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TPSGC

**1735 Route 309, Abandoned Gasoline Station
R.077441.030**

Technical specifications

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1 GENERAL

1.01 TAXES

- .1 Pay all taxes properly levied by law (including Federal, Provincial and Municipal).

1.02 FEES, PERMITS and CERTIFICATES

- .1 Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority having jurisdiction.

1.03 CONSTRUCTION PROGRESS SCHEDULE

- .1 On award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion. When the Departmental Representative has reviewed schedule, take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.
- .2 The work shall be completed by March 25, 2022

1.04 FIRE SAFETY REQUIREMENTS

- .1 Comply with the National Fire Code of Canada 2010, with respect to fire safety on construction and demolition sites.

1.05 QUALITY CONTROL

- .1 Testing Laboratory Services:
 - .1 The Contractor will appoint, for Departmental Representative approval, and pay for services of testing and report an Independent Certified Laboratory.
 - .2 Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Departmental Representative.
 - .3 Where tests indicate non-compliance with specifications, contractor to pay for initial test and all subsequent testing of work to verify acceptability of corrected work.

1.06 HAZARDOUS MATERIALS

- .1 Hazardous Materials: product, substance, or organism that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .2 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS).

1.07 TEMPORARY UTILITIES

- .1 Notify the Departmental Representative and utility companies of intended interruption of services and obtain requisite permission.

- .2 Give the Departmental Representative one week's notice related to each necessary interruption of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions during normal working hours.

1.08 CONSTRUCTION FACILITIES

- .1 Site Storage:
 - .1 The Departmental Representative will assign storage space that shall be equipped and maintained by the Contractor.
 - .2 Do not unreasonably encumber site with materials or equipment.
 - .3 Move stored products or equipment that interfere with operations of Departmental Representative or other contractors.
 - .4 Obtain and pay for use of additional storage or work areas needed for operations.
 - .5 Do not load or permit to load any part of work with weight or force that will endanger work.
- .2 Where security is reduced by work provide temporary means to maintain security.
- .3 Signage:
 - .1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etcetera, in both official languages or by the use of commonly understood graphic symbols and the approval of the Departmental Representative.
 - .2 No advertising will be permitted on this project.
 - .3 Maintain approved signs and notices in good condition for duration of project and dispose of off site, on completion of project or earlier, as directed by Departmental Representative.

1.09 COMMON PRODUCT REQUIREMENTS

- .1 Quality of Work:
 - .1 Carry out work using qualified licenced workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.
 - .2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licenced workers.
 - .3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.
- .2 Storage, Handling and Protection:
 - .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
 - .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove packaging or bundling until required in work.
- .3 Manufacturer's Instructions: unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers

1.10 EXAMINATION and PREPARATION

- .1 Examine site and conditions likely to affect work and be familiar and conversant with existing conditions.
- .2 Before commencing work, establish location and extent of services lines in area of work and notify Departmental Representative of findings.

1.11 CLEANING

- .1 Clean up as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
- .2 Upon completion remove temporary protection and surplus materials. Make good defects noted at this stage.
- .3 Clean areas under contract to a condition equal to what previously existed and to approval of Departmental Representative.

1.12 COST BREAKDOWN

- .1 Before submitting first progress claim, submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis of progress payments.

1.13 PRECEDENCE

- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual

2 PRODUCTS

2.01 NOT USED

- .1 Not used.

3 EXECUTION

3.01 NOT USED

- .1 Not used.

END OF SECTION

1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract is comprised of the removal of underground fuel storage tanks (USTs) and all associated piping, and the remains of the pump island located at an abandoned Gasoline station located at 1735 route 309 in Notre-Dame-de-La-Salette; and further identified as the Project Site.

Five single wall underground storage tanks installed in 1989 and made of steel are present and to be removed from the site and disposed according to regulations:

Main UST pit

- .1 15,000L gasoline;
- .2 15,000L gasoline;
- .3 25,000L diesel;
- .4 35,000L gasoline;

Standalone UST

- .5 4,560L used oil.

Should the tanks contain liquids (water, petroleum's, or both), it will have to be removed and disposed according to regulations, before removing the tanks. Should the granular backfill material around the tanks be contaminated with petroleum products, it will have to be removed up to the native soil and disposed according to regulations. Should anchors (concrete, steel) be present underneath the tanks, they will have to be removed and disposed according to regulations.

Once the work is complete, the excavations are to be backfilled with imported materials to the adjacent ground levels, and the surface of the site graded. The surveying plan in **Appendix 1** shows the current status of the site.

- .2 Relations and responsibilities between Contractor and subcontractors are as defined in Conditions of Contract. Assigned Subcontractors shall, in addition:
 - .1 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide.

1.02 CODES AND Standards

- .1 Conform to or exceed minimum acceptable standards of the various applicable federal, provincial, and municipal codes such as The National Building Code, The National Fire Code, Canadian Plumbing Code, Canadian Electrical Code, Canadian Code for Construction Safety, and the Provincial Construction Safety Act.
- .2 Work to conform to referenced standards and codes as reaffirmed or revised to date of specification

1.03 SUBMITTALS

- .1 Submit documents and samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Environmental Protection Plan in accordance with Section 01 35 43 – Environmental Procedures.

- .3 Submit site-specific Work Plan and Health and Safety Plan in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.03 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy of each document as follows:
 - .1 Specifications.
 - .2 Addenda.
 - .3 Reviewed Shop Drawings.
 - .4 Change Orders.
 - .5 Other Modifications to Contract.
 - .6 Field Test Reports.
 - .7 Health and Safety Plan and Other Safety Related Documents.
 - .8 WHMIS Safety Data Sheets
 - .9 Environmental Protection Plan
 - .10 Environmental Emergency Response Plan in case of product release that meets section 30 of the Storage Tank Regulation. This can be part of the Environmental Protection Plan.
 - .11 Withdrawal PSPC form: PSPC Storage Tank Withdrawal and Removal.
 - .12 Copy of contractor's RBQ license
 - .13 Other documents as specified.

1.04 PROJECT MEETINGS

- .1 Schedule and administer project meetings to review the progress of the work if requested by the Departmental Representative.
- .2 Prepare agenda for meetings.
- .3 Health and Safety shall be a mandatory item in each project meeting.
- .4 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.
- .5 Provide physical space and make arrangements for meetings.
- .6 Preside at meetings.
- .7 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .9 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants, affected parties not in attendance, and Departmental Representative.
- .9 Representative of Contractor, Subcontractor attending meetings will be qualified and authorized to act on behalf of party each represents.

1.05 TEMPORARY UTILITIES

- .1 Notify the Departmental Representative and utility companies of intended interruption of services and obtain requisite permission.

1.06 CONSTRUCTION FACILITIES / SIGNS

- .1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etc., in both official languages, or by the use of commonly understood graphic symbols to the Departmental Representative's approval.
- .2 No advertising will be permitted on this project.

1.07 Field quality control

- .1 Carry out Work using qualified licensed workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.
- .2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licenced workers.
- .3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

PRODUCTS

2.01 NOT USED

- .1 Not used.

3 EXECUTION

3.01 NOT USED

- .1 Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under sections as follows:
 - .1 Section 31 22 13 Rough grading
 - .2 Section 31 23 33.01 Excavating trenching and backfilling

1.02 APPOINTMENT AND PAYMENT

- .1 The Contractor will appoint, for Departmental Representative approval, and pay for services of testing and report an Independent Certified Laboratory.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.03 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide labour, equipment and facilities to:
 - .1 Provide safe access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Coordinate sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

3.01 NOT USED

- .1 Not Used.

END OF SECTION

1 GENERAL

1.01 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not undertake any work requiring the submission of documents and samples until the review of all submissions is complete.
- .3 Do not proceed with the work covered by the submitted documents until their review has been completed.
- .4 Submit transcription of insurance immediately after award of Contract.
- .5 Where items or information is not produced in SI Metric units converted values are acceptable.
- .6 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .8 Verify field measurements and affected adjacent Work are coordinated.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .11 Keep one reviewed copy of each submission on site.

1.02 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec, Canada.
- .3 Allow 14 days for Departmental Representative's review of each submission.

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- .4 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
 - .5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
 - .6 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
 - .7 Submissions include:
 - .1 Date of preparation and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .2 Performance characteristics.
 - .3 Standards.
 - .4 Relationship to adjacent work.
 - .8 After Departmental Representative's review, distribute copies.
 - .9 Submit electronic copy in pdf format of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
 - .10 Submit 1 electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .11 Delete information not applicable to project.
 - .12 Supplement standard information to provide details applicable to project.

- .13 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .14 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site.
- .15 Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation and procedure for managing hazards.
 - .3 All applicable Safety Data sheets (MSDS).
 - .4 Other safe-work procedures such as:
 - .1 Communication Plan;
 - .2 Contact Numbers;
 - .3 Emergency Procedures;
 - .4 Public protection;
 - .5 Use of PPE;
 - .6 Supervisor and Employee names;
 - .7 Proof (copy) of all worker Trades Qualifications, Apprentice Certificates and mandatory training certificates for all workers on the project.

1.03 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in .jpg format, standard resolution as directed by Departmental Representative.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Frequency of photographic documentation: as directed by Departmental Representative.
 - .1 Upon completion of excavation, tank removal, loading and disposal, and as directed by Departmental Representative.

1.04 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status (CNESST).

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

- .1 Province of Quebec
 - .1 An Act Respecting Occupational Health and Safety, R.S.Q., c.S-2.1 (current edition) - Updated 2005.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site-specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan
- .3 Submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and or authority having jurisdiction,
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors weekly.
- .5 Submit copies of incident and accident reports.
 - .1 The principal contractor shall immediately advise the Departmental Representative of any incident, accident, injury, near-miss, fire, explosion or chemical spill occurring at the work site, and submit copies of incident and accident reports within 24 hours after the event to the Departmental Representative.
- .6 The principal contractor shall immediately advise the Departmental Representative of any visit to the site by Federal and Provincial authorities, or health and safety inspectors, and Submit copies of reports or directions issued by such authorities within 24 hours after the visit to the Departmental Representative
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.03 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities (CNESST) prior to beginning of Work.

- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of contract award. Contractor to submit written acknowledgement to CNESST along with construction site opening Notice.
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.04 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.05 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- .2 Health and safety is a required item in the agenda for all project meetings.

1.06 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with regulatory requirements including the Quebec Act Respecting Occupational Health and Safety and the Quebec Safety Code for the Construction Industry
- .2 Comply with health and safety elements of CAN/CSA, Z462 most current edition. (Workplace Electrical Safety Standard).
- .3 Comply with CAN/CSA-Z460 most current edition - Control of Hazardous Energy.

1.07 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.08 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor shall be the Principal Contractor as described in the Quebec Act Respecting Health and Safety code for the Construction for only their scope and areas of work as defined and described this project specification.
- .3 Employ and assign to the work a Competent Person as the Supervisor to be on site during execution of the works. The Supervisor shall (but not limited to):
 - .1 Enforce safety requirements of the Contract Documents.
 - .2 Enforce applicable federal, provincial and local statutes, regulations, and ordinances
 - .3 Enforce the site-specific Health and Safety Plan.
 - .4 The Supervisor shall be an employee of the constructor.

1.09 COMPLIANCE REQUIREMENTS

- .1 Comply with R.S.Q., c. S-2.1, an Act respecting Health and Safety, and c. S-2.1, r.4 Safety Code for the Construction Industry.

1.10 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.11 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.
- .2 Provide common use signs related to traffic control, information, instruction, use of equipment, public safety devices etc., in both official languages, or by the use of commonly understood graphic symbols to the Departmental Representative's approval.
- .3 No advertising will be permitted on this project.

1.12 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.14 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

2 PRODUCTS

2.01 NOT USED

- .1 Not used.

3 EXECUTION

3.01 SITE CONDITIONS

- .1 Contractor shall be aware of all hazards identified by the Departmental Representative, all known or foreseeable hazards specific to the workplace, and those identified in the DSR. These may include but is not limited to: Traffic, Contaminated soils, water, electric, soil conditions, confined spaces, inground utilities, sheet piling, remaining fuel, etc.

END OF SECTION

1 GENERAL

1.01 SUMMARY

- .1 This section provides the general requirements for environmental protection and management during Works. The requirements of this specification shall be read in conjunction with the complete specification package for the assigned work.

1.02 REFERENCE STANDARDS

- .1 Federal Legislation
 - .1 Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (CEPA SOR/2008-197) – as Adopted by CEPA 1999.
 - .2 Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (PN 1326)
 - .3 CAN/CSA B139-19 Installation code for oil-burning
 - .4 National Fire Code 2015
 - .5 Canadian Environmental Protection Act, 1999
 - .6 Environmental Quality Act, Chapter Q-2
 - .7 Transportation of Dangerous Goods Act
 - .8 Species at Risk Act
 - .9 Canadian Wildlife Act
 - .10 Migratory Birds Convention Act
 - .11 Canadian Fisheries Act
 - .12 The Canadian Council of Ministers of the Environment (CCME), Soil Quality Guidelines for the Protection of Environmental and Human Health (2006)
 - .13 Canadian Ambient Air Quality Standards (CAAQS), Canadian Council of Ministers of the Environment (CCME);
 - .14 Canadian Standards Association - CAN/CSA-W202, Erosion and Sediment Control Inspection and Monitoring
 - .15 Canadian Environmental Emergency Regulations (SOR/2003-307)
- .2 Provincial Legislation
 - .1 Soil Protection and Contaminated Sites Rehabilitation Policy and its Action Plan for 2017-2021
 - .2 *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés* (Intervention Guide - Soil Protection and Rehabilitation of Contaminated Sites – *document available in French only*)
 - .3 Land Protection and Rehabilitation Regulation
 - .4 Regulation respecting the burial of contaminated soils

- .5 Regulation respecting contaminated soil storage and contaminated soil transfer stations

1.03 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- .3 Excavated Materials: refers to excavated overburden or soil and bedrock generated during the Works.
- .4 Excess Materials: excess excavated overburden and bedrock generated during the Works which requires off-site disposal management and/or on-site re-use subject to the federal and provincial regulatory framework and the Project requirements.
- .5 Impacted Soil: soil with contaminant concentrations above the applicable Canadian Council of Ministers of Environment (CCME) and/or Québec provincial guidelines.
- .6 Segregation: process of identifying, separating and isolating impacted soil from unimpacted soil.

1.04 GENERAL REQUIREMENTS

- .1 Ensure all site workers have received environment awareness and health and safety training as outlined in section 01 35 29.06 - Health and safety requirements and all workers are trained in the use of environmental protection equipment; for example, the proper use or deployment of spill kits.
- .2 Ensure that all workers understand their roles and responsibilities for environmental protection during performance of work and obligations under applicable environmental law.
- .3 The available soil reports are in **Appendix 2**. The contractor must take into account available information in those documents.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit documents and samples in accordance with Section 01 33 00 - Submittal Procedures.

-
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Departmental Representative.
 - .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
 - .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
 - .6 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for manifesting impacted overburden and water to be removed from site.
 - .4 Names and qualifications of persons responsible for supervising work regarding potentially impacted soil and water.
 - .5 Names and qualifications of persons responsible for training site personnel.
 - .6 Descriptions of environmental protection personnel training program.
 - .7 General principles for managing soil and excavated materials.
 - .8 Drawings indicating locations of proposed temporary excavation or material storage areas, structures, sanitary facilities, temporary staging and stockpiles of excess or spoil materials for re-use or subsequent transfer to disposal including methods to control runoff and to contain materials on site.
 - .9 Methods for minimizing the quantity of material requiring excavation and management.
 - .10 Methods to maximize the re-use of excavated material within the Works.
 - .11 An Erosion and Sediment Control Plan that will include at a minimum what is outlined in the Erosion and Sediment Control Protocol and the following:
 - .1 Details of soil erosion mitigation measures to be employed during the Works identifying type and location of erosion and sediment controls.
 - .2 Details of activities that will be monitored during Works to control soil erosion and assess the effectiveness of implemented soil erosion and sedimentation control measures.

- .3 Identification and implementation of remedial measures in the event that installed soil erosion and sedimentation control measures are determined to be performing in an unacceptable fashion.
- .4 Reporting requirements.
- .12 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
- .13 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
- .14 A Spill Control Plan that will include at a minimum:
 - .1 The types and nature of liquid chemicals, fuels and lubricants to be used during the performance of the Works;
 - .2 Procedures for storing and handling such materials, including spill response, containment and clean-up materials;
 - .3 Monitoring and inspection procedures to ensure management requirements are maintained;
 - .4 Employee training on the storage and use of such materials and the prevention of spills;
 - .5 Spill response procedures for each type of material that may be spilled, and the various environmental media that may be affected (for example, atmosphere, water bodies, ground surface);
 - .6 Quantitative and qualitative criteria to be used to determine the level of reporting necessary for spills;
 - .7 Procedures for clean-up and restoration of surfaces and environmental media affected by the spill or release;
 - .8 Requirements for notification of spills to regulatory agencies such as the Environmental Enforcement Division of the Department of the Environment and the municipality of Notre-Dame-de-la-Salette (only for releases affecting municipality infrastructure); and
 - .9 Reference to related operating procedures, plans or health and safety requirements, such as, but not limited to spills prevention and reporting, erosion and sediment control, dust management etc.
- .15 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .16 An Air pollution control plan that will include at a minimum:
 - .1 A description of the controls and methods to be implement during the Works to limit the generation and dispersion of, and mitigate potential effects of, airborne particulate matter associated with the Works outside of the project site; and
 - .2 Describes requirements for mitigation measures to be employed to prevent and control the generation of unwarranted dust and air emissions.

- .17 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .18 Wastewater Management Plan identifying methods and procedures for management and / or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines as outlined in the soil and excavation water management protocol.
- .19 A Soil Management Plan, identifying procedures for management and / or disposal of soil from excavation activities as outlined in the soil and excavation water management protocol.

1.06 SOIL AND EXCAVATION WATER MANAGEMENT PROTOCOL

- .1 Excess solid or liquid wastes, including but not limited to, concrete cuttings, accumulated excavation water, slurries, soil, rock, and groundwater generated during construction shall be collected and disposed of in accordance with applicable federal guidelines and provincial regulations.
- .2 Manipulation of overburden soil and excavation water must assume these media are impacted until proven otherwise by chemical soil and water testing.
 - .1 Directly stockpile on site overburden soil material upon excavation.
 - .2 Stockpile at least 30 m away from a water body.
 - .3 Ensure stockpiles are made on a secure polyethylene sheeting and that a secure polyethylene sheeting is used to cover each stockpile at the end of each workday and before significant raining event.
 - .1 The polyethylene sheeting must be at least 0,25 mm (0,010 inches) thick.
 - .2 Weights to be used to secure polyethylene sheeting must be heavy enough to ensure protection of stockpile from elements (winds, heavy rains).
 - .4 Sample stockpiles to determine environmental quality for material according to applicable federal and provincial regulations and protocols. The parameters to sample for are at minimum: Metals and Inorganics, Polyaromatic Hydrocarbons (PAHs), Petroleum Hydrocarbons (PHCs) and Volatile Organic Compounds (VOCs). Additional analyses requested by the disposal site selected by the bidder must be included.
 - .5 Use a laboratory accredited by the Minister of the Environment and the Fight against Climate Change and PALA for analysis of environmental samples.

- .6 Use the Canadian Council of Ministers of the Environment (CCME), Soil Quality Guidelines for the Protection of Environmental and Human Health (2006) and applicable Québec provincial soil chemical criteria to determine if soil can be reused on site.
- .7 Use the Soil Protection and Contaminated Sites Rehabilitation Policy and applicable Québec provincial soil quality criteria to determine disposal method of impacted soil.
- .8 Use a hauler licensed to transport impacted soil for transportation of impacted soils off-site in the selected province.
- .9 Dispose off-site at a licensed receiving site the impacted soil generated during the Works.
- .10 Provide the weight tickets or receipts provided by the disposal site to the Departmental Representative.
- .11 Chemically characterize and document the soil left in place by conducting a post-excavation soil verification sampling at the final excavation limits according to applicable federal and provincial regulations as described in section 02 65 00 - Underground storage tank removal.
- .12 Seeping groundwater in excavation is to be assumed impacted until proven otherwise by a chemical analysis for applicable federal and provincial standards.
- .13 Rainwater or surface run-off accumulated in excavation who's overburden material is considered impacted or has not been tested yet (presumed impacted) is to be assumed impacted until proven otherwise by a chemical analysis.
- .14 For excavation water, the parameters to sample for are: Metals and Inorganics, Polyaromatic Hydrocarbon, Petroleum Hydrocarbons, Volatile Organic Compounds.
- .15 If a floating phase is encountered in the accumulated water in the excavation pits, use sorbent booms to recuperate the floating hydrocarbon phase.
- .16 Used absorbent booms impacted by a floating hydrocarbon phase must be stored in a leakproof container and disposed of according to applicable federal and provincial regulations.
- .17 Pump suspected impacted water from excavation into a leak proof storage system to prevent run-offs and infiltration.
- .18 Perform chemical testing on suspected impacted water to determine the disposal mean.
- .19 Use a hauler licensed to transport impacted water.
- .20 Provide the weight tickets or receipts provided by the water disposal site to Departmental Representative.

- .3 Ensure all applicable permits or approvals related to site dewatering, excess excavation water collection and discharge have been obtained and a signed or executed copy of applicable permits and/or approvals is maintained on site.
- .4 Carry out all dewatering and discharge or disposal in accordance with all mitigation, reporting and documentation requirements of permits or approvals issued by regulatory authorities pertaining to the works.

1.07 SPECIES AT RISKS PROTOCOL

- .1 In the event of a SAR or potential SAR encounter, cease work immediately and The Departmental Representative will be notified. The Departmental Representative will contact regulatory agencies and authorities having jurisdiction regarding SAR. Departmental Representative will provide written direction on protective measures to be carried out.
- .2 Maintain the site in a clean state. Eliminate all trash or food scraps that may attract animals and denature wildlife.
- .3 Do not harm any wildlife encountered.

1.08 MIGRATORY BIRD PROTOCOL

- .1 Clearing and grubbing or any other activities affecting any existing vegetation cannot occur between April 01 and August 31, unless specifically permitted in writing by the Departmental Representative.
- .2 Notify the Departmental Representative of any accidental captures.
- .3 Do not destroy any active bird nests (nests with eggs or young birds) for species protected under the Migratory Birds Convention Act, 1994 and/or regulations under that Act. Do not flag or mark any nests with flagging tape or marking paint.

1.09 WILDLIFE MANAGEMENT PROTOCOL

- .1 Construction staff should not attempt to capture or handle wildlife unless the animal is in imminent peril or is injured and cannot wait for rescue by qualified personnel. Improper handling can result in injuries to both workers and wildlife and may in some cases contravene provincial or federal legislation.
- .2 If any animal is encountered, it will be allowed to move away on its own.

- .3 The management of the site shall specifically address how to avoid attracting wildlife into the workspace. The following common attractants shall be controlled or eliminated:
 - .1 Food waste and other garbage – the project area must be maintained in a clean state, free of trash or food scraps which may attract animals and denature wildlife.
 - .2 Water – effective erosion and sediment control measures shall be implemented to protect the quality of surface water from affecting adjacent or downstream habitats.
 - .3 Shelter – effective mitigation measures shall be implemented to prevent wildlife from seeking shelter in/around equipment and materials within or adjacent to the project area.
- .4 Pre-stressed work area with loud noises to allow wildlife to safely move from the area prior to starting work.

1.10 EROSION AND SEDIMENT PREVENTION PROTOCOL

- .1 The contractor is to provide an ESC plan for review of the departmental representative 7 days prior to commencing the work.
- .2 Clearing and removal of vegetation shall be undertaken as close to the start of construction work as reasonably possible. Minimize periods of exposed or disturbed soils.
- .3 Reusable tarps shall be applied to exposed slopes and stockpiles when not actively used to reduce dust generation and sediment mobilization.
- .4 Use sediment barriers (e.g. silt fence, fiber logs) to prevent the flow of eroded sediment into unwanted areas such as public spaces, private property, municipal infrastructure (e.g. storm or sewer systems), and ecological receptors (e.g. waterbodies, wetlands, habitat, etc.).
- .5 City streets adjacent to the project area will be inspected daily and cleaned, as required, if dirt and mud have been tracked from our site(s). The sediment will be removed by shoveling or sweeping and would be transported to a controlled sediment disposal area.
- .6 Apply water during dry periods for dust control.
- .7 Monitor weather forecasts and undertake preventive measures to assist in erosion and sediment control in advance of major precipitation events.

1.11 MANAGEMENT OF STORMWATER RUNOFF

- .1 Construction water must remain on site. It is not permitted to divert construction water to nearby private lands.
- .2 Direct all stormwater into an infiltration system, bio-filtration swale, stormwater retention pond and/or sediment trap.

2 PRODUCTS

2.01 NOT USED

- .1 Not Used.

3 EXECUTION

- .1 Not Used.

END OF SECTION

1 GENERAL

1.01 INSPECTION

- .1 Allow Departmental Representative access to Work.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.02 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.03 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work.
- .2 Co-operate to provide reasonable facilities for such access.

