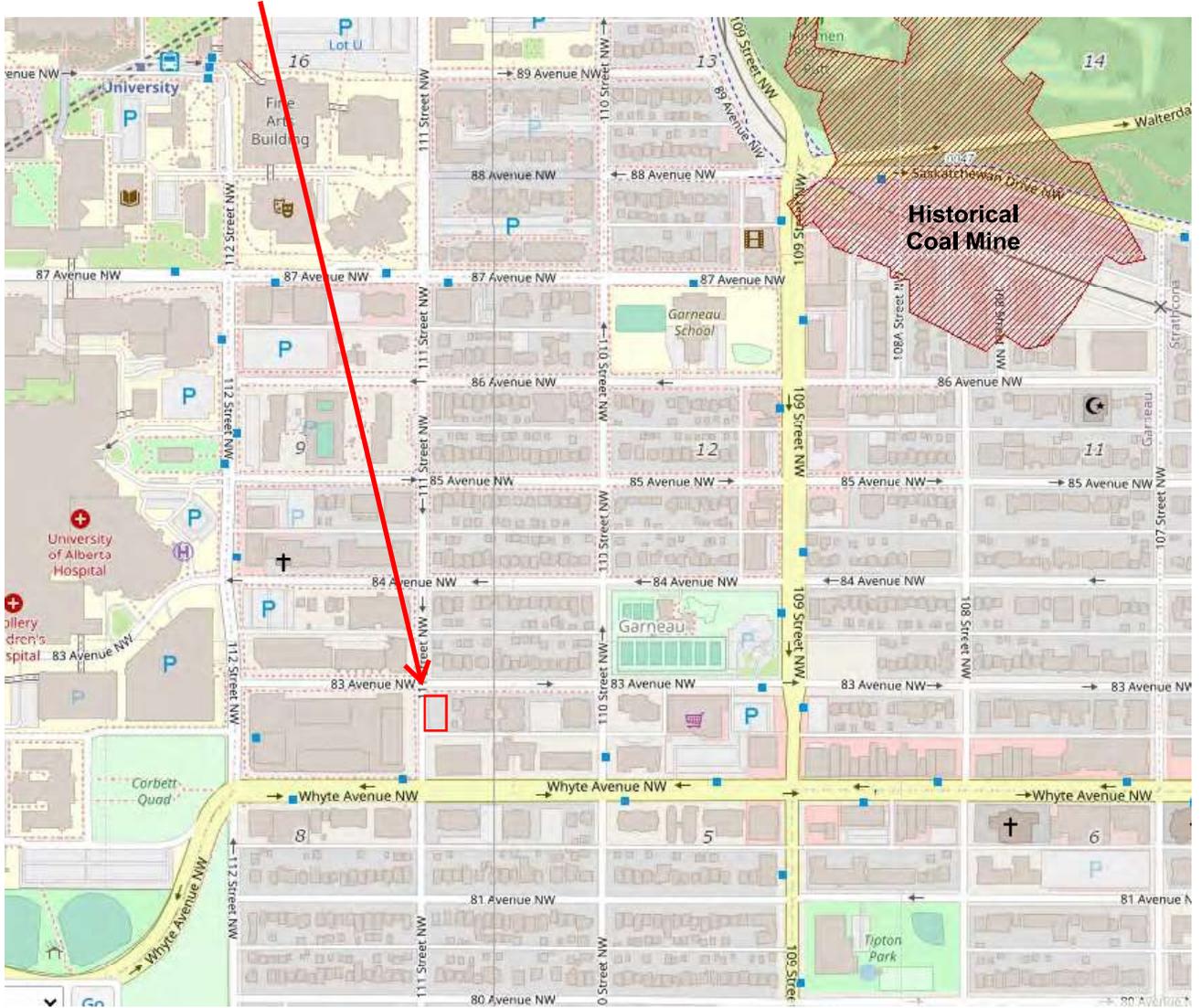
11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

February, 2021

CEL-37544B



Approximate
Site Location



Scale
200 metres

Reference: Government of Alberta, 2021.

*Scale provided is approximate. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

AER Coal Mine Information Plan

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Figure 8

Scale: As Shown

February, 2021

CEL-37544B



University of Alberta
Heating Plant Facility

Approximate
Site Location



Scale
1,000 metres

Reference: Government of Canada, 2021.

*Scale provided is approximate. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
ENVIRONMENTAL
LIMITED

NPRI Information Plan

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

Figure 9

Scale: As Shown

February, 2021

CEL-37544B

Appendix B

Correspondence

Doug Pankewich

From: diana.frechette@gov.ab.ca
Sent: Wednesday, February 10, 2021 4:03 PM
To: pankewich@shaw.ca
Subject: [E21-S-0165] Closure Letter No Records



Environment & Parks and Agriculture & Forestry
FOIP Office
10th Floor, 9Triple8 Jasper,
9888 Jasper Avenue NW
Edmonton, Alberta, T5J 5C6
Telephone: 780-427-4429
www.alberta.ca

February 10, 2021

Mr. Douglas Pankewich
CRIMSON Environmental Limited
314-222 Baseline Road, PO Box 24
Sherwood Park, Alberta T8H 1S8

Your File #: CEL-37544B
FOIP Request #: E21-S-0165
Order Number: FOIPRD-2021-8229

Dear Mr. Pankewich:

Re: Freedom of Information and Protection of Privacy Act Request for records pertaining to the property located at 11049 - 83 AVENUE NW and 11053 - 83 AVENUE NW, Edmonton

The following is in response to your request of February 5, 2021 for access under the Freedom of Information and Protection of Privacy Act to the following subject records:

Location: Plan I19 Lot 18 Block 157 , Plan I19 Lot 17 Block 157 ; 11049 - 83 AVENUE NW and 11053 - 83 AVENUE NW, Edmonton

Name(s): The site is currently owned by the City of Edmonton. There are two lots situated side by side that are used as a community garden.

Time Frame: Historical to Feb 5, 2021

Records: All records pertaining to the environmental condition of the property, including soil, groundwater, surface water, and air contamination.

A search of Alberta Environment & 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 FOIP request, please write to the above address or call me at 780-644-8515, so that we can look at ways to address these issues. If, however, we are

unable to resolve your concerns, under section 65(1) of the Freedom of Information and Protection of Privacy Act, you may ask the Information and Privacy Commissioner to review this decision. To request a review, you must complete and deliver a Request for Review form within 60 days from the date of this notice to the Commissioner at 410, 9925 – 109 Street, Edmonton, Alberta, T5K 2J8. The form is available under the Resources tab on the Commissioner's website www.oipc.ab.ca or you can call 1-888-878-4044 to request a copy of the form.

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.

If you have any questions or concerns, please write or call me at **780-644-8515**.

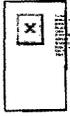
Yours truly,

Angie Chenier
Access and Privacy Advisor

Doug Pankewich

From: diana.frechette@gov.ab.ca
Sent: Wednesday, February 10, 2021 4:01 PM
To: pankewich@shaw.ca
Subject: [E21-S-0165] RD No Records

Environment & Parks and Agriculture & Forestry
FOIP Office
10th Floor, 9Triple8 Jasper,
9888 Jasper Avenue NW
Edmonton, Alberta, T5J 5C6
Telephone: 780-427-4429
www.alberta.ca



February 10, 2021

Mr. Douglas Pankewich
CRIMSON Environmental Limited
314-222 Baseline Road, PO Box 24
Sherwood Park, Alberta

Your File #: CEL-37544B
Order Number: FOIPRD-2021-8229

Dear Mr. Pankewich:

Re: Routine Disclosure Request FOIPRD-2021-8229 for Information Routinely Available Under the Environmental Protection and Enhancement (EPEA) Legislation.

Our office received your request on February 5, 2021 for the following subject records:

Location: Plan I19 Lot 18 Block 157 , Plan I19 Lot 17 Block 157 ; 11049 - 83 AVENUE NW and 11053 - 83 AVENUE NW, Edmonton

Name(s): The site is currently owned by the City of Edmonton. There are two lots situated side by side that are used as a community garden.

Time Frame: Historical to Feb 5, 2021

Records: All records pertaining to the environmental condition of the property, including soil, groundwater, surface water, and air contamination.

Alberta Environment and Parks has conducted a search of department records based on the search parameters you provided to this office and has not identified any routinely available records relating to the subject of your request. As a result of our findings, your Routine Disclosure request has been closed.

If you have any further questions or concerns, please write or call me at **780-644-8515**.

Yours truly,

Angie Chenier
Access and Privacy Advisor



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

26 February, 2021

Douglas Pankewich
Crimson Environmental Ltd.
PO Box 24, 314-222 Baseline Road
Sherwood Park, AB T8H 1S8

Dear Douglas,

Re: Your request for records search – #CEL-3737544B

On February 5, 2021, our office received your request for information regarding the following properties:

11049 & 11053 - 83 Avenue, Edmonton, Alberta

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.

Our records indicate there are no results of any contaminated sites at the above properties. No further documentation was available, no landfills found. It should be noted that the fact that records do not exist does not necessarily mean that the properties comply 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 for this service.

\$50.00 x 2 file search
TOTAL OWING: \$100.00

Sincerely,
Alberta Health Services

A handwritten signature in blue ink, appearing to read "Karah Harvey".

For Karah Harvey, HBK, BEH(AD), CPHI(C)
Environmental Health Officer/Executive Officer



Development Services
2nd Floor, 10111 104 Avenue NW
Edmonton, Alberta
T5J 0J4

Date: February 26, 2021

Our File: 386473401-001

Your File: N/A

CRIMSON ENVIRONMENTAL LIMITED
314, 222 - BASELINE ROAD
SHERWOOD PARK, ALBERTA T8H 0H6

Attention: DOUG PANKEWICH:

**Re: 11053 - 83 AVENUE NW Plan I19 Blk 157 Lot 17
11049 - 83 AVENUE NW Plan I19 Blk 157 Lot 18**

We acknowledge receipt of your inquiry dated Feb 12, 2021, regarding the property located at the above address. The following is the information you requested:

Our records indicate that there are no infractions against this property that concern our office and the bylaws we are charged with enforcing.

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 searchofrecords@edmonton.ca.

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.

MARILYN LINTON, Records Advisor
Permits and Licensing Service Centre

February 18, 2021

Our Reference No.: 386060435-001

CRIMSON Environmental Limited
#24 – 314-222 Baseline Road
Sherwood Park, Alberta, T8H 1S8

Attention: Douglas Pankewich

RE: **Your File No.:** CEL – 3737544B
Legal: Plan I19, Block 157, Lot 17
Municipal: 11053 – 83 Avenue NW, Edmonton, Alberta

A Fire Rescue Services record file search was conducted on February 10, 2021. Your payment has been received.

Fire Prevention has not received any information or reports regarding the following:

- installation/removal of underground storage tanks
- leaks
- site contamination or site remediation

Please understand that, as of the date indicated, none of the above described information has been reported to Fire Rescue Services in connection with this property. 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.

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 May 12, 2020, the File Search fees per address are \$136.00 + \$6.80 (G.S.T.) = \$142.80.

Should you have any questions, please contact Fire Prevention at (780) 496-3628.

Yours truly,

A handwritten signature in blue ink that reads "David Lagne". The signature is written in a cursive style with a large, looped initial "D".

For
G. Mayorchak
Fire Marshal

GGM/dg/ms

February 18, 2021

Our Reference No.: 386060622-001

CRIMSON Environmental Limited
#24 – 314-222 Baseline Road
Sherwood Park, Alberta, T8H 1S8

Attention: Douglas Pankewich

RE: **Your File No.:** CEL – 3737544B
Legal: Plan I19, Block 157, Lot 18
Municipal: 11049 – 83 Avenue NW, Edmonton, Alberta

A Fire Rescue Services record file search was conducted on February 10, 2021. Your payment has been received.

Fire Prevention has not received any information or reports regarding the following:

- installation/removal of underground storage tanks
- leaks
- site contamination or site remediation

Please understand that, as of the date indicated, none of the above described information has been reported to Fire Rescue Services in connection with this property. 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.

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 May 12, 2020, the File Search fees per address are \$136.00 + \$6.80 (G.S.T.) = \$142.80.

Should you have any questions, please contact Fire Prevention at (780) 496-3628.

Yours truly,

A handwritten signature in blue ink that reads "David Lagne". The signature is written in a cursive style with a large, looped initial "D".

For
G. Mayorchak
Fire Marshal

GGM/dg/ms



FINANCIAL SERVICES
AND UTILITIES

OFFICE OF THE CHIEF FINANCIAL
OFFICER & TREASURER
5TH FLOOR, CHANCERY HALL
3 SIR WINSTON CHURCHILL SQUARE
EDMONTON, ALBERTA
T5J 3A3

February 12, 2021

File No.: 71-020-008-001
Search ID: 5992

Doug Pankewich
CRIMSON Environmental Limited
24, 314-222 Baseline Road
Shrwood Park, Alberta
T8H 1S8

Dear Sir/Madam:

	<u>ADDRESS</u>	<u>LEGAL</u>
SUBJECT:	11053 - 83 AVENUE NW T6G0T8 11049 - 83 AVENUE NW T6G0T8	Plan I19 Blk 157 Lot 17 Plan I19 Blk 157 Lot 18

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 Services

Enclosure



9504 – 49 Street NW
Edmonton, Alberta
T6B 2M9 Canada
epcor.com

February 8, 2021

Application No: 385885877-001
Customer File: CEL-3737544B

Douglas Pankewich, M.Sc., P.Geol., P.Eng.
CRIMSON Environmental Limited
#24, 314 - 222 Baseline Road
Sherwood Park, AB T8H 1S8

Re: Legal Address: PLAN I19, BLOCK 157, LOT 17 & 18
Municipal Address: 11049 & 11053 – 83 AVENUE NW, EDMONTON, AB

Attached are the results of a record search for the above noted premises with respect to compliance with City of Edmonton Sewers Use Bylaws, Sewers Bylaws, Drainage Bylaws, EPCOR Drainage Services Bylaw and EPCOR Water Services and Wastewater Treatment Bylaws. Inquiries with respect to this search should be directed to the undersigned at (780) 509-8067. You will be invoiced for this service at a later date.

Regards,

A handwritten signature in cursive script, appearing to read 'D Johnston', is written in black ink.

Dave Johnston
Team Lead - Industrial Source Control
Drainage Services

Enclosure



9504 – 49 Street NW
 Edmonton, Alberta
 T6B 2M9 Canada
 epcor.com

DRAINAGE SERVICES RECORD SEARCH

THIS SEARCH COVERS RECORDS RELATED TO THE FOLLOWING SECTIONS OF CITY BYLAWS: CITY OF EDMONTON SEWERS BYLAW # 9425, Sections 4-38, SEWERS USE BYLAW # 9675, Sections 4-37, DRAINAGE BYLAW # 16200, Sections 4-40, 50-51, DRAINAGE BYLAW # 18093 Sections 15-20, EPCOR DRAINAGE SERVICES BYLAW # 18100, Schedule 2 and EPCOR WATER SERVICES AND WASTEWATER TREATMENT BYLAW # 17698, Schedule 1, Part IV, Wastewater Overstrength Surcharges.

CUSTOMER: CRIMSON Environmental Limited

CUSTOMER FILE #: CEL-3737544B DATE RECEIVED: February 5, 2021

APPLICATION #: 385885877-001

PROPERTY DETAIL:

MUNICIPAL ADDRESS: 11049 & 11053 – 83 AVENUE NW, EDMONTON, AB

LEGAL ADDRESS / DESCRIPTION: PLAN I19, BLOCK 157, LOT 17 & 18

NAME OF FACILITY: _____

TYPE OF BUSINESS: _____

- NOT INSPECTED / NO RECORDS FOUND
- INSPECTED - DATE OF INSPECTION: _____
- NO VIOLATION(S) FOUND
- VIOLATION(S) FOUND: _____
- NOTICE TO COMPLY ISSUED: _____
- FINE(S) ISSUED: _____
- OVERSTRENGTH SURCHARGES LEVIED: _____

COMMENTS: _____

This Records Search is provided in accordance with City of Edmonton Bylaw 18100, EPCOR Drainage Services Bylaw. While EPCOR strives to provide complete and accurate information, no warranties, promises or guarantees are made about the accuracy, completeness or adequacy of this Records Search.

SEARCH BY: Matt Brinkworth
 REVIEWED BY: Dave Johnston

DATE: February 8, 2021
 DATE: February 8, 2021

Locate

I'm looking for

House Number:
11049

Unit (optional):

Street or Avenue Name:
83 AVENUE NW

Popular: To show assessment values on the map [click here](#)

New: To show address labels on the map [click here](#)

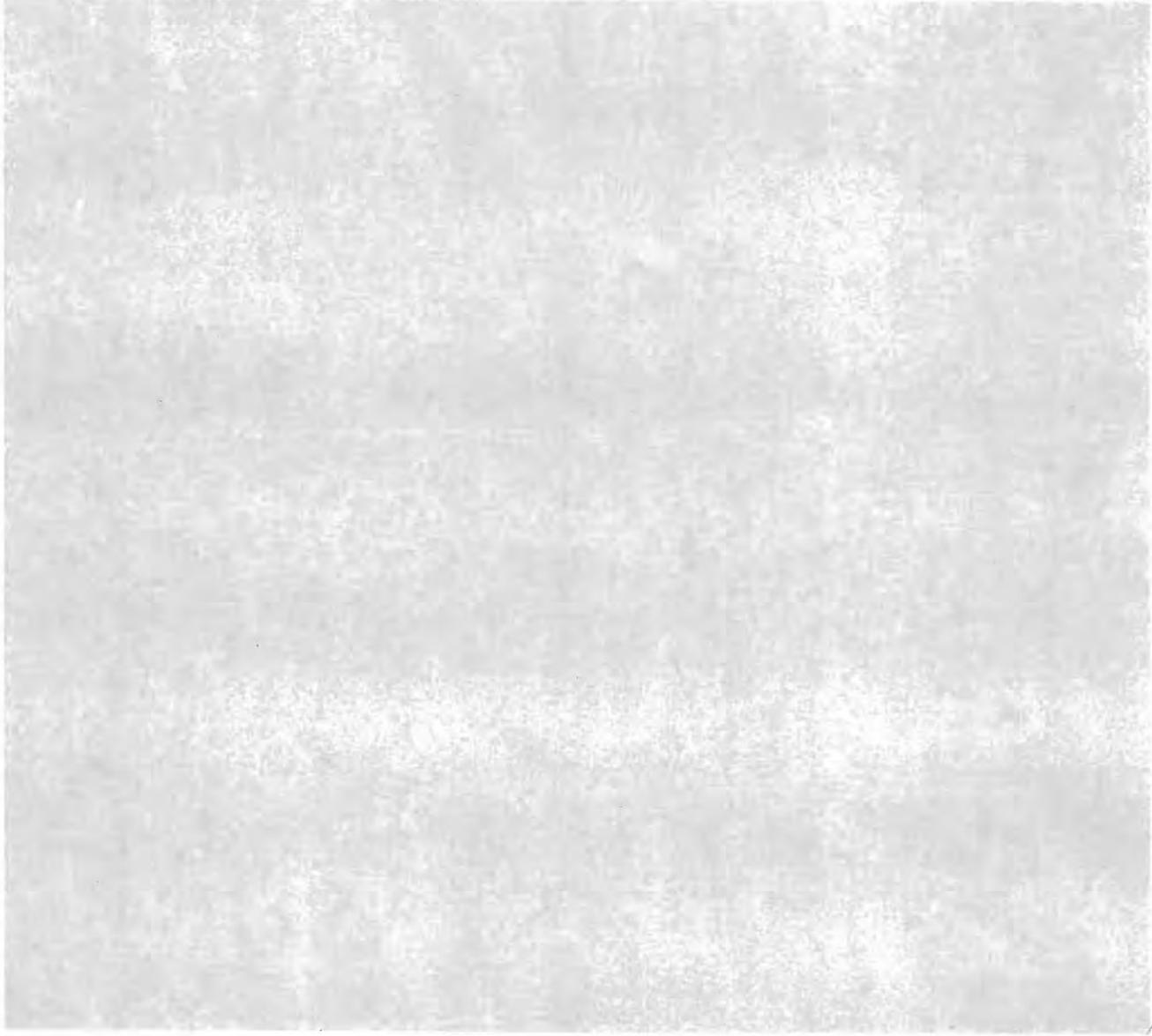
Help Data Refresh List Contact Us

Results

Address

General	Assessment	Applications	Nearby Applications	Nearby Addresses
The address "11049 - 83 AVENUE NW" found at 1 lot				
11049 - 83 AVENUE NW, T6G0T8				
Address:	11049 - 83 AVENUE NW, T6G0T8			
Legal Description for Title Lot:	Lot 18, Block 157, Plan 119			
Area:	404,588 m ²			
Year Built:				
Neighbourhood:	Garneau			
Ward:	Ward 6			
Community League:	The Garneau Community League of Edmonton			
Waste Collection:	Thursday More Information			
Current Zone:	High Rise Apartment Zone (RA9)			
Current Bylaw:	12802			
Proposed Applications:	None			

Show: Fit List



Locate

I'm looking for **Address Lookup**

House Number:
11053

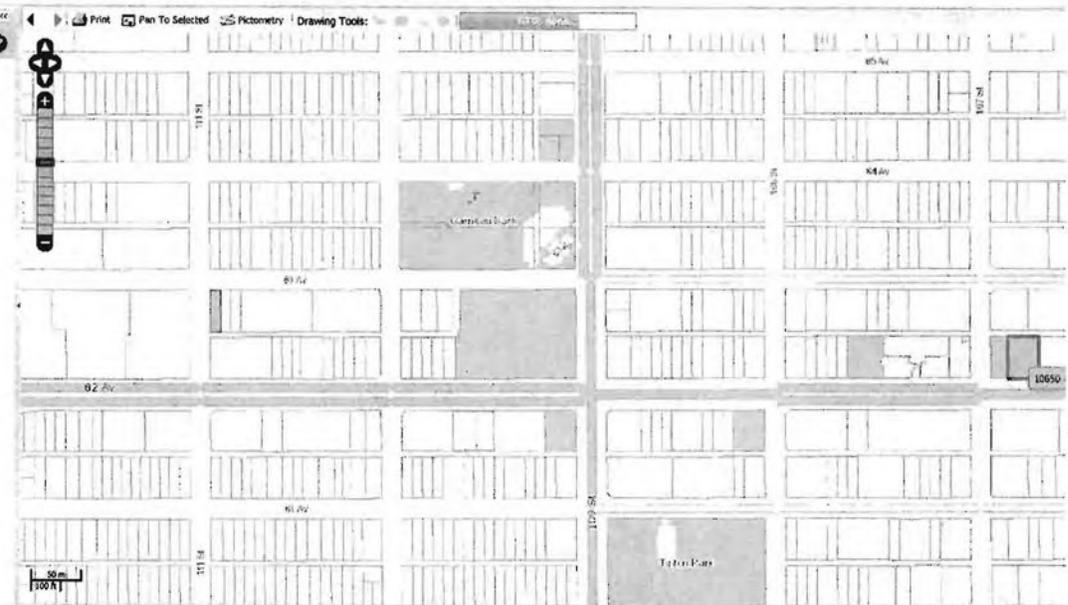
Unit (optional):

Street or Avenue Name:
83 AVENUE NW

Find Address

Popular: To show assessment values on the map [click here](#)

New: To show address labels on the map [click here](#)



Help Data Refresh List Contact Us

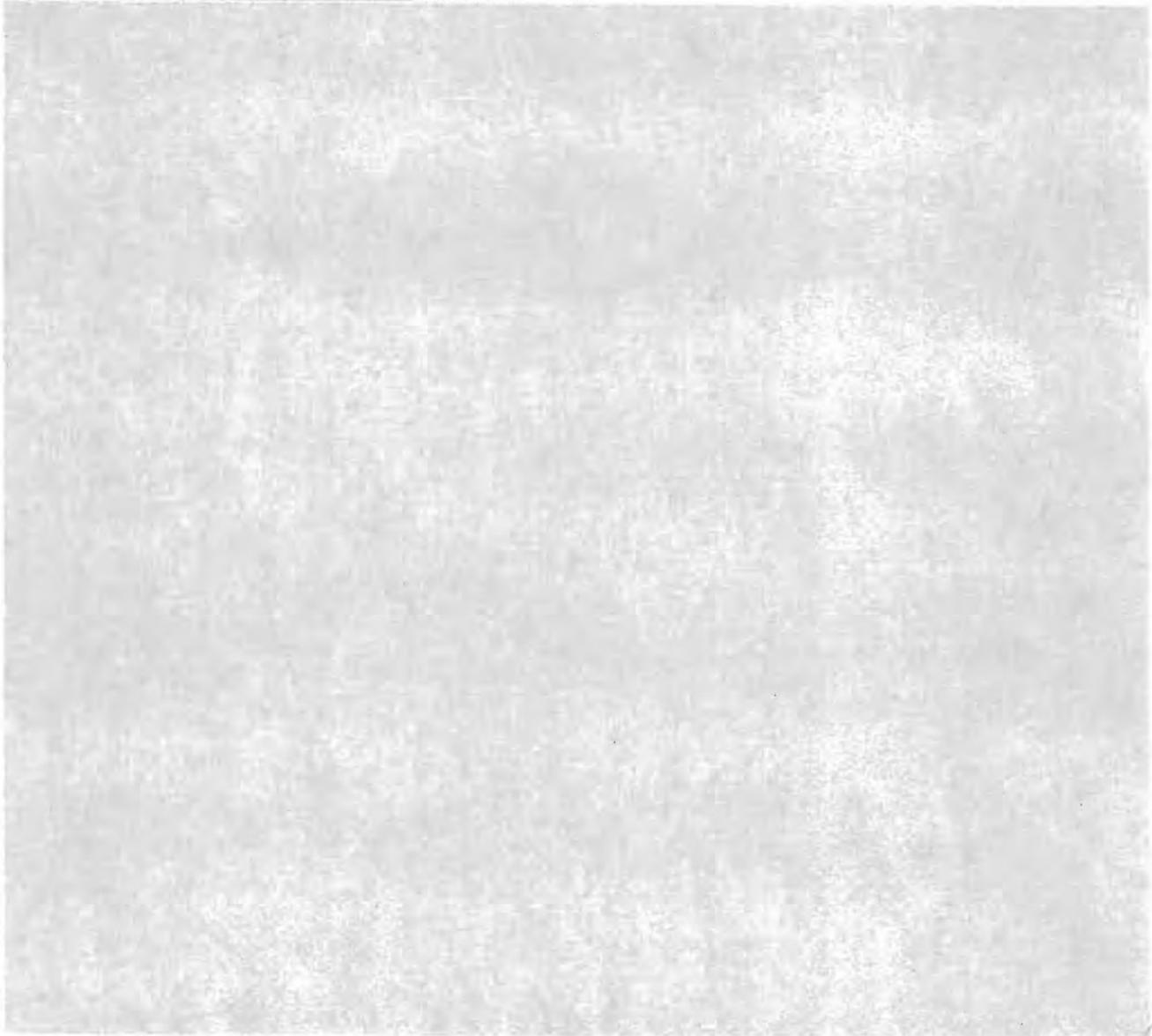
Results

Address

General	Assessment	Applications	Neighbour Applications	Neighbour Addresses
The address '11053 - 83 AVENUE NW' found at 1 lot				
11053 - 83 AVENUE NW, T6G0T8				
The address '11049 - 83 AVENUE NW' found at 1 lot				
11049 - 83 AVENUE NW, T6G0T8				

Show: Selected Only Fit List

Address:	11053 - 83 AVENUE NW, T6G0T8
Legal Description for Title Lot:	Lot 17, Block 157, Plan 119
Area:	404,833 m ²
Year Built:	
Neighbourhood:	Garneau
Ward:	Ward 8
Community League:	The Garneau Community League of Edmonton
Waste Collection:	Thursday More Information
Current Zone:	High Rise Apartment Zone (RA9)
Current Bylaw:	12800
Proposed Applications:	None



The screenshot displays the POSSE software interface. On the left, an 'Address Expansion Search' window is open, showing search criteria: 'From: 11049', 'Street: 83 AVE', and 'Status:'. Below this, a search results table is visible:

House Number	Street	House Number
11049	83 AVE	11049
11099	83 AVENUE NW	11099

The main window shows the selected address: '11049 - 83 AVENUE NW' with 'Plan 119 BIK 157 Lot 18 (Title(s): 202076059001)'. A 'Tax Roll Owner' pop-up window is overlaid on the main window, containing the following information:

- Tax Roll Owner:** CITY OF EDMONTON FIN...
- Formatted Name:** CITY OF EDMONTON FINANCIAL & CORPORATE SERVICE-REAL ESTATE
- Formatted Address:** 10PLR 10111 - 104 AVENUE NW EDMONTON A...
- First Name:** (empty field)
- Last Name/Company:** CITY OF EDMONTON FIN
- Formatted Address:** 10PLR 10111 - 104 AVENUE NW EDMONTON AB T5J 0J4
- Tax Roll Number:** 7197809
- PartyId:** 54603

Buttons for 'OK' and 'Cancel' are located at the bottom of the pop-up window.

The screenshot displays the POSSE software interface. On the left, the 'Address Expansion Search' panel shows search criteria: 'From: 11053', 'Street: 83 AVE', and 'Subst:'. Below this is a search results table with two entries:

Description	House Number	Suffix	House Number
11053 - 83 AVENUE NW	11053		83 AVE
11053 - 83 AVENUE NW	11053		83 AVE

The main window shows details for '11053 - 83 AVENUE NW' with 'Plan 119 Blk 157 Lot 17 (Title(s): 202078055)'. A 'Tax Roll Owner' pop-up window is open, displaying the following information:

- Formatted Name:** CITY OF EDMONTON FINANCIAL & CORPORATE SERVICE-REAL ESTATE
- Formatted Address:** 10FLR 10111 - 104 AVENUE NW EDMONTON A.
- Tax Roll Owner:** CITY OF EDMONTON F...
- First Name:** (empty)
- Last Name/Company:** CITY OF EDMONTON FIN
- Formatted Address:** 10FLR 10111 - 104 AVENUE NW EDMONTON AB T5J 0S4
- Tax Roll Number:** 7197700
- PartyId:** 54003

The pop-up window includes 'OK' and 'Cancel' buttons at the bottom.

February 10, 2021

Mr. Douglas Pankewich
Crimson Environmental Limited
314 222 Baseline Rd Box 24
Sherwood Park AB T8H 1S8

EMAIL: pankewich@shaw.ca

Re: ASCA Storage Tank Search – Your File No. CEL-37544B

Dear Mr. Pankewich,

As per your search request dated February 5, 2021, Alberta Safety Codes Authority (ASCA) has searched the storage tank database for existing and former installations of storage tank systems, as defined by the Fire Code, including those known to be inside structures at the following addresses:

1. 11049 83 Avenue NW, Lot 18, Block 157, Plan I19, Edmonton AB
2. 11053 83 Avenue NW, Lot 17, Block 157, Plan I19, Edmonton AB

The search of the storage tank database determined no records were available for the addresses requested.

The Freedom of Information and Protection of Privacy Act governs the information provided. Please note that the database is **not** complete. The main limitation of the database is that it only includes information reported through registration and permitting or a survey of abandoned sites completed in 1992 and should not be considered a comprehensive inventory of all past or present storage tank sites. ASCA's storage tank systems database is solely maintained based on information provided by owners and operators of storage tank systems; therefore, the database may not reflect information related to all existing or former storage tank systems in Alberta. Further information on storage tank systems or investigations involving a spill/release or contamination may be filed with the local fire service or Alberta Environment.