1.04 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.05 REJECTED WORK

- .1 Remove defective Work which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative, it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.06 REPORTS

- .1 Submit one (1) digital copy in .pdf format of inspection and test reports to Departmental Representative.
- .2 Provide a copy to subcontractor of works being inspected or tested.

1.07 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 02 65 00 - Underground Storage Tank Removal
- .2 Section 31 23 33.01 - Excavating, Trenching and Backfilling

1.02 PRICE AND PAYMENT PROCEDURES

- .1 Measurement Procedures:
 - .1 Measure removal of asphaltic concrete pavement in square metres of surface actually removed regardless of depth removed and regardless of number of operations required.
 - .2 Measure removal of Portland cement concrete pavement in square metres of surface actually removed regardless of depth removed and regardless of number of operations required.
 - .3 Payment for salvage, stockpiling, sealing, disposal, recycling, excavating, and restoration will be included in above removal items.

1.03 REFERENCE STANDARDS

- .1 Department of Justice Canada (Jus)
 - .1 Impact Assessment Act, 2019
 - .2 Canadian Environmental Protection Act (CEPA 1999)
 - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations
 - .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
 - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
 - .4 Motor Vehicle Safety Act (MVSA), 1995
 - .5 Hazardous Materials Information Review Act, 1985

1.04 DEFINITIONS

- .1 Selective Demolition: Sequencing demolition activities to allow separation and sorting of selected site materials.
- .2 Hazardous Substances: dangerous substances, dangerous goods, hazardous commodities and hazardous products, including but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well-being or environment if handled improperly.

1.05 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate with Representative for the material ownership including the following:
 - .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Representative's property, demolished materials shall become Contractor's property and shall be removed from Project site.
- .2 Pre-Demolition Meetings.
 - .1 Convene pre-installation meeting 1 week before beginning work of this Section and on-site installation, with Contractor and Representative to:
 - .1 Verify project requirements.
 - .2 Verify existing site conditions adjacent to demolition work
 - .3 Examine existing site conditions adjacent to demolition work, prior to start of Work
 - .4 Waste reporting requirements

1.06 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Action Submittals: Provide the following submittals before starting any work of this Section:
 - .1 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec, Canada as follows:
 - .1 Submit for review and approval selective site demolition drawings, diagrams or details showing sequence of selective site demolition.
 - .2 Inventory: Submit a list of items that have been removed and salvaged after selective site demolition is complete
 - .1 Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.07 QUALITY ASSURANCE

- .1 Regulatory Requirements: ensure Work is performed in compliance with CEEA and applicable Provincial regulations.
- .2 Comply with hauling and disposal regulations of Authority Having Jurisdiction.

1.08 SITE CONDITIONS

- .1 Environmental protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
 - .2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
 - .3 Fires and burning of waste or materials is not permitted on site.
 - .4 Burying of rubbish waste materials is not permitted.
 - .5 Disposal of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum-based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers, is not permitted.
 - .6 Ensure proper disposal procedures are maintained throughout the project.

- .2 Representative assumes no responsibility for Selective Site elements being demolished:
 - .1 Conditions existing at time of inspection for bidding purpose will be maintained by Representative as far as practical.

2 PRODUCTS

2.01 NOT USED

3 EXECUTION

3.01 EXAMINATION

- .1 Survey existing conditions and correlate with requirements indicated to determine extent of selective site demolition required.
- .2 Representative does not guaranty that existing conditions are the same as those indicated in Project Record Documents.
- .3 Inventory and record the condition of items being removed and salvaged.
- .4 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Representative.

3.02 PREPARATION

- .1 Protection of in-place conditions:
 - .1 Work in accordance with Section 01 35 43 - Environmental Procedures and Erosion and Sedimentation Control Plan.
 - .2 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades and properties.
 - .1 Provide bracing, shoring and underpinning as required.
 - .2 Repair damage caused by demolition as directed by Representative.

- .3 Support affected site elements and, if safety of site element being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify Representative.
- .4 Prevent debris from blocking surface drainage system which must remain in operation.
- .2 Surface Preparation:
 - .1 Verify if the electrical and service lines are still energized and disconnect them within the site to be demolished.
 - .2 Underground storage tanks and piping: remove and dispose in accordance with Section 02 65 00.
 - .3 Disruption of active or energized utilities designated to remain undisturbed is not permitted.

3.03 REMOVAL AND DEMOLITION OPERATIONS

- .1 Remove items as indicated.
- .2 Disruption of items designated to remain in place is not permitted.
- .3 Removal of pavements, curbs and gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Representative.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
- .4 Remove as many trees as required during demolition.
 - .1 Obtain written approval of Representative prior to removal of trees.
- .5 Disposal of Material:
 - .1 Dispose of materials not designated for salvage or reuse on site at authorized facilities.
- .6 Backfill: Backfill in areas as indicated and in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.04 STOCKPILING

- .1 Label stockpiles, indicating material type and quantity in accordance with Section 01 35 43-Environmental procedures.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.

- .3 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.

3.05 REMOVAL FROM SITE

- .1 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project.

3.06 RESTORATION

- .1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

3.07 CLEANING

- .1 Progress Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Remove debris, trim surfaces and leave work site clean, upon completion of Work
 - .3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for recycling.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

1 GENERAL

1.01 RELATED SECTIONS

- .1 Section 01 33 00 Submittal Procedures
- .2 Section 31 23 33.01 Excavating, trenching, and backfilling

1.02 UNIT PRICES

- .1 Provide unit price for removal and disposal of tank and associated piping.

1.03 REFERENCE STANDARDS

- .1 American Petroleum Institute (API)
 - .1 API 1604-96, Closure of Underground Petroleum Storage Tanks.
- .2 American Society for Materials and Testing (ASTM)
 - .1 ASTM E1739-95 (2002), Guide to Risk Based Corrective Action Applied at Petroleum Release Sites
 - .2 ASTM E1912-98, Guide for Accelerated Site Characterization for Confirmed or Suspected Petroleum Releases
 - .3 ASTM E1943-98 Guide for Remediation of Ground water by Natural Attenuation at Petroleum Release Sites
- .3 Canadian Federal Legislation and Guidelines
 - .1 Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (CEPA SOR/2008-197) – As adopted by CEPA 1999.
 - .2 CAN/CSA B139-19 Installation Code for oil-burning equipment (B139-19)
 - .3 Canadian Environmental Protection Act (CEPA), 1999
 - .4 Impact Assessment Act, 2019
 - .5 Environment Canada Technical Assistance Bulletin TAB 8, Tanks
 - .6 Transportation of Dangerous Goods Act (TDGA), 1992
 - .7 Motor Vehicle Safety Act (MVSA), 1995
 - .8 Canadian Council of Ministers of the Environment (CCME)
 - .9 PN1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.
- .4 National Fire Protection Agency (NFPA)
 - .1 NFPA 30: Flammable and Combustible Liquids Code (latest edition)
 - .2 NFPA 329: Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases (latest edition)

1.04 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide required information in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit a written report describing in detail procedures used to remove liquid from underground storage tank, cleaning and removing of underground storage tank, and disposal of liquid residues; provide verification that materials were disposed of in an environmentally responsible waste disposal facility; provide photographic documentation of work, including lab and field results, and receipts from disposal sites for tank and liquid residue.
- .3 Submit a written contingency plan for actions to be taken in the event of a release or emergency including:
 - .1 Emergency contact numbers;
 - .2 Classification of land use;
 - .3 Plans for covering/containing contaminated soil;
 - .4 Plans for site assessment/remediation work; and,
 - .5 Reducing risk to human health.

1.05 QUALITY ASSURANCE

- .1 Underground fuel tank removal and disposal shall comply with requirements of authorities having jurisdiction.

1.06 PROJECT SITE CONDITIONS

- .1 Obtain necessary permissions and permits from the MTQ where closure or obstruction of streets, sidewalks or driveways is required by work of this Section.
The Contractor must take all the necessary steps to obtain the road permit from the MTQ.

2 PRODUCTS

2.01 MATERIALS

- .1 Provide necessary materials, equipment, and tarps to prevent further contamination of site, and for safe handling and containment of fuel, fuel storage and removed contaminated soils.

3 EXECUTION

3.01 PREPARATION

- .1 Tank removal shall be performed by a contractor holding an appropriate license (sub-category 1.8) issued by the Régie du Bâtiment du Québec (RBQ) under the Building Act (Code de construction du Québec - chapter B-1.1).

- .2 Provide all necessary personal protective equipment, purging and inert gases, and electrical protection equipment, and verify that equipment is working properly before starting work of this Section.

3.02 UNDERGROUND STORAGE TANK REMOVAL

- .1 Liquid Removal:
 - .1 Provide samples of liquids from underground fuel storage tank to a certified hazardous waste testing facility for laboratory analysis and approval for liquid disposal and disposal location.
 - .2 Remove liquid from tank for disposal prior to removing tank from ground.
 - .3 Obtain disposal facility receipts noting proper liquid disposal.
- .2 Storage Tank Cleaning:
 - .1 Remove tank, anchoring weighting, and related strapping from ground, place it on ground adjacent to removal location, and secure it prior to cleaning. Anchorage weighting and strapping type unknown. All types to be removed.
 - .2 Measure levels of combustible vapours and oxygen, and ventilate tank if required to bring vapour or oxygen levels to safe limits:
 - .1 Ventilate tank using a small gas exhauster until vapour concentration is reduced to 10% or less of lower explosive limit.
 - .2 Oxygen content shall range from 19.5 to 23.5%.
 - .3 Cut access ports for cleaning into tank after vapour and oxygen concentrations are at a safe level.
 - .3 Clean tank by mopping, scraping, sweeping or steam cleaning interior of tank.
 - .4 Collect, contain, and place residuals removed from tank in a 200 liters capacity drum for transporting and disposal acceptable to authorities having jurisdiction.
 - .5 Obtain disposal facility receipts noting proper effluent disposal.
- .3 Storage Tank Disposal:
 - .1 Verify that final vapour and oxygen concentrations are within requirements noted above before proceeding to cut and dismantle tank for its disposal.
 - .2 Remove dismantled tank to a disposal facility acceptable to authorities having jurisdiction.
 - .3 Obtain disposal facility receipts noting proper tank disposal.
- .4 PSPC form:
 - .1 Contractor shall fill in the PSPC Storage Tank System Withdrawal and Removal Form (see **Appendix 3**) no later than one (1) week after the completion of the works and submit it to the Departmental Representative.

3.03 REMOVED TANK AREA ASSESSMENT

- .1 Collect five soil samples from removed underground storage tank area as follows:
 - .1 One sample from each of sidewalls (worst case area).
 - .2 One sample from base (worst case area).

- .2 Use sampling jars and methodology provided by the laboratory.
- .3 Deliver samples with completed chain of custody documentation to laboratory.
- .4 Laboratory shall analyze each sample for Total Petroleum Hydrocarbon (TPH) concentrations (both TPH C1 to C50 and CCME CWS PHC F1 to F4) and BTEX.
- .5 Site Restoration: Refer to Section 31 23 33.01 for requirements for backfill and compaction for non-contaminated remediation work.

3.04 CONTAMINATED SOIL REMEDIATION

- .1 Refer to section 01 35 43

3.05 PIPING REMOVAL

- .1 Remove all piping (fuel supply, vent, controls, etc.) associated and or connected to tanks.

END OF SECTION

1 GENERAL

1.01 MEASUREMENT PROCEDURES

- .1 Fixed price payment will be made for:
 - .1 Clearing isolated trees and grubbing.

1.02 REFERENCE STANDARDS

- .1 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.03 DEFINITIONS

- .1 Clearing consists of cutting off trees and brush vegetative growth to not more than specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.
- .2 Close-cut clearing consists of cutting off standing trees, brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.
- .3 Clearing isolated trees consists of cutting off to not more than specified height above ground of designated trees and disposing of felled trees and debris.
- .4 Grubbing consists of excavation and disposal of stumps and roots to not less than specified depth below existing ground surface.
- .5 EAB refers to Emerald Ash Borer a non-native, invasive beetle that is highly destructive to ash trees where it occurs.
 - .1 Woodchips in the context of EAB consist of untreated, raw bark and wood fragments broken or shredded from logs or branches. Woodchips are to be less than 2.5 cm in at least any two dimensions.
 - .2 Firewood in the context of EAB consists of non-manufactured, solid wood material, with or without bark, cut into sizes less than 1.2 metres long and less than 25 cm in diameter which may be handled manually.
 - .3 Logs in the context of EAB consist of untreated, raw wood greater than 1.2 metres in length and greater than 25 cm diameter.
 - .4 Enclosed vehicle in the context of EAB consist of any vehicle transporting regulated wood material that is equipped to preclude the loss of materials or the escape of EAB while in transit.

1.04 QUALITY ASSURANCE

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Safety Requirements: worker protection.
 - .1 Workers must wear gloves, dust masks, long sleeved clothing, eye protection, protective clothing, safety boots, safety vests when clearing and grubbing.
 - .2 Clean up spills of preservative materials immediately with absorbent material and safely discard to landfill.

1.05 STORAGE AND PROTECTION

- .1 Prevent damage to fencing, trees, shrubs, landscaping, natural features, existing pavement, utility lines which are to remain.
 - .1 Repair damaged items to approval of Departmental Representative.

1.06 WASTE MANAGEMENT AND DISPOSAL

- .1 Ash wood mixed with the wood of other species is to all be managed and disposed of as ash wood.

2 PRODUCTS

2.01 MATERIALS

- .1 Not used

3 EXECUTION

3.01 PREPARATION

- .1 Inspect site and verify with Departmental Representative, items designated to remain.
- .2 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
 - .1 Notify Departmental Representative immediately of damage to or when unknown existing utility lines are encountered.
 - .2 When utility lines which are to be removed are encountered within area of operations, notify Departmental Representative in ample time to minimize interruption of service.
- .3 Notify utility authorities before starting clearing and grubbing.
- .4 Keep roads and walks free of dirt and debris.

3.02 CLEARING

- .1 Clearing includes felling and cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within cleared areas.
- .2 Clear only where required to complete the work, by cutting at height of not more than 300 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1,000 mm above ground surface.

3.03 ISOLATED TREES

- .1 Cut off isolated trees only if required to complete the work at height of not more than 300 mm above ground surface.
- .2 Grub out isolated tree stumps.

3.04 GRUBBING

- .1 Remove and dispose of roots larger than 7.5 cm in diameter, matted roots, and designated stumps from indicated grubbing areas.
- .2 Grub out stumps and roots to not less than 200 mm below ground surface.
- .3 Fill depressions made by grubbing with suitable material and to make new surface conform with existing adjacent surface of ground.

3.05 REMOVAL AND DISPOSAL

- .1 Remove cleared and grubbed materials off site.
- .2 Any ash wood materials or firewood which is removed from the site is to be transported in an enclosed vehicle and disposed of at an authorized disposal facility.

3.06 FINISHED SURFACE

- .1 Leave ground surface in condition suitable for immediate grading operations to approval of Departmental Representative.

3.07 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, flagging tape, tools and equipment.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.02 REFERENCE STANDARDS

- .1 Bureau de normalisation du Québec
 - .1 NQ 2501-255 - « Sols – Determination of the Water Density Relation – Modified Effort Compaction Test (2700 kNm/m³)
 - .2 NQ 2560-114 - « Civil Engineering Work Aggregates ».
- .2 CAN/BNQ 2501-255 « Soils - Determination of the Water Density Relation – Modified Effort Compaction Test (2700 kNm/m³) »
- .3 Underwriters' Laboratories of Canada (ULC)

1.03 EXISTING CONDITIONS

- .1 Before commencing work establish location of buried services on and adjacent to site in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Refer to dewatering in Section 31 23 33.01 - Excavating, Trenching and Backfilling.

2 PRODUCTS

2.01 MATERIALS

- .1 Excavated or graded material existing on site suitable to use as fill for grading work if approved by Departmental Representative.
- .2 Fill material: MG-112 granular material in accordance with of Section 31 23 33.01 - Excavating, Trenching and Backfilling and Section 01 35 43 Environmental procedures.

3 EXECUTION

3.01 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for rough grading installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

3.02 GRADING

- .1 Rough grade to levels, profiles, and contours to recreate the existing condition.
- .2 Prior to placing fill over existing ground, scarify surface to depth of 150 mm minimum before placing fill over existing ground. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
- .3 Compact filled and disturbed areas to maximum dry density in accordance with CAN/BNQ 2501-255 « Soils – Determination of the Water Content – Dry Density Relation Standard Effort Compaction Effort Test (2700 kNm/m³) », as follows:
 - .1 90% under landscaped areas.
- .4 Do not disturb soil within branch spread of trees or shrubs to remain.

3.03 TESTING

- .1 Submit testing procedure, frequency of tests, testing laboratory as designated by ACLE or certified testing personnel to Departmental Representative for approval.

3.04 CLEANING

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for reuse and recycling.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.05 PROTECTION

- .1 Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 02 41 13 - Selective Site Demolition

1.02 MEASUREMENT PROCEDURES

- .1 Excavated materials will be measured in cubic metres in their original location.
 - .1 Common excavation quantities measured will be actual volume removed within following limits:
 - .1 Width for trench excavation as indicated.
 - .2 Width for excavation for structures as indicated.
 - .3 Depth from ground elevation after removal of asphaltic concrete pavement immediately prior to excavation, to elevation required to remove the underground storage tanks and associated piping.
 - .4 Excavation must be stockpiled for testing in accordance with Section 01 35 43- Environmental procedures.
 - .5 Underground Storage Tank volume shall be removed from the excavation volume. The estimated tank volume is as follows: 15, 15, 25, 35 and 4,5 cubic meters for a total of 94,5 cubic meters.
- .2 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.
- .3 Backfilling to authorized excavation limits will be measured in cubic metres compacted in place for each type of material specified.
- .4 Provide unit price for excavation and disposal of contaminated soils and contaminated water in cubic meter in the event that they are encountered during removal of underground fuel tank soil testing.
 - .1 Unit prices shall apply where more than 75 m³ of soil must be removed from boundary area around tank; base contract shall account for this initial removal amount.

1.03 REFERENCE STANDARDS

- .1 Bureau de normalisation du Québec
 - .1 BNQ 2501-255 « Soils – Determination of the Water-Density Relation – Modified Effort Compaction Test (2700 kNm/m³) »
 - .2 BNQ 2560-114 - « Civil Engineering Work - Aggregates »
- .2 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.04 DEFINITIONS

- .1 Excavation classes:
 - .1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .4 Unsuitable materials:
 - .1 Weak, chemically impacted soil, and compressible materials.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Obtain necessary permissions and permits from the MTQ if work needs to be done within right-of-way. The Contractor must take all the necessary steps to obtain the road permit from the MTQ.
- .3 Quality Control:
 - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
 - .2 Submit for review by Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.
 - .3 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
 - .4 Submit to Departmental Representative written notice when bottom of excavation is reached.
 - .5 Submit to Departmental Representative testing and inspection results and report as described in PART 3 of this Section.
- .4 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .2 Submit records of underground utility locates, indicating location plan of existing utilities as found in field or clearance record from utility authority.

1.06 QUALITY ASSURANCE

- .1 Qualification Statement: submit proof of insurance coverage for professional liability.
- .2 Where Departmental Representative is employee of Contractor, submit proof that Work by Departmental Representative is included in Contractor's insurance coverage.
- .3 Submit design and supporting data at least 2 weeks prior to beginning Work.

- .4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in the Province of Quebec, Canada.
- .5 Keep design and supporting data on site.
- .6 Engage services of qualified professional Engineer who is registered or licensed in Province of Quebec, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.
- .7 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.
- .8 Do not stockpile excavated materials from a minimum distance equal to the height of the excavation from the edge of the excavation or from the distance prescribed by the Engineer responsible for the temporary shoring.
- .9 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.07 EXISTING CONDITIONS

- .1 A geotechnical report is presented in **Appendix 4**. The contractor must take into account the information in this report.
- .2 Buried services:
 - .1 Before commencing work establish location of buried services on and adjacent to site.
 - .2 Privately owned buried services must be located by a private locator onsite. All costs associated to the locates of buried services are under the Contractor's responsibility.
 - .3 Remove obsolete buried services within 1 m of foundations.
 - .4 Prior to beginning excavation Work, notify applicable Departmental Representative and authorities having jurisdiction, establish location and state of use of buried utilities and structures. authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
 - .5 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .6 Record location of maintained, re-routed and abandoned underground lines.
- .3 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative, condition survey of existing, trees and other plants, service poles, wires, and survey benchmarks which may be affected by Work.
 - .2 Where required for excavation, cut roots or branches as directed by Departmental Representative.

2 PRODUCTS

2.01 MATERIALS

- .1 Excavated granular material for backfill: selected compactable and uncontaminated material from excavations, existing stockpiles which do not contain weak or compressible materials, frost susceptible materials, and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials. Existing material must be in accordance with Section 01 35 43 Environmental procedures.
- .2 Granular material MG-112 in conformity with standard NQ 2560-114 « Civil Engineering Work – Aggregates Part II: Sub-base course, capping layer, surface course and shoulder ».

3 EXECUTION

3.01 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly in accordance with Section 02 41 13 - Selective Site Demolition.

3.02 PREPARATION/PROTECTION

- .1 Keep excavations clean, free of standing water, and loose soil.
- .2 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .3 Protect buried services that are required to remain undisturbed.

3.03 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative in accordance with Section 01 35 43-Environmental procedures.
 - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.04 COFFERDAMS, SHORING AND BRACING

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Health and Safety Act for the Province of Québec.
- .2 During backfill operation:
 - .1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.
- .3 Upon completion of substructure construction:
 - .1 Remove cofferdams, shoring and bracing.
 - .2 Remove excess materials from site and restore watercourses as indicated by Departmental Representative.

3.05 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress as indicated in Section 01 35 43 Environmental procedures.
- .2 Provide for Departmental Representative's review and approval details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Protect open excavations against flooding and damage due to surface run-off.
- .4 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.06 EXCAVATION

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate as required to carry out work in accordance with Section 01 11 01, in all materials met.
- .3 Remove concrete, paving, demolished foundations and rubble and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative and as indicated in Section 01 35 43 Environmental procedures.
- .6 Restrict vehicle operations directly adjacent to open trenches.
- .7 Dispose of surplus and unsuitable excavated material in approved location off site.

- .8 Do not obstruct flow of surface drainage or natural watercourses.
- .9 Notify Departmental Representative when bottom of excavation is reached.
- .10 Obtain Departmental Representative approval of completed excavation.

3.07 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated. Compaction densities are percentages of maximum densities obtained from in accordance with CAN/BNQ 2501-255 « Soils - Determination of the Water-density Relation - Modified Effort Compaction Test (2700 kNm/m³) ».
 - .1 Excavated granular material for backfill compacted to 90 %.
 - .2 Granular material MG-112 compacted to 90 %.

3.08 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved installations.
 - .2 Inspection, testing, approval, and recording location of soil contamination.
 - .3 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 300mm compacted thickness up to existing grades. Compact each layer before placing succeeding layer.
- .5 The final surface must be grade in accordance with Section 31 22 13 Rough grading

3.09 RESTORATION

- .1 Clean and reinstate areas affected by Work as directed by Departmental Representative.

END OF SECTION

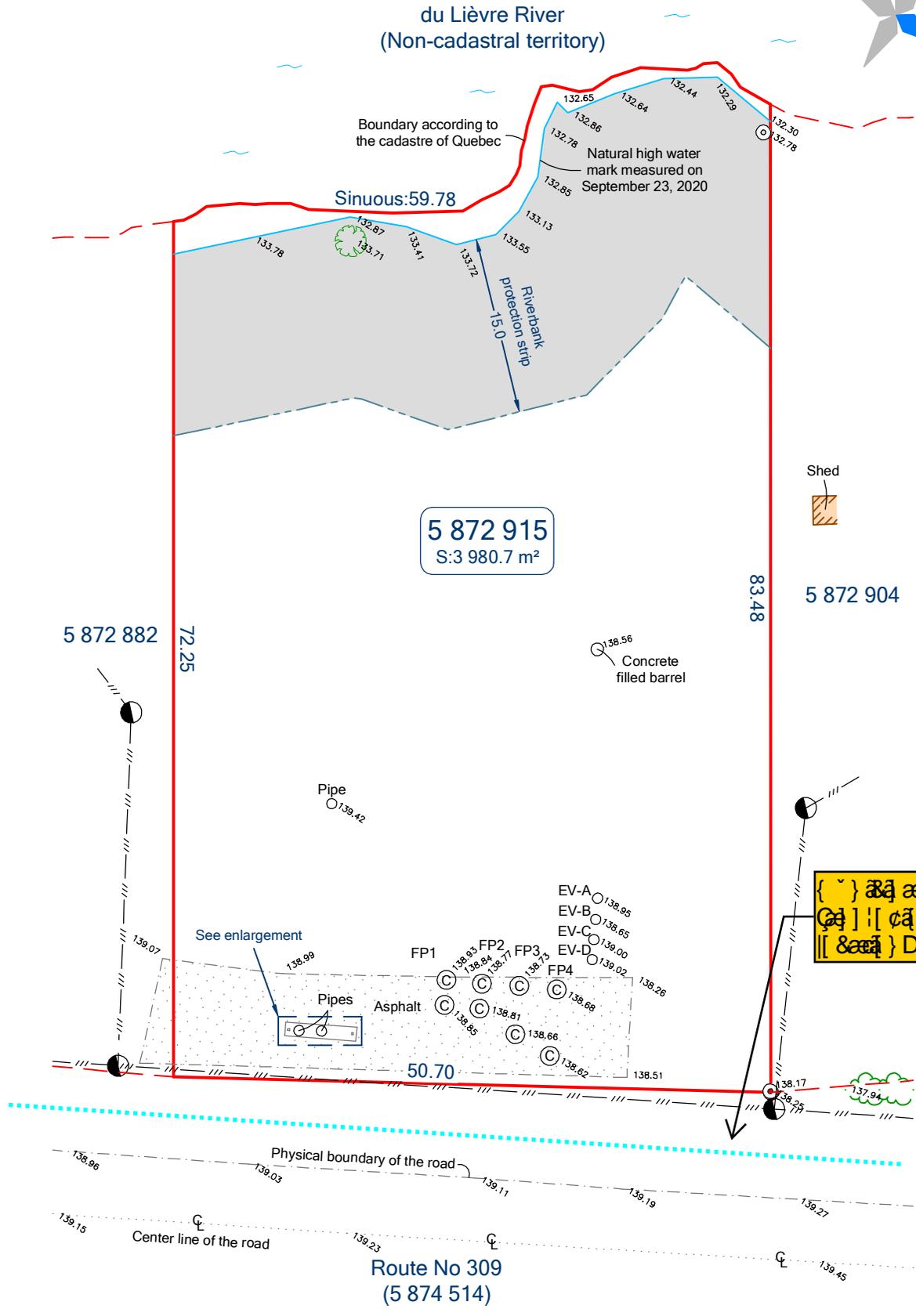
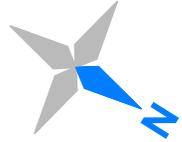
APPENDICES

APPENDIX 1

**Surveying plan
Nadeau, Fournier
October 2020**

1 page

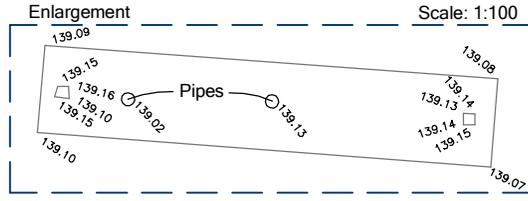
TOPOGRAPHICAL PLAN



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LEGEND:

- X— Fence
- ||— Aerial wires
- S Shed
- D Deck
- Hedge
- ⊙ Found survey mark
- ⊙ Post with guy wire
- ⊠ Well
- ⊠ Lamp post
- B Balcony
- M Mechanical equipment



SCALE: 1:500

Municipal zone: 15

- Elevations shown on this plan are orthometric heights in the vertical datum CGVD28.
- Dimensions on this plan are in metres (SI)
- Field survey was done on September 14 and 18, 2020.

Note: This document is a translation of the plan prepared by the undersigned on October 20, 2020, under the minute 10354 of his directory.

CADASTRE OF QUEBEC

Registration division: **Papineau**
 Lot(s): **5 872 915**
 Municipality: **Notre-Dame-de-la-Salette**
 Prepared at Gatineau, **22 octobre 2021**

Digitally signed by:

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TRUE COPY, signed at Gatineau

Date: _____
 By: _____

File: **56592**

Minute No **11233**

APPENDIX 2

**Soil and groundwater
management plan
WSP
October 2020**

29 pages

PUBLIC SERVICES AND PROCUREMENT CANADA

1735 ROUTE 309, NOTRE-DAME-DE-LA-SALETTE (QUÉBEC)

SOIL AND GROUNDWATER MANAGEMENT PLAN

DATE: MARCH 31, 2021





SOIL AND GROUNDWATER MANAGEMENT PLAN

PUBLIC SERVICES AND PROCUREMENT
CANADA

PROJECT NO.: 191-12784-03
CLIENT REF: R.077441.030
DATE: MARCH 31, 2021

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QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1
Remarks	Version 1 SGWMP	Version 2 SGWMP
Date	2021-03-25	2021-03-31
Prepared by	Melissa Legault-Meek	Melissa Legault-Meek
Checked by	Matthieu Rochon	Matthieu Rochon
Project number	191-12784-03	191-12784-03
Report number	01	02



SIGNATURES

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The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial and physical constraints applicable to this project.

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Overall conditions can only be extrapolated to an undefined limited area around these testing and sampling locations. The conditions that WSP interprets to exist between testing and sampling points may differ from those that actually exist. The accuracy of any extrapolation and interpretation beyond the sampling locations will depend on natural conditions, the history of Site development and changes through excavation and other activities. In addition, analysis has been carried out for the identified chemical and physical parameters only, and it should not be inferred that other chemical species or physical conditions are not present. WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off-Site.

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This limitations statement is considered an integral part of this report.



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FIGURES

FIGURE 1	SITE LOCATION
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FIGURE 3	SOIL ANALYTICAL RESULTS – PSRTC
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FIGURE 6	RÉSULTATS D'ANALYSE DES EAUX SOUTERRAINES (CCME) ET PIÉZOMÉTRIE

1 TERMS AND DEFINITIONS

CALA	Canadian Association for Laboratory Accreditation
COC	Contaminants of Concern
CSA	Canadian Standards Association
Diversion	Avoidance of waste sent to landfill or incineration
ECCE	Environment and Climate Change Canada
EA	Environmental Assessment
EC	Electrical Conductivity
ECA	Environmental Compliance Approval
EPP	Environmental Protection Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Act
EPP	Environmental Protection Plan
ESA	Environmental Site Assessment
LET	Engineered landfill
LEET	Trench landfill
LETI	Landfill in isolated territory
LEMN	Northern landfill
MECP	Ministry of the Environment, Conservation and Parks
MI	Metals and Inorganics
OPSS	Ontario Provincial Standard Specification
OSHA	Occupational Health and Safety Act
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PSPC	Public Services and Procurement Canada
RAP	Remedial Action Plan
Recycle	Recovery of waste for subsequent processing in preparation for reuse
Reuse	Recovery of waste and subsequent incorporation into the Work
RPI	Residential/Parkland/Institutional
SAR	Sodium Adsorption Ratio
SCS	Site Condition Standards
SDS	Safety Data Sheet
TCLP	Toxic Characteristic Leaching Procedure
VOC	Volatile Organic Compounds

Excavated Materials: refers to excavated overburden or bedrock generated during the Works.

Excess Materials: excess excavated overburden and bedrock generated during the Works which requires off-site disposal management and/or on-site re-use subject to the federal and provincial regulatory framework and the Project requirements.

Impacted Soil: overburden with contaminant concentrations above the applicable Canadian Council of Ministers of Environment (CCME) guidelines and/or Ministry of Environment (MELCC) standards (“soil chemical impacts”), and odorous or visually impacted soil (“aesthetic impacts”).

Known Impacts: areas of overburden confirmed through previous environmental site investigations to have concentrations of chemical parameters exceeding the applicable federal and provincial guidelines and standards prior to bid close.

Re-use: means using, processing, re-processing or recycling of excess material into a construction material or other useful product and managed under this project.

Re-use Material: material removed from the Works that is deemed suitable for use within the Site or off-Site and managed under this Project.

Segregation: process of identifying, separating and isolating impacted soil from unimpacted soil.

Suspected Impacts: areas of soil and/or groundwater that are suspected to chemically exceed the applicable federal and provincial guidelines and standards based on visual or olfactory observation, other methods of field screening, or proximity to areas of known impacts. Analytical sampling is required to confirm impacts.

Unknown Impacts: areas of impacted soil and/or groundwater that were discovered and confirmed following bid close.

Waste: any excess material that is not managed by re-use and requires off-site management.

2 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Public Services and Procurement Canada (PSPC) to complete a Soil and Groundwater Management Plan (SGWMP) for the property located at 1735 route 309, Notre-Dame-de-la-Salette, Québec (the “Site”).

2.1 OVERVIEW

This Soil and Groundwater Management Plan (SGWMP) provides a program for the management of soil and groundwater in the event of excavation work on the property. The study site was used as a gas station since at least 1965. In 1996, the gas station was destroyed by fire and the site has remained vacant following the building debris clean-up. Four (4) fuel underground storage tanks (USTs – emptied by PSPC in 2019) as well as a used oil / heating oil UST are still present on site based on current knowledge.

The Site Plan as well as the sounding locations of the Phase II Environmental Site Assessment are provided in **Figure 1** and **Figure 2**.

2.2 SCOPE OF PLAN AND PROJECT

The SGWMP specifically addresses the following:

- Legal/regulatory requirements, standards and guidelines.
- Overall soil and groundwater management strategy for the Site.
- Administrative and engineering controls.
- Reporting and record keeping requirements.
- Monitoring requirements.
- Contingency plans.
- Mandatory training required for all personnel prior to starting work.

This SGWMP is a living document and expected to be regularly reviewed and updated in response to:

- Changes in the scope of work.
- Modification of excavation means or methods.
- Changes in applicable law or standards.
- Any other instance whereby the General Contractor or PSPC assesses that the current plan does not adequately address the risk for the management of excess materials.

The Plan is based on consideration of the following:

- Specific requirements of applicable laws, regulations, guidelines, and other policies for the management of soil and groundwater in Quebec and on Federal Land.

- The specific soil types, groundwater conditions, and the presence of Contaminants of Concern, as noted in the Phase II ESA described in section 2.3.

2.3 REGULATORY FRAMEWORK

As the project is occurring on federal land, the project is being completed under a federal regulatory framework. The applicability of the provincial regulatory framework will be considered and applied where deemed necessary.

Federal Regulatory Framework:

The governing federal regulatory frameworks for characterizing soil quality are the Canadian Council of Ministers of the Environment (CCME), Soil Quality Guidelines for the Protection of Environmental and Human Health for a residential land use with unprotected groundwater and fine-textured soils.

For characterizing groundwater quality, Federal Interim Groundwater Quality Guidelines (FIGQG) for Federal Contaminated Sites for the Protection of Freshwater Aquatic Life in a fine texture soil condition and residential and commercial land uses were applied.

The CCME guideline does not provide specific recommendations for the management, disposal and handling of excess materials and soils, nor does it include a requirement for permitting and reporting to demonstrate compliance with the guideline.

Provincial Regulatory Framework:

Provincial regulations include information related to the management, testing and disposal of excess materials, such as soil and groundwater. Provincial regulations also include requirements related to permitting and certification of activities and persons involved in the removal, handling and receiving of such excess materials. Accordingly, the General Contractor will undertake the work in accordance with the Quebec regulations for soil and groundwater management because, by definition, excess materials will be moved from the federal site to locations that fall under Quebec provincial jurisdiction. Applicable provincial regulations are identified in the following documents:

- March 2019, Ministère de l'Environnement et de la Lutte contre les changements climatiques - Guide d'intervention Protection des sols et réhabilitation des terrains contaminés;
- EQA., c. Q-2; Environment Quality Act;
- EQA., c. Q-2, r. 18; Regulation respecting the burial of contaminated soils;
- EQA., c. Q-2, r. 37; Land Protection and Rehabilitation Regulation;
- EQA., c. Q-2, r. 46; Regulation respecting contaminated soil storage and contaminated soil transfer stations;
- EQA., c. Q-2, r. 32; Regulation respecting hazardous materials;
- EQA., c. C-24,2, r.43; Transportation of Dangerous Substances Regulation.

The following summarizes the relevant information set out within governing documents related specifically to this Site:

DOCUMENT	AUTHOR	REFERENCE NUMBER	DATE COMPLETED/FILED
Phase I Environmental Site Assessment	WSP	R.077441.030	January 12, 2021
Phase II Environmental Site Assessment	WSP	R.077441.030	March 31, 2021

3 OBJECTIVES

The SGWMP has been developed based on the following policy considerations:

- Compliance with applicable statutes, regulations, codes, policies, and guidelines with respect to environmental management of soil and groundwater.
- Recognition of sustainability factors including the following:
 - Minimizing the volume of earthworks required for the Site.
 - Minimizing the volume of soil and groundwater which must be managed off-site.
 - Assessment of potential options for management of impacted soil and groundwater off-site.

4 SITE OPERATIONS

4.1 VEHICLE DECONTAMINATION

4.1.1 TRAFFIC CONTROL

Dust control measures should be implemented. Where possible, trucks and heavy equipment movement between work sites and the decontamination area will be limited to a single access track chosen based on the current site conditions and excavation activities. This will be done to minimize the tracking of soil between various areas of the Site.

All excavation vehicles leaving the Site will be subject to truck and vehicle wash procedures noted in the following sections. Private vehicles will be limited to travel on the entrance route and the parking area. There will be no requirement for decontamination of private vehicles limited to these areas.

4.1.2 TRUCK AND VEHICLE WASH

All vehicles leaving the site will be subject to inspection and all vehicles leaving the site which have come into contact with the contaminated soil will be subject to a decontamination procedure. The procedure will consist of the washing of the exterior of the vehicle, wheels and hubs, and readily accessible undercarriage. Washing will be conducted using a high-pressure water spray. Trucks that do not travel or come in contact with the impacted soils (i.e., travel on asphalt and other clean road structures) may not be subject to high-pressure water washing at the discretion of the Department Representative.

A mud mat and wash rack will be established at the entrance to the Site. Vehicles will be washed with potable water from the river. The washing station will include a wash rack which is directed to a sediment trap/basin. If required, the collected water may be hauled off-site by a licensed waste hauler to an appropriate disposal facility. Sampling and analysis of the water will be conducted by the Department Representative prior to off-site disposal. The waste water will be analyzed for the parameters required by the licenced waste hauler and disposal facility. Additional chemical parameters may be analyzed, if warranted, at the discretion of the Department Representative.

All incoming vehicles will be instructed by the General Contractor regarding the requirements for vehicle decontamination. The efficiency of the vehicle decontamination procedure will be subject to random inspection by the Department Representative.

4.1.3 CONTINGENCY MEASURES

No explicit contingency measures are proposed with respect to the decontamination procedure. The efficiency of the procedure will be controlled by random spot checks, as noted previously. Where necessary, changes to operating procedure will be implemented by the Department Representative to ensure adequate washing of the vehicles. In the event that private vehicles inadvertently enter the excavation area, they will be washed at the truck station prior to leaving the site.

4.2 RESPONSIBILITY AND REPORTING

Site security, safety and maintenance of boundary stakes, site dust suppression activities and vehicle decontamination activities will be the responsibility of the General Contractor. Activities and issues identified will be reported in a daily site operations record including:

- Any site security issues.
- The requirements for dust control, including areas of application of dust suppression or other measures.

The Department Representative and/or on-Site Representatives will conduct random spot checks of the vehicle washing procedure. The date and name of the person responsible for conducting the spot check will be provided in the daily site operations record. The daily record will provide information regarding the requirements, if any, for changes to the truck wash procedure.

5 EXCAVATION MATERIAL MANAGEMENT

5.1 ON-SITE MATERIALS

The existing subsurface characteristics have been examined and the findings are described in the document listed in **Section 2.3**. The reports provide information regarding the physical condition and chemical composition of soil that will be encountered during excavations. Relevant information from the report has been summarized in the following sections of this SGWMP. The General Contractor is expected to read and be familiar with the full report details.

5.1.1 SOIL

Based on the Phase II ESA borehole logs, the surficial geology typically consists of fill material generally consisting of sand with gravel which ranged from 0.61 to 2.44 metres thickness. It is followed by a natural homogeneous clay.

Various contaminants of concern (COC) which exceeded applicable CCME Soil Quality Guidelines and Quebec standards were identified in the soil at a number of locations across the Project as illustrated in **Figures 3 and 4**.

Confirmed impacts to soil exceeding the CCME Soil Quality Guidelines include the following COCs:

- *Metals and Inorganics*: Barium, Chromium, Copper, Nickel, Lead, Zinc
- *PAHs*: Naphthalene, Phenanthrene, Pyrene, 1-Methylnaphthalene, 1,3 Dimethyl naphthalene:
- *PHCs (F1-F4)*:PHCs F2 and F3
- *VOCs*: Benzene, Toluene, Ethylbenzene, Xylene

Confirmed impacts to soil exceeding the Quebec applicable standard Annexe I-B include the following COCs:

- *Hydrocarbures pétroliers (HP C10-C50)*
- *VOCs*: Benzene, Toluene, Ethylbenzene
- *Metals (14 PRTC)*

Impacted soils exceeding CCME Guidelines and Provincial standards were identified at depths associated to the fill material as well as the native clay.

5.1.1.1 EXCESS SOIL MANAGEMENT ON-SITE

Excess soil compliant to the CCME Guidelines, i.e., meets the CCME Guidelines, can be reused on-Site subject to geotechnical suitability.

Excess soil not compliant to the CCME Guidelines, i.e., exceeds the CCME Guidelines, cannot be reused elsewhere on-Site and must be disposed of at an off-Site receiving site licenced to receive such soil.

All excess soil which cannot be reused on-site whether it be due to its chemical quality or geotechnical suitability is to be disposed off-site in accordance with **the section below**.

5.1.1.2 EXCESS SOIL MANAGEMENT OFF-SITE

Suitable receiving sites will be identified by the General Contractor. The General Contractor will provide receiver site information to the department representative for review and approval. The General Contractor will only dispose of materials at sites that have been reviewed and approved by the department representative on consultation with the General Contractor.

- The impacted soil will be transported from the Site to an acceptable MELCC final receiving site that has an Environmental Compliance Approval (ECA) valid for acceptance of solid non-hazardous waste;
- If additional information becomes available identifying the potential presence of hazardous soil conditions, additional management measures will be required of the General Contractor. The additional requirements to be adopted by the General Contractor will be discussed with the Department Representative Waste and Contamination Specialist and communicated via Site Instruction to the General Contractor;
- Written confirmation from the waste receiving site indicating acceptance of the material based on the laboratory results;
- The impacted soil will be transported by a hauler with a provincial transport permit which is valid for the duration of the work, the entire haul route, the equipment being used and the type of waste being transported; and
- Copies of the weigh tickets or receipts provided by the disposal site will be retained in the project files and documented in the report.

5.1.2 STOCKPILING

5.1.2.1 EXCESS MATERIAL GENERATED ON-SITE

Stockpiling and double handling of on-Site soil materials must remain minimal. Therefore, efforts through planning and logistics should be made to avoid the need to stockpile excavated soil. If there is a need for stockpiling of soil materials on the Site for the purpose of analysis, segregation, or staging prior to further movement, the stockpiling will be subject to the following requirements:

- Stockpiles of impacted material will be placed on a polyethylene barrier to segregate them from the underlying soils. Polyethylene shall be used to cover stockpiles at the end of each working day and shall be secured against heavy winds. Appropriate silt and erosion control measures will be implemented on all stockpiles. Stockpiles will be inspected by the General Contractor during rainfall and high wind conditions in order to ensure that the above-noted measures are maintained.
- Uncovered stockpiles will be wetted, as required, to minimize the generation of dust.
- The location, size and configuration of stockpiles will be determined by the General Contractor based on site construction activities. The location, size and configuration of all stockpiles will be noted in the daily site operation record.
- Stockpiles will be kept as flat as practicable and generally limited to heights of less than 5 m, to minimize potential wind and water erosion, and dust.
- The condition of each stockpile will be inspected visually on a daily basis by the General Contractor and the Department Representative. Appropriate actions will be taken to control dust, sedimentation, and erosion, as necessary. Records of inspection and appropriate actions will be recorded by the General Contractor in the daily site operation record.

5.1.2.2 IMPORTED EXCESS MATERIAL

For temporary stockpiling of imported aggregate materials on the Site for the purpose of analysis, segregation, or staging prior to further movement, the same stockpiling requirements are to be applied as for excess materials noted above. There will be no sampling of the environmental quality of virgin material from a licensed pit or quarry operation. Incoming virgin materials will be inspected by the Department Representative to ensure quality control. Documentation will be required regarding the license for the source.

5.2 RESPONSIBILITY AND REPORTING

5.2.1 EXCESS MATERIALS DISPOSAL

Inspection and enforcement of on-site excess material management will be the responsibility of the Department Representative and on-Site Representatives for the project. A daily field log of on-site excess materials management activities will be maintained by the on-Site Representative. The log will be prepared on a daily basis for all days for which there are on-site excess materials management activities. The log will present the following information:

- A summary of daily excess materials management activities including locations of excess materials their movement, stockpiling, placement and receiving sites.
- A summary of analysis activities including sample names and custody forms.
- Documentation will be provided for all material which is shipped from the site. The documentation will be prepared by the Department Representative and on-Site Representatives.

6 STORM WATER, EROSION AND SEDIMENT

Storm water management measures must be implemented at the Site to control the potential transport of contaminants of concern off-site during excavation activities. The measures shall include, but not be limited to, silt fences and filter socks on catch basins and utility covers as necessary.

6.1 STORMWATER CONTROL AND OUTLET

Stormwater management and surface water run-off during excavation must be managed in a manner to minimize run-off into the Lièvre River. A dewatering program may be required, as part of the excavation works, and must comply with the following conditions:

- Provision, operation, and maintenance of necessary equipment appropriately sized to keep excavations, staging areas, and other work areas free from water;
 - Water barriers as necessary to protect the site from soil erosion and from the runoff of surface water from work areas. Control of surface drainage to ensure that water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff is intercepted and diverted to suitable outlets; and
 - Disposal of water in a manner not injurious to public health or safety, to property, or to any part of work completed or under excavation. Testing of water (i.e., surface water runoff or infiltrated groundwater) is required prior to discharge to municipal sewers to demonstrate its suitability for such discharge.
-

6.1.1 EROSION CONTROL MEASURES

The site erosion control measures generally comprise the following:

- Provision of overland drainage and conveyance routes to direct storm water and sediment toward the existing catch basins and ditches.
- Provision of appropriate erosion control measures such as gravel or rock lining within conveyance routes and rock check dams utilized to slow the conveyance of storm water flows.
- Provision of perimeter silt control fences.
- Provision of additional erosion protection such as straw bales in the vicinity of ditches, and filter socks at catch basins can be provided during excavation at the discretion of the Department Representative.

A detailed erosion control plan will be required prior to excavation.

6.2 INSPECTION AND MAINTENANCE

Daily inspections will be conducted by the General Contractor and the Department Representative to determine the potential requirements for repairs, maintenance, or upgrading of all erosion control measures. The maintenance requirements will be determined based on the site conditions. Typical maintenance requirements will include the following:

- The requirement for repairs to silt fences or removal and replacement of straw bales and filter materials.

- Requirements for removal of accumulated sediments in ditches or overland conveyance routes.
-

6.3 RESPONSIBILITY AND REPORTING

Maintenance of erosion control measures will be the responsibility of the General Contractor for the project. A description of the storm water and erosion control measures conditions will be provided in the daily site operations record along with any maintenance activities that are completed at the site.

The Department Representative or on-Site Representative and the General Contractor, will be responsible for daily inspection of sediment control and erosion systems.

6.4 SITE RESTORATION AND GRADING REQUIREMENTS

All excavated areas should be restored to a condition that is safe and meets the requirements of the Project.

7 GROUNDWATER MANAGEMENT

7.1 GROUNDWATER CONDITIONS

Based on the document listed in **Section 2.3**, the depth to groundwater on the Site varies from approximately 4.04 to 7.15 mbgs, corresponding to elevations between 130.60 to 133.27 metres above mean sea level (masl). The estimated direction of groundwater flow in the overburden is toward the Lièvre River. The observed groundwater conditions represent an unconfined aquifer in the clay.

7.1.1 GROUNDWATER CHEMICAL QUALITY

The groundwater quality for all four monitoring wells identified federal PASCF exceedances of fluoranthene and pyrene and one well for copper. The groundwater quality for all four monitoring wells identified provincial exceedances of alert levels for arsenic, pyrene and fluoranthene.

The chemical analytical results of groundwater samples retrieved as part of the Phase II ESA and compared to the CCME and provincial regulatory standards are summarized in **Figures 5 and 6**.

7.2 GROUNDWATER CONTROL REQUIREMENT

If groundwater is encountered within the excavations, the dewatering discharge must be contained. Sampling and analysis must be conducted in order to confirm the quality of the discharge water in order to ensure that it meets the appropriate discharge criteria.

Dewatering of excavations may be needed during the course of the excavation activities. Excavations should be constructed in stages and surface water should be directed away to prevent significant pooling of runoff at the site. Appropriate permits will need to be in place prior to commencing excavation.

7.3 PERMITS AND APPROVALS

7.3.1 PERMIT TO TAKE WATER

No specific permits are required in Québec to dewater excavations. Provincial regulations do not apply to federal sites.

7.3.2 DISCHARGE PLAN DURING EXCAVATION

Groundwater inflows pumped from the excavations at the Site will need to be contained. Sampling and testing is required to determine discharge options.

Storm water flow will continue to be conveyed to the existing ditches via swales and overland flow. Water discharge to any of the storm water ditches at the site will be directed through sediment control systems and erosion control systems. Appropriate systems may include silt fences, silt filter socks, straw bales, and rock check dams to ensure that no erosion and sedimentation occur at these locations. This will ensure that there will be no significant erosion on the Site.