Regards,

Gerry

Gerry Letendre
ascatanks@safetycodes.ab.ca

Engineering Services Library Search Concise Report

Cadastral: 931-32-10-01 ; 931-32-10; 928-32-22; 931-32-01; 931-32-11 **ACCESSION NO:** 4403
Title: South LRT - Geotechnical Borehole Program
Date: September, 2000
Author: Cherniawski, M. ; AMEC Earth & Environmental Ltd.
Abstract: The purpose of this report is to present the results of the test borings drilled by AMEC.n
Neighbrhd: University of Alberta
Location: 114 80 to 88

Digital Copy: Yes

Cadastral: 931-32-10-02 ; 931-32-10 **ACCESSION NO:** 2497
Title: Geotechnical Investigation, South LRT Tunnel Extension from University Station to the Proposed Health Sciences Station, Report 1 and 2
Date: October 30, 2000
Author: Mainprize, E.; Cherniawski, M. ; AMEC Earth & Environmental Ltd.
Abstract: The purpose of this report is to present the results of the test borings drilled by AMEC and to summarize the available geotechnical data along proposed twin tunnel alignment.
Neighbrhd: University of Alberta
Location: 114 85 to 88

Digital Copy: Yes

Cadastral: 931-32-10-03 ; 931-32-10 **ACCESSION NO:** 2498
Title: Edmonton SLRT Soil Grouting Test Program
Date: March 7, 2001
Author: ECO Grouting Specialists, Ltd. ; ECO Grouting Specialists, Ltd.
Abstract: A soil grouting test program was performed prior to the excavation of the test area.
Neighbrhd: University of Alberta
Location: 114 85 to 88

Digital Copy: Yes

Cadastral: 931-32-10-04 ; 931-32-10 **ACCESSION NO:** 2499
Title: Edmonton SLRT Soil Grouting Test Program
Date: March 19, 2001
Author: ECO Grouting Specialist, Ltd. ; ECO Grouting Specialists, Ltd.
Abstract: Soil grouting test program was performed prior to excavation of the test area.
Neighbrhd: University of Alberta
Location: 114 Street 85 to 88

Digital Copy: Yes

Engineering Services Library Search Concise Report

Cadastral: 931-32-10-05 ; 931-32-10; 931-32-11 **ACCESSION NO:** 2501
Title: South LRT Extension, University Station to Health Sciences Centre Station, Tunnel and Portal
Date: September 28, 2001
Author: Washuta, A.S. ; UMA Engineering Ltd.
Abstract: South LRT extension, Tunnel and Portal
Neighbrhd: University of Alberta
Location: 114 85 to 88

Digital Copy: Yes

Cadastral: 931-32-10-06 ; 931-32-10; 931-32-11 **ACCESSION NO:** 2502
Title: South LRT Tunnel Extension Summary Report, Large Diameter hole (LDH) Excavations, 114 Street and 87 Avenue
Date: October 3, 2001
Author: Gilliss, S.; Barlow, J. ; AMEC Earth & Environmental Ltd.
Abstract: South LRT Tunnel Extension summary report
Neighbrhd: University of Alberta
Location: 114 87

Digital Copy: Yes

Cadastral: 931-32-10-07 ; 931-32-10; 931-32-11 **ACCESSION NO:** 2503
Title: South LRT Extension, Value (VE) Session, February 12-14, 2002
Date: February 12, 2002
Author: Fewings, R. ; Stantec Consulting Ltd.
Abstract: The subject of this session is the Preliminary Design Report. VE is a creative, organized effort using experienced, multi-disciplined teams to analyze functional requirements of a project to provide essential functions at the lowest life cycle cost.
Neighbrhd: University of Alberta
Location: 114 85 to 88

Digital Copy: Yes

Cadastral: 931-32-10-08 ; 931-32-10; 931-32-11 **ACCESSION NO:** 4404
Title: South LRT Extension, University Station to Health Sciences Centre Station, Assessment of Impact of Tunnelling on Buildings and Utilities - DRAFT
Date: March, 2001
Author: ; UMA Engineering Ltd.
Abstract: South LRT extension, Tunnel and Portal
Neighbrhd: University of Alberta
Location: 114 85 to 88

Digital Copy: Yes

Engineering Services Library Search Concise Report

Cadastral: 931-32-10-09 ; 931-32-10; 931-32-11 **ACCESSION NO:** 1493
Title: South Light Rail Transit Extension - Phase II, Preliminary Geotechnical Investigation Along 114 Street, from 87 Avenue to University Avenue (including Health Sciences Station) Geotechnical Report No. 5
Date: March 6, 1986
Author: Chatterji, P.; Harris, M.; Tweedie, R.; Kack, G. ; Thurber Consultants Ltd.
Abstract: A preliminary subsoil investigation for the proposed SLRT tunnel in the area of the University of Alberta
Neighbrhd: University of Alberta
Location: 110 Street - 114 Street University Avenue - 87 Avenue
Digital Copy: Yes

Cadastral: 931-32-10-10 ; 931-32-10 **ACCESSION NO:** 2764
Title: Geotechnical Explorations & Testing South Light Rail Transit Extension, University Station to Health Science Center, Volume 1
Date: March, 2002
Author: Golder Associates ; Golder Associates Ltd.
Abstract: Geotechnical explorations and testing for SLRT. See Volume 2 and addendum reports, 931-32-10-11 and 931-32-10-12.
Neighbrhd: University of Alberta
Location: 114 85 to 88
Digital Copy: Yes

Cadastral: 931-32-10-11 ; 931-32-10 **ACCESSION NO:** 2504
Title: Geotechnical Explorations & Testing South Light Rail Transit Extension, University Station to Health Science Center, Volume 2
Date: March, 2002
Author: Golder Associates ; Golder Associates Ltd.
Abstract: Geotechnical explorations and testing for SLRT. See Volume 1 and Volume 2 addendum No. 1, 931-32-10-10 and 931-32-10-12.
Neighbrhd: University of Alberta
Location: 114 85 to 88
Digital Copy: Yes

Cadastral: 931-32-10-12 ; 931-32-10 **ACCESSION NO:** 2765
Title: Geotechnical Explorations & Testing South Light Rail Transit Extension, University Station to Health Science Center, Volume 2 (Addendum No. 1)
Date: March, 2002
Author: Golder Associates ; Golder Associates Ltd.
Abstract: Geotechnical explorations and testing for SLRT. See Volume 1 and Volume 2 appendices, 931-32-10-10 and 931-32-10-11.
Neighbrhd: University of Alberta
Location: 114 85 to 88
Digital Copy: Yes

Engineering Services Library Search Concise Report

Cadastral: 931-32-10-13 ; 931-32-10 **ACCESSION NO:** 3192
Title: South LRT Extension, LRT-3 and LRT-1 Contract, Environmental Report
Date: August, 2004
Author: Smart, J. ; Stantec Consulting Ltd.
Abstract: The South LRT-3 construction contract involved the reconstruction of 83 Avenue. The South LRT-1 contract involved the construction of a temporary parking lot located at Varsity Field on the University of Alberta campus, and the Northern Alberta Jubilee Auditorium pre-tunneling modifications.
Neighbrhd: Windsor Park; University of Alberta
Location: 114 Street 83 to 89

Digital Copy: Yes

Cadastral: 931-32-10-14 ; 931-32-10; 931-32-01 **ACCESSION NO:** 9888
Title: Geotechnical Investigation Report - Proposed University Avenue Development, 115 Street between 80 Avenue and University Avenue NW - DIGITAL COPY ONLY
Date: October 9, 2019
Author: Robbins, Scott ; GeoPacific Consultants Ltd.
Abstract: This report presents the results of GeoPacific Consultants Ltd. investigation at the development site and provides recommendations for the design and construction of the new structure.
Neighbrhd: McKernan
Routine Disclosure: No **Digital Copy:** Yes

Cadastral: 931-36-06-01 ; 931-36-06 **ACCESSION NO:** 2965
Title: Phase I Environmental Site Assessment, 10907-82 Avenue
Date: May 1, 2002
Author: Gill, M.; Beck, R. ; Dillon Consulting Ltd.
Abstract: Non-intrusive environmental site assessment based on historical and present day information to determine possible environmental issues.
Neighbrhd: Garneau
Location: 109 to 110 82
Routine Disclosure: No **Digital Copy:** Yes

Cadastral: 931-36-06-02 ; 931-36-06 **ACCESSION NO:** 3014
Title: Phase I Environmental Site Assessment, 10907-82 Avenue
Date: April 1, 2004
Author: Wiklund, C.; Bate, A.; Haryett, G. ; Stantec Consulting Ltd.
Abstract: Update to May 2002 Phase I ESA. Recommendation made for further investigation on east side of subject property due to presence of gas station across 109 Street.
Neighbrhd: Garneau
Location: 109 82 (Whyte Avenue)
Routine Disclosure: No **Digital Copy:** Yes

Engineering Services Library Search Concise Report

Cadastral: 931-36-06-03 ; 931-36-06 **ACCESSION NO:** 5927
Title: An Environmental Site Assessment of: Canadian Bible Society, Plan: 782AT, Block: 145, Lot: A, 8440 - 109 Street NW, Edmonton, Alberta
Date: August 31, 2010
Author: Schurek, Martin ; Schur-Tek Resources Ltd.
Abstract: Phase II ESA, petroleum hydrocarbons in two soil samples from depths of about 10 metres
Neighbrhd: Garneau
Location: 8440 - 109 Street 109 85

Digital Copy: Yes

Cadastral: 931-36-06-04 ; 931-36-06 **ACCESSION NO:** 9283
Title: Phase II Environmental Site Assessment Revision 01, 8307 - 109 Street, Lots 9-15, Block 177, Plan N4000R, Edmonton, Alberta - DIGITAL COPY ONLY
Date: April 17, 2018
Author: Delisle, Michael; Finnestad, Brent; Carriere, Henri ; Tetra Tech Canada Inc.
Abstract: Phase 2 ESA at Knox United Church location for purposes of redevelopment. Former dry cleaner 70 m south and service station 130 m south.
Neighbrhd: Garneau
Location: 8307 - 109 STREET NW, T6G1E1 109 83
Routine Disclosure: Yes **Digital Copy:** Yes

Cadastral: 931-36-06-05 ; 931-36-06; 931-32-10 **ACCESSION NO:** 9812
Title: Phase I Environmental Site Assessment 11049 and 11053 - 83 Avenue NW, Edmonton, Alberta - DIGITAL COPY ONLY
Date: February 10, 2020
Author: Jaques, Timothy; Payne, Deanne ; Pinchin Ltd.
Abstract: Nothing was identified that is likely to result in potential subsurface impacts at the site. As such, no subsurface investigation work (Phase II ESA) is recommended at this time.
Neighbrhd: Garneau
Location: 11049 - 83 Avenue NW 11053 - 83 Avenue NW 111 Street 83 Avenue
Routine Disclosure: No **Digital Copy:** Yes



Pipeline Information

ATCO GAS AND PIPELINES LTD. | AB00020954 - 4
Government Pipeline Data Current to January 8, 2021

Permit Date:		License Date:	August 19, 1991
From Location:	14-20-52-24 W4M PL	To Location:	7-30-52-24 W4M RS
Length:	2.2 kms 1.38 mi	Status:	O
Substance:	NG	H₂S:	0 mol/kmol 0 ppm
Outside Diameter:	323.9 mm 12.75 "	Wall Thickness:	6.4 mm 0.25 "
Material:	S	Type:	5LX
Grade:	2411	Max Operating Pressure:	2070 kPa 300 psi
Joints:	W	Internal Coating:	U
Stress Level:	0 %	Environment:	
Original Permit Date:		Construction Date:	
Original License/Line No:	20954 - 4	NEB Registration:	
Last Occurrence Year:	1949	Abacus No:	N/A

Primary Locate Report

Alberta One-Call
Ticket #:

20210401310

FACILITIES LOCATED IN FIELD - facilities identified below as not located in field are clear within the referenced dig area:

<input type="checkbox"/> YES ATCO	<input type="checkbox"/> YES ATCO	<input checked="" type="checkbox"/> YES EPCOR	<input checked="" type="checkbox"/> YES EPCOR	<input type="checkbox"/> YES EPCOR	<input type="checkbox"/> YES COE Traffic/	<input type="checkbox"/> YES TELUS
<input checked="" type="checkbox"/> NO Gas	<input checked="" type="checkbox"/> NO Pipelines	<input type="checkbox"/> NO Drainage	<input type="checkbox"/> NO Water	<input checked="" type="checkbox"/> NO Power	<input checked="" type="checkbox"/> NO Streetlights	<input checked="" type="checkbox"/> NO

11049 83 Ave NW Edmonton, AB

LIFE SPAN OF THIS LOCATE IS 30 DAYS

This Primary and all Auxiliary Locate Reports **MUST** remain WITH the Operator on the **JOB SITE**. The **LOCATION MARKED** is **APPROXIMATE** only. Any facilities involved must be exposed by **HAND DIGGING** or approved **HYDROVAC** method before excavating with **MACHINERY**.

You are **RESPONSIBLE** for **DAMAGE** caused to any facilities by your operations within 1 meter of the alignment of the locate marks independent of depth. By accepting this locate, you acknowledge and agree to **ALL** terms & conditions outlined!

ATCO Gas Policy: Minor coating damage to natural gas lines must be reported and will be repaired free of charge. For this service, call your local ATCO Gas office. Government regulations prohibit the building of a permanent structure over a natural gas line. **Any DAMAGE MUST be reported to ATCO Gas Emergency Dispatch: Edmonton – 780-420-5585;**

ATCO Pipelines Policy: When there is a High Pressure (HP) Pipeline in the vicinity of a Ground Disturbance Site the Locate Technician shall notify the Ground Disturber that no Ground Disturbance is to take place within thirty (30) meters of the HP Pipeline (Controlled Area) until ATCO Pipelines has been notified and is present at the Ground Disturbance Site. No WORK is to take place within the "Right-of-Way" without a **CROSSING AGREEMENT** and an Inspector on Site.

City of Edmonton Policy: Any damage must be reported to City of Edmonton Facilities, streetlight, traffic signals or fibre optic infrastructure, must be reported to 311.

EPCOR Drainage Policy: EPCOR Water & Drainage DO NOT LOCATE water and drainage facilities on PRIVATE PROPERTY. Only the curb cock (C.C.) will be marked which is located on the public/private property boundary. **Damages to the sewer system are to be reported to Drainage Operations at 780-412-4500.**

EPCOR Power Policy: Excavator must hand dig or hydro-vac when working within 1m of the locate marks showing buried infrastructure. If the dig zone is within 5m of facilities at voltage levels of 72kV or above, written consent must be obtained from EPCOR Transmission prior to construction. **All damage must reported immediately to EPCOR Power Trouble at 780-412-4500.**

EPCOR Water Policy: Always hand-dig or hydrovac to expose water infrastructure when crossing or when encroaching within 1.0m on either side of the locate field marks. **Any damage to water lines is to be reported immediately to EPCOR Water Trouble 780-412-4500.** Do not assume the depth of water system since depths can vary significantly from 1.0m to 7.0m

TELUS Policy: Any **DAMAGE MUST be reported to Alberta One-Call @1-800-242-3447.** If working on Private property near an easement, Crossing Agreements **MUST** be in place **PRIOR** to working within 5.0 meters of FOTS (Fibre Optic Transmission System). Contact Crossings@telus.com

* NOTE * - all excavation within 2 meter of **ANY** visible utility infrastructure (i.e. pole, pedestal, riser, cc valve) **MUST** use a non-destructive method!

* NOTE * - Privately owned facilities may be present in the Locate Area. Any privately owned services have not been marked; check with the service / property owner.

Promark telecon Located by Promark-Telecon If there are any questions or concerns regarding this locate, please contact the ELC Hotline at 780-508-1010

Locator's Name : **Jordan D**

Date :	Arrival :	Departure :
2021-01-21	15:00:00	15:30:00

Company : **CRIMSON Environmental Limited / Douglas Pankewich**

Locator's Comments :

COMMENTS

DIG AREA AS PER TICKET

SKETCH LEGEND : Field sketch and Located Area shown on auxiliary locate sheet(s)

	PEDESTAL		SWITCH CUBE		METER/RISER		METER		NID
	SQUARE VAULT		TRANSFORMER		NO METER/RISER		NO METER		NO NID
	MANHOLE		TRAFFIC DETECTOR		POWER		POWER SVC		TELUS
	ROUND VAULT		STREETLIGHT/PEDESTAL		TELUS SERVICE		GAS MAIN		HP GAS
	POLE		TRAFFIC CONTROLLER		GAS SVC		WATER		SANITARY
	STUB		STREET LIGHT		ROAD/BUILDING		STORM		FENCE
	VALVE		POWER COIL		DIG AREA		GRAVEL		GRASS
	HAND HOLE		TEST POINT		WATER		GRAVEL		GRASS
	HYDRANT		FARM TAP UNIT		WATER		GRAVEL		GRASS
	WATER C/C		CATCH BASIN		WATER		GRAVEL		GRASS
	WATER CHAMBER VALVE				WATER		GRAVEL		GRASS

A copy of this Primary Locate Sheet and Auxiliary Locate Sheet(s) must be on site and in the hands of the machine operator during work operations. Should sketch and markings not coincide, a new locate MUST be obtained.

20210401310
TICKET NUMBER

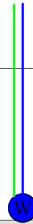
Jordan D
LOCATOR

2021-01-21
DATE



ADDRESS : 11049 83 Ave NW Edmonton, AB

83 AVE.



111 ST NW

17

18

19

**2 ABND GAS SERVICES
IN AREA, COMING FROM
GAS MAIN SOUTH
OF PROPERTY**



DATABASE REPORT

Project Property: *CEL-37544B
11053/11049 - 83 Avenue Northwest
Edmonton AB T6G 0T8*

Project No: *CEL-37544B*

Report Type: *AB Standard Report Plus*

Order No: *21021700453*

Requested by: *CRIMSON Environmental Limited*

Date Completed: *February 22, 2021*

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Reliance on information in Report: This report DOES NOT replace a full Phase I Environmental Site Assessment but is solely intended to be used as a database review of environmental records.

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Executive Summary

Property Information:

Project Property: CEL-37544B
11053/11049 - 83 Avenue Northwest Edmonton AB T6G 0T8

Project No: CEL-37544B

Coordinates:

Latitude: 53.51886999
Longitude: -113.51752734
UTM Northing: 5,932,942.19
UTM Easting: 333,095.96
UTM Zone: 12U

Elevation: 2,205 FT
672.00 M

Order Information:

Order No: 21021700453
Date Requested: February 17, 2021
Requested by: CRIMSON Environmental Limited
Report Type: AB Standard Report Plus

Historical/Products:

Aerial Photographs Aerials - National Collection

Executive Summary: Report Summary

<i>Database</i>	<i>Name</i>	<i>Searched</i>	<i>Project Property</i>	<i>Within 0.30 km</i>	<i>Total</i>
AERW	<i>Well Licenses</i>	Y	0	0	0
AGR	<i>Agriculture and Fisheries - Certificates of Approval</i>	Y	0	0	0
AOGW	<i>Alberta Oil and Gas Wells</i>	Y	0	0	0
AUWR	<i>Automobile Wrecking & Supplies</i>	Y	0	0	0
CAWD	<i>Waste Management Facilities - Certificates of Approval</i>	Y	0	0	0
CBL	<i>Commercial Activity Risk - City of Clagary Business Licenses</i>	Y	0	0	0
CDRY	<i>Dry Cleaning Facilities</i>	Y	0	0	0
CFO	<i>Confined Feeding Operations</i>	Y	0	0	0
CHEM	<i>Chemical Processing Operations - Certificates of Approval</i>	Y	0	0	0
CHM	<i>Chemical Register</i>	Y	0	0	0
CNG	<i>Compressed Natural Gas Stations</i>	Y	0	0	0
COMPOST	<i>Compost Facilities</i>	Y	0	0	0
CONV	<i>Compliance and Convictions</i>	Y	0	0	0
CTNK	<i>Fuel Sales and Storage</i>	Y	0	0	0
DRWD	<i>Approved Oilfield Waste Management Facilities</i>	Y	0	0	0
EAS	<i>Enforcement Action Summary</i>	Y	0	0	0
EBL	<i>Commercial Activity Risk - City of Edmonton Business Licenses</i>	Y	0	0	0
EEM	<i>Environmental Effects Monitoring</i>	Y	0	0	0
EHS	<i>ERIS Historical Searches</i>	Y	4	17	21
EIS	<i>Environmental Issues Inventory System</i>	Y	0	0	0
EPST	<i>Alberta Environment & Parks Storage Tanks</i>	Y	0	0	0
EPWN	<i>Environment Protection & Enhancement Act and Water Act Public Notices</i>	Y	0	0	0
ESAR	<i>Environmental Site Assessment Repository</i>	Y	0	2	2
FAC	<i>Facility List</i>	Y	0	0	0
FCON	<i>Federal Convictions</i>	Y	0	0	0
FCS	<i>Contaminated Sites on Federal Land</i>	Y	0	0	0
FIS	<i>AER Incidents & Spills</i>	Y	0	0	0
FOOD	<i>Food Processing Operations - Certificates of Approval</i>	Y	0	0	0
FRST	<i>Federal Identification Registry for Storage Tank Systems (FIRSTS)</i>	Y	0	0	0
FST	<i>Fuel Storage Tanks</i>	Y	0	12	12
FUEL STATION	<i>Edmonton Vehicle Fueling Stations</i>	Y	0	0	0
GEN	<i>Waste Generators Summary</i>	Y	0	48	48
GHG	<i>Greenhouse Gas Emissions from Large Facilities</i>	Y	0	0	0
GPP	<i>Gas Processing Plants</i>	Y	0	0	0
HELP	<i>Alberta Environment's H.E.L.P. (Help End Landfill Pollution) Program Database</i>	Y	0	0	0

Database	Name	Searched	Project Property	Within 0.30 km	Total
HORW	<i>Horizontal Wells</i>	Y	0	0	0
IAFT	<i>Indian & Northern Affairs Fuel Tanks</i>	Y	0	0	0
LANDFILLS	<i>Landfill Registrations</i>	Y	0	0	0
LDS	<i>Identification and Verification of Active and Inactive Land Disposal Sites</i>	Y	0	0	0
LDSI	<i>Land Disposal Sites on Indian Reserves</i>	Y	0	0	0
LUM	<i>Lumber Related Operations - Certificates of Approval</i>	Y	0	0	0
MINE	<i>Canadian Mine Locations</i>	Y	0	0	0
MMB	<i>Metals, Minerals and Building Materials Operations - Certificates of Approval</i>	Y	0	0	0
MNR	<i>Mineral Occurrences</i>	Y	0	0	0
NATE	<i>National Analysis of Trends in Emergencies System (NATES)</i>	Y	0	0	0
NCST	<i>PTMAA Non-Compliant Storage Tanks</i>	Y	0	0	0
NDFT	<i>National Defense & Canadian Forces Fuel Tanks</i>	Y	0	0	0
NDSP	<i>National Defense & Canadian Forces Spills</i>	Y	0	0	0
NDWD	<i>National Defence & Canadian Forces Waste Disposal Sites</i>	Y	0	0	0
NEBI	<i>National Energy Board Pipeline Incidents</i>	Y	0	0	0
NEBP	<i>National Energy Board Wells</i>	Y	0	0	0
NEES	<i>National Environmental Emergencies System (NEES)</i>	Y	0	0	0
NPCB	<i>National PCB Inventory</i>	Y	0	1	1
NPRI	<i>National Pollutant Release Inventory</i>	Y	0	0	0
OAM	<i>Operating and Abandoned Mines</i>	Y	0	0	0
OGF	<i>Oil and Gas Facilities - ST102 & ST50</i>	Y	0	0	0
OGWW	<i>Oil and Gas Wells</i>	Y	0	0	0
ORP	<i>Alberta Orphan Wells</i>	Y	0	0	0
PAP	<i>Canadian Pulp and Paper</i>	Y	0	0	0
PCFT	<i>Parks Canada Fuel Storage Tanks</i>	Y	0	0	0
PCG	<i>Petrochemical, Coal and Gas Operations - Certificates of Approval</i>	Y	0	0	0
PES	<i>Pesticide Register</i>	Y	0	0	0
PITS	<i>Conglomerate and Waste Management Facilities</i>	Y	0	0	0
PSP	<i>Alberta Private Sewage Disposal Permits</i>	Y	0	0	0
PTAP	<i>PTMAA Approved (Open) Permits</i>	Y	0	0	0
REC	<i>Hazardous Waste Receivers Summary</i>	Y	0	1	1
RST	<i>Retail Fuel Storage Tanks</i>	Y	0	0	0
SCT	<i>Scott's Manufacturing Directory</i>	Y	0	0	0
SPEC	<i>Special Operation Classifications - Certificates of Approval</i>	Y	0	0	0
WDS	<i>Inventory of Waste Disposal Sites</i>	Y	0	0	0
WSTE	<i>Wastewater Operations</i>	Y	0	0	0
WWIS	<i>Alberta Water Well Information Database</i>	Y	0	0	0
Total:			4	81	85

Executive Summary: Site Report Summary - Project Property

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Dir/Dist (m)</i>	<i>Elev diff (m)</i>	<i>Page Number</i>
<u>1</u>	EHS		11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW/0.0	-0.69	<u>26</u>
<u>1</u>	EHS		11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW/0.0	-0.69	<u>26</u>
<u>1</u>	EHS		11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW/0.0	-0.69	<u>26</u>
<u>1</u>	EHS		11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW/0.0	-0.69	<u>26</u>

Executive Summary: Site Report Summary - Surrounding Properties

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Dir/Dist (m)</i>	<i>Elev Diff (m)</i>	<i>Page Number</i>
2	EHS		11044 82 Ave Nw Edmonton AB T6G0T2	SE/19.7	0.00	27
3	GEN	EPCOR ENERGY	11044 82 AVE EDMONTON AB	SSE/31.5	0.00	27
3	EHS		11044 - 82 Avenue Edmonton AB	SSE/31.5	0.00	27
4	GEN	WESTCORP	100 8210 111 ST EDMONTON AB	WSW/37.6	-1.00	27
4	GEN	WESTCORP	100 8210 111 ST EDMONTON AB	WSW/37.6	-1.00	27
5	EHS		11024 82 Avenue NW Edmonton AB T6G 0T2	ESE/66.6	0.00	28
5	EHS		11024 82 Avenue NW Edmonton AB T6G 0T2	ESE/66.6	0.00	28
5	EHS		11024 82 Avenue NW Edmonton AB T6G 0T2	ESE/66.6	0.00	28
5	EHS		11024 82 Avenue NW Edmonton AB T6G 0T2	ESE/66.6	0.00	28
6	EHS		11135 83 Ave Nw Edmonton AB T6G2C6	W/103.1	-1.00	28
7	EHS		11121 82 Ave NW Edmonton AB T6G0T4	SW/124.0	-1.00	29
8	FST	KNOX MET MANOR	10941-83 AVE. EDMONTON (A) AB	E/172.1	0.00	29

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
<u>8</u>	ESAR	KNOX MET MANOR	Edmonton 10941 83 AVE Edmonton AB	E/172.1	0.00	<u>29</u>
<u>8</u>	FST	KNOX MET MANOR	10941-83 AVE. EDMONTON (A) AB	E/172.1	0.00	<u>30</u>
<u>9</u>	GEN	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 8210 - 112 Street, 19th Floor Edmonton AB AB	W/172.5	0.00	<u>30</u>
<u>9</u>	GEN	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 4 floor, 8215 - 112 Street Edmonton AB T6G AB T6G 2C8	W/172.5	0.00	<u>30</u>
<u>9</u>	GEN	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 10th floor, 8215 - 112 Street Edmonton AB AB T6G 2C8	W/172.5	0.00	<u>30</u>
<u>9</u>	GEN	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG c/o8215- 112StCollePI Edmonton AB T6G 5A9 AB	W/172.5	0.00	<u>31</u>
<u>9</u>	GEN	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 10th floor, 8215 - 112 Street Edmonton AB AB T6G 2C8	W/172.5	0.00	<u>31</u>
<u>9</u>	GEN	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 10th Floor, 8215 - 112 Avenue Edmonton AB AB T6G 2C8	W/172.5	0.00	<u>31</u>
<u>9</u>	GEN	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 1518 8215 112 ST Edmonton AB T6G 5A9 AB T6G 2C8	W/172.5	0.00	<u>31</u>
<u>9</u>	GEN	PUBLIC WORKS, SUPPLY AND SERVICES, PEACE RIVER	14th Fl., 8215-112 St. Edmonton AB T6G 5A9 AB	W/172.5	0.00	<u>31</u>
<u>9</u>	GEN	PUBLIC WORKS, SUPPLY AND SERVICES, RED DEER	MICHENER CENTRE 17 floor, 8215 - 112 Street Edmonton AB T6G AB T6G 2C8	W/172.5	0.00	<u>31</u>
<u>9</u>	NPCB	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICE	14th Floor, College Plaza 8215 - 112 Street Edmonton AB T6G 5A9	W/172.5	0.00	<u>32</u>

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8	W/172.5	0.00	<u>33</u>
<u>9</u>	GEN	WESTCORP	2100 COLLEGE PLAZA 8215 112 ST EDMONTON AB	W/172.5	0.00	<u>33</u>
<u>9</u>	GEN	Westcorp Inc.	2100 8215 112 ST NW Edmonton AB T6G 2C8	W/172.5	0.00	<u>33</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	<u>33</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	<u>33</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	<u>34</u>
<u>9</u>	FST	WESTCORP INC. (EXMEPT)	#200 8215-112 STR. EDMONTON (A) AB	W/172.5	0.00	<u>34</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	<u>34</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	<u>34</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB	W/172.5	0.00	<u>34</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8	W/172.5	0.00	<u>35</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	<u>35</u>
<u>9</u>	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	<u>35</u>

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
9	FST	WESTCORP INC. (EXMEPT)	200 8215-112 STR. EDMONTON (A) AB T6G2C8	W/172.5	0.00	35
9	GEN	Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W/172.5	0.00	35
10	EHS		11147 - 82 Avenue Edmonton AB T6G 0T3	WSW/187.3	0.00	36
11	EHS		11147 82 Ave Nw Edmonton AB T6G0T5	WSW/190.9	0.00	36
12	EHS		8510 111 Street Edmonton AB T6G 1H7	N/265.2	3.08	36
12	EHS		8510 111th STREET NW EDMONTON AB	N/265.2	3.08	36
13	EHS		8510 111 St Nw Edmonton AB	NNW/268.1	3.00	36
14	EHS		8510 111 Street Northwest Edmonton AB T6G 1H7	NNW/269.2	3.00	37
14	EHS		8510 111 Street Northwest Edmonton AB T6G 1H7	NNW/269.2	3.00	37
14	EHS		8510 111 Street Northwest Edmonton AB T6G 1H7	NNW/269.2	3.00	37
15	ESAR	EDMONTON BLOOD TRANSFUSION BUILDING	Edmonton 83 AVE 114 ST Edmonton AB	W/276.1	0.80	37
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 - 112 Street Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	38
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 - 112 Street Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	38

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Dir/Dist (m)</i>	<i>Elev Diff (m)</i>	<i>Page Number</i>
16	REC	UNIVERSITY OF ALBERTA HOSPITAL	8440 - 112 Street Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	38
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW/299.5	1.00	38
16	GEN	Capital Health Region	8440 112 ST Edmonton AB T6G 2B7	WNW/299.5	1.00	39
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW/299.5	1.00	39
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW/299.5	1.00	40
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW/299.5	1.00	41
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	41
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	42
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	42
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	43
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	43
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	43
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	44

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Dir/Dist (m)</i>	<i>Elev Diff (m)</i>	<i>Page Number</i>
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW/299.5	1.00	44
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW/299.5	1.00	45
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST AB	WNW/299.5	1.00	45
16	GEN	UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW/299.5	1.00	45
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW/299.5	1.00	46
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	46
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	46
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	46
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	46
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	46
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB	WNW/299.5	1.00	47
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW/299.5	1.00	47
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	47

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Dir/Dist (m)</i>	<i>Elev Diff (m)</i>	<i>Page Number</i>
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	47
16	EHS		8440 112 St Nw Edmonton AB T6G2B7	WNW/299.5	1.00	47
16	FST	UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW/299.5	1.00	47
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	48
16	GEN	University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW/299.5	1.00	48

Executive Summary: Summary By Data Source

EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Oct 31, 2020 has found that there are 21 EHS site(s) within approximately 0.30 kilometers of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
	11044 82 Ave Nw Edmonton AB T6G0T2	SE	19.66	<u>2</u>
	11044 - 82 Avenue Edmonton AB	SSE	31.51	<u>3</u>
	11024 82 Avenue NW Edmonton AB T6G 0T2	ESE	66.63	<u>5</u>
	11024 82 Avenue NW Edmonton AB T6G 0T2	ESE	66.63	<u>5</u>
	11024 82 Avenue NW Edmonton AB T6G 0T2	ESE	66.63	<u>5</u>
	11024 82 Avenue NW Edmonton AB T6G 0T2	ESE	66.63	<u>5</u>
	11147 - 82 Avenue Edmonton AB T6G 0T3	WSW	187.31	<u>10</u>
	11147 82 Ave Nw Edmonton AB T6G0T5	WSW	190.85	<u>11</u>
	8510 111th STREET NW EDMONTON AB	N	265.16	<u>12</u>
	8510 111 Street Edmonton AB T6G 1H7	N	265.16	<u>12</u>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
	8510 111 St Nw Edmonton AB	NNW	268.15	<u>13</u>
	8510 111 Street Northwest Edmonton AB T6G 1H7	NNW	269.18	<u>14</u>
	8510 111 Street Northwest Edmonton AB T6G 1H7	NNW	269.18	<u>14</u>
	8510 111 Street Northwest Edmonton AB T6G 1H7	NNW	269.18	<u>14</u>
	8440 112 St Nw Edmonton AB T6G2B7	WNW	299.53	<u>16</u>
<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW	0.00	<u>1</u>
	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW	0.00	<u>1</u>
	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW	0.00	<u>1</u>
	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	SW	0.00	<u>1</u>
	11135 83 Ave Nw Edmonton AB T6G2C6	W	103.13	<u>6</u>
	11121 82 Ave NW Edmonton AB T6G0T4	SW	123.98	<u>7</u>

ESAR - Environmental Site Assessment Repository

A search of the ESAR database, dated 1960-Aug 2020 has found that there are 2 ESAR site(s) within approximately 0.30 kilometers of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
KNOX MET MANOR	Edmonton 10941 83 AVE Edmonton AB	E	172.14	<u>8</u>
EDMONTON BLOOD TRANSFUSION BUILDING	Edmonton 83 AVE 114 ST Edmonton AB	W	276.13	<u>15</u>

FST - Fuel Storage Tanks

A search of the FST database, dated 1985-Sep 2020 has found that there are 12 FST site(s) within approximately 0.30 kilometers of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
KNOX MET MANOR	10941-83 AVE. EDMONTON (A) AB	E	172.14	<u>8</u>
KNOX MET MANOR	10941-83 AVE. EDMONTON (A) AB	E	172.14	<u>8</u>
WESTCORP INC. (EXMEPT)	200 8215-112 STR. EDMONTON (A) AB T6G2C8	W	172.52	<u>9</u>
WESTCORP INC. (EXMEPT)	#200 8215-112 STR. EDMONTON (A) AB	W	172.52	<u>9</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITALS	8440-112 STR. EDMONTON (A) AB	WNW	299.53	<u>16</u>

GEN - Waste Generators Summary

A search of the GEN database, dated 1993-Aug 2018 has found that there are 48 GEN site(s) within approximately 0.30 kilometers of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
EPCOR ENERGY	11044 82 AVE EDMONTON AB	SSE	31.51	<u>3</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 8210 - 112 Street, 19th Floor Edmonton AB AB	W	172.52	<u>9</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 4 floor, 8215 - 112 Street Edmonton AB T6G AB T6G 2C8	W	172.52	<u>9</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 10th floor, 8215 - 112 Street Edmonton AB AB T6G 2C8	W	172.52	<u>9</u>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG c/o8215- 112StCollePI Edmonton AB T6G 5A9 AB	W	172.52	<u>9</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 10th floor, 8215 - 112 Street Edmonton AB AB T6G 2C8	W	172.52	<u>9</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 10th Floor, 8215 - 112 Avenue Edmonton AB AB T6G 2C8	W	172.52	<u>9</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES	LEGISLATURE BLDG 1518 8215 112 ST Edmonton AB T6G 5A9 AB T6G 2C8	W	172.52	<u>9</u>
PUBLIC WORKS, SUPPLY AND SERVICES, PEACE RIVER	14th Fl., 8215-112 St. Edmonton AB T6G 5A9 AB	W	172.52	<u>9</u>
PUBLIC WORKS, SUPPLY AND SERVICES, RED DEER	MICHENER CENTRE 17 floor, 8215 - 112 Street Edmonton AB T6G AB T6G 2C8	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8	W	172.52	<u>9</u>
WESTCORP	2100 COLLEGE PLAZA 8215 112 ST EDMONTON AB	W	172.52	<u>9</u>
Westcorp Inc.	2100 8215 112 ST NW Edmonton AB T6G 2C8	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>
Westcorp Inc.	2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	W	172.52	<u>9</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 - 112 Street Edmonton AB T6G 2B7 AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 - 112 Street Edmonton AB T6G 2B7 AB	WNW	299.53	<u>16</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW	299.53	<u>16</u>
Capital Health Region	8440 112 ST Edmonton AB T6G 2B7	WNW	299.53	<u>16</u>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST AB	WNW	299.53	<u>16</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 112 ST EDMONTON AB	WNW	299.53	<u>16</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW	299.53	<u>16</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	<u>16</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	<u>16</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	<u>16</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	<u>16</u>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	16
University of Alberta Hospital	8440 112 ST Edmonton AB	WNW	299.53	16
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7	WNW	299.53	16
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	16
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	16
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	16
University of Alberta Hospital	8440 112 ST Edmonton AB T6G 2B7 AB	WNW	299.53	16