Samples of water must be collected from the sumps or treatment tanks/settling basins prior to discharge. Should the nature of the discharge water change (i.e., turbidity, odour, colour) then additional sampling will be conducted at the discretion of the Department Representative. The samples will be analyzed for parameters set out in the provincial MELCC groundwater discharge to the surface standards if they are to be disposed in the surface water network.

In the event that the water does not meet the discharge standards, excess groundwater can only be pumped directly by licenced liquid waste haulers or on-Site storage tanks/containers and then treated on site with a mobile treatment system and/or disposed of at a MELCC licenced off-Site liquid waste receiving facility.

7.4 ENGINEERING CONTROLS AND TREATMENT MEASURES

If groundwater control is required, then the system will operate in compliance with following:

- Requirements (including water quality requirements) of any discharge to the surface as per MELCC regulation.

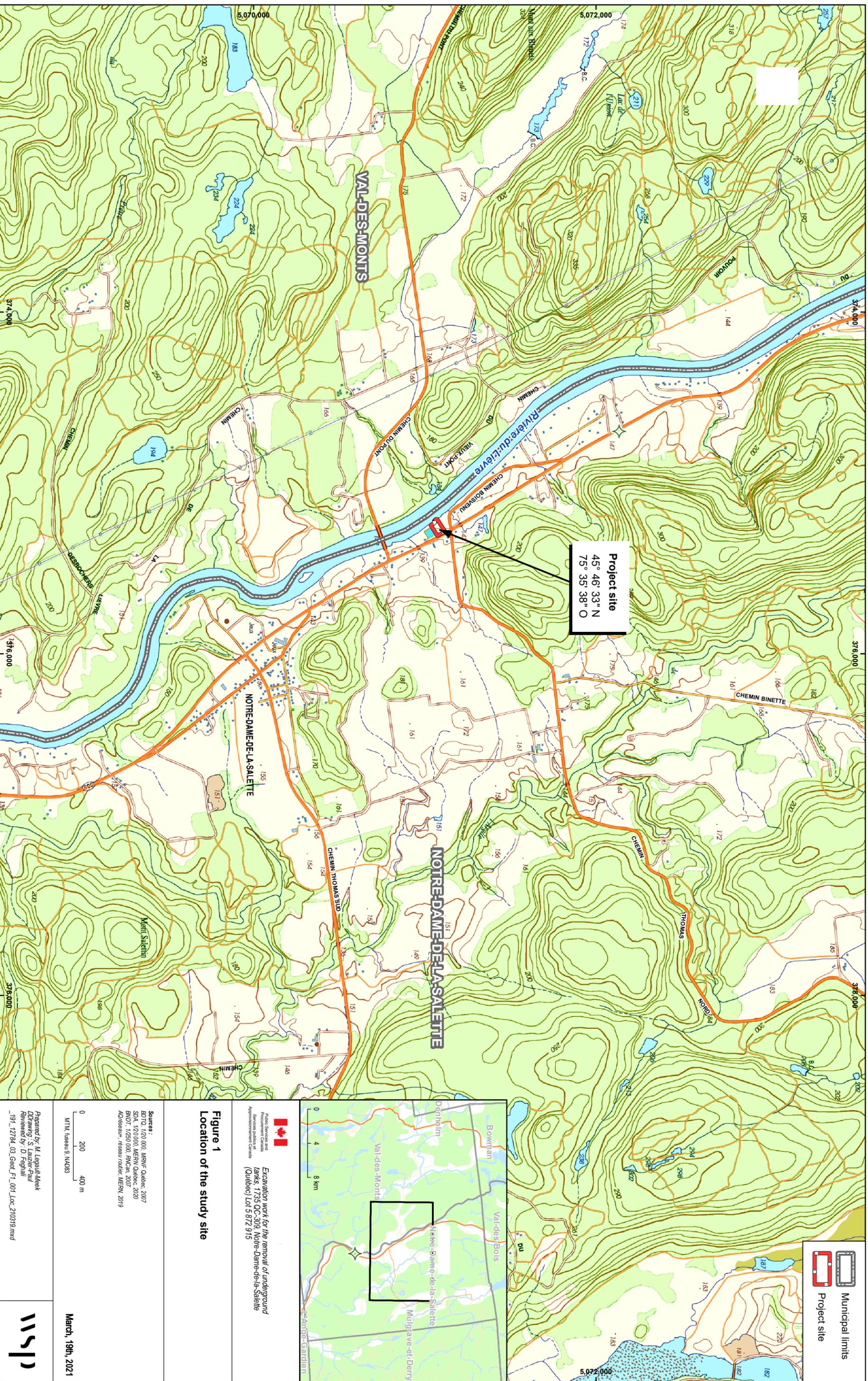
Monitoring of dewatering systems needs to include the following:

- The designer of the dewatering system will inspect the systems to ensure that they are installed and operated in accordance with the design. The systems will be inspected on a daily basis by a representative of the General Contractor in order to ensure that they are functioning appropriately.
- Results of the water quality sampling will be maintained at the site.
- The operation of the dewatering system will be documented in the daily site inspection record. The record will include the following information:
 - A summary of observations and results of qualitative monitoring (visual, odour, etc.) of the seepage noted at the excavations of the site.
 - A summary of any unusual or unexpected groundwater conditions encountered during excavation and dewatering will be provided.
 - Identification of any mitigation or remedial plans that have been implemented or proposed to be implemented at the site.

APPENDIX

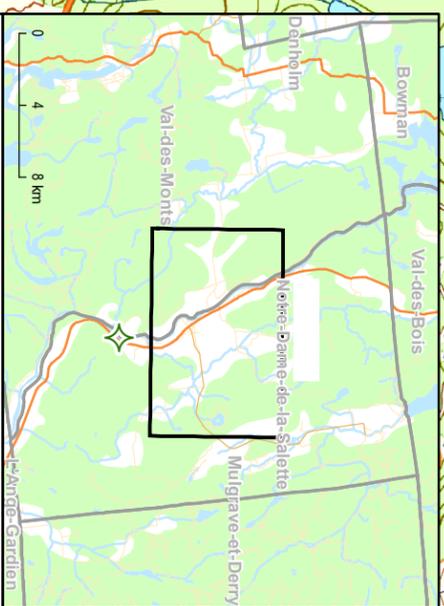
FIGURES





Project site
 45° 46' 33" N
 75° 35' 38" O

 Municipal limits
 Project site



 Public Services and Procurement Canada
 Services publiques et Approvisionnement Canada
 Excavation work for the removal of underground tanks, 1735 QC-309, Notre-Dame-de-la-Salette (Québec) Lot 5 872 915

Figure 1
 Location of the study site

Sources :
 BDTQ, 1/20 000, MRNF Québec, 2007
 SDA, 1/20 000, MERN Québec, 2020
 BMDI, 1/250 000, RNCAN, 2017
 Adressair™, réseau routier, MERN, 2019

0 200 400 m
 MTM, fuseau 9 MAD83

Prepared by: M. Legault-Misek
 Drawing: S. D. Reginald
 Reviewed by: D. Reginald
 _191_12784_03_Geod_F1_001_Loc_2103191.mxd

March, 19th, 2021





- Project site
- Environmental boreholes
- Geotechnical boreholes
- Monitoring wells (environmental)
- Water mains (approximate position)
- Overhead cables

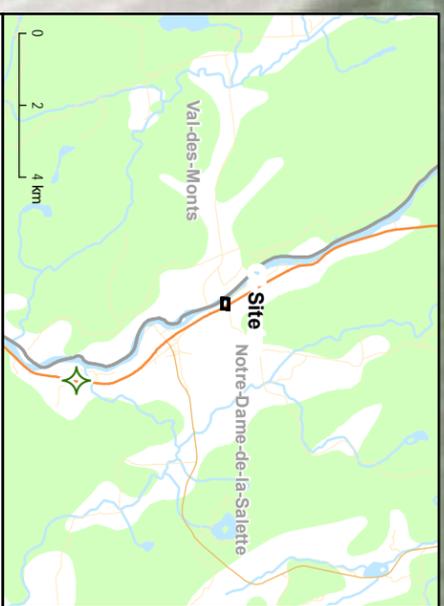


Figure 2
Location of boreholes

Public Services and Procurement Canada
Services publics et Approvisionnement Canada
(Quebec) Lot 5 872 915

Excavation work for the removal of underground tanks, 1135 QC-309, Notre-Dame-de-la-Salérette (Quebec), Lot 5 872 915

Sources:
BDTQ, 1120 000, MRNF, Québec, 2007
SDA, 1120 000, MERN Québec, 2020
BDQ1, 11250 000, RNCAN, 2007
Adresseair - réseau routier, MERN, 2019
Image satellite, Google, 2019

0 5 10 m
MTM, lisseau 9, MAD83

Prepared by: M. Legault-Meek
Drawing by: L. Estérel
Reviewed by: D. Fregault
_191_12784_03_Geotec-F2_202_Sondages_211118.ai

November 18th, 2021





MMW-15 January 28, 2021

1	0,30 - 0,91	HP C ₁₀ -C ₅₀	HAP	COV	Mix
4	2,13 - 2,74	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-06 January 26, 2021

2	0,65 - 1,22	HP C ₁₀ -C ₅₀	HAP	COV	Mix
5	2,13 - 2,74	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-10 January 26, 2021

3	2,27 - 2,38	HP C ₁₀ -C ₅₀	HAP	COV	Mix
6	3,05 - 3,25	HP C ₁₀ -C ₅₀	HAP	COV	Mix

MMW-21 January 19, 2021

1	0,00 - 0,61	HP C ₁₀ -C ₅₀	HAP	COV	Mix
3	1,22 - 1,52	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-11 January 18, 2021

1	0,24 - 0,61	HP C ₁₀ -C ₅₀	HAP	COV	Mix
3	0,91 - 1,52	HP C ₁₀ -C ₅₀	HAP	COV	Mix

MMW-20 January 18, 2021

1	0,22 - 0,35	HP C ₁₀ -C ₅₀	HAP	COV	Mix
2	0,35 - 0,80	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-08 January 26, 2021

1	0,15 - 0,61	HP C ₁₀ -C ₅₀	HAP	COV	Mix
4	1,52 - 2,13	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-14 January 22, 2021

CF1	0,00 - 0,61	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF5	2,44 - 3,05	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-13 January 21, 2021

CF1	0,15 - 0,61	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF5	2,44 - 3,05	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-01 January 20, 2021

CF4	1,83 - 2,44	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF6	3,05 - 3,66	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-12 January 21, 2021

CF1A	0,00 - 0,50	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF1A	0,00 - 0,50	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF5	2,44 - 3,05	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-16 January 26, 2021

1	0,87 - 1,01	HP C ₁₀ -C ₅₀	HAP	COV	Mix
4	1,52 - 2,13	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-09 January 25, 2021

CF1	0,50 - 0,70	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF5	2,13 - 2,74	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-04 January 25, 2021

CF1	0,90 - 1,22	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF3	1,52 - 1,90	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-17 January 26, 2021

5	2,13 - 2,74	HP C ₁₀ -C ₅₀	HAP	COV	Mix
7	3,05 - 3,66	HP C ₁₀ -C ₅₀	HAP	COV	Mix

MMW-19 January 19, 2021

1	0,42 - 1,12	HP C ₁₀ -C ₅₀	HAP	COV	Mix
4	2,13 - 2,74	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-05 January 25, 2021

CF1	0,54 - 0,76	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF4	1,52 - 2,13	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-07 January 19, 2021

2	0,91 - 1,52	HP C ₁₀ -C ₅₀	HAP	COV	Mix
4	2,00 - 2,57	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-18 January 28, 2021

1	0,89 - 1,30	HP C ₁₀ -C ₅₀	HAP	COV	Mix
5	2,74 - 3,05	HP C ₁₀ -C ₅₀	HAP	COV	Mix

B-03 January 20, 2021

CF2A	0,86 - 1,01	HP C ₁₀ -C ₅₀	HAP	COV	Mix
CF3B	1,01 - 1,22	HP C ₁₀ -C ₅₀	HAP	COV	Mix

CHEMIN THOMAS N

Soil samples analytical results in relation with the MELCC's criteria and Limit Values²

Borehole	Date	Borehole identification
CF1	0,00 - 0,50	Not sampled or not analyzed
CF2	0,50 - 1,00	Concentration ≤ A or not detected
CF3	1,50 - 2,00	Concentration > A or ≤ B
CF4	2,00 - 2,50	Concentration > B2 or ≤ C
CF5	2,50 - 3,00	Concentration > C or < RESC
CF6	3,00 - 3,50	Concentration ≥ RESC

Samples Analyzed intervals (m)

¹ General criteria of the Intervention Guide - Protection and rehabilitation of contaminated soils (MELCC, march 2019).

² Norms of Appendix 1 of the Règlement sur l'enfouissement des sols contaminés (RESC).

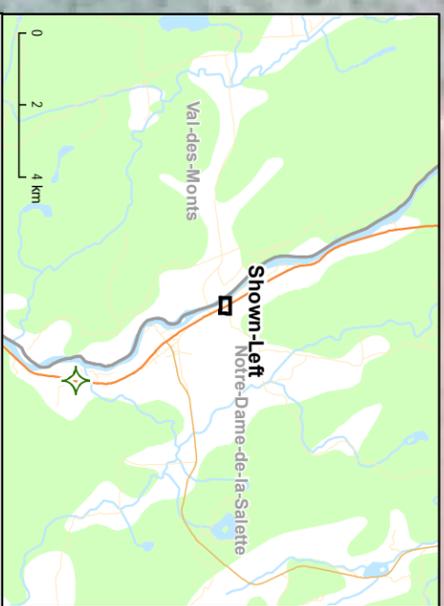
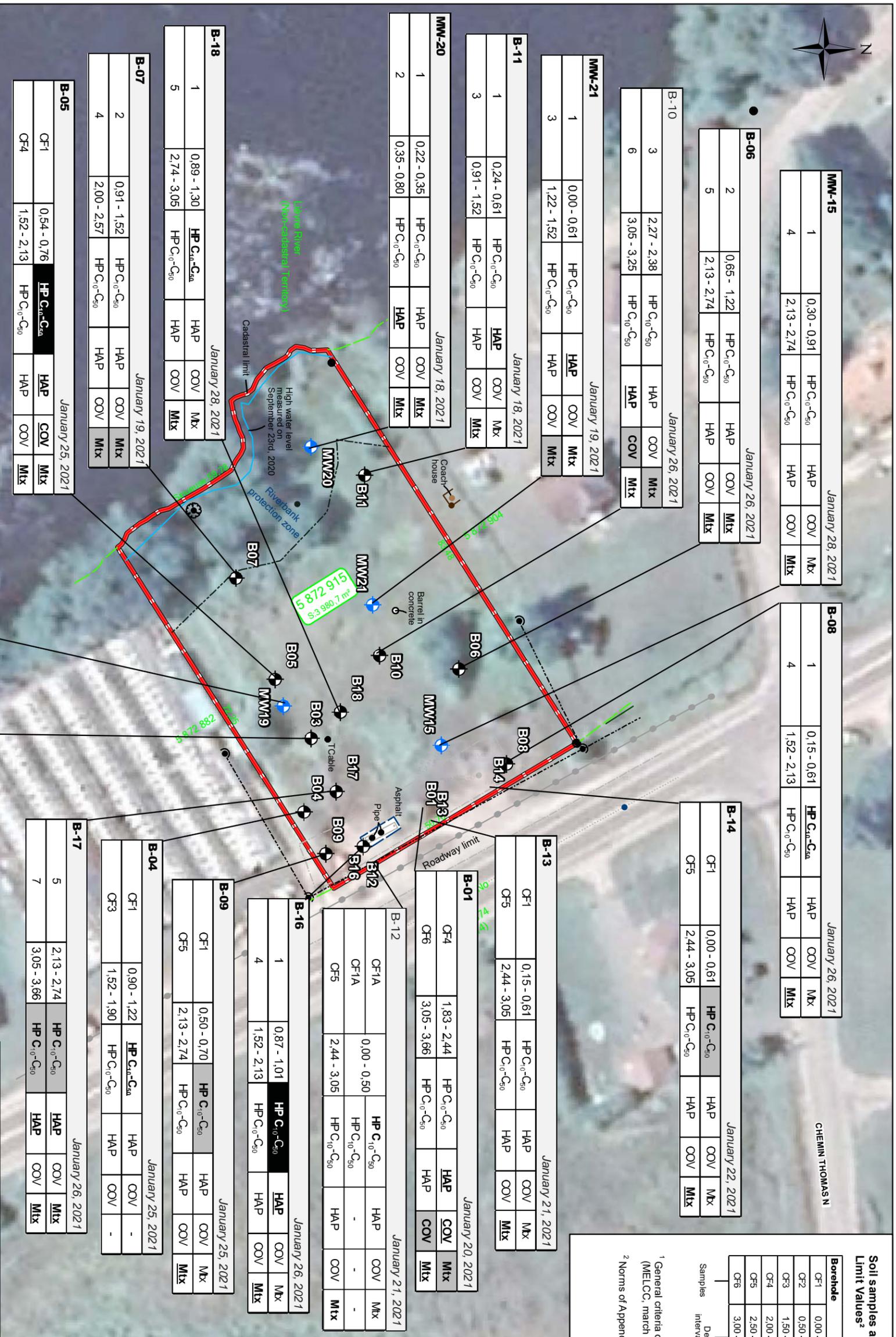


Figure 3
Soil results - PSRTC

Phase II
1735 OC-309, Notre-Dame-de-la-Salette (Québec)
Lot 5 872 915

Sources :
BDTC, 1/20 000, MRNF, Québec, 2007
SDA, 1/20 000, MERN, Québec, 2020
BDN1, 1/250 000, RNCAN, 2007
Adresses.ca - réseau routier, MERN, 2019
Image satellite, Google, 2019

Préparation : M. Legault-Méek
Dessins : A. Hébert
Approbation : M. Rochon
_191_17184_03_P1_F3_003_ResultsPSRTC_211118.ai

November 18, 2021





Barium (Ba)	580	-
Chromium (Cr)	67	67
Nickel (Ni)	46	-
Naphtalene	0.12	0.038
Benzene	-	0.64
Ethylbenzene	1.4	0.87

Barium (Ba)	1100
Copper (Cu)	110
Lead (Pb)	260
Zinc (Zn)	420

MW-21-1	MW-21-3
Barium (Ba)	590
Chromium (Cr)	68
Phenanthrene	0.17

BH-11-1	Phenanthrene
0.1	

MW-20-1	MW-20-2
Chromium (Cr)	100
Nickel (Ni)	62
Zinc (Zn)	270
Phenanthrene	0.066

B-07-2	B-07-4
Barium (Ba)	780
Chromium (Cr)	65
Lead (Pb)	700
Zinc (Zn)	330

B-05-CF1	F3 ¹	F4 ¹	Lead (Pb)	Naphtalene	Phenanthrene	Benzene	Ethylbenzene
9800	4200	280	0.027	0.05	0.086	0.11	

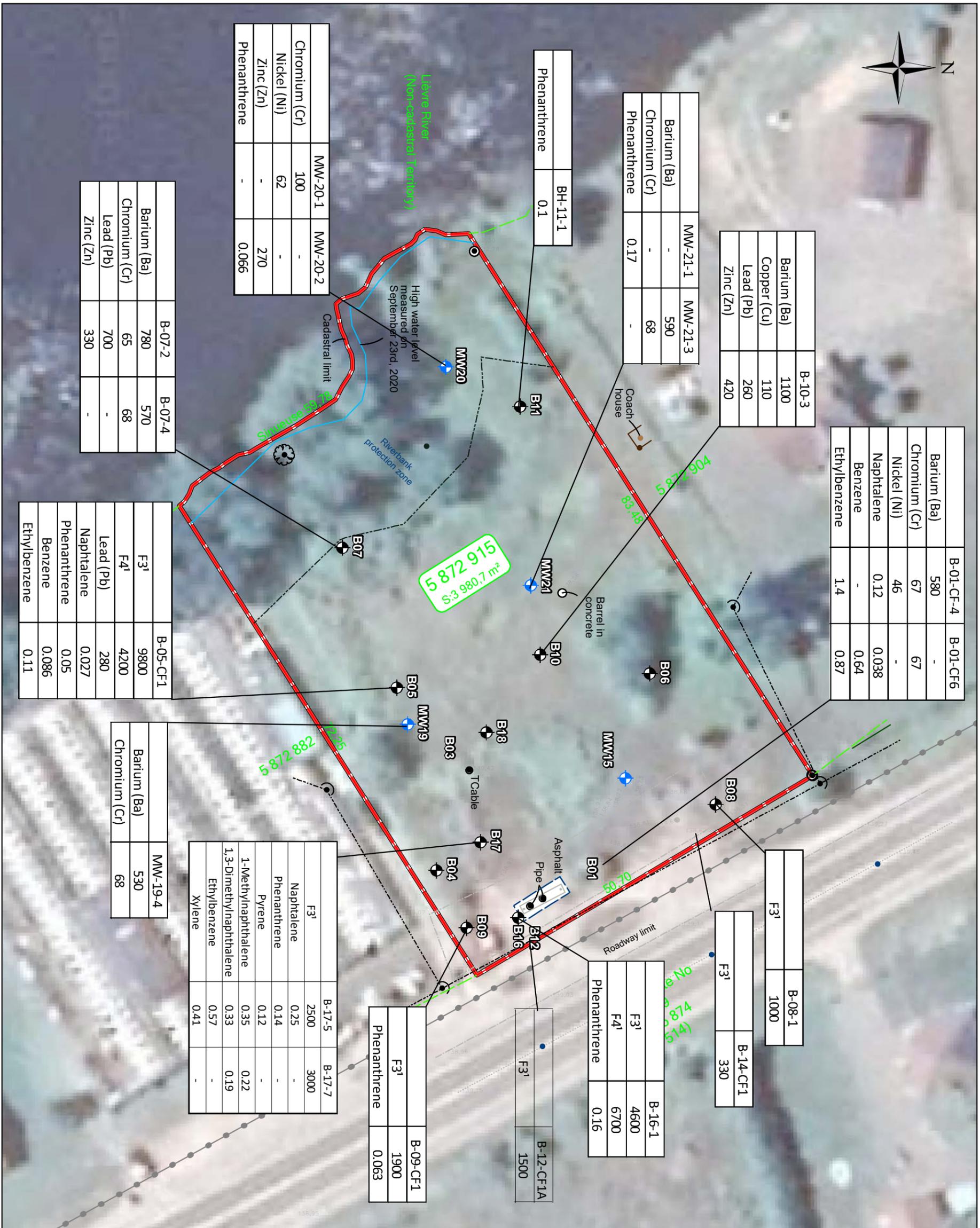
MW-19-4	Barium (Ba)	530
Chromium (Cr)	68	

B-17-5	B-17-7
F3 ¹	2500
Naphtalene	0.25
Phenanthrene	0.14
Pyrene	0.12
1-Methylnaphtalene	0.35
1,3-Dimethylnaphtalene	0.33
Ethylbenzene	0.57
Xylene	0.41

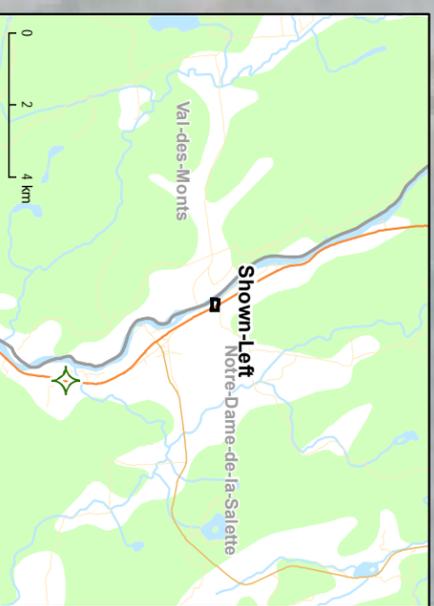
B-09-CF1	F3 ¹	Phenanthrene
1900		0.063

B-16-1	F3 ¹	F4 ¹	Phenanthrene
4600		6700	0.16

B-12-CF1A	F3 ¹	Phenanthrene
1500		



- Project site
 - Borehole
 - Monitoring well
 - Water mains (approximate position)
 - Overhead cables
- 0.2 - Exceeds the limits of CCME**