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
WESTCORP	100 8210 111 ST EDMONTON AB	WSW	37.62	4
WESTCORP	100 8210 111 ST EDMONTON AB	WSW	37.62	4

NPCB - National PCB Inventory

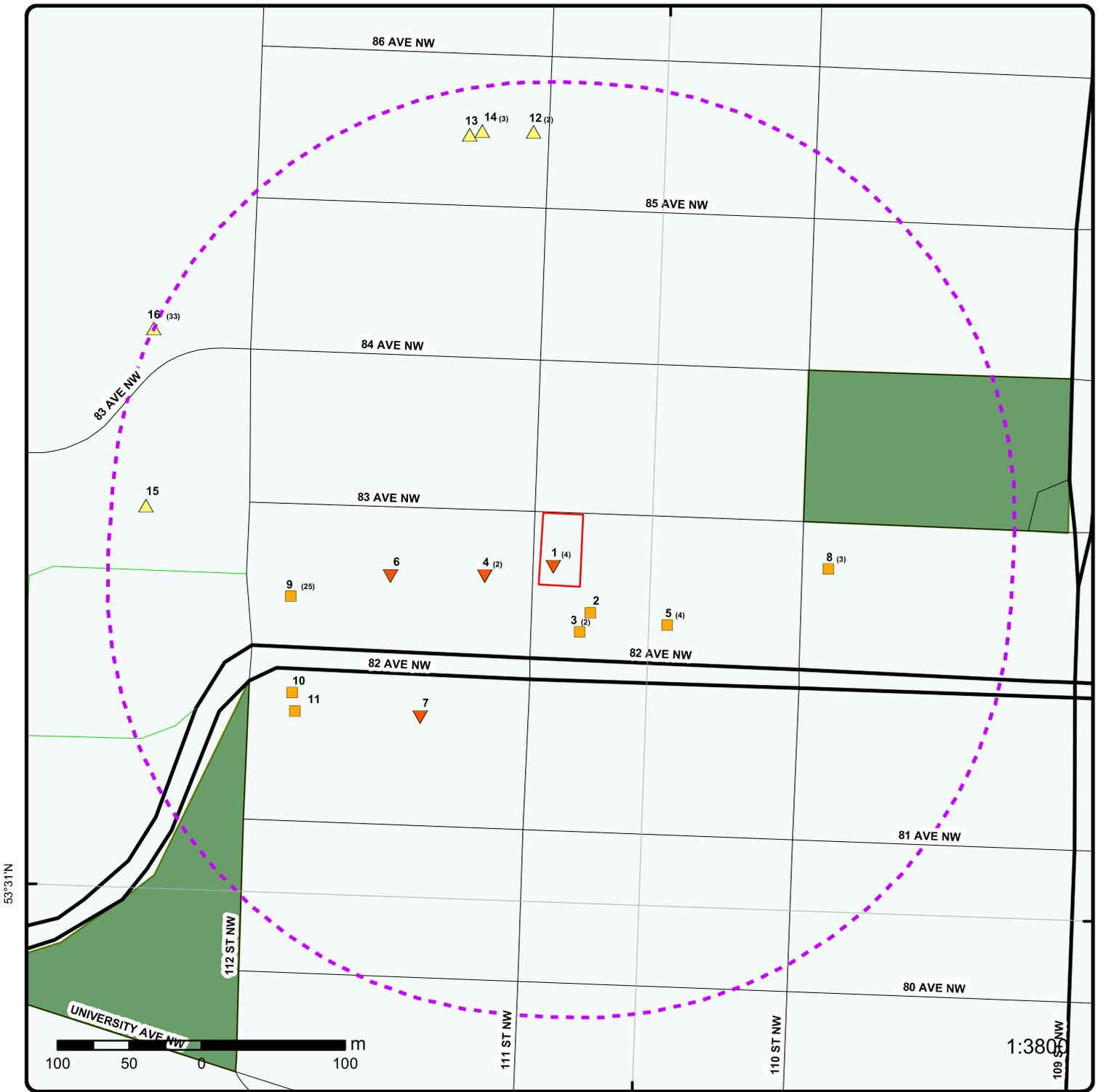
A search of the NPCB database, dated 1988-2008* has found that there are 1 NPCB site(s) within approximately 0.30 kilometers of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
ALBERTA PUBLIC WORKS, SUPPLY AND SERVICE	14th Floor, College Plaza 8215 - 112 Street Edmonton AB T6G 5A9	W	172.52	9

REC - Hazardous Waste Receivers Summary

A search of the REC database, dated 1993-Aug 2018 has found that there are 1 REC site(s) within approximately 0.30 kilometers of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (m)</u>	<u>Map Key</u>
UNIVERSITY OF ALBERTA HOSPITAL	8440 - 112 Street Edmonton AB T6G 2B7 AB	WNW	299.53	16



Map: 0.3 Kilometer Radius

Order Number: 21021700453

Address: 11053/11049 - 83 Avenue Northwest, Edmonton, AB

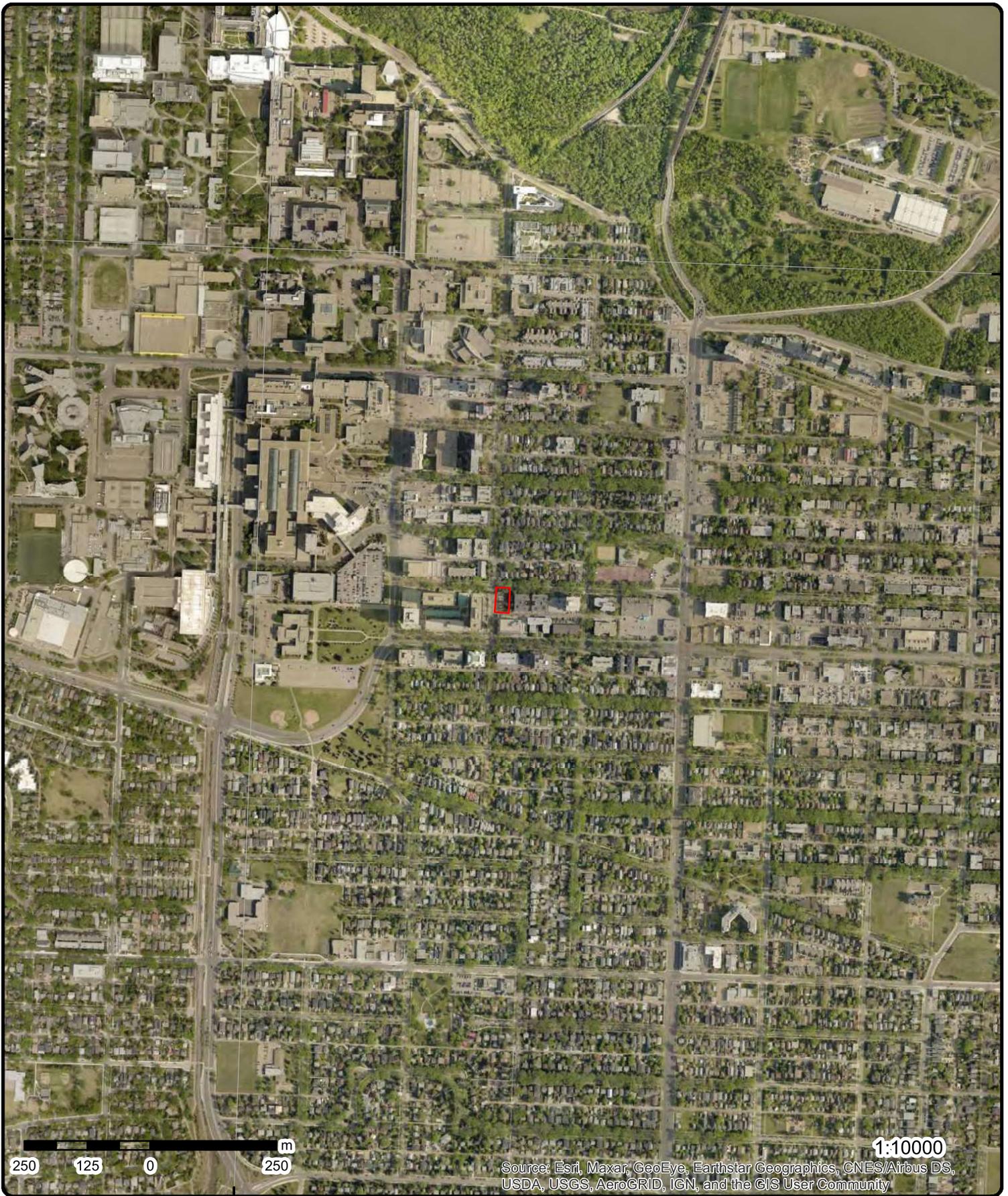


Project Property	Expressway	Industrial and Resource - Regions	National Park
Buffer Outline	Principal Highway	Main Line	Provincial or Territorial Park
Eris Sites with Higher Elevation	Secondary Highway	Sidetrack	Other Park
Eris Sites with Same Elevation	Major Road	Transit Line	Golf Course or Driving Range
Eris Sites with Lower Elevation	Local road	Abandoned Line	Park or Sports Field
Eris Sites with Unknown Elevation	Trail	Proposed Road	Other Recreation Area
	Ferry Route/Ice Road		

113°31'30"W

53°31'30"N

53°31'30"N



250 125 0 250 m

1:10000

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Aerial Year: 2019

Address: 11053/11049 - 83 Avenue Northwest, Edmonton, AB

Source: ESRI World Imagery

Order Number: 21021700453



© ERIS Information Limited Partnership

113°33'W

113°31'30"W

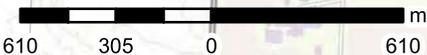
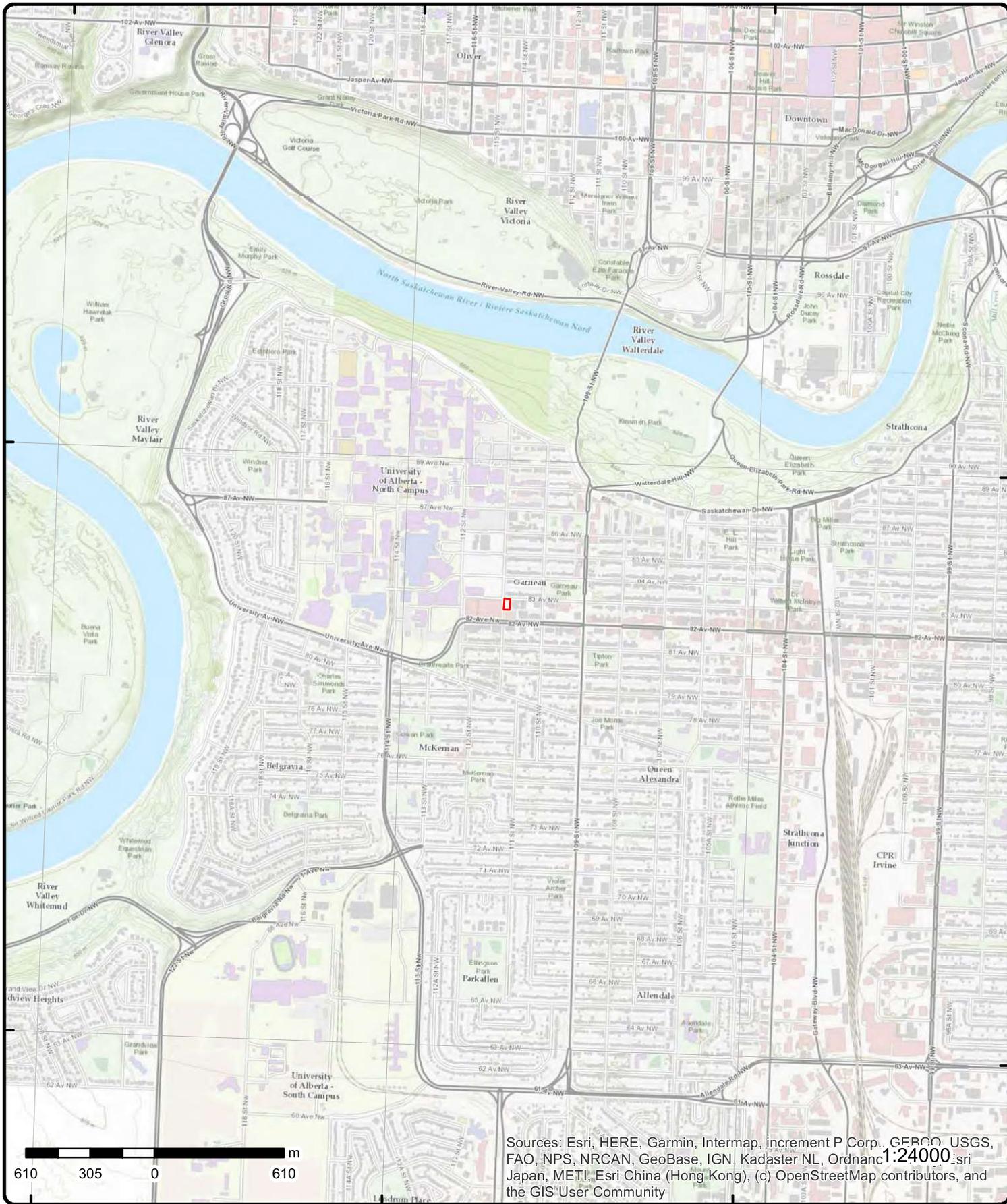
113°30'W

53°31'30"N

53°31'30"N

53°30'N

53°30'N



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Topographic Map

Address: 11053/11049 - 83 Avenue Northwest, AB

Source: ESRI World Topographic Map

Order Number: 21021700453



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Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>1</u>	1 of 4	SW/0.0	671.3 / -0.69	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	EHS
Order No: 20200122145 Status: C Report Type: Standard Report Report Date: 27-JAN-20 Date Received: 22-JAN-20 Previous Site Name: Lot/Building Size: Additional Info Ordered:		Nearest Intersection: Municipality: Client Prov/State: AB Search Radius (km): .25 X: -113.517603 Y: 53.518762			
<u>1</u>	2 of 4	SW/0.0	671.3 / -0.69	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	EHS
Order No: 20200122145 Status: C Report Type: Standard Report Report Date: 27-JAN-20 Date Received: 22-JAN-20 Previous Site Name: Lot/Building Size: Additional Info Ordered:		Nearest Intersection: Municipality: Client Prov/State: AB Search Radius (km): .25 X: -113.517603 Y: 53.518762			
<u>1</u>	3 of 4	SW/0.0	671.3 / -0.69	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	EHS
Order No: 20200122145 Status: C Report Type: Standard Report Report Date: 27-JAN-20 Date Received: 22-JAN-20 Previous Site Name: Lot/Building Size: Additional Info Ordered:		Nearest Intersection: Municipality: Client Prov/State: AB Search Radius (km): .25 X: -113.517603 Y: 53.518762			
<u>1</u>	4 of 4	SW/0.0	671.3 / -0.69	11049 & 11053 83 Avenue Northwest Edmonton AB T6G 0T8	EHS
Order No: 20200122145 Status: C Report Type: Standard Report Report Date: 27-JAN-20 Date Received: 22-JAN-20 Previous Site Name: Lot/Building Size: Additional Info Ordered:		Nearest Intersection: Municipality: Client Prov/State: AB Search Radius (km): .25 X: -113.517603 Y: 53.518762			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>2</u>	1 of 1	SE/19.7	672.0 / 0.00	11044 82 Ave Nw Edmonton AB T6G0T2	EHS
Order No:	20150423030			Nearest Intersection:	
Status:	C			Municipality:	Edmonton
Report Type:	Standard Select Report			Client Prov/State:	AB
Report Date:	29-APR-15			Search Radius (km):	.25
Date Received:	23-APR-15			X:	-113.517199
Previous Site Name:				Y:	53.518482
Lot/Building Size:					
Additional Info Ordered:					
<u>3</u>	1 of 2	SSE/31.5	672.0 / 0.00	EPCOR ENERGY 11044 82 AVE EDMONTON AB	GEN
Approval No:				DLS:	
Record ID:	1448			Phone:	
Approval Year:	2005			Contact:	
--Details--					
Material Code:	9.10				
Material Description:	Unclassified Dangerous Substance/Product				
<u>3</u>	2 of 2	SSE/31.5	672.0 / 0.00	11044 - 82 Avenue Edmonton AB	EHS
Order No:	20070223026			Nearest Intersection:	
Status:	C			Municipality:	
Report Type:	CAN - Custom Report			Client Prov/State:	
Report Date:	3/6/2007			Search Radius (km):	0.25
Date Received:	2/23/2007			X:	-113.517296
Previous Site Name:				Y:	53.518447
Lot/Building Size:	Site: 0.6 acres				
Additional Info Ordered:					
<u>4</u>	1 of 2	WSW/37.6	671.0 / -1.00	WESTCORP 100 8210 111 ST EDMONTON AB	GEN
Approval No:				DLS:	
Record ID:	1772			Phone:	
Approval Year:	2001			Contact:	
--Details--					
Material Code:	9.1				
Material Description:	Unclassified Dangerous Substance/Product				
<u>4</u>	2 of 2	WSW/37.6	671.0 / -1.00	WESTCORP 100 8210 111 ST EDMONTON AB	GEN
Approval No:				DLS:	
Record ID:	1878			Phone:	
Approval Year:	2002			Contact:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
--Details--					
Material Code:		9.10			
Material Description:		Unclassified Dangerous Substance/Product			
<u>5</u>	1 of 4	ESE/66.6	672.0 / 0.00	11024 82 Avenue NW Edmonton AB T6G 0T2	EHS
Order No:	20200122076	Nearest Intersection:			
Status:	C	Municipality:			
Report Type:	Standard Report	Client Prov/State:		AB	
Report Date:	27-JAN-20	Search Radius (km):		.25	
Date Received:	22-JAN-20	X:		-113.5163875	
Previous Site Name:		Y:		53.5184221	
Lot/Building Size:					
Additional Info Ordered:					
<u>5</u>	2 of 4	ESE/66.6	672.0 / 0.00	11024 82 Avenue NW Edmonton AB T6G 0T2	EHS
Order No:	20200122076	Nearest Intersection:			
Status:	C	Municipality:			
Report Type:	Standard Report	Client Prov/State:		AB	
Report Date:	27-JAN-20	Search Radius (km):		.25	
Date Received:	22-JAN-20	X:		-113.5163875	
Previous Site Name:		Y:		53.5184221	
Lot/Building Size:					
Additional Info Ordered:					
<u>5</u>	3 of 4	ESE/66.6	672.0 / 0.00	11024 82 Avenue NW Edmonton AB T6G 0T2	EHS
Order No:	20200122076	Nearest Intersection:			
Status:	C	Municipality:			
Report Type:	Standard Report	Client Prov/State:		AB	
Report Date:	27-JAN-20	Search Radius (km):		.25	
Date Received:	22-JAN-20	X:		-113.5163875	
Previous Site Name:		Y:		53.5184221	
Lot/Building Size:					
Additional Info Ordered:					
<u>5</u>	4 of 4	ESE/66.6	672.0 / 0.00	11024 82 Avenue NW Edmonton AB T6G 0T2	EHS
Order No:	20200122076	Nearest Intersection:			
Status:	C	Municipality:			
Report Type:	Standard Report	Client Prov/State:		AB	
Report Date:	27-JAN-20	Search Radius (km):		.25	
Date Received:	22-JAN-20	X:		-113.5163875	
Previous Site Name:		Y:		53.5184221	
Lot/Building Size:					
Additional Info Ordered:					
<u>6</u>	1 of 1	W/103.1	671.0 / -1.00	11135 83 Ave Nw Edmonton AB T6G2C6	EHS
Order No:	20140620035	Nearest Intersection:			
Status:	C	Municipality:		Edmonton	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Report Type: Standard Select Report Report Date: 26-JUN-14 Date Received: 20-JUN-14 Previous Site Name: Lot/Building Size: Additional Info Ordered:					
Client Prov/State: AB Search Radius (km): .25 X: -113.519305 Y: 53.518668					
<u>7</u>	1 of 1	SW/124.0	671.0 / -1.00	11121 82 Ave NW Edmonton AB T6G0T4	EHS
Order No: 20171102224 Status: C Report Type: Standard Report Report Date: 08-NOV-17 Date Received: 02-NOV-17 Previous Site Name: Lot/Building Size: Additional Info Ordered:					
Nearest Intersection: Municipality: EDMONTON Client Prov/State: AB Search Radius (km): .25 X: -113.518944 Y: 53.517792					
<u>8</u>	1 of 3	E/172.1	672.0 / 0.00	KNOX MET MANOR 10941-83 AVE. EDMONTON (A) AB	FST
Site No: 6234 Tank No: 1 No of Tanks: Tank Type: Tank Status: Site Status: Date Last Used: UST/AST: Contents: Other Contents: Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:					
Dt Form Rcvd: 1998/08/31 Date Removed: 199810 Removal Reason: No Longer Required Located 200m: NO Located 500m: NO DLS Coord: Lot: 19 Block: 143 Plan: 6345U Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4: Commercial / Industrial					
<u>8</u>	2 of 3	E/172.1	672.0 / 0.00	KNOX MET MANOR Edmonton 10941 83 AVE Edmonton AB	ESAR
ESA ID: 1337854 ESRD File: 00141895 File Classification: PST Name: KNOX MET MANOR Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=1337854 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00141895					
LLD: 6345U;143;19,20 LINC: 0016238454 10tm Point Coord: 98436,5928639 Extracted Dnld Dt: 2020-Sep-03					
Document Detail					
Doc Desc: SITE SENSITIVITY ASSESSMENT Doc Date: 4/1/1998					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Document Detail					
Doc Desc:		UNDERGROUND STORAGE TANK REMOVAL			
Doc Date:		3/1/1999			
<u>8</u>	3 of 3	E/172.1	672.0 / 0.00	KNOX MET MANOR 10941-83 AVE. EDMONTON (A) AB	FST
Site No:		6234		Dt Form Rcvd:	
Tank No:				Date Removed:	
No of Tanks:				Removal Reason:	
Tank Type:				Located 200m:	
Tank Status:				Located 500m:	
Site Status:				DLS Coord:	
Date Last Used:				Lot: 19	
UST/AST:				Block: 143	
Contents:				Plan: 6345U	
Other Contents:				Municipality: EDMONTON (A)	
Capacity:				Postal:	
Other Capacity:				Facility 1:	
UST Secondary:				Facility 2:	
AST Secondary:				Facility 3:	
Overfill Prevention:				Facility 4:	
Class:					
LLD:					
Spill Containment:					
Tank Status by Site Name:					
Owner Address:					
<u>9</u>	1 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES LEGISLATURE BLDG 8210 - 112 Street, 19th Floor Edmonton AB	GEN
Approval No:		ABG03669		DLS:	
Record ID:				Phone: (403)468-4820	
Approval Year:		1993-1998		Contact: Ross Stetson	
<u>9</u>	2 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES LEGISLATURE BLDG 4 floor, 8215 - 112 Street Edmonton AB T6G AB T6G 2C8	GEN
Approval No:		ABG03875		DLS:	
Record ID:				Phone: (403)427-6024	
Approval Year:		1993-1998		Contact: Dale Barrow	
<u>9</u>	3 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES LEGISLATURE BLDG 10th floor, 8215 - 112 Street Edmonton AB AB T6G 2C8	GEN
Approval No:		ABG04231		DLS:	
Record ID:				Phone: (403)427-3866	
Approval Year:		1993-1998		Contact: Ken Kimuka	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>9</u>	4 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES LEGISLATURE BLDG c/o8215-112StCollePI Edmonton AB T6G 5A9 AB	GEN
Approval No:	ABG04244			DLS:	
Record ID:				Phone:	(403)422-2526
Approval Year:	1993-1998			Contact:	Ken McNeil
<u>9</u>	5 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES LEGISLATURE BLDG 10th floor, 8215 - 112 Street Edmonton AB AB T6G 2C8	GEN
Approval No:	ABG04257			DLS:	
Record ID:				Phone:	(403)427-3866
Approval Year:	1993-1998			Contact:	Fred Storry
<u>9</u>	6 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES LEGISLATURE BLDG 10th Floor, 8215 - 112 Avenue Edmonton AB AB T6G 2C8	GEN
Approval No:	ABG04485			DLS:	
Record ID:				Phone:	(403)427-5211
Approval Year:	1993-1998			Contact:	T6G 5A9
<u>9</u>	7 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICES LEGISLATURE BLDG 1518 8215 112 ST Edmonton AB T6G 5A9 AB T6G 2C8	GEN
Approval No:	ABG04836			DLS:	
Record ID:				Phone:	(403)423-4777
Approval Year:	1993-1998			Contact:	Hubert Bourque
<u>9</u>	8 of 25	W/172.5	672.0 / 0.00	PUBLIC WORKS, SUPPLY AND SERVICES, PEACE RIVER 14th Fl., 8215-112 St. Edmonton AB T6G 5A9 AB	GEN
Approval No:	ABG04537			DLS:	
Record ID:				Phone:	(403)422-7472
Approval Year:	1993-1998			Contact:	Tim Leung
<u>9</u>	9 of 25	W/172.5	672.0 / 0.00	PUBLIC WORKS, SUPPLY AND SERVICES, RED DEER MICHENER CENTRE 17 floor, 8215 - 112 Street Edmonton AB T6G AB T6G 2C8	GEN
Approval No:	ABG04493			DLS:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Record ID:				Phone:	(403)427-3856
Approval Year:	1993-1998			Contact:	Orest Kuszka

<u>9</u>	10 of 25	W/172.5	672.0 / 0.00	ALBERTA PUBLIC WORKS, SUPPLY AND SERVICE 14th Floor, College Plaza 8215 - 112 Street Edmonton AB T6G 5A9	NPCB
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Company Code: T0007
Industry: Government (not Fed)
Site Status:
Transaction Date: 2/14/1996
Inspection Date:

--Details--

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 100.00 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 727.40 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 768.30 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use
Contents: 900.10 L

Label:
Serial No.:
PCB Type/Code: askarel
Location:
Item/State:
No. of Items:
Manufacturer:
Status: in-use

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Contents:		954.70 L			
Label:					
Serial No.:					
PCB Type/Code:		askarel			
Location:					
Item/State:					
No. of Items:					
Manufacturer:					
Status:		in-use			
Contents:		1100.00 L			
9	11 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8	GEN
Approval No:		ABG10632		DLS:	
Record ID:		887		Phone:	
Approval Year:		1999		Contact:	
--Details--					
Material Code:		UN2315			
Material Description:		Polychlorinated Biphenyls/PCB			
9	12 of 25	W/172.5	672.0 / 0.00	WESTCORP 2100 COLLEGE PLAZA 8215 112 ST EDMONTON AB	GEN
Approval No:				DLS:	
Record ID:		2089		Phone:	
Approval Year:		2003		Contact:	
--Details--					
Material Code:		9.10			
Material Description:		Unclassified Dangerous Substance/Product			
9	13 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100 8215 112 ST NW Edmonton AB T6G 2C8	GEN
Approval No:				DLS:	
Record ID:				Phone:	(780) 431-3340
Approval Year:		2007/2008		Contact:	Gwen Russell
9	14 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN
Approval No:				DLS:	
Record ID:				Phone:	(780)431-3340
Approval Year:		2008/2009		Contact:	Gwen Russell
9	15 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Approval No: Record ID: Approval Year: 2009				DLS: Phone: (780)431-3340 Contact: Gwen Russell	
9	16 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN
Approval No: Record ID: Approval Year: 2010				DLS: Phone: (780)431-3340 Contact: Gwen Russell	
9	17 of 25	W/172.5	672.0 / 0.00	WESTCORP INC. (EXMEPT) #200 8215-112 STR. EDMONTON (A) AB	FST
Site No: 8117 Tank No: 1 No of Tanks: Tank Type: Aboveground Tank Status: Currently in service Site Status: Date Last Used: UST/AST: Contents: Diesel Other Contents: Capacity: Other - specify in liters Other Capacity: 2,273 litres UST Secondary: AST Secondary: Steel Overfill Prevention: Fixed Suction Tube On Used Oil Tanks Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:				Dt Form Rcvd: 2009/12/24 Date Removed: Removal Reason: Located 200m: NO Located 500m: NO DLS Coord: Lot: 1A-3A Block: 158 Plan: 5384RS Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4: Commercial / Industrial	
9	18 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN
Approval No: Record ID: Approval Year:				DLS: Phone: Contact:	
9	19 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN
Approval No: Record ID: Approval Year: May 2011-Apr 2012				DLS: Phone: Contact:	
9	20 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB	GEN

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Approval No: Record ID: Approval Year: May 2012- Jan 2013				DLS: Phone: 780-431-3340 Contact: Gwen Russell	
9	21 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8	GEN
Approval No: Record ID: Approval Year: Feb 2013 - Sep 2013				DLS: Phone: 780-431-3340 Contact: Gwen Russell	
9	22 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN
Approval No: Record ID: Approval Year: Feb 2015				DLS: Phone: 780-431-3340 Contact: Gwen Russell	
9	23 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN
Approval No: Record ID: Approval Year: Jan 2016				DLS: Phone: 780-431-3340 Contact: Gwen Russell	
9	24 of 25	W/172.5	672.0 / 0.00	WESTCORP INC. (EXMEPT) 200 8215-112 STR. EDMONTON (A) AB T6G2C8	FST
Site No: 8117 Tank No: No of Tanks: Tank Type: Tank Status: Site Status: Date Last Used: UST/AST: Contents: Other Contents: Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:				Dt Form Rcvd: Date Removed: Removal Reason: Located 200m: Located 500m: DLS Coord: Lot: 1A-3A Block: 158 Plan: 5384RS Municipality: EDMONTON (A) Postal: T6G2C8 Facility 1: Facility 2: Facility 3: Facility 4:	
9	25 of 25	W/172.5	672.0 / 0.00	Westcorp Inc. 2100, 8215 112 ST NW Edmonton AB T6G 2C8 AB	GEN
Approval No:				DLS:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Record ID:				Phone:	
Approval Year:		Dec 2016; Apr 2017; Aug 2018		Contact:	Gwen Russell
10	1 of 1	WSW/187.3	672.0 / 0.00	11147 - 82 Avenue Edmonton AB T6G 0T3	EHS
Order No:	20120201029		Nearest Intersection:		
Status:	C		Municipality: Edmonton		
Report Type:	Custom Report		Client Prov/State: AB		
Report Date:	2/7/2012 7:14:26 PM		Search Radius (km): 0.25		
Date Received:	2/1/2012 7:12:29 PM		X: -113.520294		
Previous Site Name:			Y: 53.517918		
Lot/Building Size:					
Additional Info Ordered:					
11	1 of 1	WSW/190.9	672.0 / 0.00	11147 82 Ave Nw Edmonton AB T6G0T5	EHS
Order No:	20160422130		Nearest Intersection:		
Status:	C		Municipality: Edmonton		
Report Type:	Standard Report		Client Prov/State: AB		
Report Date:	29-APR-16		Search Radius (km): .25		
Date Received:	22-APR-16		X: -113.520254		
Previous Site Name:			Y: 53.517804		
Lot/Building Size:					
Additional Info Ordered:					
12	1 of 2	N/265.2	675.1 / 3.08	8510 111 Street Edmonton AB T6G 1H7	EHS
Order No:	20080505032		Nearest Intersection: 85 Ave and 111 St		
Status:	C		Municipality:		
Report Type:	Complete Report		Client Prov/State: AB		
Report Date:	5/14/2008		Search Radius (km): 0.25		
Date Received:	5/5/2008		X: -113.518061		
Previous Site Name:			Y: 53.521471		
Lot/Building Size:	Apartment complex, >10 stories				
Additional Info Ordered:					
12	2 of 2	N/265.2	675.1 / 3.08	8510 111th STREET NW EDMONTON AB	EHS
Order No:	20101021043		Nearest Intersection: 111TH STREET & 85 AVE. NW		
Status:	C		Municipality:		
Report Type:	Standard Report		Client Prov/State: ON		
Report Date:	11/1/2010		Search Radius (km): 0.25		
Date Received:	10/21/2010 3:35:33 PM		X: -113.517972		
Previous Site Name:			Y: 53.521474		
Lot/Building Size:					
Additional Info Ordered:					
13	1 of 1	NNW/268.1	675.0 / 3.00	8510 111 St Nw Edmonton AB	EHS
Order No:	20121210013		Nearest Intersection:		
Status:	C		Municipality:		
Report Type:	Standard Report		Client Prov/State: ON		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Report Date: 13-DEC-12 Date Received: 10-DEC-12 Previous Site Name: Lot/Building Size: Additional Info Ordered:					
14	1 of 3	NNW/269.2	675.0 / 3.00	8510 111 Street Northwest Edmonton AB T6G 1H7	EHS
Order No: 20200617070 Status: C Report Type: Standard Report Report Date: 22-JUN-20 Date Received: 17-JUN-20 Previous Site Name: Lot/Building Size: Additional Info Ordered:					
Nearest Intersection: Municipality: Client Prov/State: AB Search Radius (km): .25 X: -113.51851 Y: 53.5214693					
14	2 of 3	NNW/269.2	675.0 / 3.00	8510 111 Street Northwest Edmonton AB T6G 1H7	EHS
Order No: 20200617070 Status: C Report Type: Standard Report Report Date: 22-JUN-20 Date Received: 17-JUN-20 Previous Site Name: Lot/Building Size: Additional Info Ordered:					
Nearest Intersection: Municipality: Client Prov/State: AB Search Radius (km): .25 X: -113.51851 Y: 53.5214693					
14	3 of 3	NNW/269.2	675.0 / 3.00	8510 111 Street Northwest Edmonton AB T6G 1H7	EHS
Order No: 20200617070 Status: C Report Type: Standard Report Report Date: 22-JUN-20 Date Received: 17-JUN-20 Previous Site Name: Lot/Building Size: Additional Info Ordered:					
Nearest Intersection: Municipality: Client Prov/State: AB Search Radius (km): .25 X: -113.51851 Y: 53.5214693					
15	1 of 1	W/276.1	672.8 / 0.80	EDMONTON BLOOD TRANSFUSION BUILDING Edmonton 83 AVE 114 ST Edmonton AB	ESAR
ESA ID: 1340735 ESRD File: 00078094 File Classification: PST Name: EDMONTON BLOOD TRANSFUSION BUILDING Map Link: http://www.esar.alberta.ca/esarmap.aspx?esaid=1340735 ESAR Link: http://www.esar.alberta.ca/esarmain.aspx?esaid=00078094					
LLD: 1677TR;A LINC: 0014475439 10tm Point Coord: 97960,5928657 Extracted Dnld Dt: 2020-Sep-03					
Document Detail					
Doc Desc: CORRESPONDENCE Doc Date: 11/1/2005					

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
<u>Document Detail</u>					
Doc Desc:		ENVIRONMENTAL ASSESSMENT			
Doc Date:		6/1/1990			
16	1 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 - 112 Street Edmonton AB T6G 2B7 AB	GEN
Approval No:	ABG01017			DLS:	
Record ID:				Phone:	(403)492-8805
Approval Year:	1993-1998			Contact:	Len Seredynski
16	2 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 - 112 Street Edmonton AB T6G 2B7 AB	GEN
Approval No:	ABG01017			DLS:	
Record ID:				Phone:	(403)492-9751
Approval Year:	1993-1998			Contact:	Glen Baron
16	3 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 - 112 Street Edmonton AB T6G 2B7 AB	REC
Approval No:	ABR01054			Phone:	(403)492-8471
Approval Year:	1993-1998			Contact:	Ki Lam
16	4 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7	GEN
Approval No:	ABG01017			DLS:	
Record ID:	8			Phone:	
Approval Year:	1999			Contact:	
<u>--Details--</u>					
Material Code:	UN1479				
Material Description:	Oxidizing Substances, n.o.s. (Liquid or Solid)				
Material Code:	UN1760				
Material Description:	Corrosive Liquids, n.o.s.				
Material Code:	UN1950				
Material Description:	Aerosols				
Material Code:	UN1993				
Material Description:	Flammable Liquids, n.o.s.				
Material Code:	UN2030				
Material Description:	Hydrazine hydrate or Hydrazine, aqueous				
Material Code:	UN2315				
Material Description:	Polychlorinated Biphenyls/PCB				
Material Code:	UN2810				
Material Description:	Poisonous Liquids, n.o.s.				