Phase II
 1735 OC-309, Notre-Dame-de-la-Salette (Québec)
 Lot 5 872 915

Figure 4
 Soil results - CCME

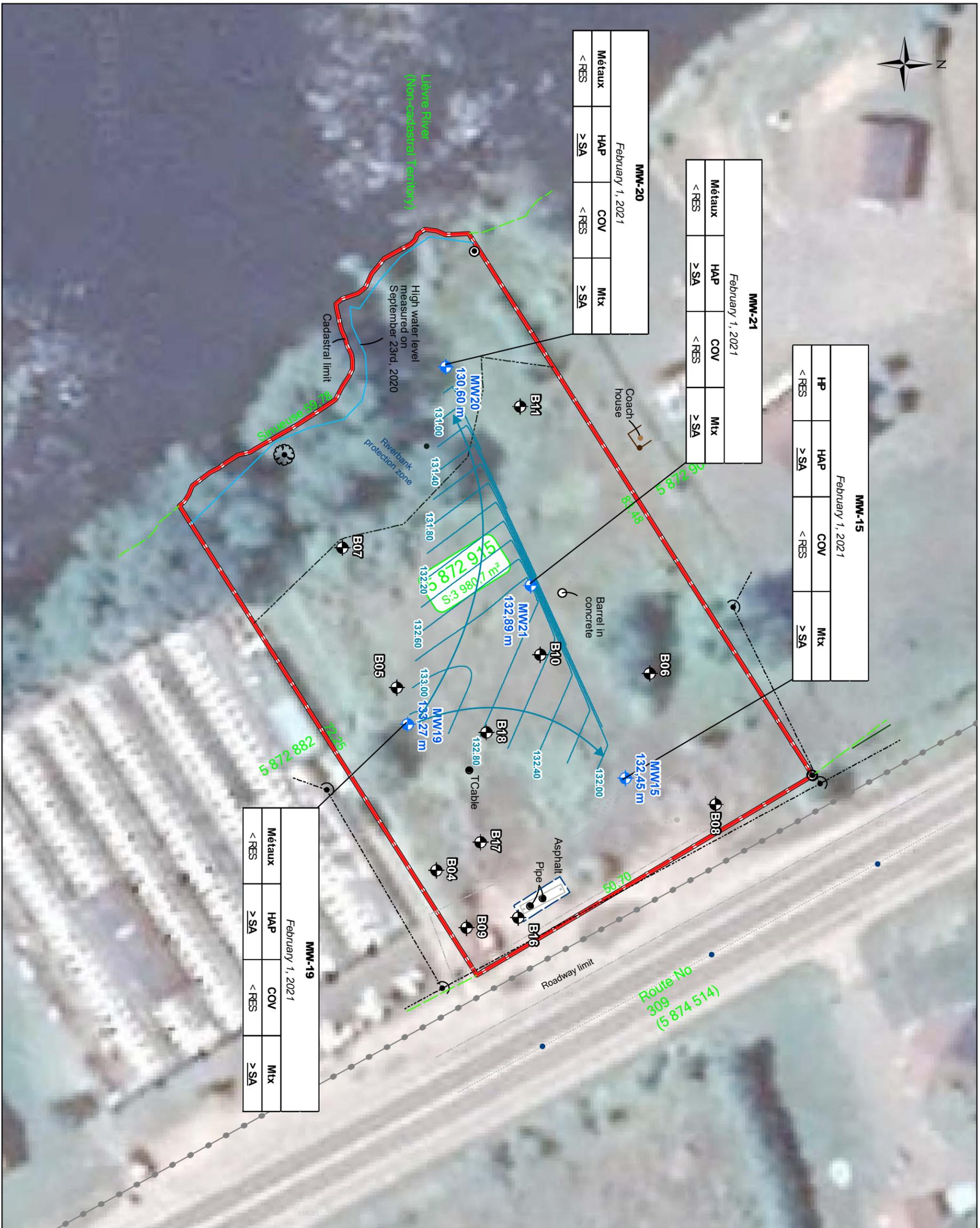
Sources :
 BDTQ, 1/20 000, MRNF, Québec, 2007
 SDA, 1/20 000, MERN, Québec, 2020
 BND1, 1/250 000, RNCAN, 2017
 Adressesur - ressur routier, MERN, 2019
 Image satellite, Google, 2019



November 18, 2021

Préparation : M. Legault-Mack
 Dessin : A. Hébert
 Approbation : M. Rochon
 _191_12784_03_P1_F4_003_ResultsCCME_211118.ai





Project site

- Project site
- Borehole
- Monitoring well
- Water mains (approximate position)
- Overhead cables

Piezometric measurements (February 1, 2021)

- Flow Direction Of Groundwater
- Piezometric Contour (X.XX m)
- Groundwater Elevation In Meters

Groundwater Analytical Results Based on MELCC Criteria*

MW-19	February 1, 2021
Groundwater	sample identification
Metals	Analyzed parameters
< RES	Concentration < criteria*
< RES	Concentration > the alert threshold*
> RES	Concentration > criteria*
-	Not analyzed or undefined

*Critère "Eau de consommation" (EC) ou "Résurgence dans l'eau de surface" (RES) du Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés (MELCC, mars 2019). Les seuils d'alerte correspondent à 50 % des valeurs des critères pour la RES

Phase II

1735 OC-309, Notre-Dame-de-la-Salette (Québec)

Lot 5 872 915

Figure 5

Groundwater results - PSRTC

Sources :

- BDTQ, 1:20 000, MRNF, Québec, 2007
- SDA, 1:20 000, MERN Québec, 2020
- BDI, 1:250 000, RNCAN, 2007
- Adresseur, réseau routier, MERN, 2019
- Image satellite, Google, 2019

Préparation : M. Legault-Melek
 Dessin : A. Hébert
 Approbation : M. Rochon
 _191_12784_03_P1_F5_005_ResultsFaupPSRTC_211118.ai

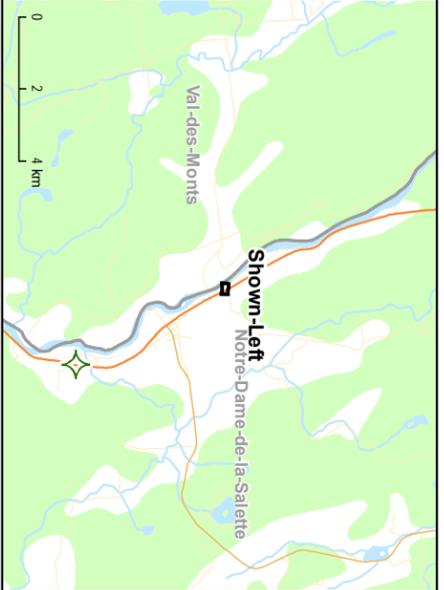
November 18, 2021



- Project site
- Borehole
- Monitoring well
- Water mains (approximate position)
- Overhead cables
- Piezometric measurements (February 1, 2021)**
- Flow Direction Of Groundwater
- Piezometric Contour (X.XX m)
- XX.XXX m Groundwater Elevation In Meters

Groundwater Analytical Results Based on MELCC Criteria

MW-19	Groundwater
February 1, 2021	sample identification
Metals	Analyzed parameters
< RES	Concentration < criteria
> RES	Concentration > criteria
-	Not analyzed or undefined



Phase II
 1735 OC-309, Notre-Dame-de-la-Salette (Quebec)
 Lot 5 872 915

Figure 6
Groundwater results -CCME

Sources :
 BDTQ, 1/20 000, MRNF, Québec, 2007
 SDA, 1/20 000, MERN, Québec, 2020
 BMD1, 1/250 000, RNCAN, 2007
 Adressesair, réseau routier, MERN, 2019
 Image satellite, Google, 2019



November 18, 2021



APPENDIX 3

**PSPC Storage Tank System
Withdrawal and Removal Form
TPSGC
June 2020**

4 pages



PSPC Storage Tank System Withdrawal and Removal Form

Instructions	For use by the National Storage Tank Subject Matter Expert
<ul style="list-style-type: none"> Complete one form for each Storage Tank System that is: <ul style="list-style-type: none"> temporarily withdrawn from service permanently withdrawn from service removed Complete applicable sections only Ensure all required signatures are included in Section 6 (Certification) Return completed form to: EnregistrementRS.STRegistration@tpsgc-pwgsc.gc.ca 	Date first received
	Subsequent date received <small>(due to incomplete information, if applicable)</small>
	Date entered into FIRSTS
	Entered by
	Comments
PSPC Registration Process for Storage Tank Systems	For use by the Regional Storage Tank Subject Matter Expert
https://gcdocs.gc.ca/tpsgc-pwgsc/lisapi.dll/link/76006565	Comments

SECTION 1: PURPOSE OF NOTIFICATION (Check all that apply)	
<input type="checkbox"/> Component(s) temporary withdrawal <i>(complete sections 2, 3 & 6)</i> <input type="checkbox"/> Component(s) permanent withdrawal <i>(complete sections 2, 4 & 6)</i> <input type="checkbox"/> Storage tank system temporary withdrawal <i>(complete sections 2, 3 & 6)</i> <input type="checkbox"/> Storage tank system permanent withdrawal <i>(complete sections 2, 4 & 6)</i> <input type="checkbox"/> Component(s) removal <i>(complete sections 2, 5 & 6)</i> <input type="checkbox"/> Storage tank system removal <i>(complete sections 2, 5 & 6)</i>	Environment and Climate Change Canada (EC) Storage Tank Identification Number: EC - _____

SECTION 2: LOCATION OF STORAGE TANK SYSTEM AND DOCUMENTS	
Facility Name	Street address where tank system is located <small>(or provide GPS coordinates or latitude & longitude)</small>
Street address where tank system records are located	Street address where environmental emergency response plan is located
<input type="checkbox"/> Same location as the storage tank system	<input type="checkbox"/> Same location as the storage tank system <input type="checkbox"/> Not applicable (storage tank system has been removed)

Description of action taken on contamination (please provide summary only or attach reports)										
No long-term harmful effects³	<input type="checkbox"/> Yes <input type="checkbox"/> No									
Label attached to fill pipe <i>SOR/2008-197 Section 44.(4)</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No									
Name of person withdrawing component or storage tank system (print):					Certification Number:					
_____					_____					
Must be withdrawn by a person approved to do so in the province in which the system or component is located, or withdrawal is supervised by a professional engineer in accordance with SOR/2008-197 Section 44.(1)										

SECTION 5: REMOVAL FROM SERVICE										
	Tank _____		Tank _____		Tank _____		Tank _____		Tank _____	
	Tank	Component	Tank	Component	Tank	Tank	Component	Tank	Component	Tank
Date removed <i>SOR/2008-197 Section 45</i>	YYYY/MM/DD									
Removed by an approved person	<input type="checkbox"/> Yes <input type="checkbox"/> No									
Withdrawal records kept⁴	<input type="checkbox"/> Yes <input type="checkbox"/> No									
Name of person removing component or storage tank system (print):					Certification Number:					
_____					_____					
(Must be withdrawn by a person approved to do so in the province in which the system or component is located, or withdrawal is supervised by a professional engineer) in accordance with SOR/2008-197 Section 45.										

³ Has the withdrawal been done in a way such that there will be no immediate or long-term harmful effect on the environment and it will not constitute a danger to human life or health?

⁴ Records must be kept at the owner's or operator's place of work nearest to the system for five (5) years after the day on which the withdrawal and/or removal record was made (*SOR/2008-197 Section 46.(1)*).

SECTION 6: CERTIFICATION

This section to be completed by the Building Technician/Operator/Contractor/Consultant/Project Manager:

I hereby certify that the information provided with respect to the identification of the storage tank system under Section 28 of the *Storage Tank Systems for Petroleum and Allied Petroleum Products Regulations* (SOR 2008-197) is accurate and complete.

Name _____ Title _____

Signature _____ Date (YYYY/MM/DD) _____

This section to be completed by PSPC Regional Storage Tank Subject Matter Expert:

I hereby certify that I have reviewed the contents of this form to ensure that information provided with respect to the identification of the storage tank system under Section 28 of *Storage Tank Systems for Petroleum and Allied Petroleum Products Regulations* (SOR 2008-197) is complete and accurate to the best of my knowledge.

Regional PSPC Storage Tank Subject
Matter Expert

Name _____ Title _____

Signature _____ Date (YYYY/MM/DD) _____

This section to be completed by the PSPC Asset Manager:

I hereby certify that the information provided with respect to the identification of the storage tank system under Section 28 of the *Storage Tank Systems for Petroleum and Allied Petroleum Products Regulations* (SOR 2008-197) is complete.

PSPC Asset Manager

Name _____ Title _____

Signature _____ Date (YYYY/MM/DD) _____

APPENDIX 4

Geotechnical report

WSP

June 2021

97 pages

GEOTECHNICAL STUDY

EXCAVATION WORK FOR THE REMOVAL OF UNDERGROUND TANKS - 1735 ROUTE 309, NOTRE-DAME-DE-LA-SALETTE, QUEBEC

JUNE 2021

CONFIDENTIAL





GEOTECHNICAL STUDY

EXCAVATION WORK FOR THE REMOVAL OF UNDERGROUND TANKS - 1735 ROUTE 309, NOTRE-DAME-DE-LA- SALETTE, QUEBEC

PUBLIC SERVICES AND PROCUREMENT
CANADA

REPORT (FINAL VERSION)
CONFIDENTIAL

PROJECT NO.: 191-12784-03
DATE : JUNE 2021

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Project number	191-12784-03		

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This report was prepared by WSP for the account of Public Services and Procurement Canada, in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

CLIENT

PUBLIC SERVICES AND PROCUREMENT CANADA

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Operations

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- B** BOREHOLE LOGS
- C** LABORATORY ANALYSIS
- D** PHOTOGRAPHIC REPORT

1 INTRODUCTION

1.1 CONTEXT

PUBLIC SERVICES AND PROCUREMENT CANADA requires a geotechnical study on lot 5 872 915 in Notre-Dame-de-la-Salette, Quebec, at 1735, route 309.

The study site is occupied by an abandoned gas station and has been the subject of separate Phase I and Phase II Environmental Site Assessments (ESA). The geotechnical study was required as a complement to the Phase II ESA as part of the excavations required in the vicinity of route 309 and elsewhere on the site, to allow for the removal of the former underground storage tanks.

The overall location of the study site is shown in Figure 1, while Figure 2 shows the site boundaries and details of the investigation conducted.

1.2 MANDATE OBJECTIVES

The objectives of the geotechnical study are as follow:

- Determine the nature and properties of the soils by drilling and testing;
 - Evaluate the necessary geotechnical parameters of the local soils for the stability study of the excavation walls and support structure as well as the backfill procedures;
 - Assess the reuse potential of excavated soil.
-

1.3 DESCRIPTION OF THE STUDY SITE

The study site is located in the municipality of Notre-Dame-de-la-Salette, in a commercial, residential and agricultural sector near route 309. It is bounded to the north by a residential sector including Boisvenu Street, to the east by route 309 and then by a residential and agricultural sector. To the south are commercial greenhouses and to the west the Lièvre River. The study site is owned by the Government of Canada as it is an orphan site. The study site is accessible via route 309.

The eastern section of the study site has a relatively flat surface and is almost entirely occupied by grassy areas. A concrete slab corresponding to a former fuel pump island is visible in the southeast corner while an asphalt surface is present in the northeast corner. The western section of the study site has a steep downward slope towards the Lièvre River and is entirely occupied by grassy and wooded areas. The study site is almost rectangular in shape, with a surface area of 3981 m² and the coordinates of its central point are as follows: 45°46' 33" N latitude and 75°35' 38" W longitude.

1.4 LIMITATIONS AND GENERAL CONDITIONS

This report has been prepared at the request of Public Services and Procurement Canada. No copies of this report, in whole or in part, may be made by any third party without the express consent of Public Services and Procurement Canada.

This report is subject to certain limiting conditions that arise from the problems inherent to the contamination phenomena and to the geological, geotechnical and hydrogeological profiles of any site under investigation by drilling. It is important to emphasize that these conditions and limitations are part of this report and allow a better understanding of it. They are presented in detail in **Appendix A**.

2 METHODOLOGY

2.1 LOCATION OF BOREHOLES AND UNDERGROUND INFRASTRUCTURES

All five (5) geotechnical boreholes, identified as B-01, B-03, B-12, B-13 and B-14 were implemented in the study area at the same time as the environmental boreholes, identified on Figure 2.

The request to locate underground infrastructures was made through Info-Excavation, the Municipality of Notre-Dame-De-La-Salette's localisation service and the specialized firm Promark for private underground infrastructures.

No public utility member of Info-Excavation was present on the site. Public municipal infrastructures (sewers, watermains, traffic lights, etc.) were present and were identified by the Municipality.

2.2 DRILLING AND SAMPLING

For presentation purposes, only the geotechnical boreholes are discussed in the methodology. For the methodology and detailed soil stratigraphy of the environmental borings, the Phase II ESA report, provided under separate cover, will be available.

The geotechnical drilling was carried out on January 20, 21 and 22, 2021. The boreholes were advanced with a geoprobe drill operated by Forages L.L.E., under the constant supervision of WSP's technical staff.

Based on the excavation area, drilling was carried out to a minimum depth of 8 m.

For all boreholes, B-caliber split-spoons (51 mm outside diameter and 610 mm length) were used to determine the N values of the standard penetration test (according to ASTM D1586) and collected reworked soil samples at the same time. Sampling was conducted at continuous intervals. The samples were visually described to identify the nature and type of soil encountered.

The Nilcon field vane was used to measure the undrained shear strength of both the intact and remoulded clay in all five boreholes.

At borehole B-14, soil sampling was terminated at a depth of 8.53 m. Drilling continued with Dynamic Cone Penetrometer (DCP) testing to a depth of approximately 29 m with no refusals recorded.

For geotechnical purposes, samples were placed in sealed plastic bags for analysis. All soil samples collected during the field work were sent to our laboratory for further visual examination and laboratory testing to determine the properties of the soils in place.

The stratigraphic description of the boreholes is presented in the borehole reports in **Appendix B**.

The coordinates, elevation, and sampled depth of the boreholes are provided in **Table 2-1** below.

Table 2-1 **Coordinates, elevation and depth of boreholes**

BOREHOLE	WEST COORDINATE (M) ⁽¹⁾	NORTH COORDINATE (m) ⁽¹⁾	GEODETTIC ELEVATION (m)	REACHED DEPTH (m)
B-01	375294	5071089	139.06	8.53
B-03	375280	5071068	138.53	9.30
B-12	375304	5071079	139.02	9.30
B-13	375296	5071090	139.90	9.00
B-14	375290	5071101	138.65	28.96

(1) The coordinates presented are in NAD83-MTM zone 9.

2.3 LABORATORY TESTING

A total of seventeen (17) soil samples collected from the boreholes were selected and sent to the WSP laboratory in Ottawa to evaluate certain geotechnical properties of the intercepted soils in the boreholes. The list of tests performed is presented in the table below. The results of the laboratory analyses are presented in **Appendix C**.

Table 2-2 **Laboratory testing - soil**

BOREHOLE	SAMPLE	DEPTH (M)	TEST
B-01	CF-05	2.44 – 3.05	Grain size distribution analysis (BNQ 2501 025) Atterberg limits (ASTM D4318) Moisture content (BNQ 2501-170)
B-01	CF-07	3.66 – 4.27	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-01	CF-11	6.10 – 6.71	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-03	CF-04	1.34 – 1.83	Grain size distribution analysis (BNQ 2501-025) Atterberg limits (ASTM D4318) Moisture content (BNQ 2501-170)
B-03	CF-05	2.44 – 3.05	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-03	CF-07	3.66 – 4.27	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-12	CF-1A	0.00 – 0.50	Grain size distribution analysis (BNQ 2501-025)
B-12	CF-02	0.61 – 1.22	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-12	CF-05	2.44 – 3.05	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-12	CF-08	4.27 – 4.88	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-13	CF-03	1.22 – 1.83	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)

BOREHOLE	SAMPLE	DEPTH (M)	TEST
B-13	CF-08	4.27 – 4.88	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-13	CF-12	6.71 – 7.32	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-14	CF-02	0.61 – 1.22	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-14	CF-06	3.05 – 3.66	Grain size distribution analysis (BNQ 2501-025) Atterberg limits (ASTM D4318) Moisture content (BNQ 2501-170)
B-14	CF-08	4.27 – 4.88	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)
B-14	CF-10	5.49 – 6.10	Moisture content (BNQ 2501-170) Atterberg limits (ASTM D4318)

3 SUBSURFACE CONDITIONS

3.1 STRATIGRAPHIC SUMMARY

A layer of granular fill was generally encountered in the boreholes. Clay fill also appeared to be in place in some locations (remoulded clay). The fill was overlying the natural clay deposit. The bedrock was not reached in any borehole. Detailed descriptions of the stratigraphic layers are presented in the following sections. Table 3-1 below summarizes all stratigraphic units and their depths. Detailed borehole descriptions are presented in the logs in **Appendix B**.

Table 3-1 Stratigraphic summary

BOREHOLE	ASPHALT DEPTH (m) [ELEVATION (m)]	GRANULAR FILL DEPTH (m) [ELEVATION (m)]	PROBABLE CLAY FILL DEPTH (m) [ELEVATION (m)]	NATURAL CLAY DEPOSIT ⁽¹⁾ DEPTH (m) [ELEVATION (m)]
B-01	-	0.00 – 0.61 [139.06 – 138.45]		0.61 – 8.53 [138.45 – 130.53]
B-03	-	-	0.00 – 1.34 ⁽²⁾ [138.54 – 137.19]	1.34 – 9.30 [137.19 – 129.23]
B-12	-	0.00 – 0.50 [139.02 – 138.52]		0.50 – 9.30 [138.52 – 129.72]
B-13	0.00 – 0.15 [139.90 – 139.75]	0.15 – 0.61 [139.75 – 139.29]		0.61 – 9.00 [139.29 – 130.90]
B-14	-	0.00 – 0.61 [138.65 – 138.04]	0.61 – 3.66 ⁽²⁾ [138.04 – 134.99]	3.70 – 28.96 [134.95 – 109.69]

(1) Depth confirmed by sampling or by means of in situ tests (scissometer, DCPT).

(2) Intermittent sand layers in the probable clay fill.

3.2 ASPHALT

A 150 mm thick layer of asphalt was encountered at borehole B-13 on the surface.

3.3 GRANULAR FILL

A layer of granular fill consisting of gravelly sand, some silt and trace clay was encountered at all the boreholes except B-03. This fill was present under the asphalt (B-13) or directly on the surface. The gravelly sand was generally frozen at the time of the investigation and its compactness could not be assessed, the N-values being unrepresentative under these conditions.

A grain size analysis was carried out on a surface sample from borehole B-12. This analysis showed the presence of 21% gravel, 65% sand, 11% silt and 2% clay.

3.4 PROBABLE CLAY FILL

A probable fill layer of remoulded clay was encountered at boreholes B-03 and B-14, extending to depths of 1.34 m and 3.66 m respectively. Sandy layers are also visible in this fill layer. A slightly moist and stiff clay is encountered in the first two meters. However, this clay becomes very soft under the sandy layer at borehole B-14, following a measurement with the Nilcon field vane, that shows a shear strength value equivalent to that of a remoulded clay rather than the much higher values of the intact clay encountered in all the other boreholes.

Two Atterberg limits were performed on this layer at Borehole B-14, one in the stiff upper portion and the other in the very soft lower portion. Table 3-2 shows the results.

Table 3-2 Consistency and moisture content limit results - probable clay fill

BOREHOLE	SAMPLE	DEPTH (m)	WATER CONTENT (%)	LIQUIDITY LIMIT (%)	PLASTICITY LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX (%)	USCS*
B-14	CF-02	0.61 – 1.22	23.65	46.55	18.81	27.74	0.17	CL
B-14	CF-06	3.05 – 3.66	46.08	52.50	20.88	31.62	0.80	CH

* Unified Soil Classification System (USCS)

3.5 NATURAL COHESIVE DEPOSIT

A cohesive silty clay deposit was encountered at all boreholes. The upper part of the deposit consists of a weathered crust, which is a brown, slightly moist, stiff clay with shear strength values greater than 70 kPa for the undrained intact clay. Below the crust, the silty clay gradually becomes grayer, with increasing moisture content with depth, and a firm to stiff consistency. Undrained shear strength values of the intact clay ranged from 42 kPa to 65 kPa, while those of the remoulded clay range from 3 to 13 kPa. The sensitivity of this clay ranges from 4 to 17, corresponding to a moderately sensitive to extra-sensitive clay.

All drilling was terminated at this layer without finding another layer. A dynamic cone penetration test (DCPT) was carried out at borehole B-14 to a depth of 29.0 m. The bedrock was not reached and the low "N" values indicate the probable continuity of the silty clay layer.

Atterberg limits and moisture contents analyses were performed on fourteen (14) samples of this deposit collected from all boreholes. The results are presented in Table 3-3 below and details are presented in Appendix C.

Table 3-3 Consistency limits and moisture content results - cohesive deposit

BOREHOLE	SAMPLE	DEPTH (m)	WATER CONTENT (%)	LIQUIDITY LIMIT (%)	PLASTICITY LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX (%)	USCS*
B-01	CF-05	2.44 – 3.05	37.69	52.90	20.52	32.38	0.53	CH
B-01	CF-07	3.66 – 4.27	41.80	55.90	21.25	34.65	0.59	CH
B-01	CF-11	6.10 – 6.71	44.10	42.54	20.55	21.99	1.07	CL
B-03	CF-04	1.83 – 2.44	34.02	50.92	21.32	29.60	0.43	CH
B-03	CF-05	2.44 – 3.05	42.75	55.60	21.90	33.70	0.62	CH
B-03	CF-07	3.66 – 4.27	41.67	52.70	21.61	31.09	0.65	CH
B-12	CF-02	0.61 – 1.22	28.90	49.75	21.38	28.37	0.26	CL

BOREHOLE	SAMPLE	DEPTH (m)	WATER CONTENT (%)	LIQUIDITY LIMIT (%)	PLASTICITY LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX (%)	USCS*
B-12	CF-05	2.44 – 3.05	42.30	53.69	20.76	32.93	0.65	CH
B-12	CF-08	4.27 – 4.88	38.38	51.69	21.20	30.49	0.56	CH
B-13	CF-03	1.22 – 1.83	41.93	57.35	21.34	36.01	0.57	CH
B-13	CF-08	4.27 – 4.88	43.23	51.09	21.21	29.88	0.74	CH
B-13	CF-12	6.71 – 7.32	42.84	39.33	20.12	19.21	1.18	CL
B-14	CF-08	4.27 – 4.88	40.27	51.65	20.70	30.95	0.63	CH
B-14	CF-10	5.49 – 6.10	41.55	43.77	20.60	23.17	0.90	CL

* Unified Soil Classification System (USCS)

Three (3) grain size distribution analyses were performed on the selected samples to identify its components. The results are presented in Table 3-4 below and details are presented in Appendix C.