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Material Code:		UN2813			
Material Description:		Sub.which in contact with water emit fla			
Material Code:		UN3139			
Material Description:		Oxidizing liquid, n.o.s.			
Material Code:		UN2809			
Material Description:		Mercury			
Material Code:		NA9500			
Material Description:		Leachable Toxic Waste			
Material Code:		UN1325			
Material Description:		Flammable Solids, n.o.s.			

16	5 of 33	WNW/299.5	673.0 / 1.00	Capital Health Region 8440 112 ST Edmonton AB T6G 2B7	GEN
Approval No:	ABG03583			DLS:	
Record ID:	115			Phone:	
Approval Year:	1999			Contact:	
--Details--					
Material Code:		UN2803			
Material Description:		Gallium			
Material Code:		UN2810			
Material Description:		Poisonous Liquids, n.o.s.			
Material Code:		UN2813			
Material Description:		Sub.which in contact with water emit fla			
Material Code:		UN3082			
Material Description:		Environmentally Hazardous sub., liquid			
Material Code:		UN3139			
Material Description:		Oxidizing liquid, n.o.s.			
Material Code:		UN1760			
Material Description:		Corrosive Liquids, n.o.s.			
Material Code:		UN1993			
Material Description:		Flammable Liquids, n.o.s.			

16	6 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7	GEN
Approval No:	ABG01017			DLS:	
Record ID:	830			Phone:	
Approval Year:	2000			Contact:	
--Details--					
Material Code:		NA9500			
Material Description:		Leachable Toxic Waste			
Material Code:		PCBCAPS			
Material Description:		Polychlorinated Biphenyls/PCB Capacitors			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Material Code:		UN1325			
Material Description:		Flammable Solids, n.o.s.			
Material Code:		UN1479			
Material Description:		Oxidizing Substances, n.o.s. (Liquid or Solid)			
Material Code:		UN1760			
Material Description:		Corrosive Liquids, n.o.s.			
Material Code:		UN1950			
Material Description:		Aerosols			
Material Code:		UN1956			
Material Description:		Compressed or liquified Gases, nos			
Material Code:		UN1993			
Material Description:		Flammable Liquids, n.o.s.			
Material Code:		UN2794			
Material Description:		Batteries, wet, filled with acid,electri			
Material Code:		UN2809			
Material Description:		Mercury			
Material Code:		UN2810			
Material Description:		Poisonous Liquids, n.o.s.			
Material Code:		UN2811			
Material Description:		Poisonous Solids, n.o.s.			
Material Code:		UN3104			
Material Description:		Organic peroxide type C, solid			
Material Code:		UN3139			
Material Description:		Oxidizing liquid, n.o.s.			

16	7 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 112 ST EDMONTON AB	GEN
Approval No:				DLS:	
Record ID:	1688			Phone:	
Approval Year:	2001			Contact:	

--Details--

Material Code:	2.4
Material Description:	Corrosive Gas
Material Code:	3
Material Description:	Flammable Liquids
Material Code:	4.1
Material Description:	Readily Ignitable
Material Code:	4.3
Material Description:	Emits Flammable Gases with Water Contact
Material Code:	5.1
Material Description:	Contributes to Combustion
Material Code:	6.1
Material Description:	Poisonous by Inhaling/Contact/Ingestion

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Material Code:			8		
Material Description:			Corrosive Substances		
Material Code:			9		
Material Description:			Miscellaneous Dangerous Goods		
Material Code:			9.1		
Material Description:			Unclassified Dangerous Substance/Product		
Material Code:			9.3		
Material Description:			Unclassified Dangerous Waste		

16	8 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 112 ST EDMONTON AB	GEN
Approval No:				DLS:	
Record ID:	1832			Phone:	
Approval Year:	2002			Contact:	
--Details--					
Material Code:			2.20		
Material Description:			Non-Flamm./Non-Toxic/Non-Corrosive Gas		
Material Code:			2.40		
Material Description:			Corrosive Gas		
Material Code:			3.00		
Material Description:			Flammable Liquids		
Material Code:			4.30		
Material Description:			Emits Flammable Gases with Water Contact		
Material Code:			5.10		
Material Description:			Contributes to Combustion		
Material Code:			6.10		
Material Description:			Poisonous by Inhaling/Contact/Ingestion		
Material Code:			8.00		
Material Description:			Corrosive Substances		
Material Code:			9.00		
Material Description:			Miscellaneous Dangerous Goods		
Material Code:			9.30		
Material Description:			Unclassified Dangerous Waste		

16	9 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No:	3005			Dt Form Rcvd:	2002/09/03
Tank No:	1			Date Removed:	200010
No of Tanks:				Removal Reason:	No Longer Required
Tank Type:				Located 200m:	NO
Tank Status:				Located 500m:	NO
Site Status:				DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	A
Contents:				Plan:	3991KS

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Other Contents: Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:				Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4:	Provincial Government
16	10 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No: 3005 Tank No: 2 No of Tanks: Tank Type: Tank Status: Site Status: Date Last Used: UST/AST: Contents: Other Contents: Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:				Dt Form Rcvd: 2002/09/03 Date Removed: 200010 Removal Reason: No Longer Required Located 200m: NO Located 500m: NO DLS Coord: Lot: Block: A Plan: 3991KS Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4:	Provincial Government
16	11 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No: 3005 Tank No: 3 No of Tanks: Tank Type: Tank Status: Site Status: Date Last Used: UST/AST: Contents: Other Contents: Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:				Dt Form Rcvd: 2002/09/03 Date Removed: 200010 Removal Reason: No Longer Required Located 200m: NO Located 500m: NO DLS Coord: Lot: Block: A Plan: 3991KS Municipality: Postal: Facility 1: Facility 2: Facility 3: Facility 4:	Provincial Government

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
16	12 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No:	3005			Dt Form Rcvd:	2002/09/03
Tank No:	4			Date Removed:	200311
No of Tanks:				Removal Reason:	No Longer Required
Tank Type:	Underground			Located 200m:	NO
Tank Status:				Located 500m:	NO
Site Status:				DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	A
Contents:	Diesel			Plan:	3991KS
Other Contents:				Municipality:	
Capacity:	Other - specify in liters			Postal:	
Other Capacity:	30,000 litres			Facility 1:	
UST Secondary:	Double Walled Tank			Facility 2:	
AST Secondary:				Facility 3:	
Overfill Prevention:	Liquid - Tight Fill Box			Facility 4:	Provincial Government
Class:					
LLD:					
Spill Containment:	Liquid - Tight Fill Box; Liquid / Vapour Tight Couplings On Fill Pipes				
Tank Status by Site Name:					
Owner Address:					

16	13 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No:	3005			Dt Form Rcvd:	2002/09/03
Tank No:	5			Date Removed:	200311
No of Tanks:				Removal Reason:	No Longer Required
Tank Type:	Underground			Located 200m:	NO
Tank Status:				Located 500m:	NO
Site Status:				DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	A
Contents:	Diesel			Plan:	3991KS
Other Contents:				Municipality:	
Capacity:	Other - specify in liters			Postal:	
Other Capacity:	30,000 litres			Facility 1:	
UST Secondary:	Double Walled Tank			Facility 2:	
AST Secondary:				Facility 3:	
Overfill Prevention:	Liquid - Tight Fill Box			Facility 4:	Provincial Government
Class:					
LLD:					
Spill Containment:	Liquid - Tight Fill Box; Liquid / Vapour Tight Couplings On Fill Pipes				
Tank Status by Site Name:					
Owner Address:					

16	14 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No:	3005			Dt Form Rcvd:	2002/09/03
Tank No:	6			Date Removed:	199706
No of Tanks:				Removal Reason:	Tank Replacement
Tank Type:				Located 200m:	NO
Tank Status:				Located 500m:	NO
Site Status:				DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	A
Contents:				Plan:	3991KS
Other Contents:				Municipality:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:				Postal: Facility 1: Facility 2: Facility 3: Facility 4: Provincial Government	

16	15 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No:	3005			Dt Form Rcvd:	2002/09/03
Tank No:	7			Date Removed:	199706
No of Tanks:				Removal Reason:	No Longer Required
Tank Type:				Located 200m:	NO
Tank Status:				Located 500m:	NO
Site Status:				DLS Coord:	
Date Last Used:				Lot:	
UST/AST:				Block:	A
Contents:				Plan:	3991KS
Other Contents:				Municipality:	
Capacity:				Postal:	
Other Capacity:				Facility 1:	
UST Secondary:				Facility 2:	
AST Secondary:				Facility 3:	
Overfill Prevention:				Facility 4:	Provincial Government
Class:					
LLD:					
Spill Containment:					
Tank Status by Site Name:					
Owner Address:					

16	16 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 112 ST EDMONTON AB	GEN
Approval No:				DLS:	
Record ID:	1970			Phone:	
Approval Year:	2003			Contact:	
--Details--					
Material Code:	5.20				
Material Description:	Liable to Explosive Decomposition				
Material Code:	3.00				
Material Description:	Flammable Liquids				
Material Code:	4.30				
Material Description:	Emits Flammable Gases with Water Contact				
Material Code:	5.10				
Material Description:	Contributes to Combustion				
Material Code:	6.10				
Material Description:	Poisonous by Inhaling/Contact/Ingestion				
Material Code:	8.00				
Material Description:	Corrosive Substances				

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
16	17 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 112 ST EDMONTON AB	GEN
Approval No: Record ID: 2870 Approval Year: 2004		DLS: Phone: Contact:			
--Details--					
Material Code:		5.10			
Material Description:		Contributes to Combustion			
Material Code:		6.10			
Material Description:		Poisonous by Inhaling/Contact/Ingestion			
Material Code:		8.00			
Material Description:		Corrosive Substances			
16	18 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 112 ST AB	GEN
Approval No: Record ID: 2942 Approval Year: 2005		DLS: Phone: Contact:			
--Details--					
Material Code:		5.10			
Material Description:		Contributes to Combustion			
Material Code:		6.10			
Material Description:		Poisonous by Inhaling/Contact/Ingestion			
Material Code:		8.00			
Material Description:		Corrosive Substances			
16	19 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITAL 8440 112 ST EDMONTON AB	GEN
Approval No: Record ID: Approval Year: 2006		DLS: Phone: Contact:			
--Details--					
Material Code:		3.00			
Material Description:		Flammable Liquids			
Material Code:		5.1			
Material Description:		Contributes to Combustion			
Material Code:		8			
Material Description:		Corrosive Substances			
Material Code:		8			
Material Description:		Corrosive Substances			
Material Code:		9			
Material Description:		Miscellaneous Dangerous Goods			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Material Code:		9			
Material Description:		Miscellaneous Dangerous Goods			
Material Code:		9.1			
Material Description:		Unclassified Dangerous Substance/Product			
Material Code:		6.1			
Material Description:		Poisonous by Inhaling/Contact/Ingestion			
16	20 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7	GEN
Approval No:				DLS:	
Record ID:				Phone:	
Approval Year:		2007/2008		Contact:	
16	21 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No:				DLS:	
Record ID:				Phone:	
Approval Year:		2008/2009		Contact:	
16	22 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No:				DLS:	
Record ID:				Phone:	
Approval Year:		2009		Contact:	
16	23 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No:				DLS:	
Record ID:				Phone:	
Approval Year:		2010		Contact:	
16	24 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No:				DLS:	
Record ID:				Phone:	
Approval Year:				Contact:	
16	25 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No:				DLS:	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
Record ID: Approval Year:		May 2011-Apr 2012		Phone: Contact:	
16	26 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB	GEN
Approval No: Record ID: Approval Year:		May 2012- Jan 2013		DLS: Phone: Contact:	
16	27 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7	GEN
Approval No: Record ID: Approval Year:		Feb 2013 - Sep 2013		DLS: Phone: Contact:	
16	28 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No: Record ID: Approval Year:		Feb 2015		DLS: Phone: Contact:	
16	29 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No: Record ID: Approval Year:		Jan 2016		DLS: Phone: Contact:	
16	30 of 33	WNW/299.5	673.0 / 1.00	8440 112 St Nw Edmonton AB T6G2B7	EHS
Order No: Status: Report Type: Report Date: Date Received: Previous Site Name: Lot/Building Size: Additional Info Ordered:		20160217146 C Standard Report 19-FEB-16 17-FEB-16		Nearest Intersection: Municipality: Edmonton Client Prov/State: ON Search Radius (km): .25 X: -113.523518 Y: 53.520882	
16	31 of 33	WNW/299.5	673.0 / 1.00	UNIVERSITY OF ALBERTA HOSPITALS 8440-112 STR. EDMONTON (A) AB	FST
Site No: Tank No: No of Tanks: Tank Type:		3005		Dt Form Rcvd: Date Removed: Removal Reason: Located 200m:	

Map Key	Number of Records	Direction/Distance (m)	Elev/Diff (m)	Site	DB
Tank Status: Site Status: Date Last Used: UST/AST: Contents: Other Contents: Capacity: Other Capacity: UST Secondary: AST Secondary: Overfill Prevention: Class: LLD: Spill Containment: Tank Status by Site Name: Owner Address:				Located 500m: DLS Coord: Lot: Block: A Plan: 3991KS Municipality: EDMONTON (A) Postal: Facility 1: Facility 2: Facility 3: Facility 4:	
16	32 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No: Record ID: Approval Year: Dec 2016				DLS: Phone: Contact:	
16	33 of 33	WNW/299.5	673.0 / 1.00	University of Alberta Hospital 8440 112 ST Edmonton AB T6G 2B7 AB	GEN
Approval No: Record ID: Approval Year: Aug 2018				DLS: Phone: Contact:	

Unplottable Summary

Total: **1** Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
AUWR	GENERAL RECYCLING INDUSTRIES LTD	84 AVE NW	EDMONTON AB	T6B3H3

Unplottable Report

Site: GENERAL RECYCLING INDUSTRIES LTD
84 AVE NW EDMONTON AB T6B3H3

Database:
[AUWR](#)

Headcode: 01169400
Headcode Desc: SCRAP METALS
Phone: 7804615555
List Name:
Description:

Appendix: Database Descriptions

*Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. Note: Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Well Licenses:

Provincial [AERW](#)

Locations of Well Licenses made available by the Alberta Energy Regulator (AER) as ST37. Includes Active, Suspended, Abandoned, Drilled and Cased Oil, Gas, Crude Bitumen well licenses, as well as Observation, Injection, Disposal, and Undefined well licences.

Government Publication Date: Jan 31, 2021

Agriculture and Fisheries - Certificates of Approval:

Provincial [AGR](#)

This database contains approvals for processes pertaining to drying of alfalfa/forage/peat, feedlots, fish farms and feed/seed mills. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Alberta Oil and Gas Wells:

Provincial [AOGW](#)

The Alberta Energy Utilities Board - now the Alberta Energy Regulator (AER) - maintained a database of oil and gas wells drilled in the province of Alberta. The database contains information on well name, licensee name, license number, location, status, total well depth and date of final drilling. Please note that this database will not be updated, information on wells drilled after September 2003 can be found in the Oil and Gas Wells (OGW) database under the 'Private Source Database' section.

Government Publication Date: 1883-Sept 2003*

Automobile Wrecking & Supplies:

Private [AUWR](#)

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Dec 31, 2020

Waste Management Facilities - Certificates of Approval:

Provincial [CAWD](#)

This database contains approvals for processes pertaining to waste management facilities (hazardous waste manifesting, waste disposal/incineration/open burning/processing/storage/treatment). Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993 - Jan 2020

Commercial Activity Risk - City of Calgary Business Licenses:

Provincial [CBL](#)

List of locations with Business Licences for the follow commercial activities: apartment building with 4 or more stories, auto-body shop, fabric cleaning, manufacturing, motor vehicle dealerships and service/repair, and salvage yard/auto wrecking. Data made available by the City of Calgary.

Government Publication Date: Dec 31, 2020

Dry Cleaning Facilities:

Federal [CDRY](#)

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2018

Confined Feeding Operations:

Provincial

CFO

In 1991, the Natural Resources Conservation Board (NRCB) was created to review applications for approval of major natural resource development projects in Alberta. In January 2002, the NRCB was given the responsibility to regulate the Confined Feeding Operation industry. The Agricultural Operation Practices Act defines a confined feeding operation to be: "an activity on land that is fenced or enclosed or within buildings where livestock are confined for the purpose of growing, sustaining, finishing or breeding by means other than grazing, but does not include seasonal feeding and bedding sites." Under the AOPA regulations, all new or expanding confined feeding operations (CFOs) or manure storage facilities are required to make an application for Approval, Registration or Authorization to the NRCB before construction or expansion commences. Geographic coordinates were provided in DLS (Dominion Land Survey) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the Quarter section only.

Government Publication Date: 2002-Oct 2020**Chemical Processing Operations - Certificates of Approval:**

Provincial

CHEM

This database contains approvals for processes pertaining to the manufacturing and use of chemical products and pesticides. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012**Chemical Register:**

Private

CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-Dec 31, 2020**Compressed Natural Gas Stations:**

Private

CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -Dec 2020**Compost Facilities:**

Provincial

COMPOST

A list of compost facility registrations made available by Alberta Environment and Parks (AEP). Composting facilities operating under a registration are required to follow the requirements in the Code of Practice for Compost Facilities, which outlines the minimum requirements for the design, construction, operation, and reclamation of compost facilities that accept up to 20,000 tonnes of feedstock per year.

Government Publication Date: Dec 31, 2019**Compliance and Convictions:**

Provincial

CONV

This database summarizes the penalties and convictions handed down by the Alberta courts. This database identifies companies and/or individuals that have been found guilty of environmental offenses under Alberta's Environmental Protection Legislation. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Unfortunately, from state of the data, the location that the address pertains to cannot be confirmed.

Government Publication Date: 1993-Jun 2020**Fuel Sales and Storage:**

Provincial

CTNK

List of locations with Business Licences for fuel sales and storage. Data made available by the City of Calgary.

Government Publication Date: Dec 31, 2020**Approved Oilfield Waste Management Facilities:**

Provincial

DRWD

A list of approved first and third party oilfield waste management facilities. First-party receivers can only accept upstream oilfield waste generated by one oil and gas company, but can come from various sites. Third-party receivers can accept upstream oilfield waste from various sites and various generators. This data is made available by the Alberta Energy Regulator (AER).

Government Publication Date: Jul 2019**Enforcement Action Summary:**

Provincial

EAS

This database maintained by the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB) - summarizes high risk enforcement action 1, high risk enforcement action 2 (persistent noncompliance), high risk enforcement action 3 (failure to comply or demonstrated disregard), low risk enforcement action - global REFER and legislative/regulatory enforcement action. Fields will include licensee/company name, non-compliance event, date of enforcement, location, etc.

Government Publication Date: 2007-Sep 2020

Commercial Activity Risk - City of Edmonton Business Licenses:

Provincial [EBL](#)

List of locations with Business Licenses for the follow commercial activities: cannabis processing or cultivation, construction vehicle and equipment sales/rentals, livestock operation, general industrial, and vehicle repair. Data made available by the City of Edmonton.

Government Publication Date: Dec 31, 2020

Environmental Effects Monitoring:

Federal [EEM](#)

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches:

Private [EHS](#)

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Oct 31, 2020

Environmental Issues Inventory System:

Federal [EIS](#)

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Alberta Environment & Parks Storage Tanks:

Provincial [EPST](#)

List of storage tanks under the purview of Alberta Environment and Parks.

Government Publication Date: Jul 31, 2016

Environment Protection & Enhancement Act and Water Act Public Notices:

Provincial [EPWN](#)

A list of Public Notices of Applications, Decisions, and Revisions pertaining to applications made to Alberta Environment and Parks under the Water Act (WA) and Alberta Environment Protection and Enhancement Act (EPEA). Dominion Land Survey (DLS) locations provided by the source are subject to accuracy limitations inherent to the DLS system.

Government Publication Date: Jun 30, 2020

Environmental Site Assessment Repository:

Provincial [ESAR](#)

Environmental site assessments determine the quality of soil and groundwater of a site, particularly at retail gas stations and other commercial and industrial sites. A site assessment does not necessarily mean a site is, or ever was, contaminated. Alberta's Environmental Site Assessment Repository (ESAR) is an online, searchable database that provides scientific and technical information about assessed and/or reclaimed sites throughout Alberta. Search Alberta's ESAR using meridian, range, township, and section values at <http://www.esar.alberta.ca/esarmain.aspx> to gain access to reclamation certificates and/or associated files (applications, reports).

Government Publication Date: 1960-Aug 2020

Facility List:

Provincial [FAC](#)

This database contains a complete list of new, active and suspended facilities in Alberta including batteries, gas plants, meter stations, and other facilities. Information provided includes: facility id, facility name, operator name, sub type description, location, facility license no, and operational status; now includes EDCT (Energy Development Category Type) type and description. Made available by the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB).

Government Publication Date: Up to Sep 30, 2020

Federal Convictions:

Federal [FCON](#)

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land:

Federal [FCS](#)

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Sep 2020

AER Incidents & Spills:

Provincial [FIS](#)

Received from the Alberta Energy Regulator (AER) - formerly the ERCB (Energy Resources Conservation Board) and EUB (Energy Utilities Board) - this database, which used to be called EISL (Environmental Information System Listing), contains reported environmental incidents beginning in 1975. Descriptions include noise infractions, air quality emissions, oil spills and failures for pipelines, wells, plants, and batteries. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1975-Nov 2020

Food Processing Operations - Certificates of Approval:

Provincial [FOOD](#)

This database contains approvals for processes pertaining to the manufacturing of food products. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Federal Identification Registry for Storage Tank Systems (FIRSTS):

Federal [FRST](#)

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: May 31, 2018

Fuel Storage Tanks:

Provincial [FST](#)

List tank sites in unaccredited areas of the Province. Includes active tank sites, sites with tanks temporarily out of service, and sites at which tanks have been removed from the ground. Information in this database was collected according to Alberta Regulation AR 291/95 Storage Tank System Management and to AR 52/98 Fire Code which was formerly the Alberta Fire Code Regulation, 1992 (AR 204/92). The Petroleum Tank Management Association of Alberta (PTMAA) regulated Storage Tanks in unaccredited areas of Alberta from 1994 until June 2020, at which point the Safety Codes Council assumed responsibility for services related to storage tank management.

Government Publication Date: 1985-Sep 2020

Edmonton Vehicle Fueling Stations:

Provincial [FUEL STATION](#)

A list of sites that have a City of Edmonton business license for Vehicle Fueling Stations. Listing made available by the City of Edmonton.

Government Publication Date: Dec 31, 2020

Waste Generators Summary:

Provincial [GEN](#)

Under Alberta's Waste Control Regulation, Alta. Reg. 192/96, a generator is a person who consigns hazardous waste for storage, transport, treatment or disposal. As of 2007, Alberta Environment no longer provides detailed information on each waste generator, such as approval number, class, and class description.

Government Publication Date: 1993-Aug 2018

Greenhouse Gas Emissions from Large Facilities:

Federal [GHG](#)

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2018

Gas Processing Plants:

Provincial [GPP](#)

The Alberta Energy Regulator (AER) - formerly the ERCB (Energy Resources Conservation Board) - has an inventory of all Gas Processing Plants in Alberta, with information such as location, names of plant, facility type, operator name, facility license, design capacities, etc.

Government Publication Date: Oct 2016-Oct 31, 2020

Alberta Environment's H.E.L.P. (Help End Landfill Pollution) Program Database:

Provincial

[HELP](#)

The H.E.L.P. Data Tracking and Management Control System was created to provide tracking and management capabilities of industrial landfills in Alberta for the Department of Environment. Detailed information including company name, location, type of landfill, priority, score, status, use and much more is included in this database.

Government Publication Date: June 1988*

Horizontal Wells:

Provincial

[HORW](#)

Defined as drilling directionally at a wellbore inclination angle exceeding 85 degrees, horizontal drilling can help increase resource recovery while minimizing surface impact. Recent improvements in the technology have made it possible to combine horizontal drilling with hydraulic fracturing to help coax oil and natural gas out of tight rock. Today, more than half of western Canada's wells are being drilled horizontally. Data includes: well locations (LE,LS,SE,TWP,RG,M,E), licence numbers, well names, Business Associate (BA) codes, licensee abbreviations, spud dates, final drilling dates, total depth, true vertical depth, and last updated dates. Made available by the Alberta Energy Regulator (AER) - formerly the Energy Resources Conservation Board (ERCB).

Government Publication Date: Mar 2015-Aug 31, 2020

Indian & Northern Affairs Fuel Tanks:

Federal

[IAFT](#)

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Landfill Registrations:

Provincial

[LANDFILLS](#)

A list of landfill registrations made available by Alberta Environment and Parks (AEP). Landfills operating under a registration are required to follow the requirements in the Code of Practice for Landfills, which outlines the minimum requirements for the construction, operation and reclamation of landfills that accept 10,000 tonnes or less per year of non-hazardous and inert waste.

Government Publication Date: Mar 31, 2020

Identification and Verification of Active and Inactive Land Disposal Sites:

Provincial

[LDS](#)

In late 1981, Environment Canada and Alberta Environment initiated a project to identify and verify land disposal sites in the province of Alberta. A point scoring system was used to classify the sites into potential priority 1, priority 2 or priority 3 groups on the basis of the type of waste received at the sites and the site environment. Sites that, according to available information, may pose a hazard to public health and safety or the environment are classified as potential priority 1 sites.

Government Publication Date: Oct 1982*

Land Disposal Sites on Indian Reserves:

Provincial

[LDSI](#)

In late 1981, Environment Canada and Alberta Environment initiated a project to identify and verify land disposal sites in the province of Alberta. This database specifically identifies land disposal sites on Indian Reserves. Information on each site is limited to: location, band, size and general comments.

Government Publication Date: Oct 1982*

Lumber Related Operations - Certificates of Approval:

Provincial

[LUM](#)

This database contains approvals for processes pertaining to the manufacturing of wood products, pulp and paper including the associated water treatment processes. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Canadian Mine Locations:

Private

[MINE](#)

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Metals, Minerals and Building Materials Operations - Certificates of Approval:

Provincial

[MMB](#)

This database contains approvals for processes pertaining to the manufacturing of building materials, metals, and mineral products. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Mineral Occurrences:

Provincial **MNR**

The AMDO (Alberta Mineral Deposits and Occurrences) application was created by the Minerals and Coal Geoscience Section of the Alberta Geological Survey as a database for mineral deposits in Alberta in the early 1990s. This is a one time inventory and will not be updated.

Government Publication Date: 1993-2003*

National Analysis of Trends in Emergencies System (NATES):

Federal **NATE**

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

PTMAA Non-Compliant Storage Tanks:

Provincial **NCST**

The Alberta Fire Code requires that storage tanks be registered. Tanks may not be registered because they do not meet minimum equipment standards or the owners have not made the annual registration application or paid the necessary registration fees. Some tank owners have installed tanks without a permit. This source contains information on facilities which have tanks that have ceased to be registered or have never been registered. It is maintained and updated by the Petroleum Tank Management Association of Alberta (PTMAA).

Government Publication Date: Sep 2016-May 31, 2020

National Defense & Canadian Forces Fuel Tanks:

Federal **NDFT**

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills:

Federal **NDSP**

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites:

Federal **NDWD**

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents:

Federal **NEBI**

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Sep 30, 2020

National Energy Board Wells:

Federal **NEBP**

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES):

Federal **NEES**

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory:

Federal

NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory:

Federal

NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Operating and Abandoned Mines:

Provincial

OAM

This data is based on the 2001 edition (revised in 2003), published by the Alberta Energy and Utilities Board (EUB) now the Alberta Energy Regulator (AER). It was a one time inventory of Operating and Abandoned Coal Mines in Alberta. In 1905, Alberta began to catalogue coal mines by assigning a unique number to each operation. This database will provide information on location, mine #, mine name, mine company, life span, amount of coal produced, depth, thickness and other important information concerning the mine.

Government Publication Date: 2001, 2003*

Oil and Gas Facilities - ST102 & ST50:

Provincial

OGF

List of batteries, gas plants, meter stations, and other facilities in the province of Alberta, made available as ST102 (Parts A and B) and ST50 (B) by the Alberta Energy Regulator (AER).

Government Publication Date: Dec 31, 2020

Oil and Gas Wells:

Private

OGWW

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Nov 30, 2020

Alberta Orphan Wells:

Provincial

ORP

The Orphan Well Association (OWA) maintains lists of properties designated as orphan by the Alberta Energy Regulator (AER). Includes the location, well ID, licensee name and license number of orphan wells, sites, and facilities that have been identified for the purpose of abandonment, suspension, decommission, and reclamation. Legacy wells under long term care and custody are excluded. Please note that the OWA Orphan List also includes properties with production information from the AER. The OWA makes no representation, warranties, or guarantees, expressed or implied, for the fitness of the data with respect to its use.

Government Publication Date: Jan 2007-Aug 31, 2020

Canadian Pulp and Paper:

Private

PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks:

Federal

PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Petrochemical, Coal and Gas Operations - Certificates of Approval:

Provincial

PCG

This database contains approvals for processes pertaining to petroleum, coal, and oil and gas processing. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Pesticide Register:

Provincial PES

This is a list of Registered Pesticide Vendors in Alberta (retail and wholesale). The pesticide vendor list is comprised of vendors who have both audited AWSA pesticide storage facilities as part of their operation, and those vendors that do not have an audited AWSA pesticide storage facilities. Non-audited retail and wholesale vendors may be selling products that are not covered by the AWSA program, or may be utilizing external AWSA pesticide warehouses. Registration numbers and expiry dates are identified for each operation. If a registration number is not present, the operation's vendor registration is in the process of renewal.

Government Publication Date: 1998-Aug 2015

Conglomerate and Waste Management Facilities:

Provincial PITS

This database contains approvals for processes pertaining to the use of gravel pits, sand pits, and clay pits. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Alberta Private Sewage Disposal Permits:

Provincial PSP

These permits are private sewage disposal permits that have been issued to owners and contractors. They would include various types of installations including holding tanks, septic tanks, packaged treatment plants, sand filters, fields, mounds, lagoons and open discharges. In 2003 Alberta Municipal Affairs started collecting information and issuing permits using an electronic permitting system. These records include all private sewage disposal permits within the jurisdiction of Alberta Municipal Affairs.

Government Publication Date: 2003-2013

PTMAA Approved (Open) Permits:

Provincial PTAP

The Petroleum Tank Management Association of Alberta maintains a list of open permits it has issued within its jurisdiction. Prior to installing, removing, or altering tanks, storage tanks owners must receive approval in the form of a permit from the Authority Having Jurisdiction (in this case, PTMAA).

Government Publication Date: Apr 2016-Apr 30, 2020

Hazardous Waste Receivers Summary:

Provincial REC

A waste receiving location is any site or facility to which waste is transferred through a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents receivers of regulated wastes under Alberta's Waste Control Regulation, Alta. Reg. 192/96. As of 2007, Alberta Environment no longer provides detailed information on each waste receiver, such as approval number, class, and class description.

Government Publication Date: 1993-Aug 2018

Retail Fuel Storage Tanks:

Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Dec 31, 2020

Scott's Manufacturing Directory:

Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Special Operation Classifications - Certificates of Approval:

Provincial SPEC

This database contains approvals for processes pertaining to classifications listed as special operations (i.e. locations owned/operated by municipalities, operations that involve the presence of pesticides). Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Inventory of Waste Disposal Sites:

Private WDS

This one time inventory is a compilation of information collected from each region and pertains to active, regulated waste disposal sites within the province of Alberta. In the past, waste disposal sites were registered with both regional and health offices. That process was dissolved and regional landfills were developed. There is no central source of this information. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1998*

Wastewater Operations:

Provincial

[WSTE](#)

This database contains approvals for processes pertaining to wastewater treatment systems. Please note that, as per the source of this database, some of the geographic information may pertain to a head office or mailing address and not necessarily the site of operations to which the certificate applies. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location. Therefore, locations will be accurate to the quarter section only.

Government Publication Date: 1993-2012

Alberta Water Well Information Database:

Provincial

[WWIS](#)

List of wells in the Alberta Water Well Information Database made available by Alberta Environment and Parks, containing approximately 500,000 records with nearly 5,000 drilling reports added annually. Some geographic coordinates have been provided in ATS (Alberta Township Survey system) format but do not contain offsets that are necessary to pinpoint a specific location; some locations will be accurate to the quarter section only. The Province of Alberta advises that the data may not be fully checked, and disclaims all responsibility for its accuracy. This data was previously collected from the Groundwater Information Center of the Natural Resource Service.