Table 3-4 Results of particle size analysis on the cohesive deposit

BOREHOLE	SAMPLE	DEPTH (m)	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	DESCRIPTION
B-01	CF-05	2.44 – 3.05	0	1.0	34.8	64.3	Silty clay, traces of sand
B-03	CF-05	2.44 – 3.05	0	0.6	35.0	64.4	Silty clay
B-14	CF-06	3.05 – 3.66	0	0.6	32.2	67.2	Silty clay

3.6 GROUNDWATER

Four (4) standpipe piezometers were installed in nearby environmental boreholes. The groundwater levels in the wells were slowly raising and might not have reached a confirmed static level. Approximately two weeks after the wells were installed, the subsurface water level ranged from 4 to 5 m deep at wells MW-19 to MW-21. At well MW-15, the measurement was taken four days later and was still over 7 m deep. Table 3-5 below summarizes the measurements made.

Table 3-5 Depth of groundwater

WELL	DEPTH OF GROUNDWATER (M) 2021-02-01	GEODETTIC ELEVATION (M) 2021-02-01
MW-15	7.15	132.45
MW-19	4.94	133.27
MW-20	4.04	130.60
MW-21	4.74	132.88

It should be noted that groundwater levels can vary and are subject to seasonal fluctuations as well as fluctuations in response to major weather events.

4 RECOMMENDATIONS

4.1 GENERAL

This section presents the main recommendations for this project. It is important to note that the geotechnical investigation is based on preliminary information provided by the Client.

According to the information provided, the project involves excavations to remove existing underground tanks on lot 5 872 915 in Notre-Dame-De-La-Salette, Quebec.

The geotechnical investigation revealed a layer of granular fill at the surface of all the boreholes except B-03. Clay fill was also encountered at B-03 and B-14. Under the fill, a natural cohesive deposit was encountered at all boreholes.

Based on the results of the geotechnical investigation and assuming that they are representative of the overall stratigraphy of the site, comments and recommendations are presented in the following sections.

The conditions encountered elsewhere on the site may differ from those observed at the borehole locations, notably the depths of the deposits, their nature and the bedrock depth. In this context, we recommend that the excavations be inspected by a geotechnical engineer to ensure the representativeness of the borehole stratigraphy and, if necessary, to detect any particularities not observed during the geotechnical investigation that could affect our conclusions and recommendations.

4.2 TEMPORARY EXCAVATION AND DRAINAGE

The excavation required to remove the underground tanks will be approximately 4 m deep, according to the information obtained.

Based on the data collected from the geotechnical investigation, the excavations will be carried out mainly in the cohesive deposit, depending on the area and the depths to be reached.

4.2.1 SHORT-TERM DRAINAGE

The groundwater table was measured at a depth of just over 4 m, two weeks after the work was completed. However, it is likely that the water level has not yet reached its static level and is actually a little higher.

Water entry into the trenches must be anticipated. Infiltrations caused by runoff or by water occluded in the surface layers of the soil could also occur during excavations, depending on the climatic conditions or the time of year when the work is carried out.

At the proposed excavations in the study areas, it will be necessary to ensure that an appropriate drainage system is in place to keep the bottom of the excavations dry.

Pumping rates may vary, even considerably, depending on the soil and groundwater conditions at the time of the work. Soils containing a significant proportion of fine particles will be encountered during the excavation work, so measures must be taken to prevent soil erosion caused by the flow of water by providing, if required and depending on the system selected, appropriate geotextile or granular filters.

Lastly, it is important to remind the contractor in charge of the pumping that any discharge of pumped water into the environment must comply with municipal and/or provincial regulations and standards.

4.2.2 SOIL EXCAVATION

It is estimated that the excavations required to remove the old tanks are more than 7 m away from route 309. It is therefore possible to carry out the excavations in open trenches, depending on their depth. It is recommended to have temporary excavation slopes in the order of 1.0H:1.0V in soils above the groundwater level, and 3.0H:1.0V or more gradual below the groundwater level. The excavation slopes should be reduced if there are signs of instability. Excavation sidewalls should be inspected regularly to detect any elements that could break off and endanger workers. In addition, the circulation of vehicles and construction machinery as well as the storage of construction materials and the piling of excavated soil must be avoided in the vicinity of the crest of the excavation for a distance at least equal to the depth of excavation. Backfilling should be done as soon as possible to avoid degradation of exposed slopes.

If necessary, and if there is insufficient space for open trench excavations, a temporary support system could be used. A design by an experienced engineer will be required based on the parameters presented below.

In all cases, temporary excavation works and pumping should be carried out by contractors with recognized expertise in these domains. The execution method of such works is important to ensure quality and proper performance. An appropriate quality control program should be applied during the work.

Assuming that the excavation and temporary support work will last less than a week, it would be realistic to use the cohesion and internal friction angle values of the undrained clay (short term). However, for a duration of work longer than one week, the designer will have to consider the drained clay parameters (long term).

The geotechnical parameters listed in **Table 4-1** are suggested to calculate lateral forces:

Table 4-1 Geotechnical soil parameters for earth pressure calculations

CONDITIONS	PARAMETERS	GRANULAR FILL	CLAY FILL	COHESIVE DEPOSIT (BROWN CLAY CRUST)	LOWER COHESIVE DEPOSIT (GREY)
General	Unit weight, γ_h (kN/m ³) :	19.0	16.0	17.0	17.0
	Effective unit weight, γ (kN/m ³) :	9.2	6.2	7.2	7.2
Undrained conditions - Short term	Cohesion c' (kPa)	0	5	70	40
	Friction angle, Φ (°)	30	0	0	0
Drained conditions - Long term	Cohesion c' (kPa)	0	0	10	10
	Friction angle, Φ (°)	30	24	24	24
Earth pressure coefficients	Active earth pressure coefficient, K_a :	$(1 - \sin \Phi) / (1 + \sin \Phi)$			
	Passive earth pressure coefficient, K_p :	$(1 + \sin \Phi) / (1 - \sin \Phi)$			
	Lateral earth pressure at rest coefficient, K_0 :	$1 - \sin \Phi$			

The extra loads created by the presence of adjacent structures, by the temporary storage of materials or soils, etc. will have to be taken into account in the calculation of the lateral forces. It is important to remember that the designer will have to take into account the additional load caused by traffic on route 309.

The groundwater level should be considered at a depth of approximately 2 m for the calculations. Below this level, the dislodged weight of the soil added to the groundwater pressure should be considered in the calculation of lateral forces.

Excavations must be carried out in compliance with the requirements of the Act respecting occupational health and safety of the Safety Code for the construction industry (CNESST). Temporary excavation slopes for construction purposes are the responsibility of the contractor and will have to be adjusted according to actual ground conditions at the time of construction (soil density, presence of water, debris, evidence of local instabilities, etc.).

4.2.3 BACKFILLING OF TRENCHES

Clay soils from the excavations could be reused for backfill, if environmentally acceptable, and where no structures or foundations are projected to be built. If the volume of excavated soils is not sufficient to fill the excavation cavities, a Class B backfill can be used in the lower portion, while keeping a minimum of 300 mm of clay layer at surface. The purpose of this layer is to create a surface that is impermeable to surface infiltration and to create a homogeneous surface with the rest of the land.

4.3 GENERAL RECOMMENDATIONS

4.3.1 REUSE OF EXISTING SOIL PROTOCOL

Existing clay soils are not considered compactable and therefore should not be reused in any location where soil compaction is required. Reuse for landscaping purposes may be considered if necessary.

4.3.2 REVIEW OF PLANS AND SPECIFICATIONS

To ensure compliance with the technical recommendations developed in this report, it is recommended that the design plans for the proposed works and structures be reviewed by a geotechnical engineer.

4.3.3 SUPERVISION AND INSPECTION

During the construction works, it is recommended to monitor the geotechnical and qualitative aspects of the different phases of the works including:

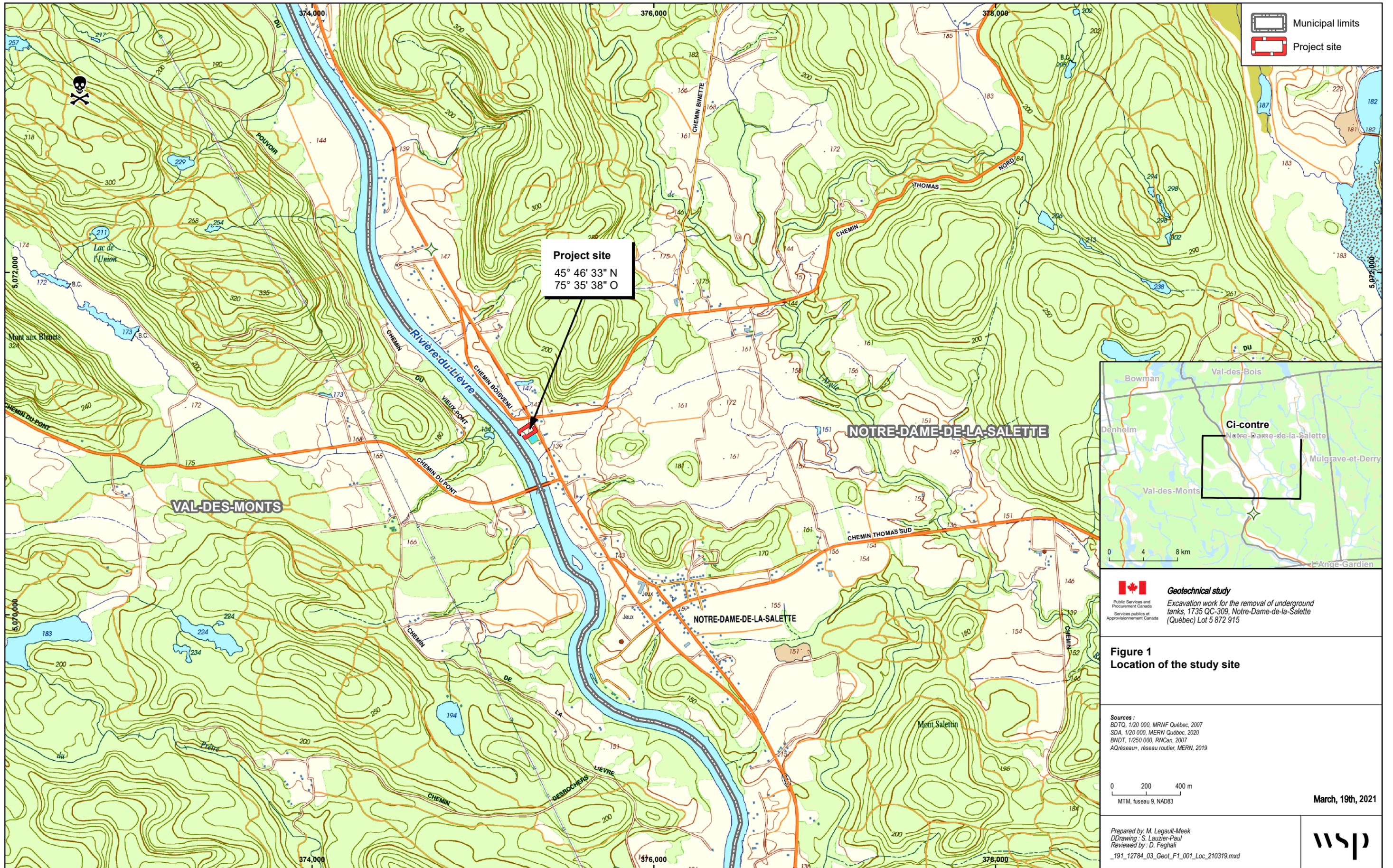
- Inspection of the excavation work and the installation of the support system, if necessary, during construction;
- Supervision of backfilling and compaction operations to ensure that compliant materials are used and that the specified compaction levels are achieved.

5 BIBLIOGRAPHY

- MTQ. 2020. Tome III – Ouvrages d’art, Chapitre 4. Publications Québec.
- CANADIAN GEOTECHNICAL SOCIETY. 2013. Canadian Foundation Engineering Manual. 4th Edition. BiTech Publishers, Richmond, B.C., 476 p.

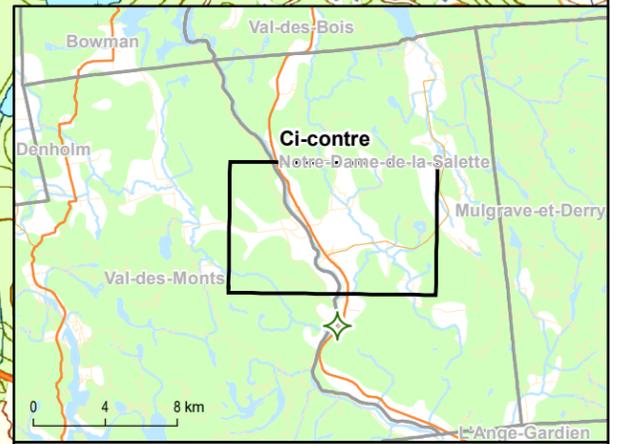
Figures





 Municipal limits
 Project site

Project site
 45° 46' 33" N
 75° 35' 38" O



 **Geotechnical study**
 Excavation work for the removal of underground tanks, 1735 QC-309, Notre-Dame-de-la-Salette (Québec) Lot 5 872 915

Figure 1
 Location of the study site

Sources :
 BD1Q, 1/20 000, MRNF Québec, 2007
 SDA, 1/20 000, MERN Québec, 2020
 BNDT, 1/250 000, RVCAN, 2007
 AQRéseaux, réseau routier, MERN, 2019

0 200 400 m
 MTM, fuseau 9, NAD83

Prepared by: M. Legault-Meek
 Drawing: S. Lauzier-Paul
 Reviewed by: D. Feghali
 _191_12784_03_Geot_F1_001_Loc_210319.mxd

March, 19th, 2021



La précision des limites et les mesures montrées sur ce document ne doivent pas servir à des fins d'ingénierie ou de délimitation foncière. Aucune analyse foncière n'a été effectuée par un arpenteur-géomètre.

APPENDIX

A LIMITATIONS



LIMITS AND GENERAL CONDITIONS - GEOTECHNICAL STUDY

Use of the report

The factual data, interpretations, and recommendations contained in this report relate to a specific project as described in said report and are not applicable to any other project or site. If the project is modified in design, location, or elevation, or if the project is not initiated within eighteen months of the date of issuance of this report, WSP shall be consulted to review the validity of the recommendations provided in this report.

The recommendations made in this report are intended only for the guidance of the designer. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual survey results to determine how geotechnical, hydrogeological and geological conditions may affect their work.

To maintain the integrity of this report and allow for its meaningful interpretation, no data, values, or results may be partially removed from it. This report is to be used only for the purpose for which it was prepared.

Follow-up of the study and work

Some or all of the design and construction details may not be known at the time of the WSP report. It is therefore essential that WSP be contracted at the final design stage to review the design drawings and specifications for foundations, earthworks, earth retaining structures and drainage. This review ensures that the design is consistent with the geotechnical data and recommendations of the WSP report.

It is recommended that WSP be contracted during construction, first to verify and confirm that the geotechnical, hydrogeological, and geological conditions present on the entire site do not differ from those indicated in the WSP report. Secondly, it is essential to certify that the construction work does not adversely affect the recommendations of the report.

Soil and rock conditions

The descriptions of soils and rock in this report are derived from commonly accepted methods of classification and identification used in geotechnical practice. Classification and identification of soils and rock requires the judgment of a WSP engineer, which does not guarantee the accuracy of the descriptions.

However, WSP applies a description appropriate to the classifications commonly used in geotechnical practice.

The soil and rock conditions described in this report are those observed at the time of the study. Unless otherwise indicated, these conditions represent the basis for the recommendations in this report. However, soil and rock conditions may be significantly altered by construction activities (equipment traffic, excavation, pile driving, blasting, etc.) on the site or on nearby sites. Excavation may expose soils to changes in properties caused by moisture, drying or freezing. Unless otherwise specified, soils and rock shall be protected from the damaging effect of such changes or reworking during construction.

Borehole reports and interpretation of observed conditions

The overburden and bedrock are variable in nature and characteristics over a greater or lesser area and also in depth. The borehole reports provide only approximate, point conditions of these geological formations at the location of the boreholes. The contacts between the different layers indicated on the reports may be difficult to distinguish. This is because the nature of the soils may change progressively with depth, so that the contact between two layers may be imprecise and correspond rather to a transition zone. The precision of the stratigraphy encountered depends on the drilling method, the frequency and the sampling method, and the homogeneity of the soils encountered. The spacing between drill holes, the frequency of sampling and the type of drilling depend on budgetary considerations and the time frame, both of which are established before the work begins.

Geotechnical, hydrogeological and geological conditions between borehole locations are interpreted by interpolation or are dependent on the judgment of the geotechnical engineer. In reality, the stratigraphy can vary significantly, so the interpretation of the study results must be done with caution by the reader of the report.

Groundwater levels in this report are only those observed at the location and date of the surveys as presented in the report. These conditions may vary seasonally or as a result of construction on the site or nearby sites.

Change in observed conditions

When geotechnical, hydrogeological, or geological conditions encountered at the site differ from those indicated in the report, either because of the heterogeneous nature of the soils and rock or because changes have occurred as a result of construction (or for any other reason), the client must, as a condition of use of the report, notify WSP of the change in conditions and provide WSP with an opportunity to revise the recommendations made in the report. Recognizing a change in soil and rock conditions requires experience; therefore, it is recommended that an experienced geotechnical engineer be dispatched to the site to assess the changing conditions.

Drainage

Groundwater drainage is often required for both temporary and permanent structures. Improper design or execution of a drainage system can have serious consequences. Under no circumstances can WSP assume responsibility for damage caused by an inadequate drainage system, unless WSP was specifically involved in both the detailed design and ongoing field monitoring during the construction of the drainage system.

APPENDIX

B BOREHOLE LOGS





BOREHOLE DRILLING RECORD : B-01

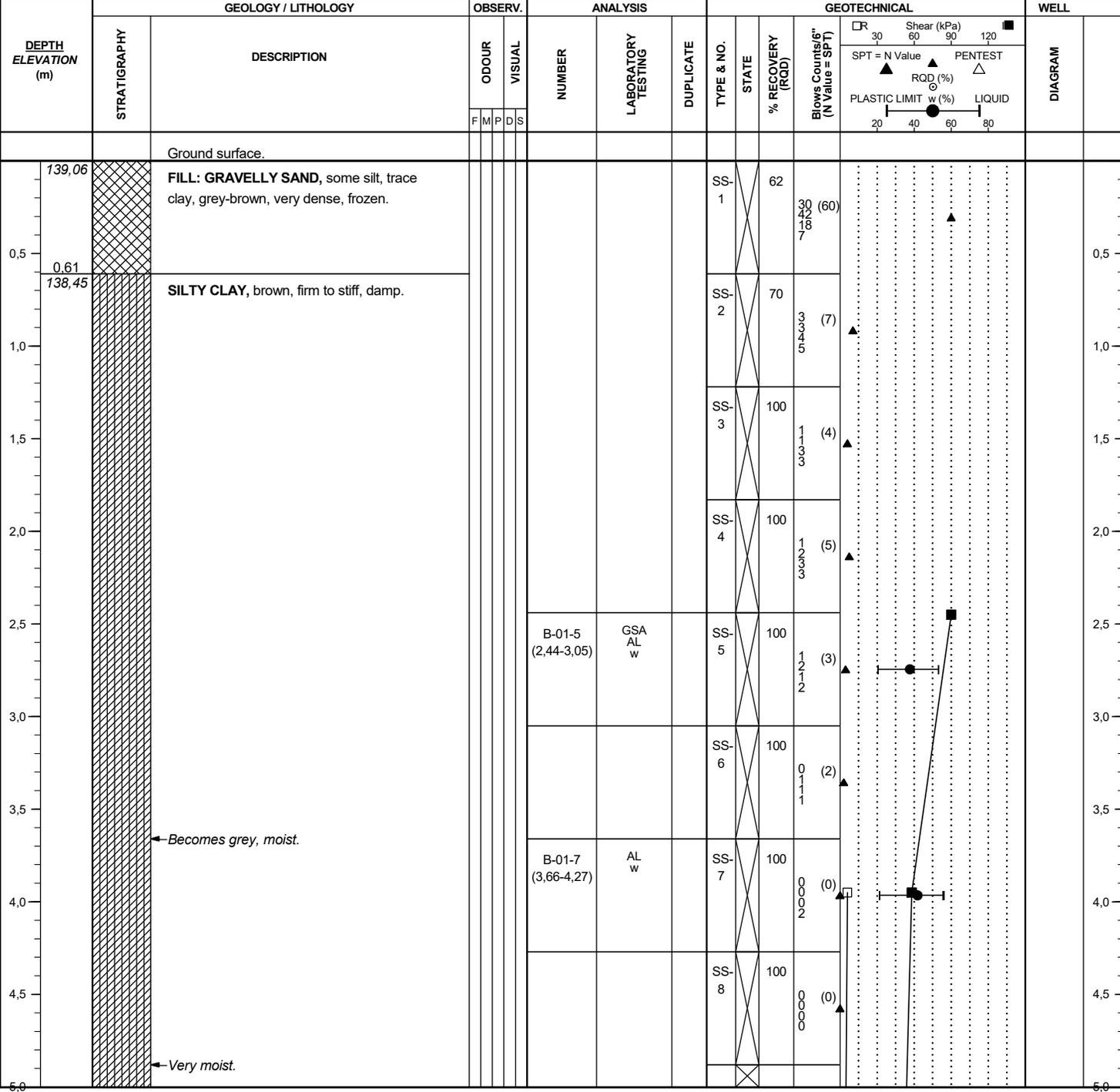
Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-20**
 Date (End): **2021-01-20**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375294 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071089 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **139.06 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: Forage L.L.E. inc Drilling Equipment: Géoprobe 7822DT Drilling Method: Split Spoon Borehole Diameter: 57.2 mm Drilling Fluid:	WELL DETAILS COPING Elevation : SCREEN Bottom Depth : Length : Opening : WATER Elevation: WATER Date: Water Level Free Phase	ODOUR F - Light M - Medium P - Persistent VISUAL D - Disseminated Product S - Saturated with Product	SAMPLE TYPE DC - Diamond Core SS - Split Spoon PS - Piston Sample TC - Hollow Tube MA - Manual Auger TR - Trowel ST - Shelby Tube TT - DT-32 Liner	SAMPLE STATE Undisturbed Remoulded Lost Cored
	AL - Atterberg Limits PENTEST - Blow Counts/300mm w - Moisture Content GSA - Grain Size Analysis PL - Point Load Test wL - Liquidity Limit Sg - Specific Gravity SPT - N Value (Blow Counts/300mm) P - Plasticity Limit			

Project : 191-12784-03 (GEO TECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEO TECH.GDT 2021-9-13