Government Publication Date: 1880-Dec 31, 2020

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

Appendix C

Historical Land Titles

Lot 17, Block 157, Plan I19



LAND TITLE CERTIFICATE

B
LINC SHORT LEGAL TITLE NUMBER
0015 558 407 I19;157;17 202 078 059

LEGAL DESCRIPTION
PLAN I19
BLOCK 157
LOT 17

ESTATE: FEE SIMPLE
ATS REFERENCE: 4;24;52;7;RL

MUNICIPALITY: CITY OF EDMONTON

REFERENCE NUMBER: 802 158 169

REGISTERED OWNER(S)				
REGISTRATION	DATE (DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
202 078 059	09/04/2020	TRANSFER OF LAND		SEE INSTRUMENT

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	

NO REGISTRATIONS

TOTAL INSTRUMENTS: 000

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN
ACCURATE REPRODUCTION OF THE CERTIFICATE OF
TITLE REPRESENTED HEREIN THIS 5 DAY OF
FEBRUARY, 2021 AT 04:19 P.M.

ORDER NUMBER: 40983805

CUSTOMER FILE NUMBER:



END OF CERTIFICATE

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED
FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER,
SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

THE ABOVE PROVISIONS DO NOT PROHIBIT THE ORIGINAL PURCHASER FROM
INCLUDING THIS UNMODIFIED PRODUCT IN ANY REPORT, OPINION,
APPRAISAL OR OTHER ADVICE PREPARED BY THE ORIGINAL PURCHASER AS
PART OF THE ORIGINAL PURCHASER APPLYING PROFESSIONAL, CONSULTING
OR TECHNICAL EXPERTISE FOR THE BENEFIT OF CLIENT(S).



HISTORICAL LAND TITLE CERTIFICATE
TITLE CANCELLED ON APRIL 09, 2020

B
LINC SHORT LEGAL TITLE NUMBER
0015 558 407 I19;157;17 802 158 169

LEGAL DESCRIPTION
PLAN I19
BLOCK 157
LOT 17

ESTATE: FEE SIMPLE
ATS REFERENCE: 4;24;52;7;RL

MUNICIPALITY: CITY OF EDMONTON

REGISTERED OWNER(S)
REGISTRATION DATE (DMY) DOCUMENT TYPE VALUE CONSIDERATION

802 158 169 14/07/1980 \$120,000

OWNERS

ST. JOHN'S INSTITUTE.
OF 11024 - 82 AVENUE, EDMONTON
ALBERTA

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION
NUMBER DATE (D/M/Y) PARTICULARS

112 161 715 01/06/2011 MORTGAGE
MORTGAGEE - KEB HOLDINGS INC.
301,52319 RR231
SHERWOOD PARK
ALBERTA T8B1A8
ORIGINAL PRINCIPAL AMOUNT: \$500,000

122 128 058 27/04/2012 MORTGAGE
MORTGAGEE - KEB HOLDINGS INC.
301,52319 RR231
SHERWOOD PARK
ALBERTA T8B1A8
ORIGINAL PRINCIPAL AMOUNT: \$750,000

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

PAGE 2
802 158 169

REGISTRATION

NUMBER DATE (D/M/Y) PARTICULARS

132 208 088 10/07/2013 DISCHARGE OF MORTGAGE 122128058

202 077 912 08/04/2020 CAVEAT
RE : VENDOR'S LIEN
CAVEATOR - ST. JOHN'S INSTITUTE.
C/O DENTONS CANADA LLP
2500 STANTEC TOWER
10220 103 AVENUE
EDMONTON
ALBERTA T5J0K4
AGENT - SIERRA HEISLER

202 078 059 09/04/2020 TRANSFER OF LAND
OWNERS - THE CITY OF EDMONTON.
#1 SIR WINSTON CHURCHILL SQUARE, EDMONTON
ALBERTA T5J2R7
NEW TITLE ISSUED

TOTAL INSTRUMENTS: 005

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN
ACCURATE REPRODUCTION OF THE CERTIFICATE OF
TITLE REPRESENTED HEREIN THIS 9 DAY OF
FEBRUARY, 2021 AT 09:37 A.M.

ORDER NUMBER: 40996671

CUSTOMER FILE NUMBER: 7545294



END OF CERTIFICATE

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED
FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER,
SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

THE ABOVE PROVISIONS DO NOT PROHIBIT THE ORIGINAL PURCHASER FROM
INCLUDING THIS UNMODIFIED PRODUCT IN ANY REPORT, OPINION,
APPRAISAL OR OTHER ADVICE PREPARED BY THE ORIGINAL PURCHASER AS
PART OF THE ORIGINAL PURCHASER APPLYING PROFESSIONAL, CONSULTING
OR TECHNICAL EXPERTISE FOR THE BENEFIT OF CLIENT(S).

Certificate of Title

Canada



NO.	8	0	2	1	5	8	1	6	9
REF.	1	0	7	-	J	-	1	8	5
VALUES	1	2	0	0	0	0	0	0	0

M	RD.	TWP.	SEC.	D.	PT.
1					

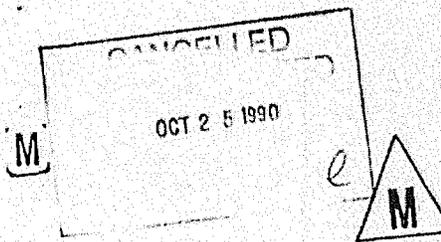
PLAN	BLK.	LOT	PT.
1-19	157	17	

North Alberta Land Registration District

THIS IS TO CERTIFY that **ST. JOHN'S INSTITUTE**

IS now the owner of an estate in fee simple
of and in

PLAN I-19
BLOCK ONE HUNDRED AND FIFTY SEVEN (157)
LOT SEVENTEEN (17)
EDMONTON



SUBJECT TO THE ENCUMBRANCES, LIENS, ESTATES OR INTERESTS NOTIFIED BY MEMORANDUMS 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 14 day of JULY, A.D. 1980.

Post Office Address 11024 - 82 AVENUE

EDMONTON, ALBERTA



Calodugis AD. Registrar
North Alberta Land Registration District

CANCELLED
Certificate of Title

NO.	1	0	7	-	J	-	1	8	5
REF.	1	1	8	-	0	-	5	2	
VALUE \$		1	4	0	0	0	0	0	0

Canada

RENEWAL
874 M.F.

M



M	RG.	TWP.	SEC.	Q.	PT.
1					

PLAN	BLK.	LOT	PT.
2	I-19	157	17

North Alberta Land Registration District

THIS IS TO CERTIFY that ALICE COWAN OF EDMONTON,
IN THE PROVINCE OF ALBERTA

IS now the owner of an estate in fee simple

of and in

PLAN I-19
BLOCK ONE HUNDRED AND FIFTY SEVEN (157)
LOT SEVENTEEN (17)
EDMONTON

TITLE CANCELLED No. 802158169
and full
 on this 14 day of July 1980
[Signature]
 A.D. Registrar

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 SEVENTEENTH day of MARCH, A.D. 1981

Post Office Address EDMONTON, ALTA.

JPR



AD Registrar

LAND TITLES ACT, Sec. 64 - The land mentioned in any certificate of title granted under this Act shall be impeded and unless any special mention therein be subject to:

- (1) Any subsequent reservations or exceptions including royalties contained in the original grant of the land from the Crown;
- (2) All unpaid taxes, including irrigation and drainage district rates, assessed upon, or on account of the land;
- (3) Any public highway or right-of-way or other public easement, however created upon, or on account of the land;
- (4) Any subsisting lease or agreement for a lease for a period not exceeding three years, where there is actual occupation of the land under the lease;
- (5) Any decrees, orders or executions against or affecting the land or the person of the land which have been registered and maintained in force against the owner;
- (6) Any right of expropriation which may be statute be vested in any person, body corporate, or the Regent;
- (7) Any right-of-way or other easement granted or reserved under the provisions of any Act or law in force in the Province.



CANCELLED

107-J-185
 Issued on instrument registered at 10.06 o'clock
 A. M. on the 17 day of MAR.
 A. D. 19 61
 Number 874 Book M.F. folio 28
 J. M. THOM
 Registrar N.A.L.R.D.

Certificate of Title

Assoc. Fund Value \$14,000.00

Refer Cert. No. 118-0-52

North Alberta Land Registration District

This is to Certify that ALICE COWAN

OF EDMONTON IN THE PROVINCE OF ALBERTA, CANADA, (HOUSEWIFE)

is now the owner of an estate in fee simple

of and in LOT SEVENTEEN (17) IN BLOCK ONE HUNDRED AND FIFTY SEVEN

(157) IN THE CITY OF EDMONTON, AFORESAID, AS SHOWN ON SUBDIVISION

PLAN 1-19.

TITLE CANCELLED
 on full and complete record
 on this 15 day of June 1961
 A. D. Registrar JIR

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the registers

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this SEVENTEENTH day of MARCH A. D. 19 61

DN

J. M. Thom Registrar

P.O. Address EDMONTON, ALTA.

North Alberta Land Registration District

OVER

118052

CANCELLED



Certificate of Title.

Issued on instrument registered at 356' dock
 on the 2 day of June
 A.D. 1921.
 Number 2238 Book 237
W. L. Coors
 Registrar A.L.R.D.

Asso. Fund Value \$ 2.00
 Unearned Inc. Value 12.00
 7th Alberta Land Registration District.
 Refers Cert. No. 218019

LAND TITLES ACT, Sec. 43.—The land mentioned in any certificate of title granted under this Act shall by implication and without any special reservation therein, unless the contrary is expressed, be subject to all the rights, interests, and encumbrances contained in the original grant of the land from the Crown:
 38. Any public highway or right-of-way or other public easement, however created upon, over or in respect of the land;
 39. Any public utility or other easement for a period not exceeding three years, where there is actual occupation of the land under the same;
 40. Any easement or other right or interest in the land which has been registered and subsists in force on the date of the issue of the certificate;
 41. Any right of pre-emption, whether or not exercised, in respect of the land, or any part thereof, under the provisions of any Act or law in force in the Province.

This is to Certify that Harold Wales Cowan of Edmonton, in the Province of Alberta Dominion of Canada "Veterinary Inspector"  is now the owner of an estate in fee simple of and in Lot Seventeen (17) Block One hundred and fifty-seven (157) as shown on a Plan of Part of the said City of Edmonton, of record in the Land Titles Office for this Land Registration District as Plan T-19.

Satisfactory proof having been given of the loss of the Duplicate of the Certificate of Title a Fresh Duplicate has been issued this 17 day of March A.D. 1921 in Day Book No. 873 M.E.

A. D. Registrar
 A. D. Registrar

CANCELLED

THIS CERTIFICATE OF TITLE IS CANCELLED
 In full
 IN ACCORDANCE WITH THE TRANSFER SUBJECT TO A VESTED INTEREST IN RESERVATION IN FULL A FRESH CERTIFICATE OF TITLE NO. 107-T-185 ISSUED THIS 17 DAY OF March 1921 TO Alice Cowan
 DR. J. H. M. E. Registrar

subject to the encumbrances, liens and interests notified by memorandums 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 June A.D. 1921
W. L. Coors Registrar
 P.O. Address Edmonton 7th Alberta Land Registration District.

JUN 7 1921

Harold L. L. Loughlin James 25 7 110

218019

218



Certificate of Title.

I certify that the within instrument
duly entered and recorded in the Land
Titles Office for the Province of Alberta Land
Registration District at Edmonton in the
Province of Alberta at 12:00 o'clock
P.M. on the 21 day of May
A. D. 1912 Number 1226 Book 187
Vol 114
W. L. L. L. Registrar.
N. A. L. R. D.

Refer Book No. 1376

Last Value \$1200

NORTH ALBERTA Land Registration District

This is to Certify that Harold L. L. Loughlin
of the City of Edmonton in the Province of Alberta Dominion
of Canada Gentleman.



is now the owner of an estate in fee simple
of and in lot numbered Section 17 in Block One Hundred
and Fifty-seven 171 as shown on a Plan of a part of
the said City of Edmonton of record in the Land Titles office
for this Land Registration District as Plan I

LAND TITLES ACT, Sec. 6. The land mentioned in any certificate of title granted under this Act shall by implication and without any further words be deemed to be granted subject to the following conditions: (1) Any existing mortgages or encumbrances contained in the original grant of the land from the Crown; (2) Any public highway right-of-way or other public easement, however created upon or over or in respect of the land; (3) Any right of way or easement for a line for a period not exceeding three years, where there is actual occupation of the land; (4) Any drainage, water or sewerage easement affecting the interest of the owner of the land which has been registered in the Land Titles Office; (5) Any right of appropriation which may by statute or ordinance be vested in any person, body corporate, or any authority; (6) Any right of way or other easement granted or acquired under the provisions of any Act or law in force in the Province.

CANCELLED

This Certificate is
in full
of the amount of \$1180.00
2. L. L. L.
Harold L. L. Loughlin
77 St. C. K.
Amherst

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 first day of May A.D. 1912

P.O. Address Edmonton Alta

W. L. L. L. Registrar,
NORTH ALBERTA Land Registration District.

Received May 1911

137 65

137 ✓

CANADA

Refer Cert No, 5564

Duplicate Certificate of Title

I Certify that the within Instrument is duly entered and registered in the Land Title Office for the North Western Land Registration District at Edmonton in the Province of Alberta at 11:30 AM on the 11th day of October A. D. 1906 Register 2796
J. H. McLaughlin
N. A. L. S. S.

NORTH ALBERTA Land Registration District



This is to Certify that James Y. Mitchell of the Town of Brathena, in the Province of Alberta, Canada, Premier is now the owner of an estate in fee simple of and in lot numbered seventeen (17) and Eighteen (18) in Block One Hundred and Fifty-six (156) as shown on a plan of part of the Townsite of Brathena, aforesaid of Record in the Land Titles Office in this Land Registration District as Plan I 4

CANCELLED

This Certificate of Title is cancelled Lot 18 & 17 full 1189 1/2 and a new Certificate of Title No. 2190 issued this 29th day of March A. D. 1912 to E. C. McLaughlin 6124 B. 1/2
E. C. McLaughlin
N. A. L. S. S.

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 eleventh day of October, A. D. 1906.

P. O. Address Brathena, Alta.

J. H. McLaughlin Registrar, NORTH ALBERTA Land Registration District

This Certificate of Title is cancelled Lot 17 Bl. 157 and a new Certificate of Title No. 2190 issued this 29th day of March A. D. 1912 to E. C. McLaughlin
E. C. McLaughlin
N. A. L. S. S.

Lot 18, Block 157, Plan I19

ENCUMBRANCES, LIENS & INTERESTS

PAGE 2
202 078 059 +1

REGISTRATION
NUMBER DATE (D/M/Y) PARTICULARS

C/O DENTONS CANADA LLP
2500 STANTEC TOWER
10220 103 AVENUE
EDMONTON
ALBERTA T5J0K4
AGENT - SIERRA HEISLER

202 087 251 22/04/2020 DISCHARGE OF MORTGAGE 112161715

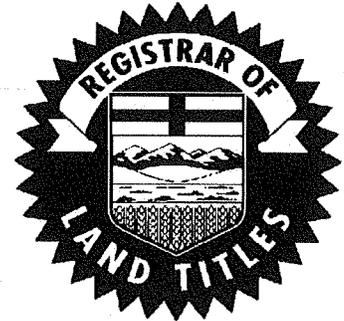
202 090 721 27/04/2020 DISCHARGE OF CAVEAT 202077912

TOTAL INSTRUMENTS: 004

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN
ACCURATE REPRODUCTION OF THE CERTIFICATE OF
TITLE REPRESENTED HEREIN THIS 9 DAY OF
FEBRUARY, 2021 AT 09:26 A.M.

ORDER NUMBER: 40996479

CUSTOMER FILE NUMBER: 7545294



END OF CERTIFICATE

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED
FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER,
SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

THE ABOVE PROVISIONS DO NOT PROHIBIT THE ORIGINAL PURCHASER FROM
INCLUDING THIS UNMODIFIED PRODUCT IN ANY REPORT, OPINION,
APPRAISAL OR OTHER ADVICE PREPARED BY THE ORIGINAL PURCHASER AS
PART OF THE ORIGINAL PURCHASER APPLYING PROFESSIONAL, CONSULTING
OR TECHNICAL EXPERTISE FOR THE BENEFIT OF CLIENT(S).



HISTORICAL LAND TITLE CERTIFICATE
CURRENT TITLE WITH HISTORICAL DATA

S
LINC SHORT LEGAL TITLE NUMBER
0015 558 399 I19;157;18 202 078 059 +1

LEGAL DESCRIPTION
PLAN I19
BLOCK 157
LOT 18
EXCEPTING THEREOUT ALL MINES AND MINERALS

ESTATE: FEE SIMPLE
ATS REFERENCE: 4;24;52;7;RL

MUNICIPALITY: CITY OF EDMONTON

REFERENCE NUMBER: 822 075 640

REGISTERED OWNER(S)					
REGISTRATION	DATE (DMY)	DOCUMENT	TYPE	VALUE	CONSIDERATION
202 078 059	09/04/2020	TRANSFER OF LAND			SEE INSTRUMENT

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
112 161 715	01/06/2011	MORTGAGE MORTGAGEE - KEB HOLDINGS INC. 301,52319 RR231 SHERWOOD PARK ALBERTA T8B1A8 ORIGINAL PRINCIPAL AMOUNT: \$500,000
202 077 912	08/04/2020	CAVEAT RE : VENDOR'S LIEN CAVEATOR - ST. JOHN'S INSTITUTE.

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

PAGE 2
202 078 059 +1

REGISTRATION
NUMBER DATE (D/M/Y) PARTICULARS

C/O DENTONS CANADA LLP
2500 STANTEC TOWER
10220 103 AVENUE
EDMONTON
ALBERTA T5J0K4
AGENT - SIERRA HEISLER

202 087 251 22/04/2020 DISCHARGE OF MORTGAGE 112161715

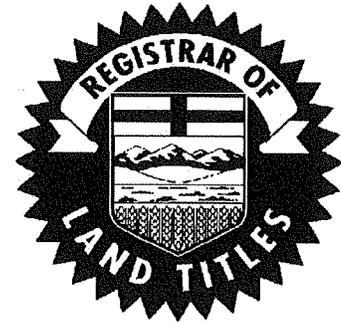
202 090 721 27/04/2020 DISCHARGE OF CAVEAT 202077912

TOTAL INSTRUMENTS: 004

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN
ACCURATE REPRODUCTION OF THE CERTIFICATE OF
TITLE REPRESENTED HEREIN THIS 9 DAY OF
FEBRUARY, 2021 AT 09:26 A.M.

ORDER NUMBER: 40996479

CUSTOMER FILE NUMBER: 7545294



END OF CERTIFICATE

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED
FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER,
SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

THE ABOVE PROVISIONS DO NOT PROHIBIT THE ORIGINAL PURCHASER FROM
INCLUDING THIS UNMODIFIED PRODUCT IN ANY REPORT, OPINION,
APPRAISAL OR OTHER ADVICE PREPARED BY THE ORIGINAL PURCHASER AS
PART OF THE ORIGINAL PURCHASER APPLYING PROFESSIONAL, CONSULTING
OR TECHNICAL EXPERTISE FOR THE BENEFIT OF CLIENT(S).



HISTORICAL LAND TITLE CERTIFICATE
TITLE CANCELLED ON APRIL 09, 2020

S
LINC SHORT LEGAL TITLE NUMBER
0015 558 399 I19;157;18 822 075 640

LEGAL DESCRIPTION
PLAN I19
BLOCK 157
LOT 18
EXCEPTING THEREOUT ALL MINES AND MINERALS

ESTATE: FEE SIMPLE
ATS REFERENCE: 4;24;52;7;RL

MUNICIPALITY: CITY OF EDMONTON

REGISTERED OWNER(S)
REGISTRATION DATE(DMY) DOCUMENT TYPE VALUE CONSIDERATION

822 075 640 06/04/1982 \$108,500

OWNERS

ST. JOHN'S INSTITUTE.
OF 11024 - 82 AVENUE, EDMONTON
ALBERTA

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION
NUMBER DATE (D/M/Y) PARTICULARS

112 161 715 01/06/2011 MORTGAGE
MORTGAGEE - KEB HOLDINGS INC.
301,52319 RR231
SHERWOOD PARK
ALBERTA T8B1A8
ORIGINAL PRINCIPAL AMOUNT: \$500,000

122 128 058 27/04/2012 MORTGAGE
MORTGAGEE - KEB HOLDINGS INC.
301,52319 RR231
SHERWOOD PARK
ALBERTA T8B1A8

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

PAGE 2
822 075 640

REGISTRATION
NUMBER DATE (D/M/Y) PARTICULARS

ORIGINAL PRINCIPAL AMOUNT: \$750,000

132 208 088 10/07/2013 DISCHARGE OF MORTGAGE 122128058

202 077 912 08/04/2020 CAVEAT

RE : VENDOR'S LIEN
CAVEATOR - ST. JOHN'S INSTITUTE.
C/O DENTONS CANADA LLP
2500 STANTEC TOWER
10220 103 AVENUE
EDMONTON
ALBERTA T5J0K4
AGENT - SIERRA HEISLER

202 078 059 09/04/2020 TRANSFER OF LAND

OWNERS - THE CITY OF EDMONTON.
#1 SIR WINSTON CHURCHILL SQUARE, EDMONTON
ALBERTA T5J2R7
NEW TITLE ISSUED

TOTAL INSTRUMENTS: 005

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN
ACCURATE REPRODUCTION OF THE CERTIFICATE OF
TITLE REPRESENTED HEREIN THIS 9 DAY OF
FEBRUARY, 2021 AT 09:26 A.M.

ORDER NUMBER: 40996479

CUSTOMER FILE NUMBER: 7545294



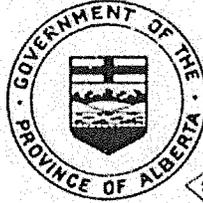
END OF CERTIFICATE

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED
FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER,
SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

THE ABOVE PROVISIONS DO NOT PROHIBIT THE ORIGINAL PURCHASER FROM
INCLUDING THIS UNMODIFIED PRODUCT IN ANY REPORT, OPINION,
APPRAISAL OR OTHER ADVICE PREPARED BY THE ORIGINAL PURCHASER AS
PART OF THE ORIGINAL PURCHASER APPLYING PROFESSIONAL, CONSULTING
OR TECHNICAL EXPERTISE FOR THE BENEFIT OF CLIENT(S).

Certificate of Title

Canada



NO.	8	2	2	0	7	5	6	4	0
REF.	7	7	2	1	2	4	7	5	1
VALUE \$	1	0	8	5	0	0	0	0	0

M	HG.	TWP.	SEC.	O.	PT.
1					
PLAN	BLK.	LOT	PT.		
2	1	19		1	57
				1	8

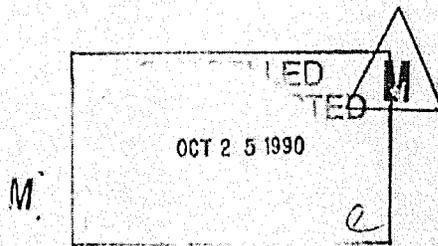
North Alberta Land Registration District

THIS IS TO CERTIFY that ST. JOHN'S INSTITUTE OF EDMONTON, IN THE PROVINCE OF ALBERTA.

IS now the owner of an estate in fee simple
of and in

PLAN 1-19
BLOCK ONE HUNDRED AND FIFTY SEVEN (157)
LOT EIGHTEEN (18)
(EDMONTON - R.L. 7)

EXCEPTING THEREOUT ALL MINES AND MINERALS.



SUBJECT TO THE ENCUMBRANCES, LIENS, ESTATES OR INTERESTS NOTIFIED BY MEMORANDUMS 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 6 day of APRIL, A.D. 19

Post Office Address 11024-82 AVE.
EDMONTON, ALTA.



[Signature] A.D. Registrar

North Alberta Land Registration District

Canada

CANCELLED

Certificate of Title



NO.	7	7	2	1	2	4	7	5	1
REF.	7	7	2	1	0	7	1	0	7
VALUES			6	9	9	1	5	0	0

M	RG.	TWP.	SEC.	O.	PT.
1					

PLAN	BLK.	LOT	PT.
21-19	157	18	

North Alberta Land Registration District

THIS IS TO CERTIFY that RICHARD MICHAEL KANE AND JO-ANN KANE (HIS WIFE),
 BOTH OF EDMONTON, IN THE PROVINCE OF ALBERTA
 ARE now the owner S of an estate in fee simple AS JOINT TENANTS
 of and in

PLAN I-19
 BLOCK ONE HUNDRED AND FIFTY SEVEN (157)
 LOT EIGHTEEN (18)
 (EDMONTON - R.L. 7)

EXCEPTING THEREOUT ALL MINES AND MINERALS

TITLE CANCELLED No. 10207561
 on this 6 day of APRIL 1977
[Signature]
 A.D. Registrar

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 4TH day of JULY, A.D. 1977
 Post Office Address 11049 - 83 AVE.,
EDMONTON, ALTA.



[Signature] AD Registrar
 North Alberta Land Registration District

CANCELLED
Certificate of Title

Canada



NO.	7	7	2	1	0	7	1	0	7
REF.	7	5	2	0	2	0	3	1	1
VALUES			6	3	4	5	0	0	0

M.	R.G.	TWP.	SEC.	O.	PT.
1					

PLAN	BLK.	LOT	PT.
1-19	157	18	

North Alberta Land Registration District

THIS IS TO CERTIFY that **DARLENE E. LEICKNER**
OF EDMONTON, IN THE PROVINCE OF ALBERTA

IS now the owner of an estate in fee simple
of and in

PLAN 1-19
BLOCK ONE HUNDRED AND FIFTY SEVEN (157)
LOT EIGHTEEN (18)

(EDMONTON - R.L. 7)

EXCEPTING THEREOUT ALL MINES AND MINERALS.

TITLE CANCELLED	<u>772124751</u>
on this <u>4</u> day of <u>July</u> 19 <u>77</u>	
A. D./Registrar <i>[Signature]</i>	



SUBJECT TO THE ENCUMBRANCES, LIENS, ESTATES OR INTERESTS NOTIFIED BY MEMORANDUM OR WRITING 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 10 day of JUNE, A.D. 1977

Post Office Address SUITE #1, 7604-95 STREET
EDMONTON, ALBERTA

[Signature] AD, Registrar
RR
North Alberta Land Registration District

CANCELLED
Certificate of Title

Canada



M NO.	7	5	2	0	2	0	3	1	1
REF.	7	3	1	2	4	9			
VALUES	3	7	0	0	0	0	0	0	0

M	RG.	TWP.	SEC.	O.	PT.
1					

PLAN	BLK.	LOT	PT.
1	191	57	18

North Alberta Land Registration District

THIS IS TO CERTIFY that EDWARD BEVERLY BRANCH (THE YOUNGER) AND MARY ETTE BRANCH (HIS WIFE) BOTH OF EDMONTON, IN THE PROVINCE OF ALBERTA

now the owner of an estate in fee simple AS JOINT TENANTS

of and in LOT EIGHTEEN (18)
IN BLOCK ONE HUNDRED AND FIFTY SEVEN (157)
ON PLAN I-19.
(EDMONTON - R.L. 7)

EXCEPTING THEREOUT ALL MINES AND MINERALS.

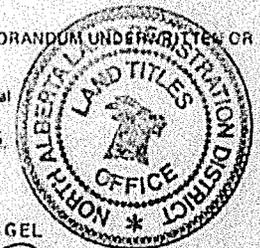
TITLE CANCELLED No 772107107
In Full
on this 10 day of June 1977
J. Ding
A.D. Registrar

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 3 day of MARCH A.D. 1975

Post Office Address 11049 - 83 AVENUE,
EDMONTON, ALTA.



GEL

J.K. Peace A.D. Registrar

LAND TITLES ACT, Sec. 84 - The land mentioned in any certificate of title granted under this Act shall by implication and without any special mention therein, be subject to -

- (1) Any subsisting reservations or exceptions including royalties contained in the original grant of the land from the Crown;
- (2) All unpaid taxes, including municipal and drainage district rates;
- (3) Any public highway or right-of-way or other public easement, however created upon, over or in respect of the land;
- (4) Any subsisting lease or agreement for a lease for a period not exceeding three years, where there is actual occupation of the land under the same;
- (5) Any distress, writ or execution against or affecting the interest of the owner of the land which have been registered and maintained in force against the owner;
- (6) Any debt of expropriation which may by statute be created in any person, body corporate, or Her Majesty;
- (7) Any right-of-way or other easement granted or acquired under the provisions of any Act or law in force in the Province.



issued on instrument registered at 10,30 o'clock
 A. M. on the 15 day of JUNE
 A.D. 19 71
 Number 886 Book S.P. Folio 28
 E.F. GAMACHE
 Registrar, H.A.L.R.D.

Certificate of Title

JUN 10 1971

Assee Fund Value \$28,000.00

Refer Cert. No. 249-U-208

North Alberta Land Registration District

This is to Certify that

CHARLES H. DENET (SYSTEMS ANALYST)

AND SANDRA L. DENET (HIS WIFE) BOTH OF EDMONTON IN THE PROVINCE OF ALBERTA, CANADA

IMPORTANT NOTICE
 It will be to the interest of every Owner and Mortgagee to furnish the Land Titles Office, Edmonton, with his full address (Post Office and Street number) or any change in address when Notices of dealings with this Title may be sent.

is now the owner of an estate in fee simple AS JOINT TENANTS AND NOT AS TENANTS IN COMMON,

of and in LOT EIGHTEEN (18) IN BLOCK ONE HUNDRED AND FIFTY SEVEN (157)

IN THE CITY OF EDMONTON, AFORESAID, AS SHOWN ON SUBDIVISION PLAN I-19.

(R.L. 7)

RESERVING THEREOUT ALL MINES AND MINERALS.

THIS CERTIFICATE IS CANCELLED
 IN FULL
 IN ACCORDANCE WITH THE ACT SUBJECT TO THE PROVISIONS OF THE REGULATIONS THEREIN AND A NOTICE OF THIS
 ISSUED THIS 3 DAY OF MAR 1971
 TO EDWARD BEVERLY BRADEN, ET AL
 DB: 75 209,037 J. K. K...
 A.D. REGISTRAR

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 FIFTEENTH day of JUNE A.D. 19 71

Ed Stephens A.D. Registrar

RO Address 11049-83 AVE., EDMONTON, ALTA.

North Alberta Land Registration District

887 S.P. MTGE. DATED 27-MAY-71 REG. 10.33 AM 15-JUN-71 ABOVE LAND BY CHARLES H. DENET ET AL TO THE ROYAL TRUST COMPANY 10039-JASPER AVE. EDM. ALTA. FOR \$14,000.00 AT 98.

OVER

LAND TITLES ACT, Sec. 84 - The land mentioned in any certificate of title granted under this Act shall by implication and without any special mention therein, be subject to -

- (1) Any subsisting encumbrances or exceptions including easements contained in the original grant of the land from the Crown;
- (2) All unpaid taxes, including taxation and drainage district rates;
- (3) Any public highway or right-of-way or other public easement, however created upon, over or in respect of the land;
- (4) Any subsisting lease or agreement for a lease for a period not exceeding three years, where there is actual occupation of the land under the lease;
- (5) Any decision, order or execution against or affecting the interest of the owner of the land which has been registered and indorsed in force against the owner;
- (6) Any right of reversion which may by statute be vested in any person, body corporate, or Her Majesty;
- (7) Any right-of-way or other easement granted or acquired under the provisions of any Act or law in force in the Province.

247-U-208



Issued on instrument registered at 11.26 o'clock
 A. M. on the 20 day of OCT.
 A.D. 19 64
 Number 7283 Book N.S. folio 222
 L. A. DUMMEL
 Registrar, N.A.L.R.D.

247

Certificate of Title

Assoc. Fund Value \$5,650.00

TRANSMISSION

Refer Cert. No. 131-B-115

North Alberta Land Registration District.

This is to Certify that ANNE ELIZABETH LEVA (NEE LYNDON) (HOUSEWIFE)

AND JOHN LAWRENCE LYNDON (SOLICITOR) BOTH OF EDMONTON, IN THE PROVINCE OF ALBERTA, CANADA,

EXECUTORS OF THE ESTATE OF CHLGE LYNDON (DECEASED)

is now the owner of an estate in fee simple

of and in LOT EIGHTEEN (18) IN BLOCK ONE HUNDRED AND FIFTY SEVEN (157)

IN THE CITY OF EDMONTON, AFORESAID, AS SHOWN ON SUBDIVISION PLAN 1-10

(P.L.S -7)

RESERVING THEREOUT ALL MINES AND MINERALS.

CANCELLED

THIS CERTIFICATE OF TITLE IS CANCELLED
 IN FULL

IN ACCORDANCE WITH THE TRANSFER SUBJECT TO ANY EXCEPTIONS AND RESERVATIONS THEREIN AND A NEW CERTIFICATE OF TITLE NO. 249-U-208
 ISSUED THIS 20 DAY OF OCT. 1964
 TO ALBERT PETER LEVA ET AL
 DB 7284 N.S. A.H. WILSON
 AD REGISTRAR

subject to the encumbrances, liens and interests notified by memorandum underwritten or endorsed hereon, or which may hereafter be made in the registers

In Witness Whereof I have hereunto subscribed my name and affixed my official seal this TWENTIETH day of OCTOBER A.D. 19 64

ANS

Al Stephens Registrar

P.O. Address EDMONTON, ALTA.

North Alberta Land Registration District

OVER

LAND TITLES ACT, Sec. 81—The land mentioned in any certificate of this kind shall be deemed to be registered and subject to any special conditions therein, unless the contrary is expressly declared, to subject to—

- (1) Any subsiding river, dam or exception contained in the original grant of the land from the Crown;
- (2) All unpaid taxes, including inheritance and drainage district rates;
- (3) Any public highway or right-of-way or other public easement, however created upon, over or in respect of the land;
- (4) Any subsiding lease or agreement for a lease for a period not exceeding three years, where there is actual occupation of the land under the same; or
- (5) Any decree, order or transaction against or affecting the interest of the owner of the land which has been registered and maintained in force against the owner;
- (6) Any right of appropriation which may by statute be vested in any person, body corporate, or His Majesty;
- (7) Any right-of-way or other easement created or acquired under the provisions of any Act or law in force in the Province.