BOREHOLE DRILLING RECORD : B-01

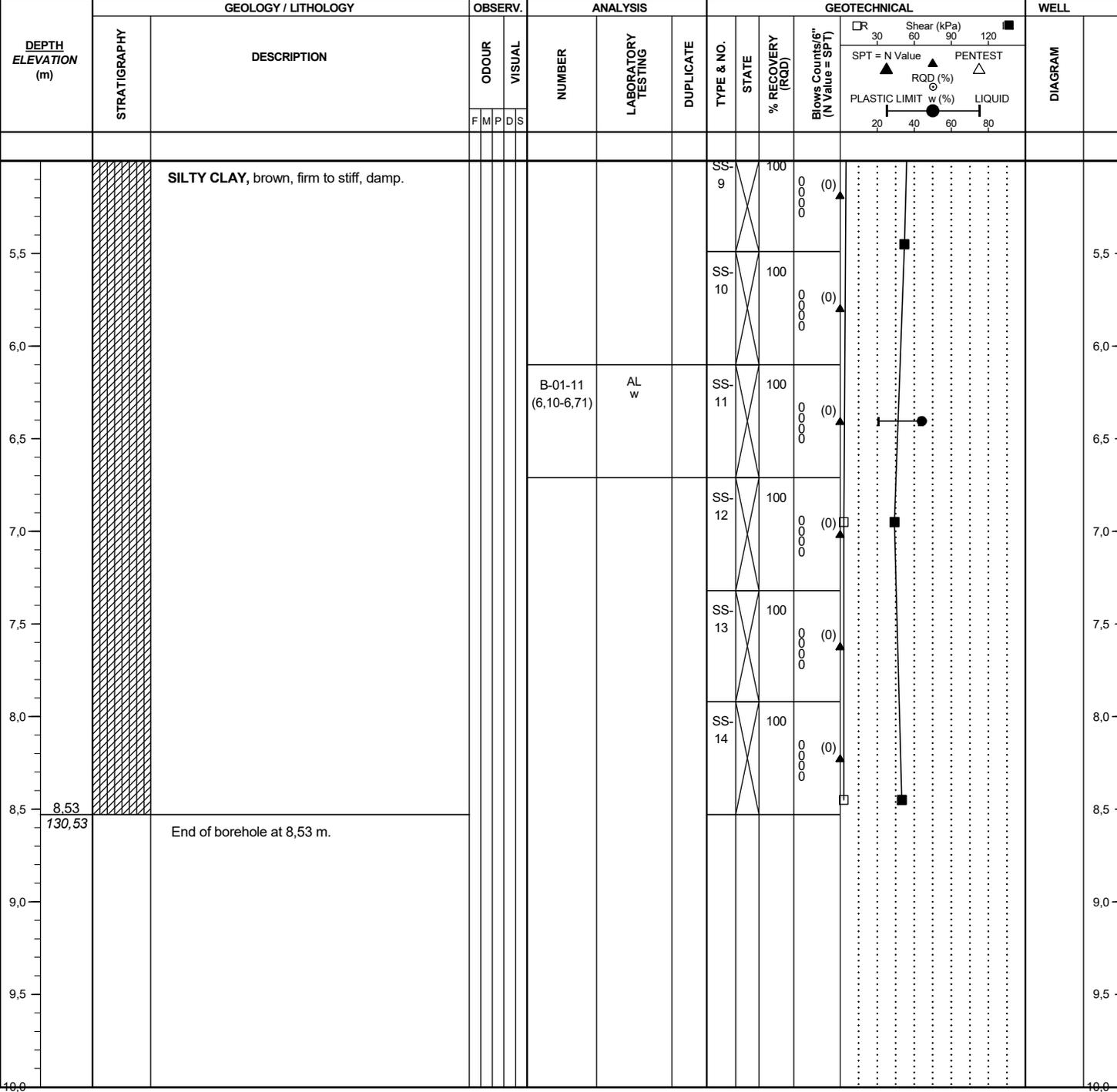
Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-20**
 Date (End): **2021-01-20**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375294 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071089 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **139.06 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: Forage L.L.E. inc	WELL DETAILS	ODOUR	SAMPLE TYPE	SAMPLE STATE
Drilling Equipment: Géoprobe 7822DT	COPING Elevation :	F - Light	DC - Diamond Core	Undisturbed
Drilling Method: Split Spoon	SCREEN Bottom Depth :	M - Medium	SS - Split Spoon	Remoulded
Borehole Diameter: 57.2 mm	Length :	P - Persistent	TC - Piston Sample	Lost
Drilling Fluid:	Opening :	VISUAL	MA - Manual Auger	Cored
	WATER Elevation:	D - Disseminated Product	TR - Trowel	
	WATER Date:	S - Saturated with Product	ST - Shelby Tube	
	<input checked="" type="checkbox"/> Water Level <input checked="" type="checkbox"/> Free Phase	AL - Atterberg Limits	TT - DT-32 Liner	
		GSA - Grain Size Analysis	PENTEST - Blow Counts/300mm	w - Moisture Content
		Sg - Specific Gravity	PL - Point Load Test	wL - Liquidity Limit
			SPT - N Value (Blow Counts/300mm)	P - Plasticity Limit

Project : 191-12784-03 (GEOTECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEOTECH.GDT 2021-9-13





BOREHOLE DRILLING RECORD : B-03

Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-20**
 Date (End): **2021-01-20**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375280 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071068 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **138.53 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: **Forage L.L.E. inc**
 Drilling Equipment: **Géoprobe 7822DT**
 Drilling Method: **Split Spoon**
 Borehole Diameter: **57.2 mm**
 Drilling Fluid:

WELL DETAILS
 COPING Elevation :
 SCREEN Bottom Depth :
 Length :
 Opening :
 WATER Elevation:
 WATER Date:
 Water Level Free Phase

ODOUR
 F - Light
 M - Medium
 P - Persistent
 VISUAL
 D - Disseminated Product
 S - Saturated with Product

SAMPLE TYPE
 DC - Diamond Core
 SS - Split Spoon
 PS - Piston Sample
 TC - Hollow Tube
 MA - Manual Auger
 TR - Trowel
 ST - Shelby Tube
 TT - DT-32 Liner

SAMPLE STATE
 Undisturbed
 Remoulded
 Lost
 Cored

AL - Atterberg Limits
 GSA - Grain Size Analysis
 Sg - Specific Gravity

PENTEST - Blow Counts/300mm
 PL - Point Load Test
 SPT - N Value (Blow Counts/300mm)

w - Moisture Content
 wL - Liquidity Limit
 P - Plasticity Limit

DEPTH ELEVATION (m)	STRATIGRAPHY	GEOLOGY / LITHOLOGY DESCRIPTION	OBSERV.					ANALYSIS			GEOTECHNICAL				WELL DIAGRAM					
			ODOUR		VISUAL			NUMBER	LABORATORY TESTING	DUPLICATE	TYPE & NO.	STATE	% RECOVERY (RQD)	Blows Counts/6" (N Value = SPT)		Shear (kPa)	SPT = N Value	PENTEST	RQD (%)	LIQUID
			F	M	P	D	S													
5.5		SILTY CLAY, brown, firm to stiff, damp. Very moist.									SS-9		100	(0)						
6.0			SS-10		100	(0)														
6.5			SS-11		100	(0)														
7.0			SS-12		100	(0)														
7.5			SS-13		100	(0)														
8.0	SS-14		100	(0)																
9.30		End of borehole at 9,30 m.																		

Project : 191-12784-03 (GEOTECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEOTECH.GDT 2021-9-13



BOREHOLE DRILLING RECORD : B-12

Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-21**
 Date (End): **2021-01-22**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375304 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071079 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **139.02 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: **Forage L.L.E. inc**
 Drilling Equipment: **Géoprobe 7822DT**
 Drilling Method: **Split Spoon**
 Borehole Diameter: **57.2 mm**
 Drilling Fluid:

WELL DETAILS
 COPING Elevation :
 SCREEN Bottom Depth :
 Length :
 Opening :
 WATER Elevation :
 WATER Date :
 Water Level Free Phase

ODOUR
 F - Light
 M - Medium
 P - Persistent
 VISUAL
 D - Disseminated Product
 S - Saturated with Product

SAMPLE TYPE
 DC - Diamond Core
 SS - Split Spoon
 PS - Piston Sample
 TC - Hollow Tube
 MA - Manual Auger
 TR - Trowel
 ST - Shelby Tube
 TT - DT-32 Liner

SAMPLE STATE
 Undisturbed
 Remoulded
 Lost
 Cored

AL - Atterberg Limits
 GSA - Grain Size Analysis
 Sg - Specific Gravity
 PENTEST - Blow Counts/300mm
 PL - Point Load Test
 SPT - N Value (Blow Counts/300mm)
 w - Moisture Content
 wL - Liquidity Limit
 P - Plasticity Limit

DEPTH ELEVATION (m)	STRATIGRAPHY	GEOLOGY / LITHOLOGY DESCRIPTION	OBSERV.					ANALYSIS			GEOTECHNICAL				WELL DIAGRAM			
			ODOUR		VISUAL			NUMBER	LABORATORY TESTING	DUPLICATE	TYPE & NO.	STATE	% RECOVERY (RQD)	Blows Counts/300mm (N Value = SPT)		Shear (kPa)	PENTEST	LIQUID
			F	M	P	D	S											
139.02		Ground surface.																
0.50		FILL: GRAVELLY SAND , some silt, trace clay, dark brown, frozen.																
138.52		SILTY CLAY , trace sand, brown, stiff, damp.																
0.5																		
1.0																		
1.5																		
2.0																		
2.5																		
3.0		← Becomes grey, moist.																
3.5		← Very moist.																
4.0																		
4.5																		
5.0																		

Project : 191-12784-03 (GEOTECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEOTECH.GDT 2021-9-13



BOREHOLE DRILLING RECORD : B-14

Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-22**
 Date (End): **2021-01-22**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375290 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071101 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **138.65 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: **Forage L.L.E. inc**
 Drilling Equipment: **Géoprobe 7822DT**
 Drilling Method: **Split Spoon**
 Borehole Diameter: **57.2 mm**
 Drilling Fluid:

WELL DETAILS
 COPING Elevation :
 SCREEN Bottom Depth :
 Length :
 Opening :
 WATER Elevation:
 WATER Date:
 Water Level Free Phase

ODOUR
 F - Light
 M - Medium
 P - Persistent
 VISUAL
 D - Disseminated Product
 S - Saturated with Product

SAMPLE TYPE
 DC - Diamond Core
 SS - Split Spoon
 PS - Piston Sample
 TC - Hollow Tube
 MA - Manual Auger
 TR - Trowel
 ST - Shelby Tube
 TT - DT-32 Liner

SAMPLE STATE
 Undisturbed
 Remoulded
 Lost
 Cored

AL - Atterberg Limits
 GSA - Grain Size Analysis
 Sg - Specific Gravity
 PENTEST - Blow Counts/300mm
 PL - Point Load Test
 SPT - N Value (Blow Counts/300mm)
 w - Moisture Content
 wL - Liquidity Limit
 P - Plasticity Limit

Project : 191-12784-03 (GEO TECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEO TECH.GDT 2021-9-13

DEPTH ELEVATION (m)	STRATIGRAPHY	GEOLOGY / LITHOLOGY DESCRIPTION	OBSERV.					ANALYSIS			GEOTECHNICAL				WELL DIAGRAM				
			ODOUR	VISUAL				NUMBER	LABORATORY TESTING	DUPLICATE	TYPE & NO.	STATE	% RECOVERY (RQD)	Blows Counts/6" (N Value = SPT)		Shear (kPa)	PENTEST	LIQUID	
			F	M	P	D	S												
138,65		Ground surface.																	
0,61 138,04		FILL: SAND some organic matter, some gravel, brown, frozen.																	
1,83 136,82		SILTY CLAY, trace sand, trace gravel, brown, stiff, damp.							B-14-2 (0,61-1,22)	AL w	SS-2	50	(4)						
2,17 136,48		SAND, brown, lâche, moist.							B-14-4A (1,83-2,17)		SS-4	100	(0)						
		REMOULDED SILTY CLAY, brown, damp. ← Trace sand, moist.							B-14-4B (2,17-2,44)		SS-5	100	(0)						
3,66 134,99		SAND, brown, lâche, moist.							B-14-6 (3,05-3,66)	GSA AL w	SS-6	100	(0)						
		SILTY CLAY, brown-grey, firm to stiff, moist.									SS-7	100	(0)						
									B-14-8 (4,27-4,88)	AL w	SS-8	100	(0)						



BOREHOLE DRILLING RECORD : B-14

Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-22**
 Date (End): **2021-01-22**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375290 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071101 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **138.65 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: Forage L.L.E. inc Drilling Equipment: Géoprobe 7822DT Drilling Method: Split Spoon Borehole Diameter: 57.2 mm Drilling Fluid:	WELL DETAILS COPING Elevation : SCREEN Bottom Depth : Length : Opening : WATER Elevation: WATER Date: Water Level Free Phase	ODOUR F - Light M - Medium P - Persistent VISUAL D - Disseminated Product S - Saturated with Product	SAMPLE TYPE DC - Diamond Core SS - Split Spoon PS - Piston Sample TC - Hollow Tube MA - Manual Auger TR - Trowel ST - Shelby Tube TT - DT-32 Liner	SAMPLE STATE  Undisturbed  Remoulded  Lost  Cored
	AL - Atterberg Limits PENTEST - Blow Counts/300mm w - Moisture Content GSA - Grain Size Analysis PL - Point Load Test wL - Liquidity Limit Sg - Specific Gravity SPT - N Value (Blow Counts/300mm) P - Plasticity Limit			

DEPTH ELEVATION (m)	STRATIGRAPHY	GEOLOGY / LITHOLOGY DESCRIPTION	OBSERV.					ANALYSIS				GEOTECHNICAL				WELL DIAGRAM						
			ODOUR		VISUAL			NUMBER	LABORATORY TESTING	DUPLICATE	TYPE & NO.	STATE	% RECOVERY (RQD)	Blows Counts/6" (N Value = SPT)	SPT = N Value		PENTEST	RQD (%)	LIQUID			
			F	M	P	D	S													Shear (kPa)	PLASTIC LIMIT w (%)	
10.5		DYNAMIC CONE PENETROMETER TEST: (no sampling).																				
11.0																						
11.5																						
12.0																						
12.5																						
13.0																						
13.5																						
14.0																						
14.5																						
15.0																						

Project : 191-12784-03 (GEOTECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEOTECH.GDT 2021-9-13



BOREHOLE DRILLING RECORD : B-14

Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-22**
 Date (End): **2021-01-22**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375290 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071101 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **138.65 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: **Forage L.L.E. inc**
 Drilling Equipment: **Géoprobe 7822DT**
 Drilling Method: **Split Spoon**
 Borehole Diameter: **57.2 mm**
 Drilling Fluid:

WELL DETAILS
 COPING Elevation :
 SCREEN Bottom Depth :
 Length :
 Opening :
 WATER Elevation:
 WATER Date:
 Water Level Free Phase

ODOUR
 F - Light
 M - Medium
 P - Persistent
 VISUAL
 D - Disseminated Product
 S - Saturated with Product

SAMPLE TYPE
 DC - Diamond Core
 SS - Split Spoon
 PS - Piston Sample
 TC - Hollow Tube
 MA - Manual Auger
 TR - Trowel
 ST - Shelby Tube
 TT - DT-32 Liner

SAMPLE STATE
 Undisturbed
 Remoulded
 Lost
 Cored

AL - Atterberg Limits
 GSA - Grain Size Analysis
 Sg - Specific Gravity
 PENTEST - Blow Counts/300mm
 PL - Point Load Test
 SPT - N Value (Blow Counts/300mm)
 w - Moisture Content
 wL - Liquidity Limit
 P - Plasticity Limit

DEPTH ELEVATION (m)	STRATIGRAPHY	GEOLOGY / LITHOLOGY DESCRIPTION	OBSERV.					ANALYSIS				GEOTECHNICAL				WELL DIAGRAM				
			ODOUR		VISUAL			NUMBER	LABORATORY TESTING	DUPLICATE	TYPE & NO.	STATE	% RECOVERY (RQD)	Blows Counts/6" (N Value = SPT)	SPT = N Value		PENTEST	RQD (%)	LIQUID	
			F	M	P	D	S													
15.5		DYNAMIC CONE PENETROMETER TEST: (no sampling).																		
16.0																				
16.5																				
17.0																				
17.5																				
18.0																				
18.5																				
19.0																				
19.5																				
20.0																				

Project : 191-12784-03 (GEOTECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEOTECH.GDT 2021-9-13



BOREHOLE DRILLING RECORD : B-14

Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-22**
 Date (End): **2021-01-22**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375290 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071101 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **138.65 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: **Forage L.L.E. inc**
 Drilling Equipment: **Géoprobe 7822DT**
 Drilling Method: **Split Spoon**
 Borehole Diameter: **57.2 mm**
 Drilling Fluid:

WELL DETAILS
 COPING Elevation :
 SCREEN Bottom Depth :
 Length :
 Opening :
 WATER Elevation:
 WATER Date:
 Water Level Free Phase

ODOUR
 F - Light
 M - Medium
 P - Persistent
 VISUAL
 D - Disseminated Product
 S - Saturated with Product

SAMPLE TYPE
 DC - Diamond Core
 SS - Split Spoon
 PS - Piston Sample
 TC - Hollow Tube
 MA - Manual Auger
 TR - Trowel
 ST - Shelby Tube
 TT - DT-32 Liner

SAMPLE STATE
 Undisturbed
 Remoulded
 Lost
 Cored

AL - Atterberg Limits
 GSA - Grain Size Analysis
 Sg - Specific Gravity
 PENTEST - Blow Counts/300mm
 PL - Point Load Test
 SPT - N Value (Blow Counts/300mm)
 w - Moisture Content
 wL - Liquidity Limit
 P - Plasticity Limit

DEPTH ELEVATION (m)	STRATIGRAPHY	GEOLOGY / LITHOLOGY DESCRIPTION	OBSERV.					ANALYSIS				GEO TECHNICAL				WELL DIAGRAM			
			ODOUR		VISUAL			NUMBER	LABORATORY TESTING	DUPLICATE	TYPE & NO.	STATE	% RECOVERY (RQD)	Blows Counts/6" (N Value = SPT)	SHEAR (kPa)		PENTEST		
			F	M	P	D	S											PLASTIC LIMIT w (%)	LIQUID
20.5		DYNAMIC CONE PENETROMETER TEST: (no sampling).																	
21.0																			
21.5																			
22.0																			
22.5																			
23.0																			
23.5																			
24.0																			
24.5																			
25.0																			

Project : 191-12784-03 (GEO TECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEOTECH.GDT 2021-9-13



BOREHOLE DRILLING RECORD : B-14

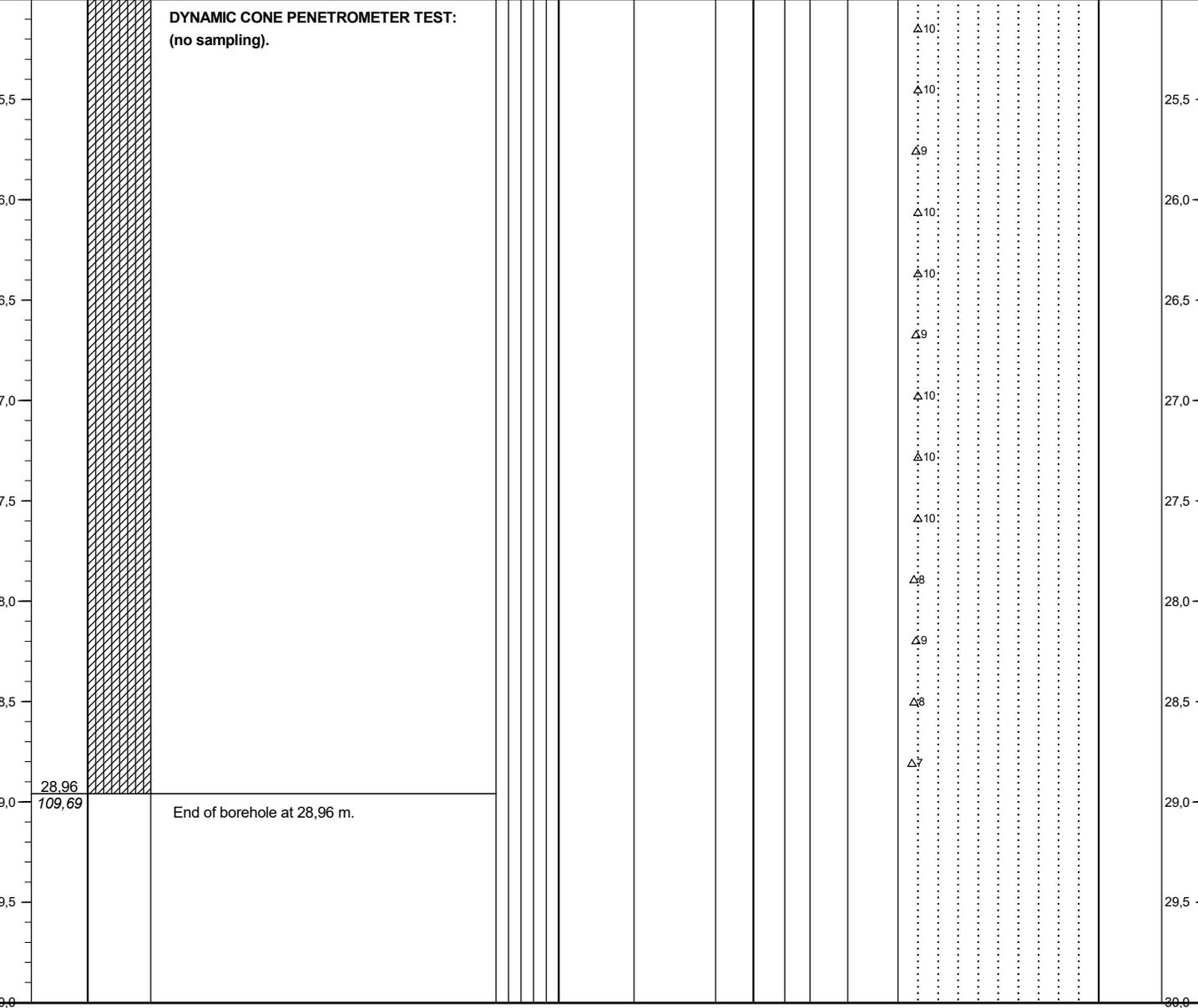
Prepared by: **Ève Sabourin**
 Reviewed by: **David Feghali**

Date (Start): **2021-01-22**
 Date (End): **2021-01-22**

Project Name: **Geotechnical study - Excavation work for the removal of underground tanks** Project Number: **191-12784-03**
 Site: **1735 Route 309** Geographic Coordinates: **X = 375290 W**
 Sector: **Notre-Dame de la Salette (QC)** **Y = 5071101 N**
 Client: **Public Services and Procurement Canada** Surface Elevation: **138.65 m (Géodésique)**
 Plunge / Azimuth:

Drilling Company: Forage L.L.E. inc	WELL DETAILS	ODOUR	SAMPLE TYPE	SAMPLE STATE
Drilling Equipment: Géoprobe 7822DT	COPING Elevation :	F - Light	DC - Diamond Core	Undisturbed
Drilling Method: Split Spoon	SCREEN Bottom Depth :	M - Medium	SS - Split Spoon	Remoulded
Borehole Diameter: 57.2 mm	Length :	P - Persistent	PS - Piston Sample	Lost
Drilling Fluid:	Opening :	VISUAL	TC - Hollow Tube	Cored
	WATER Elevation:	D - Disseminated Product	MA - Manual Auger	
	WATER Date:	S - Saturated with Product	TR - Trowel	
	<input checked="" type="checkbox"/> Water Level <input checked="" type="checkbox"/> Free Phase		ST - Shelby Tube	
			TT - DT-32 Liner	

DEPTH ELEVATION (m)	STRATIGRAPHY	GEOLOGY / LITHOLOGY DESCRIPTION	OBSERV.					ANALYSIS			GEOTECHNICAL				WELL DIAGRAM			
			ODOUR	VISUAL				NUMBER	LABORATORY TESTING	DUPLICATE	TYPE & NO.	STATE	% RECOVERY (RQD)	Blows Counts/6" (N Value = SPT)		Shear (kPa)	PENTEST	LIQUID
			F	M	P	D	S											



Project : 191-12784-03 (GEOTECH).GPJ Type of report : WSP_EN_WELL-ENVIRO AND GEOTECHNICAL_2012 Data Template : WSP_TEMPLATE_GEOTECH.GDT 2021-9-13