131-8-119



CANCELLED 131

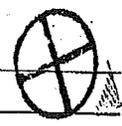
Based on instrument registered at 1:30 o'clock
 A. on the 20 day of AUG:
 A.D. 19 47
 Number 1905 Sub. Gik's File 56
 As To: HINNARD
 Registrar, A.L.L.R.D.

Certificate of Title.

North Alberta Land Registration District.

Assess Fund Value \$5650.00 Unimproved Value \$500.00 Refer Cert. No. 76-8-63

This is to Certify that CHLOE LYNDON
 OF EDMONTON IN THE PROVINCE OF ALBERTA DOMINION OF CANADA



is now the owner of an estate in fee simple
 of and in LOT EIGHTEEN (18) IN BLOCK ONE HUNDRED AND FIFTY SEVEN (157)

IN RIVER LOT SEVEN (7) A SUBDIVISION OF THE CITY OF EDMONTON AFORESAID;
 OF RECORD IN THE LAND TITLES OFFICE FOR THIS LAND REGISTRATION DISTRICT
 AS PLAN 1-19;

RESERVING THEREOUT ALL MINES AND MINERALS;

CANCELLED
 THIS CERTIFICATE OF TITLE IS CANCELLED
In full under transmission
 IN ACCORDANCE WITH THE TRANSFER SUBJECT TO ANY EXCEPTIONS OR RESERVATIONS HEREIN AND A NEW CERTIFICATE OF TITLE IS ISSUED
 ISSUED THIS 20 DAY OF Oct. 1947
 TO *Drum Elizabeth Lane et al*
 7283 N.S.
 [Signature] REGISTRAR

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 TWENTYETH day of AUGUST A.D. 19 47

P.O. Address 11049-83RD AVE
EDMONTON ALTA

[Signature] Registrar
 North Alberta Land Registration District

SEP 18 1947

LAND TITLES ACT, Sec. 37.—The land registered in any certificate of title granted under this Act shall by implication and without any special mention therein, unless the contrary is expressly declared, be subject to—

- (1) Any subsisting reservation or exception contained in the original grant of the land from the Crown;
- (2) All unpaid taxes, including litigation or drainage district rates;
- (3) Any public highway or right-of-way or other public easement, however created, which exists or is reserved in respect of the land;
- (4) Any subsisting lease or agreement for a lease for a period not exceeding three years, where there is actual occupation of the land under the lease;
- (5) Any decrees, orders or prohibitions relating to or affecting the interest of the owner of the land which have been registered and maintained in force against the owner;
- (6) Any rights of appropriation which may by statute or ordinance be vested in any person, body corporate, or His Majesty;
- (7) Any right-of-way or other payment granted or acquired under the provisions of any Act or law in force in the Province.



CANCELLED

Filed on instrument registered at 10, 58 of 6
 on the 4 day of MAY
 A.D. 1926
 No. 6097
 D. B. No. 198
J. D. [Signature]
 Registrar

Certificate of Title.

North Alberta Land Registration District.

Assoc. Fund Value \$ 5950 Unearned Inc. Value \$ 500 Refer Cert. No. 25-8-57

This is to Certify that MARGARET KERBER

OF EDMONTON IN THE PROVINCE OF ALBERTA DOMINION OF CANADA.



is now the owner of an estate in fee simple

of and in LOT EIGHTEEN (18) BLOCK ONE HUNDRED AND FIFTY-SEVEN (157); IN RIVER LOT SEVEN (7)

SUBDIVISION OF THE CITY OF EDMONTON AFORESAID OF RECORD IN THE LAND TITLES OFFICE FOR THIS LAND REGISTRATION DISTRICT AS PLAN 1.19.

EXCEPTING THEREOUT ALL MINES AND MINERALS,

CANCELLED

This Certificate of Title is cancelled
In Full
 and a NEW CERTIFICATE OF TITLE No. 131 B 119
 Issued this 20 day of August 1947
 to *Charles L. Gardner*
 D.B. No. 1888
W. D. [Signature]
 Registrar

subject to the encumbrances, liens and interests notified by memorandum endorsed thereon 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 FOURTH day of MAY A.D. 1926

P.O. Address EDMONTON ALTA,

North Alberta Land Registration District

5406 DD MTGE DATED 8-OCT-24 REG. 10,08 AM 14-OCT-24 JESSIE FOX TO MUTUAL LIFE ASSCE COY OF CANADA ABOVE LAND FOR \$ 2500 AT 6

5467 D1 MTGE DATED 3-MCH-26 REG. 12,20 PM 3-APR-26 JESSIE FOX TO MORRIS GOODMAN ET AL OF TORONTO ONT, ABOVE LAND FOR \$ 1500 AT 7

The above mentioned *Mtge* No. *2247*
 is discharged by instrument dated the *25* day
 of *Oct* 1926, Registered at *1029*
 the *2* day of *Nov* 1926, by D. B.
 No. *2302*
M. [Signature]
 Registrar

The above mentioned *Mtge* No. *2247*
 is discharged by instrument dated the *2* day
 of *Oct* 1926, Registered at *1029*
 the *17* day of *Oct* 1926, by D. B.
 No. *2302*
M. [Signature]
 Registrar

OVER

The title of Within land
 is subject to a MORTGAGE made by Margaret Kerber
 to Can. Perm. Trust Ltd.
 of Edmonton for 3000⁰⁰ and
 interest thereon at 7 1/2 per cent. Dated the
16 day of Oct. 1929
 Registered at 104 on the 17 day of
Oct. 1929 as 3215 EB
Rome Land
 Registrar.

Title of 1418 Blk 157
 is subject to a CAVEAT filed by the Assessor of the
 City of Edmonton under Tax Recovery Act. (1922)
 dated 9 Nov. 1931 Reg'd 10 Nov. 1931 as D. B.
 No. 4985
 Filed 96
W. L. Brown
 Registrar.

The above mentioned Caveat No. 4985
 is discharged by instrument dated the 3 day
 of Feb. 1932 Registered at 133 M.,
 the 4 day of Feb. 1932; as D. B.
 No. 63988
W. L. Brown
 Registrar.

The above mentioned Mortg No. 3215 EB
 is discharged by instrument dated the 26 day
 of March 1938 registered at 1148 N.
 the 6 day of Aug. 1947, as D. B.
 No. 58926 I
Fred Barclay
 Registrar.

CANCELLED

25 48

25-S-57



Based on instrument registered at 11:54 a.m. on the 25th day of May 1923. Number 5974, Part D. X. Folio 186. J. W. Boos Registrar, S. S. R. O.

LAND TITLES ACT, 1922. Sec. 45 - The land mentioned in any certificate of title granted under this Act shall be subject to the provisions of this Act and to the provisions of the Act in force at the time of the registration of the certificate of title. (1) Any mortgage, lien or other encumbrance created by or in favour of a person who is not the registered owner of the land shall be void as against the registered owner. (2) Any mortgage, lien or other encumbrance created by or in favour of a person who is not the registered owner of the land shall be void as against the registered owner if the instrument creating the same is not registered in the office of the Registrar within the time specified in this Act. (3) Any mortgage, lien or other encumbrance created by or in favour of a person who is not the registered owner of the land shall be void as against the registered owner if the instrument creating the same is not registered in the office of the Registrar within the time specified in this Act. (4) Any mortgage, lien or other encumbrance created by or in favour of a person who is not the registered owner of the land shall be void as against the registered owner if the instrument creating the same is not registered in the office of the Registrar within the time specified in this Act. (5) Any mortgage, lien or other encumbrance created by or in favour of a person who is not the registered owner of the land shall be void as against the registered owner if the instrument creating the same is not registered in the office of the Registrar within the time specified in this Act. (6) Any mortgage, lien or other encumbrance created by or in favour of a person who is not the registered owner of the land shall be void as against the registered owner if the instrument creating the same is not registered in the office of the Registrar within the time specified in this Act. (7) Any mortgage, lien or other encumbrance created by or in favour of a person who is not the registered owner of the land shall be void as against the registered owner if the instrument creating the same is not registered in the office of the Registrar within the time specified in this Act.

Certificate of Title

Assoc. Fund Value \$ 5.00.00
Unearned Inc. Value \$ 5.00.00

Refer Cert. No. 83-L-53

North Alberta Land Registration District

This is to Certify that Jessie How, of Edmonton, in the Province of Alberta, Dominion of Canada Married Woman

is now the owner of an estate in fee simple of and in Lot Eighteen (18), in Block One hundred and fifty-seven (157), in River Lot Seven (7), Subdivision of the City of Edmonton aforesaid, of record in the Land Titles Office for this Land Registration District as Class I 19

TITLE CANCELLED No. 5974
On Sale under Renewal
on the 25th day of May 1923
J. W. Boos
R.D. Registrar

The Title of Blank Land
subject to a CAVEAT filed by the Assessor of the City of Edmonton under Tax Recovery Act. (1922)
Dated 13 Nov. 1920, Reg'd 13 Nov. 1923, as D. B.
No. 494 D. J.
Folio 217
J. W. Boos
Registrar

This is full and a NEW CERTIFICATE OF TITLE No. 46-2-63
issued this 4th day of May 1923
to Margaret Kuber
D. B. No. 6694 D.I.
J. W. Boos
Registrar

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-fifth day of May A.D. 1923.

J. W. Boos Registrar, North Alberta Land Registration District.

P.O. Address Edmonton, Alta.

The title of above land
is subject to a CAVEAT filed by Jessie How
in the Multiple Life
Wm. J. Barak 2578
interest thereon at 10%
of 10%
registered at 1124
on the 14th day of May 1923
J. W. Boos
Registrar

The above mentioned caveat No. 1124
is discharged by instrument dated the 15th day
of May 1923, registered at 201
on the 29th day of May 1923, as D. B.
No. 6694 D.I.
J. W. Boos
Registrar

The title of Within Land
is subject to a Western Supply made by Ed #34
of 28 for 1926
Registered at 11.24.26 on the 28 day of Nov
1926 as D. B. No. 654 DC
W. Lee
Registrar

The title of Within Land
is subject to a MORTGAGE made by Jessie
Case Morris Goodman et al
of Accounts Out for \$1,500 and
interest 7 % per annum. Dated the
31 Mar 1926
Registered at 12²⁰ M., the 3 day of
April 1926 as D. B. No. 1464 Pt
R. McLeod
Registrar

The above mentioned McKee No. 6554 DC
is discharged by instrument dated the 19 day
of Dec 1926 Registered at 2 P. M.
the 20 day of Dec 1926 as D. B.
No. 7532 DG
R. McLeod
Registrar

The above mentioned McKee No. 6554 DC
is discharged by instrument dated the 25 day
of Oct 1926 Registered at 1:00 P. M.
the 2 day of Nov 1926 as D. B.
No. 2202 SA
R. McLeod
Registrar



13-L-53 Certificate of Title.

Issued on instrument registered at 12:18 o'clock
 P. M. on the 29 day of Sept
 A. D. 1921.
 Number 2919, Dist. C. G. Folio 89.
W. H. Brown
 Registrar A.L.R.U.

Assoc. Fund Value \$1000.⁰⁰
 Unclaimed Inc. Value \$1000.⁰⁰

NORTH ALBERTA Land Registration District.
 Paper Cont. No. 120-S-57.

CANCELLED

This is to Certify that *Waldron W. Brown*
 of *Edmonton*, in the Province of *Alberta* Dominion of
Canada "Gentleman"



is now the owner of an estate in fee simple
 of and in *Lot Eighteen (18), Block One hundred and Fifty-Seven (157), Part of
 River Lot Seven (7) in the City of Edmonton aforesaid, of record in the
 Land Titles Office, for this Land Registration District, as Plan I 19*

CANCELLED

This Certificate of Title is cancelled.
 and a NEW CERTIFICATE OF TITLE No. 25559
 issued this 25 day of Sept 1921
 to *Waldron W. Brown*
 D. B. No. 5074 102
W. H. Brown
 Registrar

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 *September* A.D. 1921
W. H. Brown Registrar

P.O. Address *Edmonton* *Alta.* NORTH ALBERTA Land Registration District *56.*

LAND TITLES ACT (R.S.A. 1907, c. 10) and without any special limitation thereon, unless the conditions contained in this certificate of title are complied with, the grant of the land from the Crown:
 (1) Any public highway or right-of-way or other public easement, however created upon, over or in respect of the land;
 (2) Any public utility easement, however created upon, over or in respect of the land;
 (3) Any public right-of-way or other public easement, however created upon, over or in respect of the land;
 (4) Any public utility easement, however created upon, over or in respect of the land;
 (5) Any right of way or other easement, however created upon, over or in respect of the land;
 (6) Any right of way or other easement, however created upon, over or in respect of the land;
 (7) Any right of way or other easement, however created upon, over or in respect of the land;
 (8) Any right of way or other easement, however created upon, over or in respect of the land;
 (9) Any right of way or other easement, however created upon, over or in respect of the land;

130-8-51



Certificate of Title.

Issued on instrument registered at 12.7.1921
 on the 12. day of March
 A. D. 1921.
 Number 2226 Reg. CK File 109
W. L. Brown
 Registrar A.L.R.D.

Asses. Fund Value \$1000

Unassessed Inc. Value \$1000

NORTH ALBERTA

Land Registration District.
 Refers Cert. No. 1687 42

CANCELLED

This is to Certify that James M. Naughton of
 "Carmangay" in the Province of Alberta Dominion of Canada.
 Merchant, Executor of the Estate of Peter A. M^o Naughton, (deceased),
 is now the owner of an estate in fee simple
 of and in Lot Eighteen (18) in Block One Hundred and fifty-seven (157)
 part of River Lot seven (7) in the City of Edmonton in the said Province,
 of record in the Land Titles Office for this Land Registration District:
 as Plan J. 12



CANCELLED

This Certificate of Title is cancelled
 in full
 and a new Certificate of Title No. 2226
 issued this 29 day of Sept
 A. D. 1921 to W. L. Brown
 D. B. No. 27622
W. L. Brown
 Registrar

subject to its 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 29th

day of March A.D. 1921

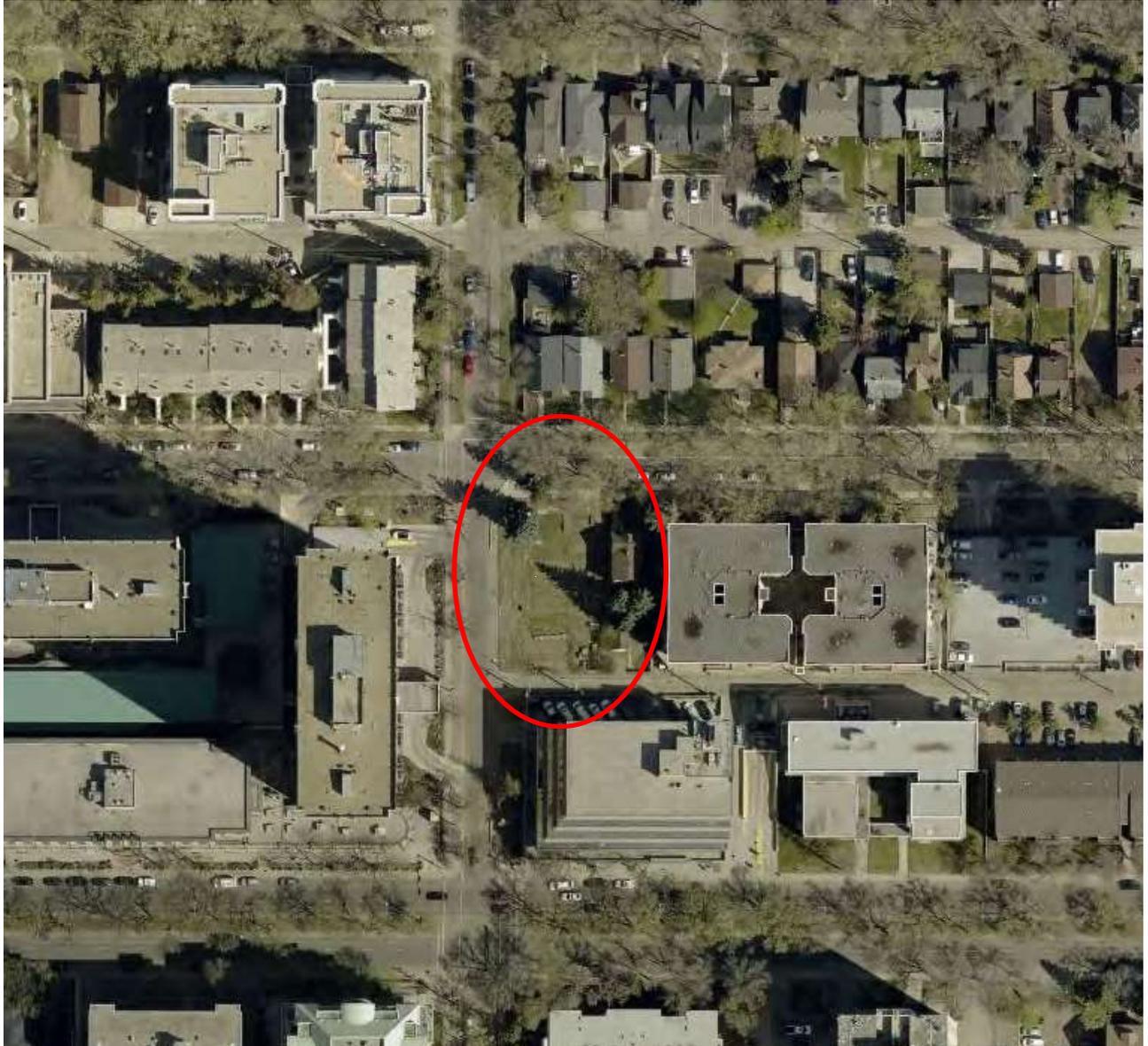
at
 P.O. Address Carmangay Alta

W. L. Brown Registrar,
 NORTH ALBERTA Land Registration District.

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Appendix D

Photographs



Reference: City of Edmonton, 2021.



CRIMSON
ENVIRONMENTAL
LIMITED

2020 Aerial Photograph

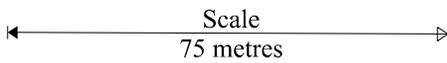
11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Plate A

Scale: As Shown

February, 2021

CEL-37544B



Reference: Google, 2021.

*Scale provided is approximate and as provided by the source.



CRIMSON
ENVIRONMENTAL
LIMITED

2017 Aerial Photograph

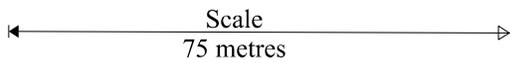
Plate B

Scale: Unknown

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

February, 2021

CEL-37544B



Reference: Google, 2021.

*Scale provided is approximate and as provided by the source.



CRIMSON
ENVIRONMENTAL
LIMITED

2012 Aerial Photograph

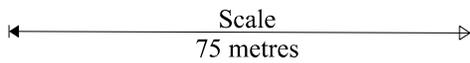
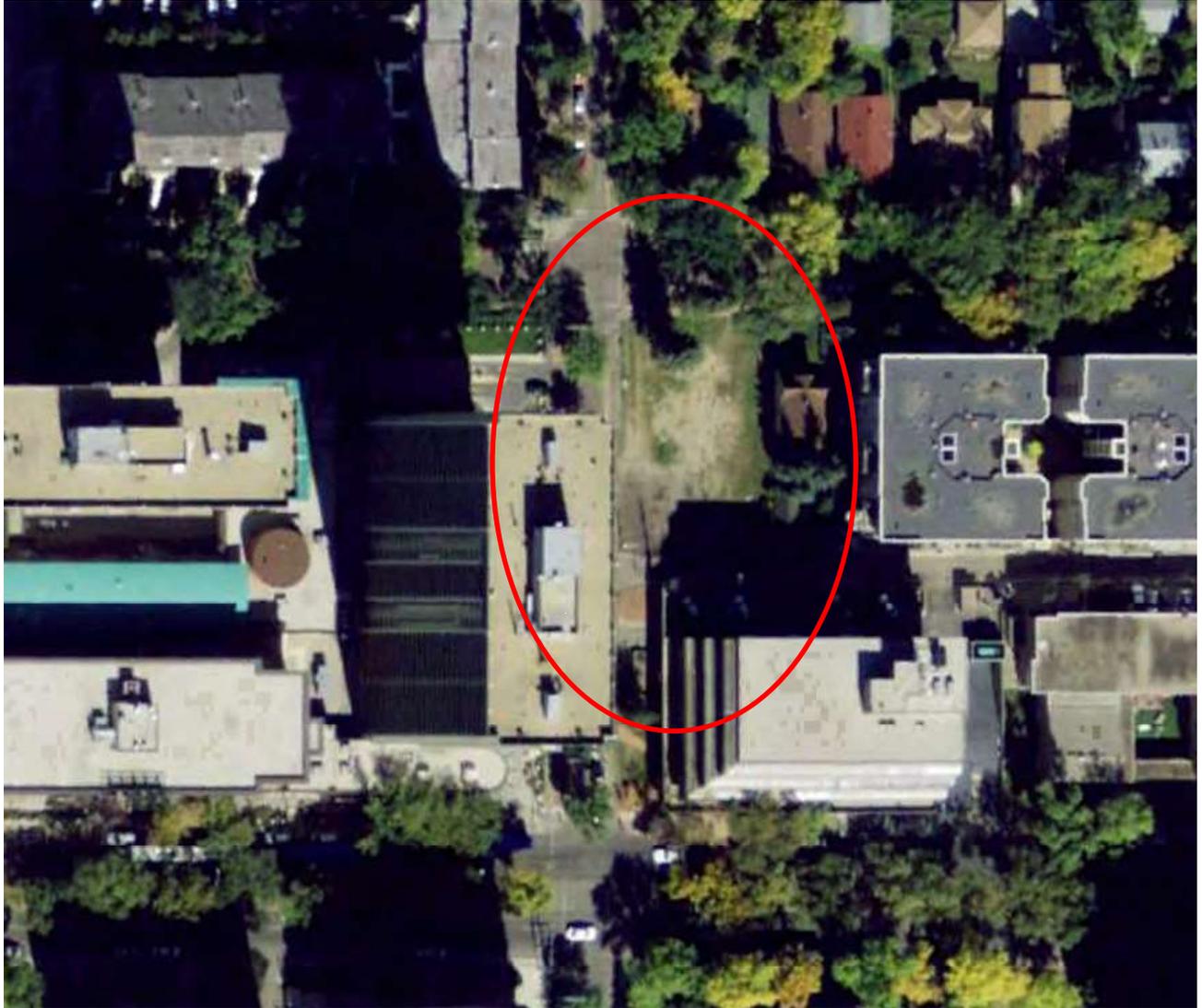
11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

Plate C

Scale: Unknown

February, 2021

CEL-37544B



Reference: Google, 2021.

*Scale provided is approximate and as provided by the source.



CRIMSON
ENVIRONMENTAL
LIMITED

2008 Aerial Photograph

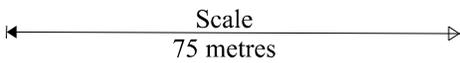
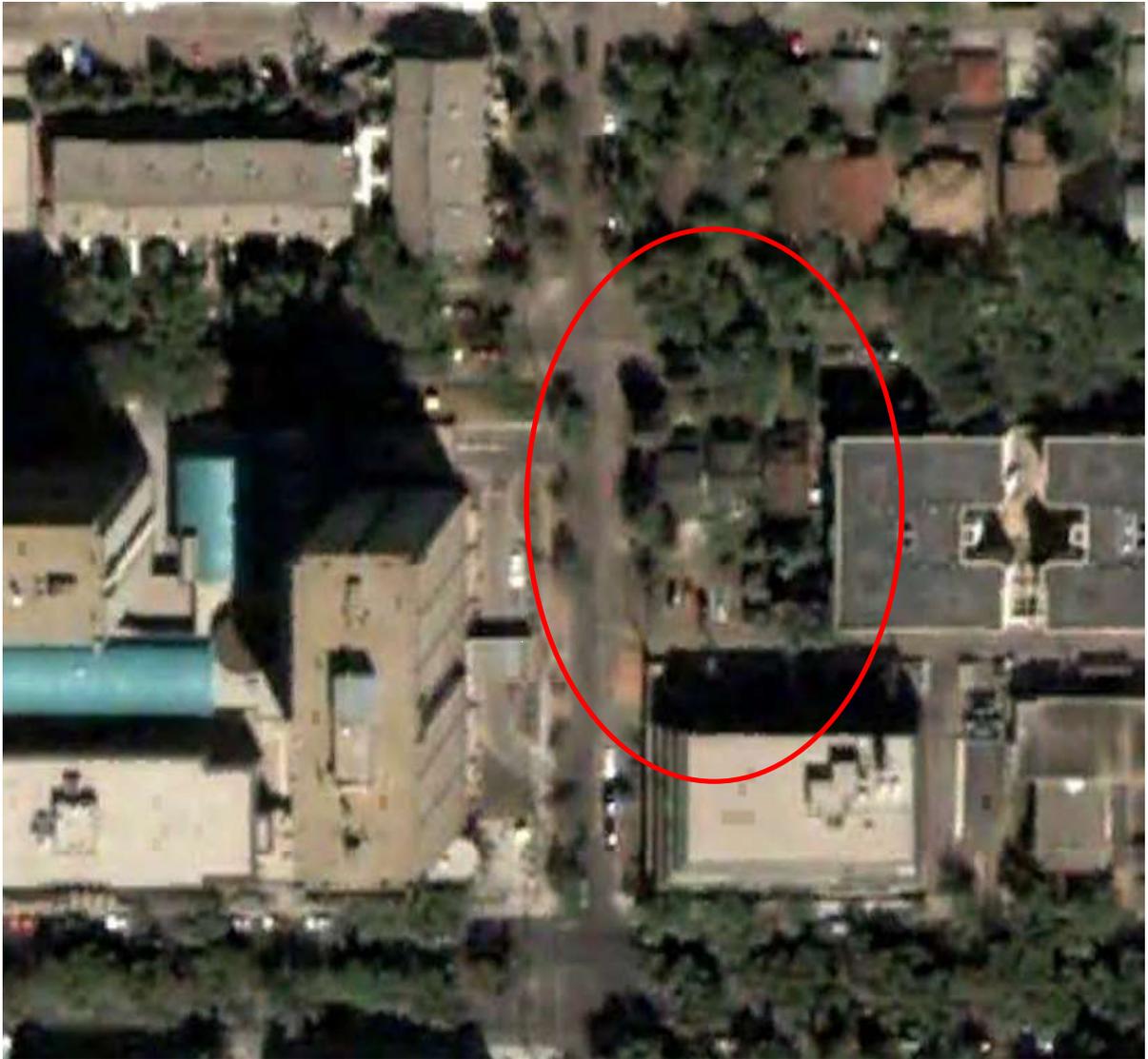
11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

Plate D

Scale: Unknown

February, 2021

CEL-37544B



Reference: Google, 2021.

*Scale provided is approximate and as provided by the source.



CRIMSON
ENVIRONMENTAL
LIMITED

2004 Aerial Photograph

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Plate E

Scale: Unknown

February, 2021

CEL-37544B



Reference: Ecolog Eris, 2021.

*Scale of the original photograph was 1:10,000. Provided scale unknown.



CRIMSON
ENVIRONMENTAL
LIMITED

1991 Aerial Photograph

Plate F

Original Scale: 1:10,000

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:15,000. Provided scale unknown.



CRIMSON
ENVIRONMENTAL
LIMITED

1988 Aerial Photograph

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Plate G

Original Scale: 1:15,000

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:5,000. Provided scale unknown.



CRIMSON
ENVIRONMENTAL
LIMITED

1978 Aerial Photograph

Plate H

Original Scale: 1:5,000

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:6,000. Provided scale unknown.



CRIMSON
ENVIRONMENTAL
LIMITED

1965 Aerial Photograph

Plate I

Original Scale: 1:6,000

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:8,500. Provided scale unknown.



CRIMSON
ENVIRONMENTAL
LIMITED

1957 Aerial Photograph

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Plate J

Original Scale: 1:8,500

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:20,000. Provided scale unknown.



CRIMSON
ENVIRONMENTAL
LIMITED

1952 Aerial Photograph

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Plate K

Original Scale: 1:20,000

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:20,000. Provided scale unknown.



CRIMSON
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1948 Aerial Photograph

Plate L

Original Scale: 1:20,000

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:12,000. Provided scale unknown.



CRIMSON
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LIMITED

1930 Aerial Photograph

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Plate M

Original Scale: 1:12,000

February, 2021

CEL-37544B



Reference: City of Edmonton Archives, 2021.

*Scale of the original photograph was 1:20,000. Provided scale unknown.



CRIMSON
ENVIRONMENTAL
LIMITED

1924 Aerial Photograph

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

Plate N

Original Scale: 1:20,000

February, 2021

CEL-37544B



Photograph 1. Subject site facing south.



Photograph 2. Subject site facing southwest.



CRIMSON
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Site Photographs 1

Plate O

Scale: Unknown

11049 & 11053 - 83 Avenue NW
 Lots 17 & 18, Block 157, Plan 119
 Edmonton, Alberta

February, 2021

CEL-37544B



Photograph 3. Northern portion of subject site facing east.



Photograph 4. Subject site facing south.



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Site Photographs 2

Plate P

Scale: Unknown

11049 & 11053 - 83 Avenue NW
 Lots 17 & 18, Block 157, Plan I19
 Edmonton, Alberta

February, 2021

CEL-37544B



Photograph 5. Adjacent properties across 111 Street and 83 Avenue.
Photograph taken facing northwest.



Photograph 6. Adjacent properties to the north across 83 Avenue.
Photograph taken facing north.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Photographs 3

Plate Q

Scale: Unknown

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

February, 2021

CEL-37544B



Photograph 7. Adjacent properties to the east and south.
Photograph taken facing south.



Photograph 8. Adjacent properties to the west across 111 Street.
Photograph taken facing southwest. Subject site in foreground.



CRIMSON
ENVIRONMENTAL
LIMITED

Site Photographs 4

Plate R

Scale: Unknown

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

February, 2021

CEL-37544B



Photo 9. Google maps image of site without snow cover.
 Photograph taken facing east.



Photo 10. Google maps image of site without snow cover.
 Photograph taken facing south.

Reference: Google, 2021. Date of photograph unknown.



CRIMSON
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 LIMITED

Site Photographs 5

Plate S

Scale: Unknown

11049 & 11053 - 83 Avenue NW
 Lots 17 & 18, Block 157, Plan I19
 Edmonton, Alberta

February, 2021

CEL-37544B

Limited Phase II Environmental Site Assessment
11049 - 83 Avenue NW &
11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

Prepared by

CRIMSON Environmental Limited

PO Box 24 - #314 – 222 Baseline Road

Sherwood Park, Alberta, T8H 1S8

Telephone: 780.719.4959

The Association of Professional Engineers and Geoscientists of Alberta
Permit to Practice P08305

for

The City of Edmonton

Engineering Services Section

Integrated Infrastructure Services

Business Planning & Support Branch

11004 - 190 Street NW

Edmonton, Alberta

T5S 0G9

Project Number: CEL-37544B

April 9, 2021

EXECUTIVE SUMMARY

CRIMSON Environmental Limited (CRIMSON) was retained by the City of Edmonton to conduct a Limited Phase II Environmental Site Assessment (ESA) of two vacant parcels of land situated in the city's Garneau Neighbourhood. The municipal addresses for the subject properties are 11049 - 83 Avenue NW and 11053 - 83 Avenue NW, Edmonton, Alberta (Figures 1 and 2). The legal description for the subject site is Lots 17 and 18, Block 157, Plan I19. This report summarizes the scope of work, methodology and findings of the investigation.

The purpose of the investigation was to obtain soil quality data with respect to a select list of petroleum hydrocarbon (PHC) constituents, Alberta Tier I trace metals and/or salinity related parameters. The assessment was completed specifically to ascertain the soil quality of fill materials that were placed into the void that resulted from the removal of the private residences that were previously located on-site.

The intrusive portion of this investigation was completed on March 22, 2021. A total of three boreholes were drilled using a track mounted drill rig operated by Landmark Drilling Services Ltd. The rig was equipped with solid stem augers. All of the boreholes were drilled to approximate depths ranging between 3.0 and 3.8 mbgl and were backfilled with bentonite and drill cuttings upon completion. A total of four soil samples were transported to the Element Materials Technology Canada Inc. Laboratory in Edmonton with the appropriate chain-of-custody information. All soil samples were analysed for refined petroleum hydrocarbon constituents, Alberta Tier 1 trace metals and salinity related parameters.

The results of the analytical testing obtained for all of the samples submitted to the laboratory during this assessment are not indicative of any impact from refined petroleum hydrocarbons, Alberta Tier 1 trace metals or salinity related parameters. Based on the results of the assessment, no further assessment or remediation of the on-site fill materials is recommended at this time.

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1.0 INTRODUCTION

CRIMSON Environmental Limited (CRIMSON) was retained by the City of Edmonton to conduct a Limited Phase II Environmental Site Assessment (ESA) of two vacant parcels of land situated in the city's Garneau Neighbourhood. The municipal addresses for the subject properties are 11049 - 83 Avenue NW and 11053 – 83 Avenue NW, Edmonton, Alberta (Figures 1 and 2). The legal description for the subject site is Lots 17 and 18, Block 157, Plan I19. This report summarizes the scope of work, methodology and findings of the investigation.

The purpose of the investigation was to obtain soil quality data with respect to a select list of petroleum hydrocarbon (PHC) constituents, Alberta Tier I trace metals and/or salinity related parameters. The assessment was completed specifically to ascertain the soil quality of fill materials that were placed into the void that resulted from the removal of the private residences that were previously located on-site.

1.1 Scope of Work

The final scope of work included the following tasks:

- Observe the drilling of three boreholes at the locations provided on Figure 4. All of the boreholes were drilled to approximate depths ranging between of 3.0 and 3.8 metres below ground level (mbgl);
- Complete a soil-sampling program for the purpose of quantifying potential impacts. This included the collection of soil samples at a regular interval of approximately 0.75 metres or as deemed necessary by field staff. Final collection depths were determined in the field and were dependent upon field conditions;
- Complete combustible vapour screening of all soil samples collected during the investigation;
- Submit select soil samples to an accredited laboratory for chemical analysis; and
- Prepare a report documenting the findings of the investigation.

Authorization to complete the assessment was obtained from the client and from the property owner prior to commencement.

1.2 Methodology

This investigation was completed following the recommended procedures outlined in the Canadian Standards Association (CSA) Publication Z769-00 Phase II Environmental Site Assessment and the Alberta Environmental Site Assessment Standard (2016) provided by Alberta Environment and Parks (AEP). These documents are considered to be the standards for Phase II ESAs in Alberta and it is CRIMSON's experience that investigations completed in accordance with these documents are generally acceptable to AEP as well as major financial institutions. It should be noted that this investigation was limited to an assessment of soil quality and was not intended to meet all of the requirements of a Phase II ESA.

The field portion of the investigation was completed on March 22, 2021. The information contained in this report, including all conclusions and recommendations, is subject to the limitations presented in Section 9.

2.0 SITE DESCRIPTION

The subject site (also referred to as the subject properties) includes two vacant parcels of land situated at 11049 - 83 Avenue NW and 11053 – 83 Avenue NW, Edmonton, Alberta (Figures 1 and 2). The legal description for the subject properties is Lots 17 and 18, Block 157, Plan I19 and the properties are situated within the city's Garneau Neighbourhood. Based on historical data, the subject properties have recently been utilized for agricultural purposes. However, private residences are reported to have been present on-site from at least the mid-1920s to approximately 2004.

With respect to adjacent properties, the site is surrounded by a mix of residential and/or commercial structures. A private residence is situated immediately east of the subject site followed by the Garneau Gates apartment building. 83 Avenue NW is located immediately north of the subject site followed by several private residences. 111 Street NW is situated immediately west of the subject site followed by the Windsor Park Plaza apartment building. Residential properties are also located northwest and northeast of the subject properties. An alley way is located immediately south of the subject site followed by the Garneau Professional Centre office building. Several commercial properties are located on the ground floor of the complex including a restaurant, health care facilities and a pharmacy. A commercial property is also situated southwest of the subject properties and immediately south of the Windsor Park Plaza apartment building. This facility includes hair and beauty salons and several restaurants. A site plan including adjacent land uses is provided on Figure 4 (Appendix A).

The topography of the subject properties was generally flat with surface water runoff controlled by the site grading and the City of Edmonton's municipal storm sewer system.

The closest water body to the site is the North Saskatchewan River which is located approximately 1 kilometre north and west of the subject properties.

The subject properties and the residential properties to the east and northwest of the subject site are currently zoned RA9 (High Rise Apartment Zone). The private residences to the north and northeast of the site are currently zoned DC1 (Direct Development Control Provision). The Windsor Park Plaza building situated to the west of the subject properties across 111 Street NW is currently zoned DC2 (Site Specific Development Control Provision) and the Garneau Professional Centre office building is currently zoned CO (Commercial Office Zone). The on-site and surrounding land-use zonings are provided in Figure 3 (Appendix A).

2.1 Geology

As indicated by Kathol and McPherson (1975), the surficial geology in the general area of the subject properties is reported to be comprised of glacio-lacustrine deposits. These deposits are reported to consist of clay, silt and sand with minor gravel. River Terrace deposits and erosional features are also reported to be present in the area west and northwest of the subject site near the North Saskatchewan River.

The upper bedrock underlying the subject properties is reported to be the Cretaceous aged Horseshoe Canyon Formation (also known as the Edmonton Formation). The bedrock is reported to be comprised of highly variable layers of sandstone, siltstone and mudstone as well as laterally continuous coal deposited in a non-marine to marginal marine environment (AGS, 2013).

2.2 Hydrogeology

The local hydrogeology of the Edmonton Area is generally dominated by the presence of the North Saskatchewan River and/or the presence of fluvial sands and gravels of the subsurface Empress Formation.

The AEP Groundwater Information System was consulted for information that may be available regarding water wells present on-site or near the subject properties. No water wells are reported to be present on-site or within 500 metres of the subject properties.

3.0 REGULATORY GUIDELINES

The Alberta Tier 1 Soil and Groundwater Remediation Guidelines, (2019) provided by AEP are considered to be the applicable regulatory guidelines to determine impacts from refined petroleum hydrocarbons and/or trace metals in soil. This document summarizes the regulatory requirements in Alberta and provides a site management process for soil and groundwater contamination. Based on the current, on-site land use, the Tier 1 Guidelines for residential, parkland and/or commercial land uses have been applied to the entire site. Based on the results of this assessment, the lowest guideline for either coarse grained or fine-grained sediments has been provided for assessment purposes. This is considered to be a conservative measure and is based on the limited amount of site specific geological data that is available at the time of publication. It should, however, be noted that the underlying, native clay observed during the assessment was found to be fine-grained in nature.

With regards to salinity related parameters, the Alberta Tier 1 Salt Remediation Guidelines provided in the Alberta Tier 1 Soil and Groundwater Remediation Guidelines, (2019) are considered to be the applicable regulatory guidelines. Based on the location of the analysed soil samples, the guidelines for subsoil have been used for assessment purposes.

4.0 METHODOLOGY

4.1 Intrusive Investigation

The intrusive portion of this investigation was completed on March 22, 2021. A total of three boreholes were drilled using a track mounted drill rig operated by Landmark Drilling Services Ltd. The rig was equipped with solid stem augers. All of the boreholes were drilled to approximate depths ranging between 3.0 and 3.8 mbgl and were backfilled with bentonite and drill cuttings upon completion. The completion locations of all boreholes are provided on Figure 4 in Appendix A and borehole logs are provided in Appendix C.

4.2 Soil Sampling

A total of ten soil samples were collected during this assessment. Duplicate samples were collected at all borehole locations at the depth intervals indicated on the borehole logs (Appendix C). At each sampling point, one portion of the soil sample for each depth interval was placed directly into a clearly labeled polyethylene bag for combustible vapour screening and/or analytical purposes (inorganic parameters only). The second portion of the soil sample at each depth interval was placed into clearly labeled, laboratory prepared, 125 millilitre glass jars complete with Teflon-lined plastic lids. In addition, approximately 5 milligrams of soil was inserted directly into each of two laboratory prepared vials filled with approximately 5 millilitres of methanol. Sampling gloves were changed prior to the collection of every soil sample. Soil samples were transported to the Element Materials Technology Canada Inc.

Laboratory in Edmonton with the appropriate chain-of-custody information. All soil samples were transported in chilled coolers.

5.0 RESULTS OF THE INVESTIGATION

5.1 Stratigraphy

The soil profile observed during this investigation included varying thicknesses of fill materials including silt, sand, organics, gravel and clay with trace amounts of debris including styrofoam, wood, metal and brick. The fill materials were underlain by clay. Detailed descriptions are provided on the borehole logs in Appendix C.

5.2 Grain-size Analyses

Two soil samples were submitted for grain size analyses during this assessment. The samples were collected at an approximate depth of 3.8 mbgl and are interpreted to be undisturbed native soil. The results indicate that the underlying surficial clay is predominantly classified as fine-grained under the Alberta Tier 1 Guidelines. The results are provided on Table 1 in Appendix A and copy of the laboratory report is provided in Appendix D.

5.3 Chemical Analyses

The results of chemical analyses completed on the soil samples collected during this investigation are provided on Tables 2 - 4 in Appendix B. A copy of the laboratory report is provided in Appendix D. The results are summarized in the following subsections. With respect to analytical samples, selection was based upon the location of the borehole, geology, on-site observations, field screening results and professional judgment.

5.3.1 Refined Petroleum Hydrocarbons – Surface Soil

Four surface soil samples (collection depth \leq 3.0 mbgl) were submitted for chemical analyses of a select list of refined petroleum hydrocarbon constituents. This includes analyses for benzene, toluene, ethylbenzene, total xylenes (BTEX) and petroleum hydrocarbon (PHC) fractions one through four (F1-F4). The results of the analyses are provided on Table 2 (Appendix B) and indicated that the concentrations of all analysed parameters were below their respective, applicable Alberta Tier 1 Guidelines.

5.3.2 Alberta Tier 1 Trace Metals

Four soil samples were submitted for chemical analyses of a select list of Alberta Tier 1 trace metals. The results of the analyses are provided on Table 3 (Appendix B) and indicate that the concentrations of the analysed parameters were below their respective, applicable Alberta Tier 1 Guidelines.

5.3.3 Salinity Related Parameters

Four soil samples were submitted for chemical analyses of a select list of salinity related during this investigation. The results of the analyses are provided on Table 4 in Appendix B and are summarized as follows:

- The soluble conductivity values of the submitted samples ranged from 0.37 to 0.83 dS/m. All of the samples are classified as “Good” under the Alberta Tier 1 Salt Remediation Guidelines;
- The sodium adsorption ratios (SAR) values of the submitted samples ranged from 0.6 to 1.2. All of the samples are classified as “Good” under the Alberta Tier 1 Salt Remediation Guidelines;
- The pH values reported for all of the samples were within the range specified in the Alberta Tier 1 Guidelines for residential and/or commercial land uses.

6.0 CONCLUSIONS & RECOMMENDATIONS

The results of the analytical testing obtained for all of the samples submitted to the laboratory during this assessment are not indicative of any impact from refined petroleum hydrocarbons, Alberta Tier 1 trace metals or salinity related parameters. Based on the results of the assessment, no further assessment or remediation of the on-site fill materials is recommended at this time.

7.0 QUALIFICATIONS OF THE ASSESSOR

This report was completed by Mr. Douglas Pankewich of CRIMSON Environmental Limited. Mr. Pankewich has over twenty five years of professional and project management experience as an environmental geologist in both the private and public sectors. He has worked on over 500 projects including Phase I, II, and III ESAs, contaminant delineation investigations, hydrogeological investigations and remediation projects for both soil and groundwater. Mr. Pankewich is a graduate of Laval University and the University of Québec at the National Institute for Scientific Research. He holds undergraduate degrees in Geology and Geological Engineering as well as a Master of Sciences degree in Earth Sciences.

8.0 REFERENCES

1. Alberta Environment and Parks. *Alberta Environmental Site Assessment Standard*, 2016;
2. Alberta Geological Survey. Map 600. *Bedrock Geology Map of Alberta*. Edmonton, Alberta. March, 2013;
3. City of Edmonton. *Environmental Site Assessment Guidebook*. Edmonton, Alberta. March, 2016;
4. CRIMSON Environmental Limited. *Phase I Environmental Site Assessment 11049 – 83 Avenue NW & 11053 – 83 Avenue NW, Edmonton, Alberta*. Project Number: CEL-37544B. February 26, 2021;
5. CSA International Standard Z768-01. *Phase I Environmental Site Assessment*. Toronto, Ontario. 2016; and
6. Kathol and McPherson. *Urban Geology of Edmonton*. Alberta Research Council. Bulletin 32. Edmonton, Alberta. 1975.

9.0 STATEMENT OF LIMITATIONS

Subject to the following conditions and limitations, the investigation described in this report has been conducted in a manner consistent with a reasonable level of care and skill normally exercised by members of the health, safety and environmental consulting profession currently practicing under similar conditions in the area:

1. This report has been prepared for the exclusive use of the City of Edmonton. The report is intended to provide an assessment of known or potential environmental concerns and liabilities associated with past and current practices of the subject properties;
2. The report is based on data and information collected from available records, personal interviews and a site investigation conducted by CRIMSON personnel. CRIMSON has relied in good faith on information provided by individuals and sources noted in this report. We accept no responsibility for any deficiency, misstatements, or inaccuracy contained in this report as a result of omissions, misstatements, or fraudulent acts of persons interviewed;
3. The site investigation is based solely on the site conditions at the site at the time of the field investigation as described in this report;
4. The service provided by CRIMSON in completing the investigation is intended to assist the Client with a business decision. The liability of this site is not transferred to CRIMSON as a result of such services, and CRIMSON does not make recommendations regarding the purchase, sale or investment of the property;
5. The scope of the investigation described in this report has been limited by the budget set for the investigation in our contract. The scope of the investigation has been reasonable having regard to that budget constraint;
6. The investigation described in this report has relied upon information provided by third parties concerning the history of the site. Except as stated in this report, we have not made an independent verification of such historical information;
7. The investigation described in this report has been made in the context of existing government regulations generally promulgated at the date of this report. The investigation did not take account of any government regulations not in effect or not generally promulgated at the date of this report;
8. Where indicated or implied in this report, or where mandated by the condition of the site and its attendant structures, the conclusions of this report are based on visual observation of the site and a limited amount of sampling. The conclusions of this report do not apply to any areas of the site not available for inspection or areas not sampled;
9. The investigation was limited in scope. As such, the potential remains for the presence of unknown, unidentified, or unforeseen surface or subsurface contamination. If further evidence suggests potential contamination, a follow-up investigation including sampling and analysis would be recommended; and
10. This report is intended for the exclusive use of the company, organization or individual to whom it is addressed. It may not be used or relied upon in any manner whatsoever, or for any purpose whatsoever, by any other party. The Consultant makes no representation of fact or opinion of any nature whatsoever to any person or entity other than the company, organization or individual to whom this report is addressed.

10.0 CLOSURE

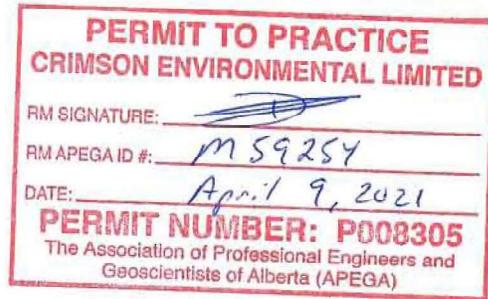
We trust that this report meets with your current requirements. Should you have any questions or concerns please do not hesitate to contact the undersigned.

Respectfully Submitted,

CRIMSON Environmental Limited



Douglas Pankewich, M.Sc., P.Geol., P.Eng.
Geological Engineer



Appendix A

Figures



Approximate
Site Location



Scale
30 metres

Reference: The City of Edmonton, 2021 & Goggle, 2021.

*Scale provided is approximate.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
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Site Location Plan

Figure 1

Scale: As Shown

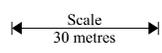
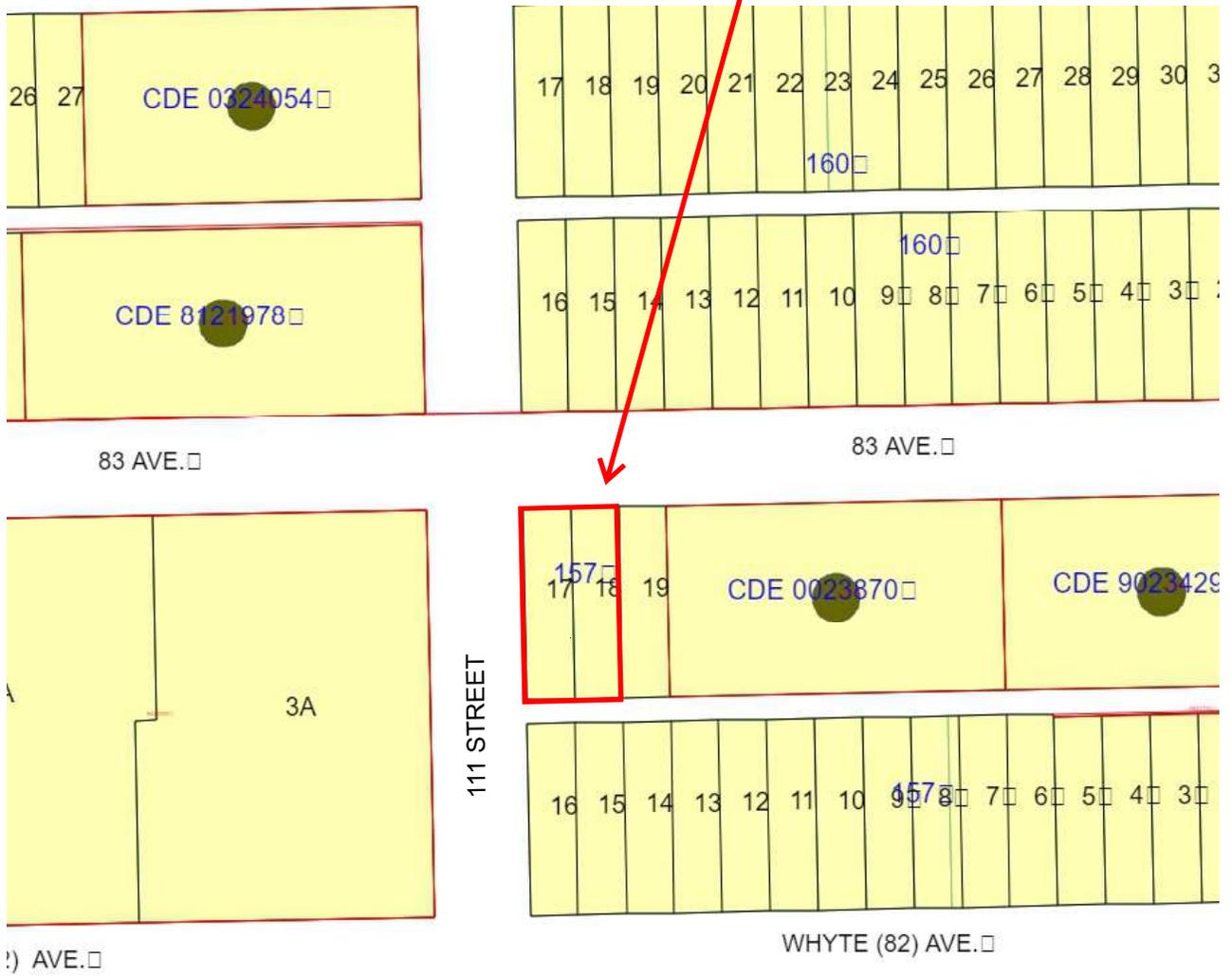
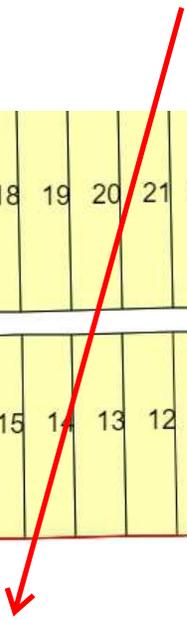
11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan 119
Edmonton, Alberta

February, 2021

CEL-37544B



Approximate Site Location



Reference: Government of Alberta, 2021.

*Scale provided is nominal. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



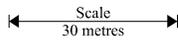
CRIMSON
ENVIRONMENTAL
LIMITED

Site Survey Plan	Figure 2
	Scale: As Shown
11049 & 11053 - 83 Avenue NW Lots 17 & 18, Block 157, Plan I19 Edmonton, Alberta	February, 2021
	CEL-37544B



Legend

- CO = Commercial Office Zone
- DC1 = Direct Control Development Provision
- DC2 (732) = Site Specific Development Control Provision
- RA8 = Medium Rise Apartment Zone
- RA9 = High Rise Apartment Zone
- US = Urban Services Zone



Reference: The City of Edmonton, 2021.

*Scale provided is nominal. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
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LIMITED

Site Zoning Plan	Figure 3
	Scale: As Shown
11049 & 11053 - 83 Avenue NW Lots 17 & 18, Block 157, Plan I19 Edmonton, Alberta	February, 2021
	CEL-37544B



Scale
10 metres

Legend

● Borehole Location

Reference: The City of Edmonton, 2021.

*All details including the scale are approximate. Scale provided is that of the figure.

**This figure is not intended for design or construction purposes. Property lines are approximate.



CRIMSON
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LIMITED

Borehole Location Plan

Figure 4

Scale: As Shown

11049 & 11053 - 83 Avenue NW
Lots 17 & 18, Block 157, Plan I19
Edmonton, Alberta

February, 2021

CEL-37544B

Appendix B

Tables

Table 1. Grain Size Data

Particle Size	Detection Limit	Units	Analytical Results	
			21-01 @ 3.8 m	21-02 @ 3.8 m
% Sand	1.0	%	13.0	14.0
% Silt	1.0	%	43.0	42.0
% Clay	1.0	%	44.0	44.0
Texture	-	-	Silty Clay	Silty Clay
AB, Tier 1 Classification	-	-	Fine	Fine

Table 2. Surface Soil Analytical Chemistry - Refined Petroleum Hydrocarbon Constituents

Parameter	Sample - Analytical Results				Regulatory Guideline ²	
	21-01		21-02	21-03	Residential / Parkland Land Uses	Commercial Land Uses
	@ 0.8 m	@ 2.3 m	@ 1.5 m	@ 0.8 m		
Benzene	<0.005	<0.005	<0.005	<0.005	0.046	0.046
Toluene	<0.02	<0.02	<0.02	<0.02	0.12	0.12
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	0.073	0.073
Total Xylenes	<0.03	<0.03	<0.03	<0.03	0.99	0.99
CWS Fraction 1 - BTEX	<10	<10	<10	<10	24	270
CWS Fraction 2 (C10-16)	<25	<25	<25	<25	130	260
CWS Fraction 3 (C16-34)	<50	<50	59	<50	300	1,700
CW S Fraction 4 (C34-50)	<100	<100	<100	<100	2,800	3,300
CW S Fraction 4G (C34-50)	<100	<100	<100	<100	2,800	3,300

Notes:

1. All values expressed as parts-per-million (ppm);
2. *Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019*. Lowest guidelines for coarse and/or fine grained soil provided; and
3. Values (if any) which exceed the applicable Alberta Tier 1 Guideline are highlighted.

Table 3. Soil Analytical Chemistry - Alberta Tier I Trace Metals

Parameter	Sample - Analytical Results				Regulatory Guideline ²	
	21-01		21-02	21-03	Residential / Parkland Land Uses	Commercial Land Uses
	@ 0.8 m	@ 2.3 m	@ 1.5 m	@ 0.8 m		
Total Antimony (Sb)	0.3	0.4	0.7	0.6	20	40
Total Arsenic (As)	4.8	8.1	9.2	6.1	17	26
Total Barium (Ba)	96	203	427	140	500	2,000
Total Beryllium (Be)	0.2	0.7	0.7	0.2	5	8
Boron (B), Sat. Paste Ext.	0.1	0.12	0.17	0.2	3.3	5.0
Total Cadmium (Cd)	0.16	0.22	0.3	0.21	10	22
Total Chromium (Cr)	8.6	25	29	11.1	64	87
Hex. Chromium (Cr 6+)	<0.05	<0.05	<0.05	<0.05	0.4	1.4
Total Cobalt (Co)	5.5	10.1	9.9	6.6	20	300
Total Copper (Cu)	7.5	23.7	24.5	12.4	63	91
Total Lead (Pb)	6.0	12.4	11.3	9.2	140	260
Total Mercury (Hg)	<0.05	<0.05	0.06	<0.05	6.6	24
Total Molybdenum (Mo)	<1.0	1.0	1.2	<1.0	4	40
Total Nickel (Ni)	13.3	27.8	32.8	16.6	45	89
Total Selenium (Se)	<0.3	0.6	0.4	<0.3	1	2.9
Total Silver (Ag)	<0.10	0.2	0.1	<0.10	20	40
Total Thallium (Tl)	0.1	0.17	0.19	0.14	1	1
Total Tin (Sn)	<1.0	<1.0	<1.0	<1.0	5	300
Total Uranium (U)	0.6	1.0	1.1	0.8	23	33
Total Vanadium (V)	12	33.3	34.2	16.4	130	130
Total Zinc (Zn)	39	77	100	54	250	410

Notes:

1. All values expressed as parts-per-million (ppm). Mg/kg for all analyses except boron by sat. paste which is expressed as mg/L;
2. Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019;
3. -- = Sample not analysed for this parameter;
4. NG = No guideline provided by AEP; and
5. Values (if any) which exceed the applicable Alberta Tier 1 Guideline are highlighted. Orange Highlight is solely due to detection limit.

Table 4. Subsoil Analytical Chemistry - Salinity Related Parameters

Analytical Parameter	Units	Samples - Analytical Results				Regulatory Guidelines				
		21-01		21-02	21-03	Alberta Tier 1 Salt Remediation Guidelines for Subsoil				Alberta Tier 1 Guidelines for Commercial Land Uses ²
		@ 0.8 m	@ 2.3 m	@ 1.5 m	@ 0.8 m	Good	Fair	Poor	Unsuitable	
Soluble Conductivity (Sat. Paste)	dS/m	0.37	0.58	0.83	0.47	<3	3 - 5	5 - 10	>10	4
Sodium Adsorption Ratio	N/A	0.7	0.6	1.2	1.0	<4	4 - 8	8 - 12	>12	12
% Saturation	%	39	113	87	48	--	--	--	--	--
Calcium	mg/kg	16.5	72.6	74	23.3	--	--	--	--	--
Magnesium	mg/kg	3.8	19	20.2	5.2	--	--	--	--	--
Sodium	mg/kg	7	25	43	14	--	--	--	--	--
Potassium	mg/kg	2	9	7	3	--	--	--	--	--
Chloride	mg/L	7	9	11	7	--	--	--	--	--
Chloride	mg/kg	3	11	9	3	--	--	--	--	--
Sulfate (SO ₄)	mg/kg	27.8	155	182	49.1	--	--	--	--	--
TGR	T/ac	<0.1	<0.1	<0.1	<0.1	--	--	--	--	--
Soluble (CaCl ₂) pH	pH	7.7	7.7	7.6	7.8	--	--	--	--	6.0 to 8.5

Notes:

1. AEP. *Alberta Tier 1 Salt Remediation Guidelines, 2019*. Guideline for topsoil or subsoil provided as indicated;
2. Alberta Tier 1 Soil and Groundwater Remediation Guidelines, 2019. Commercial and/or industrial land uses; and
2. -- = No Standard Provided by AEP.

Appendix C

Borehole Logs

PROJECT: Limited Phase II ESA	CLIENT: City of Edmonton	TESTHOLE NO: 21-01
LOCATION: 11053 - 83 Avenue NW, Edmonton, AB		PROJECT NO.: CEL-37544B
CONTRACTOR: Landmark Drilling Ltd.	METHOD: Solid Stem	ELEVATION (m):
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND		

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Vapour Concentration (ppm)			COMMENTS	DEPTH (m)
						100	1000	10000		
0		XXXX	TOPSOIL with vegetation at surface.							
		XXXX	CLAY, very silty, fine sand, trace fine-coarse gravel, crumbled, stiff, low plastic, brown, dry, trace debris (styrofoam, metal, brick) and organics.		1					
		XXXX			2					
		XXXX			3					
		XXXX	CLAY, very silty, fine sand, firm to soft, high plastic, brown, moist, trace iron stains.		4					
		XXXX			5					
4		XXXX	End of borehole at 3.8 metres below ground level. Borehole backfilled with bentonite with drill cuttings at surface. All details provided on this borehole log are approximate.							
5										
6										
7										
8										

LOGGED BY: DP	COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP	COMPLETION DATE: 3/22/21
PROJECT MANAGER: Pankewich	Page 1 of 1

ENVIRONMENTAL BOREHOLE LOGS CEL-37544B 2021.GPJ UJMA.GDT PRINT: 3/31/21 By:pankewich@shaw.ca

PROJECT: Limited Phase II ESA	CLIENT: City of Edmonton	TESTHOLE NO: 21-02
LOCATION: 11049 - 83 Avenue NW, Edmonton, AB		PROJECT NO.: CEL-37544B
CONTRACTOR: Landmark Drilling Ltd.	METHOD: Solid Stem	ELEVATION (m):
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND		

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0			TOPSOIL with vegetation at surface.					
			CLAY, very silty, fine sand, trace fine-coarse gravel, stiff, low plastic, brown and grey, dry, trace debris (styrofoam, metal, brick) and organics.		1			
					2			
					3			
			CLAY, very silty, fine sand, firm to soft, high plastic, brown, moist, trace iron stains.		4			
					5			
4			End of borehole at 3.8 metres below ground level. Borehole backfilled with bentonite with drill cuttings at surface. All details provided on this borehole log are approximate.					
5								
6								
7								
8								

LOGGED BY: DP	COMPLETION DEPTH: 3.80 m
REVIEWED BY: DP	COMPLETION DATE: 3/22/21
PROJECT MANAGER: Pankewich	Page 1 of 1

ENVIRONMENTAL BOREHOLE LOGS CEL-37544B 2021.GPJ UJMA.GDT PRINT: 3/31/21 By:pankewich@shaw.ca

PROJECT: Limited Phase II ESA	CLIENT: City of Edmonton	TESTHOLE NO: 21-03
LOCATION: 11049 - 83 Avenue NW, Edmonton, AB		PROJECT NO.: CEL-37544B
CONTRACTOR: Landmark Drilling Ltd.	METHOD: Solid Stem	ELEVATION (m):
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE		
BACKFILL TYPE <input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND		

DEPTH (m)	BACKFILL DETAILS	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Vapour Concentration (ppm)			COMMENTS	DEPTH (m)
						100	1000	10000		
0		XXXX	TOPSOIL with vegetation at surface.							
		XXXX	CLAY, very silty, fine sand, trace fine-coarse gravel, crumbled, stiff, low plastic, brown, dry, trace debris (styrofoam, metal, brick) and organics.		1					
		XXXX			2					
		XXXX			3					
		XXXX	CLAY, very silty, fine sand, firm to soft, high plastic, brown, moist, trace iron stains.		4					
3		XXXX	End of borehole at 3.0 metres below ground level. Borehole backfilled with bentonite with drill cuttings at surface. All details provided on this borehole log are approximate.							
4										
5										
6										
7										
8										

LOGGED BY: DP	COMPLETION DEPTH: 3.00 m
REVIEWED BY: DP	COMPLETION DATE: 3/22/21
PROJECT MANAGER: Pankewich	Page 1 of 1

ENVIRONMENTAL BOREHOLE LOGS CEL-37544B 2021.GPJ UJMA.GDT PRINT: 3/31/21 By:pankewich@shaw.ca

Appendix D

Laboratory Reports

Report Transmission Cover Page

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Contact	Company	Address
Doug Pankewich	Crimson Environmental Ltd.	#24 -314 - 222 Baseline Road Sherwood Park, AB T8H 1S8 Phone: (780) 719-4959 Fax: Email: pankewich@shaw.ca

Delivery	Format	Deliverables
Email - Merge Reports	PDF	COA
Email - Merge Reports	PDF	Invoice
Email - Multiple Reports By Agreement	PDF	COC / Test Report
Email - Single Report	Legacy Crosstab in CSV	Test Report

Notes To Clients:

- Mar 26, 2021 - Report was issued to include changes to the Project ID from CEL-375448 to CEL-37544B as requested by Doug Pankewich of Crimson Environmental on Mar.26,2021.
Previous report 2605938.
- Mar 29, 2021 - Report was issued to include retest result for Cr, and Ni analysis on sample 1481514-3 as requested by Doug Pankewich on March 26, 2021.
- Mar 30, 2021 - Sample 1481514-3; 7438932: Sample 1481514-3: the repeated result for strong acid extractable metals analysis differs significantly from the original. The cause of the difference is sample inhomogeneity.

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Analytical Report

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

		Reference Number	1481514-1	1481514-2	1481514-3	
		Sample Date	Mar 22, 2021	Mar 22, 2021	Mar 22, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	21-01 / 0.8 / m	21-01 / 2.3 / m	21-02 / 1.5 / m	
		Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
Metals Strong Acid Digestion						
Boron	Saturated Paste	mg/L	0.10	0.12	0.17	0.05
Antimony	Strong Acid Extractable	mg/kg	0.3	0.4	0.7	0.2
Arsenic	Strong Acid Extractable	mg/kg	4.8	8.1	9.2	0.2
Barium	Strong Acid Extractable	mg/kg	96	203	427	1
Beryllium	Strong Acid Extractable	mg/kg	0.2	0.7	0.7	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.16	0.22	0.30	0.01
Chromium	Strong Acid Extractable	mg/kg	8.6	25.0	29.0	0.5
Cobalt	Strong Acid Extractable	mg/kg	5.5	10.1	9.9	0.1
Copper	Strong Acid Extractable	mg/kg	7.5	23.7	24.5	1
Lead	Strong Acid Extractable	mg/kg	6.0	12.4	11.3	0.1
Mercury	Strong Acid Extractable	mg/kg	<0.05	<0.05	0.06	0.05
Molybdenum	Strong Acid Extractable	mg/kg	<1.0	1.0	1.2	1
Nickel	Strong Acid Extractable	mg/kg	13.3	27.8	32.8	0.5
Selenium	Strong Acid Extractable	mg/kg	<0.3	0.6	0.4	0.3
Silver	Strong Acid Extractable	mg/kg	<0.10	0.2	0.1	0.1
Thallium	Strong Acid Extractable	mg/kg	0.10	0.17	0.19	0.05
Tin	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Uranium	Strong Acid Extractable	mg/kg	0.6	1.0	1.1	0.5
Vanadium	Strong Acid Extractable	mg/kg	12.0	33.3	34.2	0.1
Zinc	Strong Acid Extractable	mg/kg	39	77	100	1
Salinity						
Electrical Conductivity	Saturated Paste	dS/m	0.37	0.58	0.83	0.01
SAR	Saturated Paste		0.7	0.6	1.2	
% Saturation		%	39	113	87	
Calcium	Saturated Paste	mg/kg	16.5	72.6	74.0	
Magnesium	Saturated Paste	mg/kg	3.8	19.0	20.2	
Sodium	Saturated Paste	mg/kg	7	25	43	
Potassium	Saturated Paste	mg/kg	2	9	7	
Chloride	Saturated Paste	mg/L	7	9	11	2
Chloride	Saturated Paste	mg/kg	3	11	9	
Sulfate (SO4)	Saturated Paste	mg/kg	27.8	155	182	
TGR	Saturated Paste	T/ac	<0.1	<0.1	<0.1	
Soil Acidity						
pH	1:2 Soil:CaCl2 sol.	pH	7.7	7.7	7.6	
Water Soluble Parameters						
Chromium (VI)	Dry Weight	mg/kg	<0.05	<0.05	<0.05	0.05
Mono-Aromatic Hydrocarbons - Soil						
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Toluene	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02

Analytical Report

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

	Reference Number	1481514-1	1481514-2	1481514-3	
	Sample Date	Mar 22, 2021	Mar 22, 2021	Mar 22, 2021	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	21-01 / 0.8 / m	21-01 / 2.3 / m	21-02 / 1.5 / m	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Soil - Continued					
Ethylbenzene	Dry Weight	mg/kg	<0.005	<0.005	0.005
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	0.03
Methanol Field Preservation			Yes	Yes	Yes
Volatile Petroleum Hydrocarbons - Soil					
F1 C6-C10	Dry Weight	mg/kg	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil					
Extraction Date	Total Extractables		23-Mar-21	23-Mar-21	23-Mar-21
F2c C10-C16	Dry Weight	mg/kg	<25	<25	25
F3c C16-C34	Dry Weight	mg/kg	<50	<50	59
F4c C34-C50	Dry Weight	mg/kg	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	100
% C50+	%		<5	<5	<5
Silica Gel Cleanup					
Silica Gel Cleanup			Done	Done	Done
Soil % Moisture					
Moisture	Soil % Moisture	% by weight	10.40	22.50	21.90

Analytical Report

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Reference Number	1481514-4
Sample Date	Mar 22, 2021
Sample Time	NA
Sample Location	
Sample Description	21-03 / 0.8 / m

Matrix Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion					
Boron	Saturated Paste	mg/L	0.20		0.05
Antimony	Strong Acid Extractable	mg/kg	0.6		0.2
Arsenic	Strong Acid Extractable	mg/kg	6.1		0.2
Barium	Strong Acid Extractable	mg/kg	140		1
Beryllium	Strong Acid Extractable	mg/kg	0.2		0.1
Cadmium	Strong Acid Extractable	mg/kg	0.21		0.01
Chromium	Strong Acid Extractable	mg/kg	11.1		0.5
Cobalt	Strong Acid Extractable	mg/kg	6.6		0.1
Copper	Strong Acid Extractable	mg/kg	12.4		1
Lead	Strong Acid Extractable	mg/kg	9.2		0.1
Mercury	Strong Acid Extractable	mg/kg	<0.05		0.05
Molybdenum	Strong Acid Extractable	mg/kg	<1.0		1
Nickel	Strong Acid Extractable	mg/kg	16.6		0.5
Selenium	Strong Acid Extractable	mg/kg	<0.3		0.3
Silver	Strong Acid Extractable	mg/kg	<0.10		0.1
Thallium	Strong Acid Extractable	mg/kg	0.14		0.05
Tin	Strong Acid Extractable	mg/kg	<1.0		1
Uranium	Strong Acid Extractable	mg/kg	0.8		0.5
Vanadium	Strong Acid Extractable	mg/kg	16.4		0.1
Zinc	Strong Acid Extractable	mg/kg	54		1
Salinity					
Electrical Conductivity	Saturated Paste	dS/m	0.47		0.01
SAR	Saturated Paste		1.0		
% Saturation		%	48		
Calcium	Saturated Paste	mg/kg	23.3		
Magnesium	Saturated Paste	mg/kg	5.2		
Sodium	Saturated Paste	mg/kg	14		
Potassium	Saturated Paste	mg/kg	3		
Chloride	Saturated Paste	mg/L	7		2
Chloride	Saturated Paste	mg/kg	3		
Sulfate (SO4)	Saturated Paste	mg/kg	49.1		
TGR	Saturated Paste	T/ac	<0.1		
Soil Acidity					
pH	1:2 Soil:CaCl2 sol.	pH	7.8		
Water Soluble Parameters					
Chromium (VI)	Dry Weight	mg/kg	<0.05		0.05
Mono-Aromatic Hydrocarbons - Soil					
Benzene	Dry Weight	mg/kg	<0.005		0.005
Toluene	Dry Weight	mg/kg	<0.02		0.02

Analytical Report

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Reference Number	1481514-4
Sample Date	Mar 22, 2021
Sample Time	NA
Sample Location	
Sample Description	21-03 / 0.8 / m

Matrix Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Soil - Continued					
Ethylbenzene	Dry Weight	mg/kg	<0.005		0.005
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03		0.03
Methanol Field Preservation			Yes		
Volatile Petroleum Hydrocarbons - Soil					
F1 C6-C10	Dry Weight	mg/kg	<10		10
F1 -BTEX	Dry Weight	mg/kg	<10		10
Extractable Petroleum Hydrocarbons - Soil					
Extraction Date	Total Extractables		23-Mar-21		
F2c C10-C16	Dry Weight	mg/kg	<25		25
F3c C16-C34	Dry Weight	mg/kg	<50		50
F4c C34-C50	Dry Weight	mg/kg	<100		100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100		100
% C50+		%	<5		
Silica Gel Cleanup					
Silica Gel Cleanup			Done		
Soil % Moisture					
Moisture	Soil % Moisture	% by weight	12.80		

Analytical Report

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Reference Number	1481514-5	1481514-6
Sample Date	Mar 22, 2021	Mar 22, 2021
Sample Time	NA	NA
Sample Location		
Sample Description	21-01 / 3.8 / m	21-02 / 3.8 / m
Matrix	Soil	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Physical and Aggregate Properties					
Texture		Silty Clay	Silty Clay		
Sand	50 µm - 2 mm	% by weight	13	14	0.1
Silt	2 µm - 50 µm	% by weight	43	42	0.1
Clay	<2 µm	% by weight	44	44	0.1

Approved by: 
Benjamin Morris, B.Sc
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Quality Control

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Extractable Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	µg/mL	0	-10	10	yes
F3c C16-C34	µg/mL	0	-30	30	yes
F4c C34-C50	µg/mL	0	-20	20	yes
F4HTGCc C34-C50+	µg/mL	0	-20	20	yes

Date Acquired: March 23, 2021

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	µg/mL	103.94	80	120	yes
F3c C16-C34	µg/mL	104.58	80	120	yes
F4c C34-C50	µg/mL	101.78	80	120	yes
F4HTGCc C34-C50+	µg/mL	97.20	80	120	yes

Date Acquired: March 23, 2021

Metals Strong Acid Digestion

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Boron	mg/L	0.00399657	-0.05	0.07	yes
Antimony	µg/L	0.00971927	-0.1	0.2	yes
Arsenic	µg/L	0.0110009	-0.2	0.2	yes
Barium	µg/L	0.2507	-1	1	yes
Beryllium	µg/L	0.000354551	-0.1	0.1	yes
Cadmium	µg/L	0.00335032	-0.01	0.01	yes
Chromium	µg/L	0.0286106	-0.5	0.5	yes
Cobalt	µg/L	0.00976233	-0.1	0.1	yes
Copper	µg/L	0.027756	-0.6	1.2	yes
Lead	µg/L	0.00900567	-5.0	5.0	yes
Mercury	µg/L	0.00334385	-0.04	0.04	yes
Molybdenum	µg/L	0.0461884	-1.0	1.0	yes
Nickel	µg/L	0.0167366	-0.4	0.7	yes
Selenium	µg/L	-0.0340915	-0.3	0.3	yes
Silver	µg/L	0.00522368	-0.09	0.14	yes
Thallium	µg/L	0.00862961	-0.04	0.04	yes
Tin	µg/L	0.0435741	-0.4	0.4	yes
Uranium	µg/L	0.0219923	-0.5	0.5	yes
Vanadium	µg/L	-0.0412416	-0.1	0.1	yes
Zinc	µg/L	0.110493	-1	1	yes

Date Acquired: March 23, 2021

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Antimony	mg/kg	0.4	0.4	20	0.4	yes
Arsenic	mg/kg	7.5	7.8	20	0.4	yes
Barium	mg/kg	126	128	20	2	yes
Beryllium	mg/kg	0.7	0.6	20	0.2	yes
Cadmium	mg/kg	0.09	0.08	20	0.02	yes
Chromium	mg/kg	29.7	33.2	20	1.1	yes
Cobalt	mg/kg	8.1	8.5	20	0.2	yes

Quality Control

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Metals Strong Acid Digestion - Continued

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Copper	mg/kg	17.7	18.7	20	2.2	yes
Lead	mg/kg	9.6	9.9	20	0.2	yes
Mercury	mg/kg	0.06	0.06	20	0.05	yes
Molybdenum	mg/kg	<1.0	1.1	20	2.2	yes
Nickel	mg/kg	26.8	28.7	20	1.1	yes
Selenium	mg/kg	1.1	0.9	20	0.7	yes
Silver	mg/kg	<0.10	<0.10	20	0.22	yes
Thallium	mg/kg	0.19	0.18	20	0.11	yes
Tin	mg/kg	<1.0	<1.0	20	2.2	yes
Uranium	mg/kg	0.9	0.9	20	1.1	yes
Vanadium	mg/kg	34.9	36.2	20	0.2	yes
Zinc	mg/kg	55	57	20	2	yes

Date Acquired: March 23, 2021

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Antimony	mg/kg	40.2	37.8	42.2	yes
Arsenic	mg/kg	40.0	36.3	43.9	yes
Barium	mg/kg	203	188	212	yes
Beryllium	mg/kg	19.6	17.4	22.2	yes
Cadmium	mg/kg	2.10	1.88	2.28	yes
Chromium	mg/kg	102	93.2	107.0	yes
Cobalt	mg/kg	20.1	18.2	21.2	yes
Copper	mg/kg	199	183.1	212.7	yes
Lead	mg/kg	19.4	18.3	21.3	yes
Mercury	mg/kg	2.99	2.64	3.36	yes
Molybdenum	mg/kg	200	185.1	222.3	yes
Nickel	mg/kg	99.5	92.4	106.2	yes
Selenium	mg/kg	40.4	35.2	44.2	yes
Silver	mg/kg	20.3	18.20	22.40	yes
Thallium	mg/kg	9.68	9.02	10.82	yes
Tin	mg/kg	206	191.2	215.2	yes
Uranium	mg/kg	101	86.0	116.0	yes
Vanadium	mg/kg	20.0	18.0	21.6	yes
Zinc	mg/kg	198	186	210	yes

Date Acquired: March 23, 2021

Antimony	mg/kg	3.7	3.2	4.7	yes
Arsenic	mg/kg	4.0	3.4	5.2	yes
Barium	mg/kg	106	82	124	yes
Beryllium	mg/kg	0.3	0.2	0.5	yes
Cadmium	mg/kg	0.98	0.78	1.20	yes
Chromium	mg/kg	87.1	70.9	98.5	yes
Cobalt	mg/kg	6.9	5.8	8.2	yes
Copper	mg/kg	126	108.4	148.0	yes
Lead	mg/kg	276	200.6	318.8	yes
Mercury	mg/kg	0.07	0.05	0.09	yes

Quality Control

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Metals Strong Acid Digestion - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Molybdenum	mg/kg	1.2	0.9	1.4	yes
Nickel	mg/kg	26.8	22.5	32.1	yes
Selenium	mg/kg	<0.3	0.3	0.3	yes
Silver	mg/kg	3.8	2.28	6.00	yes
Thallium	mg/kg	0.08	0.05	0.10	yes
Tin	mg/kg	11.1	8.4	12.6	yes
Uranium	mg/kg	<0.5	0.3	0.7	yes
Vanadium	mg/kg	31.2	17.8	46.9	yes
Zinc	mg/kg	346	283	390	yes

Date Acquired: March 23, 2021

Mono-Aromatic Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Benzene	ng	0	-0.005	0.005	yes
Toluene	ng	0	-0.06	0.06	yes
Ethylbenzene	ng	0	-0.030	0.030	yes
Total Xylenes (m,p,o)	ng	0	-0.09	0.09	yes
Styrene	ng	0	-0.030	0.030	yes

Date Acquired: March 23, 2021

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	ng	91.29	80	120	yes
Toluene	ng	87.69	80	120	yes
Ethylbenzene	ng	94.58	80	120	yes
m,p-Xylene	ng	96.16	80	120	yes
Total Xylenes (m,p,o)	ng	96.84	80	120	yes
Styrene	ng	94.72	80	120	yes

Date Acquired: March 23, 2021

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Benzene	mg/kg	<0.005	<0.005	50	0.010	yes
Toluene	mg/kg	<0.02	<0.02	50	0.04	yes
Ethylbenzene	mg/kg	<0.005	<0.005	50	0.020	yes
m,p-Xylene	mg/kg	<0.02	<0.02	50	0.04	yes
o-Xylene	mg/kg	<0.02	<0.02	50	0.04	yes
Total Xylenes (m,p,o)	mg/kg	<0.03	<0.03	50	0.06	yes
Styrene	mg/kg	<0.01	<0.01	50	0.020	yes

Date Acquired: March 23, 2021

Physical and Aggregate Properties

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Sand	% by weight	34	35	10	0	yes
Silt	% by weight	46	46	10	0	yes
Clay	% by weight	20	19	10	0	yes

Date Acquired: March 23, 2021

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
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Quality Control

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Physical and Aggregate Properties - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Sand	% by weight	29	20	32	yes
Clay	% by weight	32	27	36	yes
<50 um	% by weight	71.0	67.500	82.500	yes
Date Acquired: March 23, 2021					

Salinity

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	0.0414157	-0.4	0.5	yes
Magnesium	mg/L	0.00333044	-0.1	0.1	yes
Sodium	mg/L	0.0131344	-0	2	yes
Potassium	mg/L	0.0310204	-0.5	0.7	yes
Chloride	mg/L	1.7566	0	5	yes
Sulfate-S	mg/L	0.0331045	-0	1	yes

Date Acquired: March 23, 2021

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Electrical Conductivity	dS/m	1.63	1.31	1.79	yes
% Saturation	%	58	55	67	yes
Calcium	mg/L	308	231.4	347.2	yes
Magnesium	mg/L	54.0	40.3	60.7	yes
Sodium	mg/L	23	20	26	yes
Potassium	mg/L	11.4	9.6	13.2	yes
Chloride	mg/L	31	25	33	yes
Sulfate-S	mg/L	222	175	242	yes

Date Acquired: March 23, 2021

Electrical Conductivity	dS/m	32.3	26.80	35.20	yes
Calcium	mg/L	244	231.3	256.5	yes
Magnesium	mg/L	97.2	92.7	101.7	yes
Sodium	mg/L	244	225	264	yes
Potassium	mg/L	246	222.6	270.6	yes
Chloride	mg/L	2090	1852	2229	yes
Sulfate-S	mg/L	147	138	156	yes

Date Acquired: March 23, 2021

Soil Acidity

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
pH	pH	7.8	7.7	10	0.3	yes

Date Acquired: March 23, 2021

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
pH	pH	6.6	6.3	6.9	yes

Date Acquired: March 23, 2021

Volatile Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
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Quality Control

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Volatile Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F1 C6-C10	ng	0	-10	10	yes

Date Acquired: March 23, 2021

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
F1 C6-C10	mg/kg	<10	<10	50	0	yes
F1 -BTEX	mg/kg	<10	<10	50	0	yes

Date Acquired: March 23, 2021

Water Soluble Parameters

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Chromium (VI)	mg/L	-0.001	-0.10	0.10	yes

Date Acquired: March 23, 2021

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Chromium (VI)	mg/kg	<0.05	<0.05	10	0.01	yes

Date Acquired: March 23, 2021

Methodology and Notes

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
1:5 Water Soluble Extraction	APHA	* Colorimetric Method, 3500-Cr B	Mar 23, 2021	Element Edmonton - Roper Road
1:5 Water Soluble Extraction	McKeague	* Soluble Salts in Extracts of 1:5 Soil:Water Mixtures, 3.23	Mar 23, 2021	Element Edmonton - Roper Road
BTEX-CCME - Soil	CCME	* Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	Mar 23, 2021	Element Calgary
BTEX-CCME - Soil	US EPA	* Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260	Mar 23, 2021	Element Calgary
Metals ICP (Hot Block) in soil	EPA	* Sample Preparation Procedure for Spectrochemical Determination of Total Recoverable Elements, October 1999, 200.2	Mar 23, 2021	Element Edmonton - Roper Road
Metals ICP (Hot Block) in soil	EPA	* Sample Preparation Procedure for Spectrochemical Determination of Total Recoverable Elements, October 1999, 200.2	Mar 30, 2021	Element Edmonton - Roper Road
Metals ICP (Hot Block) in soil	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Mar 23, 2021	Element Edmonton - Roper Road
Metals ICP (Hot Block) in soil	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	Mar 30, 2021	Element Edmonton - Roper Road
Particle Size Analysis - GS	Carter	* Hydrometer Method, 55.3	Mar 23, 2021	Element Edmonton - Roper Road
pH by CaCl2 (1:2 ratio) in soil	McKeague	* pH in 0.01M Calcium Chloride, 3.11	Mar 23, 2021	Element Edmonton - Roper Road
Saturated Paste in General Soil	APHA	* Automated Ferricyanide Method, 4500-Cl-E	Mar 23, 2021	Element Edmonton - Roper Road
Saturated Paste in General Soil	Carter	* Electrical Conductivity and Soluble Ions, Chapter 15	Mar 23, 2021	Element Edmonton - Roper Road
TEH-CCME-Soil (Shake)	CCME	* Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	Mar 23, 2021	Element Calgary

* Reference Method Modified

References

APHA	Standard Methods for the Examination of Water and Wastewater
Carter	Soil Sampling and Methods of Analysis.
CCME	Canadian Council of Ministers of the Environment
EPA	Environmental Protection Agency Test Methods - US
McKeague	Manual on Soil Sampling and Methods of Analysis
US EPA	US Environmental Protection Agency Test Methods

Comments:

- Mar 26, 2021 - Report was issued to include changes to the Project ID from CEL-375448 to CEL-37544B as requested by Doug Pankewich of Crimson Environmental on Mar.26.2021.

Methodology and Notes

Bill To: City of Edmonton	Project ID: CEL-37544B	Lot ID: 1481514
#24 -314 - 222 Baseline Road	Project Name: 83rd Avenue	Control Number:
Sherwood Park, AB, Canada	Project Location:	Date Received: Mar 22, 2021
T8H 1S8	LSD:	Date Reported: Mar 30, 2021
Attn: Doug Pankewich	P.O.: 4000109110	Report Number: 2607851
Sampled By: DP	Proj. Acct. code:	
Company: Crimson Enviro		

Previous report 2605938.

- Mar 29, 2021 - Report was issued to include retest result for Cr, and Ni analysis on sample 1481514-3 as requested by Doug Pankewich on March 26, 2021.
- Mar 30, 2021 - Sample 1481514-3; 7438932: Sample 1481514-3: the repeated result for strong acid extractable metals analysis differs significantly from the original. The cause of the difference is sample inhomogeneity.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



Appendix D

Sanitary & Storm Design Calculations

STAGE 1

SANITARY SEWER DESIGN CALCULATION

PROJECT:	Supportive Housing Study - Garneau	Per Capita Flow =	220 L/c/d	Peaking Factor =	2.6[(P/1000)^(-0.1)] (minimum 3.0)		
JOB # :	204-33	RMD, RPL, RSL Population Density =	18.7 DU/ha	3.46 P/DU	65 P/ha	Inflow/Infiltration Allowance =	0.28 L/s/ha
DATE:	7-Jun-21	RF3 Population Density =	46 DU/ha	2.52 P/U	116 P/ha	Sag Manhole Allowance =	0.40 L/s/MH
DESIGN BY:	T.C.	RF6 Population Density =	80 DU/ha	3.17 P/U	133 P/ha	Manning's "n" =	0.013
CHECKED BY:	T.C.	RA7 Population Density =	125 DU/ha	2.04 P/U	255 P/ha	1 Bedroom units	1.09 P/U
REVISIED BY:		RA8 Population Density =	225 DU/ha	2.17 P/U	488 P/ha	Supportive Space	0.93 L/s/ha (8 L/day/m ²)
REVISIED DATE:		RA9 Population Density =	325 DU/ha	1.89 P/U	614 P/ha	Peaking Factor =	10*(Q)^(-0.45) (Min=2.5, Max=25)
						Combined use building assumed same peaking factor as the residential	

Location	From MH	To MH	Area #	Added Res. Area (ha)	Total Res. Area (ha)	Added Non-Res. Area (ha)	Total Non-Res. Area (ha)	Res. Units Added (if known)	Land Use	Population		Residential		Non-Residential		Total Peak Flow (L/s)	Inflow/Infiltr. (L/s)	Added Sag MH	Total Sag MH	Sag MH Inflow (L/s)	Design Flow (L/s)	Pipe			Req'd Cap. (L/s)	Pipe Cap. (L/s)	Partial Velocity (m/s)	Full Vel. (m/s)	U/S Inv Elev	D/S Inv Elev	U/S Road Elev (CL)	U/S Road Depth to Inv (m)	
										Added	Total	Average Flow (L/s)	Peaking Factor	Average Flow (L/s)	Peaking Factor							Length (m)	Size (mm)	Slope (%)									
Existing San			0.0809	0.000	0.000	0.000	0.000		RA9	0	0																						
*assumed slope and inverts				0.000	0.000	0.000	0.000		RA7	0	0																						
*condition and depth to be inspected				0.081	0.081	0.000	0.000		RA8	39	39																						
				0.000	0.000	0.000	0.000		RF3	0	39																						
				0.000	0.000	0.000	0.000		RF6	0	39	0.10	3.60	0.00	0.00	0.4	0.0		0	0.0	0.0	0.40	14.60	150	2.00	0.5	21.6	0.47	1.22	666.60	666.31	670.75	4.15

ON-SITE STORM SEWER DESIGN SHEET FOR 1:5 YEAR EVENT

PROJECT: **Supportive Housing Study - Garneau**
 JOB #: 204-33
 DATE: 19-May-20
 DESIGN BY: A.B.
 CHECKED BY:
 REVISED BY:
 REVISED DATE:

LAND USE	"C"
RSL	0.65
RA7	0.65
RA8	0.75
RF1 & RPL & RF4	0.5
Roof Area	0.95

Initial Time of Concentration = 8.0 min
 Mannings' 'n' = 0.013

Description	From MH	To MH	Incr. Area #	Added Area (ha)	Total Area Added (ha)	Runoff Factor "C"	Equiv. Area (ha)	Total Eq. Area (ha)	Conc. Time, Tc (min)	5 yr I (mm/h)	Calculated Flow, Q (L/s)	Trunk Safety Factor	Design Flow (L/s)	Slope (%)	Actual Dia. (mm)	Nominal Dia. (mm)	Vel. (m/s)	Length (m)	Flow Time (min)	Pipe Capacity (L/s)	U/S Inv Elev	D/S Inv Elev	U/S Grnd Elev	U/S Cover To OBV (m)
			-	0.081	0.081	0.75	0.061	0.061	8.0	74.0	12	1.00	12	1.00	100	100	0.66	14.600	0.4	5	666.46	666.31	670.75	4.19
				0.000	0.000		0.000	0.000			Restricted to 35L/s/ha		3											
				0.000	0.000		0.000	0.000																
				0.081	0.081		0.061	0.061																

35L/s/ha 2.84 L/s

Garneau - Supportive Housing

Estimated Land Use Statistics	Area (Ha)	Area (Ac)	Front Feet	# Lots Proposed
Residential Area				
Commercial Area				
Multi-Family (MF) Area	0.081	0.20		1
Arterial Roadway - land dedication				
ER Area				
MR Area				
PUL area				
Total Stage Area - Gross	0.081	0.20	0.0	1
Assessable Area by the Municipality	0.081	0.20		

Description			Recommended OPC Amount	Alternative OPC Amount
Improvements				
Pre-grading & Removals			\$ 11,100	\$ 11,100
Sanitary/ Strom/ Water Site Service to property line	EPCOR - service connection fees		\$ 59,365	\$ 59,365
Surface Construction	Provisional cost to repave lane along property		\$ 23,000	\$ -
Power Service, including Streetlights			\$ 30,000	\$ -
FAC maintenance			\$ -	\$ -
Traffic Accommodation			\$ 6,000	\$ 6,000
Sub-total Improvements (rounded)			\$ 129,465	\$ 76,465
Contingency - 30%			\$ 39,000	\$ 23,000
Total Construction with Contingency			\$ 168,465	\$ 99,465
Estimated Consulting Fees				
Engineering and Testing	Assumed for Lane reconstruction only as all other items proposed to be constructed by EPCOR		\$ 20,000	
Sub-total Consulting Fees (rounded)			\$ 20,000	\$ -
Servicing Agreement Inspection fees	/ha; min. 3 ha	\$ 4,762	\$ 14,286	
Sub-total Municipal Fees (rounded)	Assumed for Lane reconstruction only as all other items proposed to be constructed by EPCOR		\$ 15,000	\$ -
Estimated Municipal Assessments				
Sanitary Sewer Trunk Charge (SSTC)	per unit	\$ 1,246	30.00 \$ 37,380	\$ 37,380
Sub-total Municipal Assessments (rounded)			\$ 38,000	\$ 38,000
Estimated External Recoveries and Payments				
No recoveries anticipated			\$ -	\$ -
Sub-total External Recoveries and Payments (rounded)			\$ -	\$ -
TOTAL OPINION OF PROBABLE COST (rounded, incl. contingency, excl. GST)			\$ 242,000	\$ 138,000

ITEM #	ITEM	UNIT	UNIT RATE	QUANTITY	AMOUNT(\$)
1.1	Grading - Onsite				
	<u>Description</u>				
.1	Site cleanup	<i>estimate</i>	\$ 5,000.00	1	\$ 5,000.00
.2	Stripping and Haul off site	<i>m³</i>	\$ 15.00	185	\$ 2,772.00
.3	Clay improt and compaction	<i>m³</i>	\$ 25.00	129	\$ 3,234.00
	Sub Total Grading Onsite				\$ 11,006.00
SCHEDULE 4 - Surface Consturction					
	<u>Description</u>				
4.1	Full Depth Reclametion				
.1	Pre - Pulverizing Road Base 0-300mm	<i>m2</i>	3.00	130.0	390
.2	250mm Full Depth Reclamation using foaming asphalt	<i>m2</i>	15.00	130.0	1,950
.3	Mobilization	<i>estimate</i>	20,000.00	1.0	20,000
	Sub Total Roadways				\$ 22,340.00

Carignan, Tammy

From: Wass Drainage <wass.drainage@epcor.com>
Sent: July 23, 2021 8:25 AM
To: Carignan, Tammy
Subject: RE: Request for Information (LDS 21-0127 and 0128)

Categories: City of Edmonton

Hi Tammy,

The estimate for the noted services (with the sanitary and storm invert at 667.2m at property line, water service at 2.6-2.75m depth at property line), is \$59,365.00.

Due to the heightened attention related to the Covid-19 virus and to reduce the risk to the public and our staff, we are not accepting visitors at our office at this time.

Please call 780-496-5444 or email wass.drainage@epcor.com for water and sewer servicing information including payments for construction of services.

Have a nice day ☺

Georganne Andersen C.E.T.

Engineering Technologist, Infill Water and Sewer Servicing

EPCOR Water Services, Inc.

MNP Tower

10235-101 Street NW

Edmonton, AB, T5J 3G1

Direct: 780-509-8313

General: 780-496-5444

GAndersen@Epcor.com

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From: Carignan, Tammy <t.carignan@schefferandrew.com>

Sent: Wednesday, July 21, 2021 7:44 AM

To: Wass Drainage <wass.drainage@epcor.com>

Subject: RE: Request for Information (LDS 21-0127 and 0128)

Notice: External Email

Use caution when opening links, attachments, and when prompted to enter User IDs, Passwords or Confidential Information.

Please report any suspicious email to the EPCOR Service Desk.

Hello, responding to the question below.

St/San in common Trench 7m north of south property line. min 3m depth at property line 67.75m or lowest depth available.

Added this to the figure attached as well

Tammy Carignan, P. Eng. | Engineering Operations Manager

Direct: 780-732-7792 | Cell: 780-952-9893

Office: 780-732-7800 | Fax: 780-732-7878

Scheffer Andrew Ltd. | Planners & Engineers

12204 – 145 Street NW Edmonton, AB T5L 4V7 | www.schefferandrew.com

From: Wass Drainage <wass.drainage@epcor.com>

Sent: July 21, 2021 7:19 AM

To: Carignan, Tammy <t.carignan@schefferandrew.com>

Subject: RE: Request for Information (LDS 21-0127 and 0128)

Hi Tammy,

I will need a depth at property line for the estimate and a dimension to locate the services at property line.

The other estimate is based on what we can reasonably install – lowest or 4.25m deep at max depth at property line.

Thanks.

Due to the heightened attention related to the Covid-19 virus and to reduce the risk to the public and our staff, we are not accepting visitors at our office at this time.

Please call 780-496-5444 or email wass.drainage@epcor.com for water and sewer servicing information including payments for construction of services.

Have a nice day ☺

Georgianne Andersen C.E.T.

Engineering Technologist, Infill Water and Sewer Servicing

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From: Carignan, Tammy <t.carignan@schefferandrew.com>

Sent: Tuesday, July 20, 2021 10:33 AM

To: Wass Drainage <wass.drainage@epcor.com>

Subject: RE: Request for Information (LDS 21-0127 and 0128)

Notice: External Email

Use caution when opening links, attachments, and when prompted to enter User IDs, Passwords or Confidential Information.

Please report any suspicious email to the EPCOR Service Desk.

Are you able to add in the estimate for the sanitary and storm off 111 street than?

Thanks.

Tammy Carignan, P. Eng. | Engineering Operations Manager

Direct: 780-732-7792 | Cell: 780-952-9893

From: Wass Drainage <wass.drainage@epcor.com>
Sent: July 20, 2021 9:56 AM
To: Carignan, Tammy <t.carignan@schefferandrew.com>
Subject: RE: Request for Information (LDS 21-0127 and 0128)

Hi Tammy,

Just so you know, the commercial/multi-family projects are all being estimated at this time if they are not coming off lanes. The fee sheet is for single family infills.

Due to the heightened attention related to the Covid-19 virus and to reduce the risk to the public and our staff, we are not accepting visitors at our office at this time.

Please call 780-496-5444 or email wass.drainage@epcor.com for water and sewer servicing information including payments for construction of services.

Have a nice day 😊

Georgianne Andersen C.E.T.

Engineering Technologist, Infill Water and Sewer Servicing

EPCOR Water Services, Inc.

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From: Carignan, Tammy <t.carignan@schefferandrew.com>
Sent: Tuesday, July 20, 2021 7:13 AM
To: Wass Drainage <wass.drainage@epcor.com>
Subject: RE: Request for Information (LDS 21-0127 and 0128)

Notice: External Email

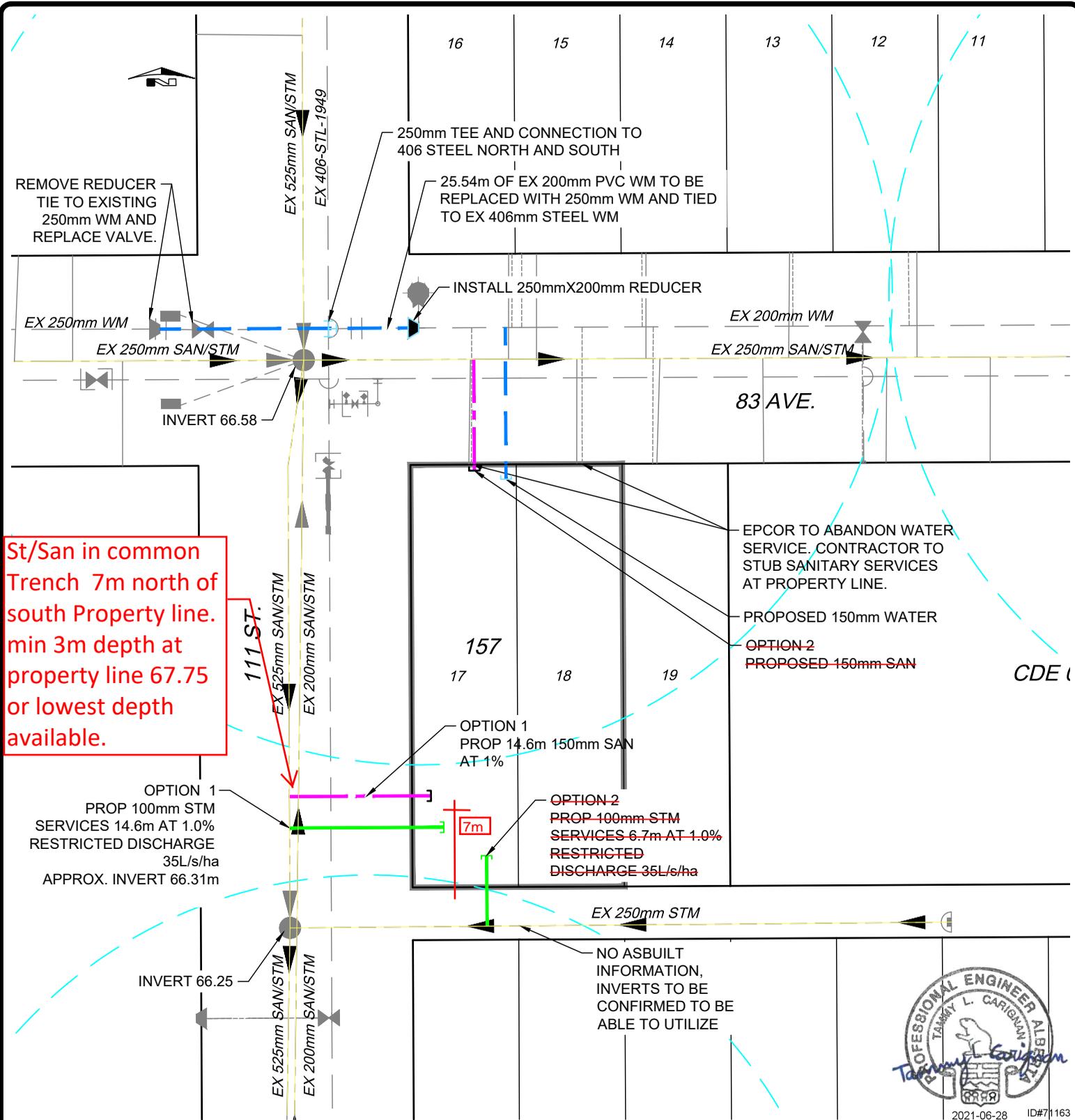
Use caution when opening links, attachments, and when prompted to enter User IDs, Passwords or Confidential Information.

Please report any suspicious email to the EPCOR Service Desk.

Thanks,

For the other site (Garneau) would we be able to get the cost this week for the water service?

We are recommending the sanitary and storm in a common trench on 111 street. I took the cost for that item from the EPCOR website - service connection Fees which was listed as \$16,300



St/San in common Trench 7m north of south Property line. min 3m depth at property line 67.75 or lowest depth available.

LEGEND

- | | | | | | |
|---------------------------|--|------------------|--|------------------|--|
| WATERMAIN (WM) | | PROPOSED HYDRANT | | EXISTING HYDRANT | |
| SANITARY SEWER (SAN) | | PLUG | | PLUG | |
| COMBINED SEWER | | PLUG | | PLUG | |
| STORM SEWER (STM) | | PLUG | | PLUG | |
| LEAD AND CATCH BASIN (CB) | | | | | |

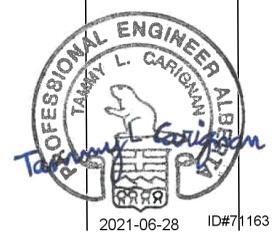


FIGURE 2
GARNEAU
SERVICING PLAN
SERVICING STUDY
PERMANENT SUPPORTIVE HOUSING SITES
CITY OF EDMONTON