APPENDIX

C LABORATORY ANALYSIS





ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-1

Project/Site: Notre Dame de la Salette

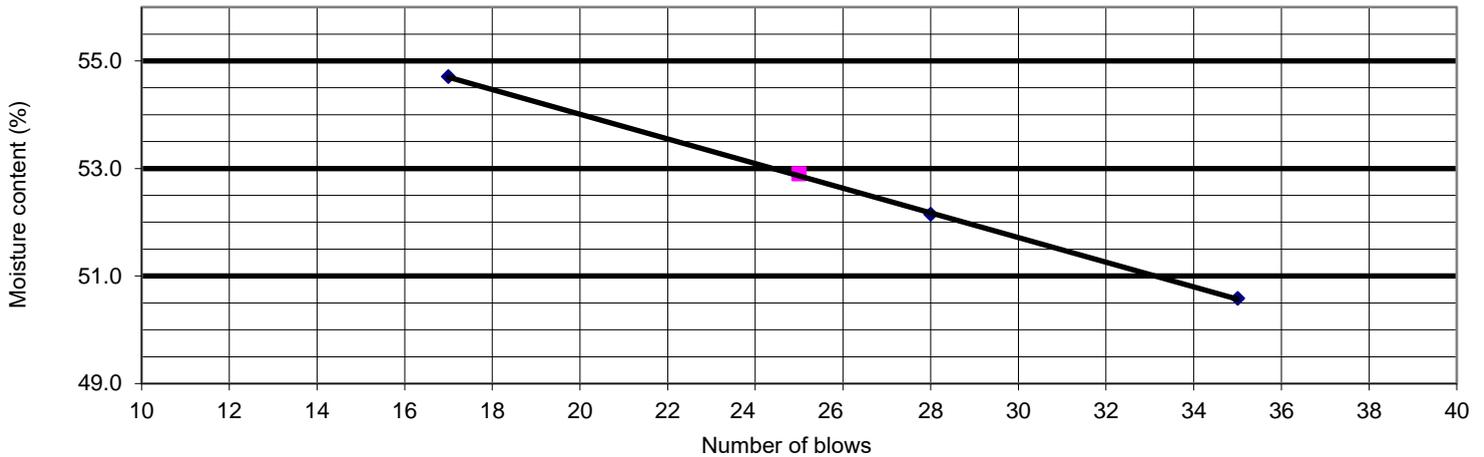
No. Projet: 191-12784-03

Borehole No.: B01

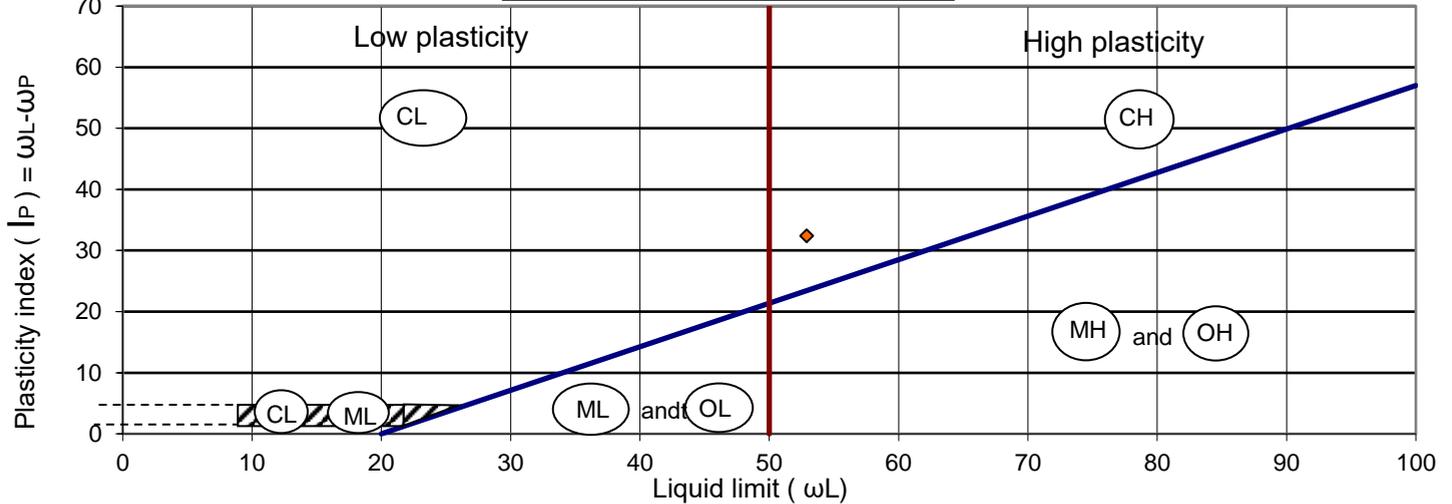
Sample No.: SS5

Sample depth: 2.44 - 3.05 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	T Natural moisture content ω _n (%)
52.90	20.52	32.38	0.53	37.69

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 2nd 2021

Reviewed by: N Krebs

Date: March, 9th 2021

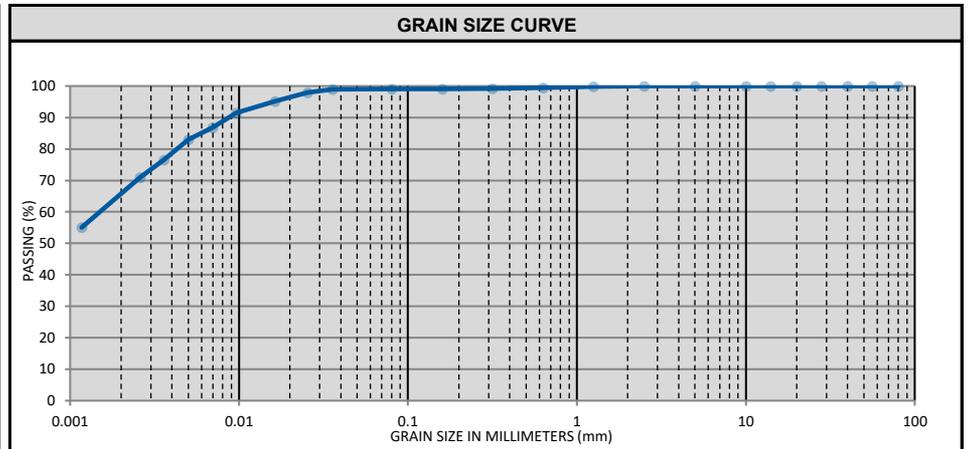


Grain size analysis

CLIENT : PSPC	Project No.: 191-12784-03
SITE : Notre Dame de laSalette	Lab sample No.: OL811-1
	SENT DATE : 3/9/2021

MATERIAL			
Material: Soil	From: Borehole		
Caliber :	ID: B01		
Use : Geotechnical study	SS5		
Sampled by: E.S.	Date : 1/20/2021	Received: 2/23/2021	

GRAIN SIZE ANALYSIS				
SIEVING (BNQ 2501-025)				
Diameter (mm)	Passing (%)	Requirements		N. Conf.
		Min	Max	
112				
80	100			
56	100			
40	100			
28	100			
20	100			
14	100			
10	100			
5	100			
2.5	100			
1.25	100			
0.630	99			
0.315	99			
0.160	99			
0.080	99			



DESCRIPTION			
Cobbles: 0.0 %	D ₁₀ :	Unified soil classification system :	
Gravel: 0.0 %	D ₃₀ :	Description :	
Sand: 1.0 %	D ₆₀ : 0.002	Silty clay, trace sand	
Silt: 34.8 %	C _c :		
Clay: 64.3 %	C _u :		

HYDROMETER (BNQ 2501-025)	
Diameter (mm)	Passing (%)
0.0357	98.9
0.0254	98.0
0.0163	95.2
0.0096	91.4
0.0070	86.8
0.0050	83.1
0.0036	76.5
0.0026	70.9
0.0012	55.1

ESSAIS DIVERS			
TESTS		RESULTS	REQUIREMENTS
Moisture content		BNQ2501-170	

PROCTOR TEST	
Method :	
Maximal density :	
Optimal moisture content :	

OBSERVATIONS :

Tested by: N Sandoval	Reviewed by: N Krebs
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ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-2

Project/Site: Notre Dame de la Salette

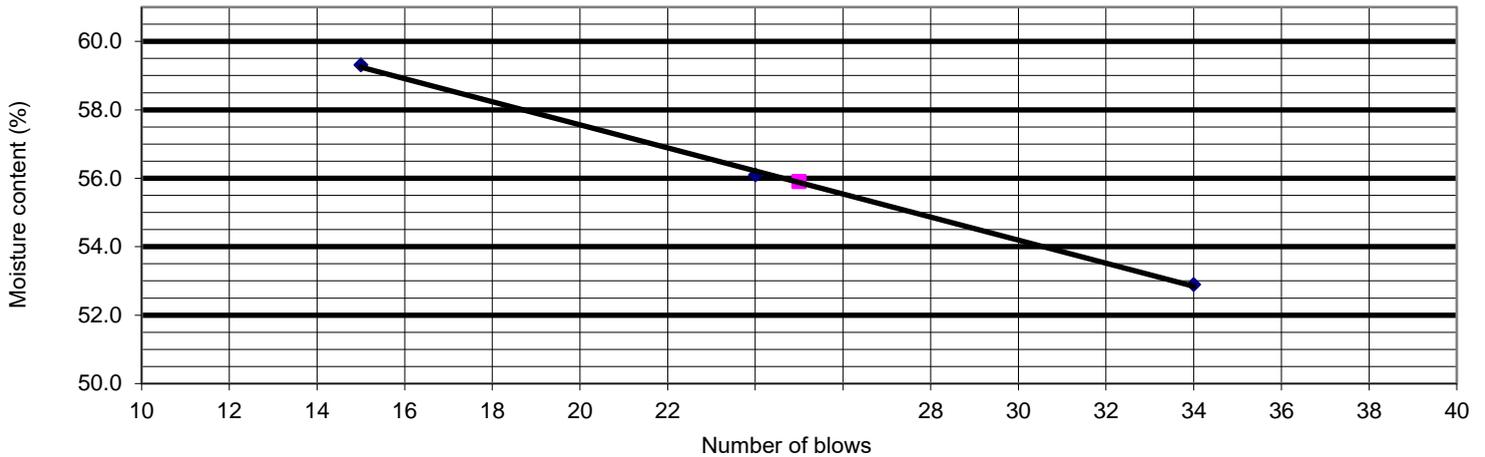
No. Project: 191-12784-03

Borehole No.: B01

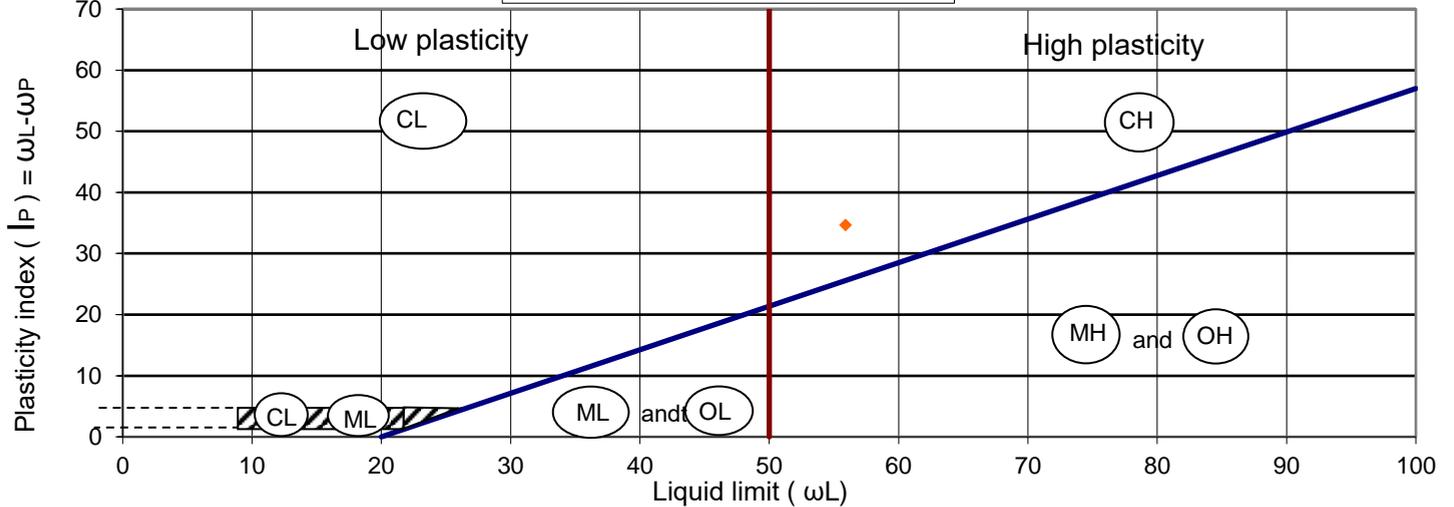
Sample No.: SS7

Sample depth: 3.66 - 4.27 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
55.90	21.25	34.65	0.59	41.80

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 2nd 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-3

Project/Site: Notre Dame de la Salette

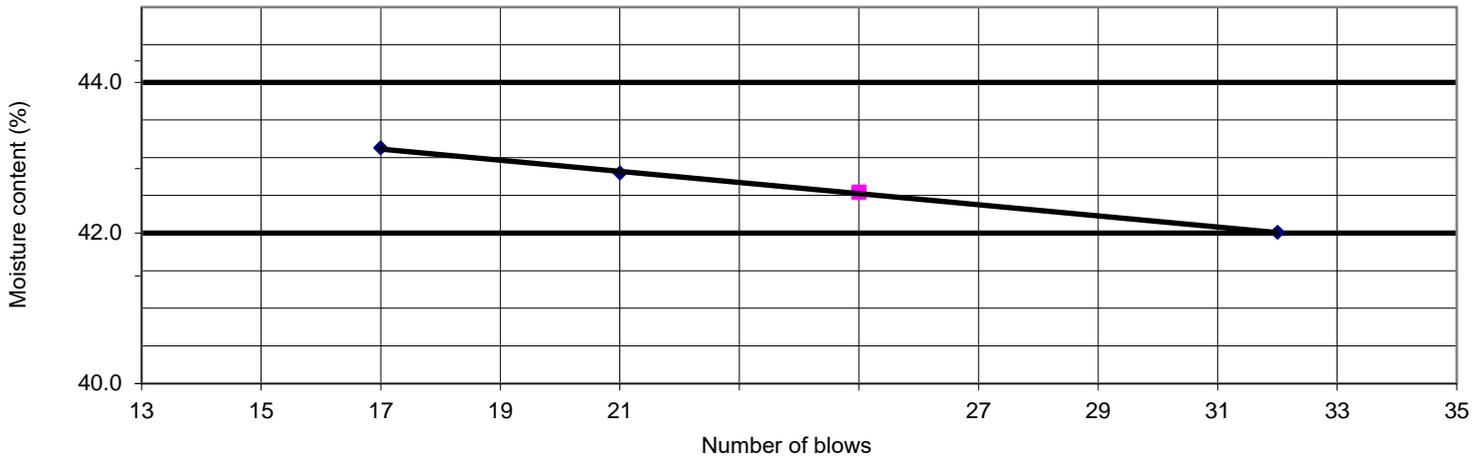
No. Projet: 191-12784-03

Borehole No.: B01

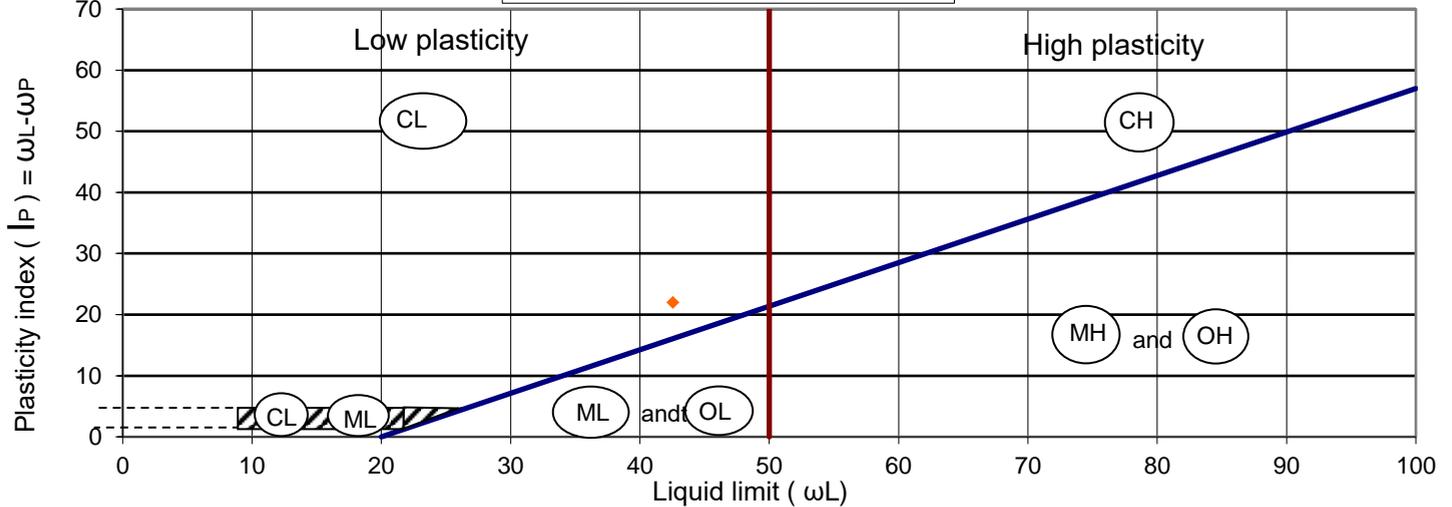
Sample No.: SS11

Sample depth: 6.10 - 6.71 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
42.54	20.55	21.99	1.07	44.10

Sample description: Low plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 3rd 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-4

Project/Site: Notre Dame de la Salette

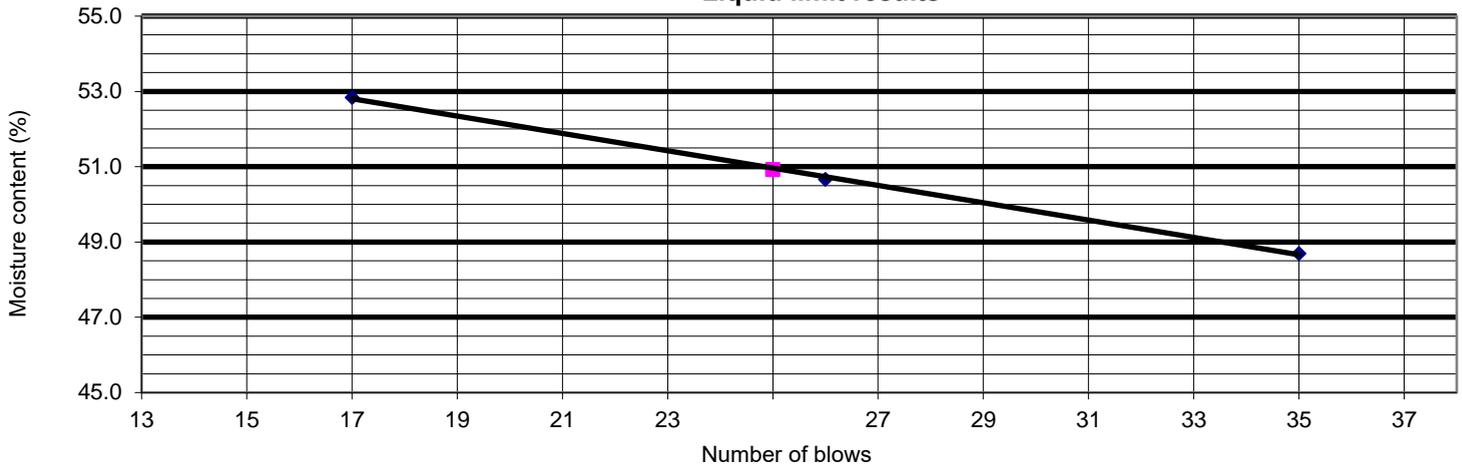
No. Projet: 191-12784-03

Borehole No.: B03

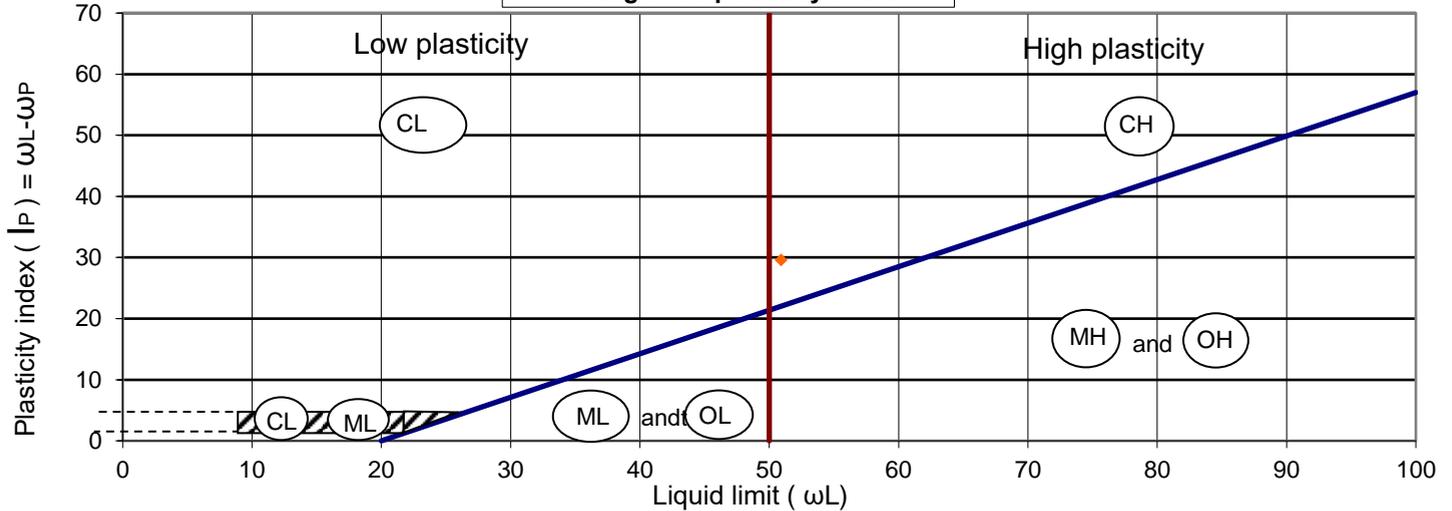
Sample No.: SS4

Sample depth: 1.80 - 2.40 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _P)	Plasticity index (I _p)	Liquidity index (I _L)	T Natural moisture content ω _n (%)
50.92	21.32	29.60	0.43	34.02

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 3rd 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-5

Project/Site: Notre Dame de la Salette

No. Projet: 191-12784-03

Borehole No.: B03

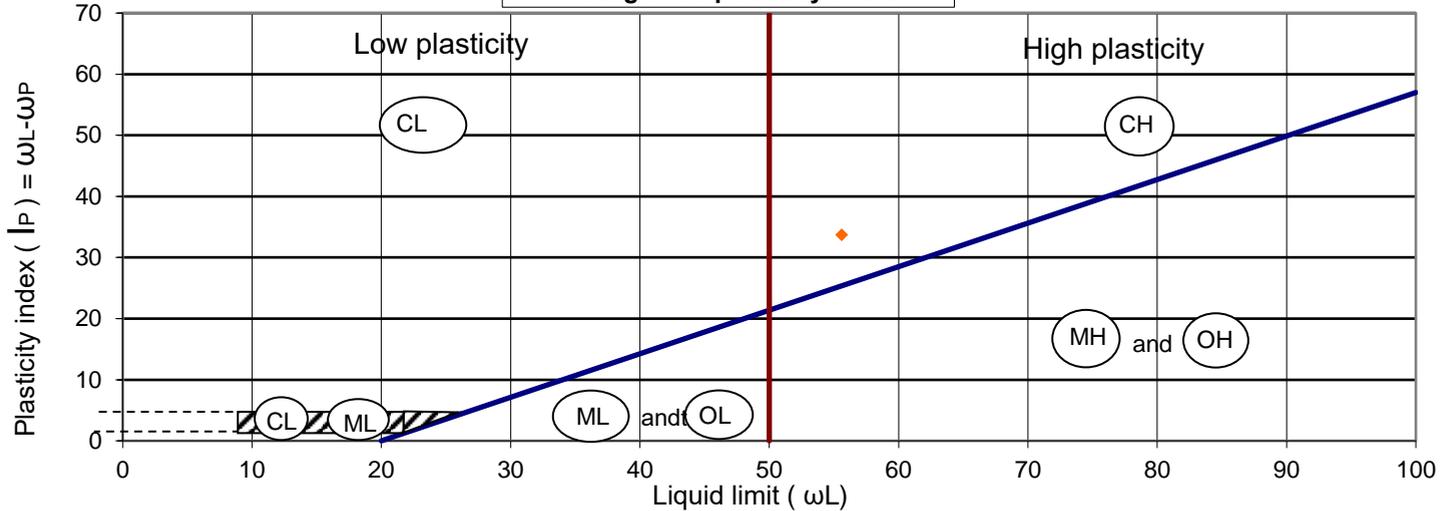
Sample No.: SS5

Sample depth: 2.44 - 3.05 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
55.60	21.90	33.70	0.62	42.75

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 1st 2021

Reviewed by: N Krebs

Date: March, 9th 2021

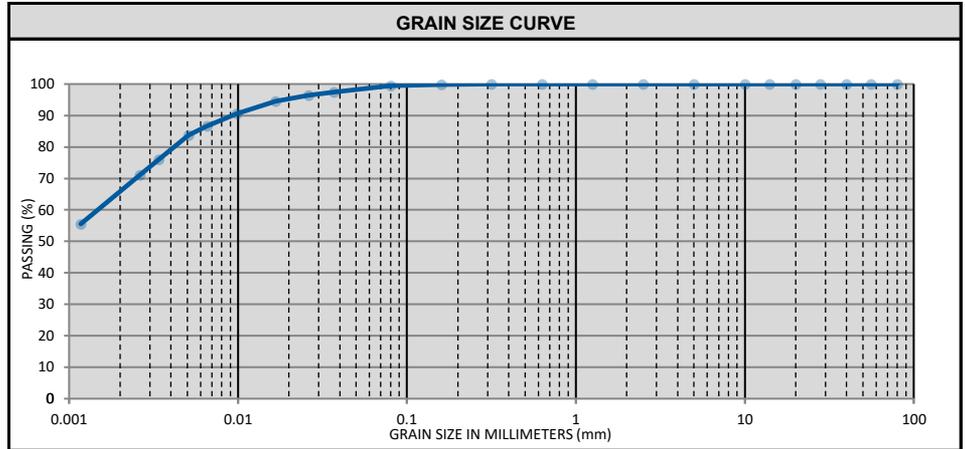


Grain size analysis

CLIENT : PSPC	Project No.: 191-12784-03
SITE : Notre Dame de laSalette	Lab sample No.: OL811-5
	SENT DATE : 3/9/2021

MATÉRIEL			
Material: Soil	From: Borehole		
Caliber :	ID: B03		
Use : Geotechnical study	SS5		
Sampled by: E.S.	Date : 1/20/2021	Received: 2/23/2021	

GRAIN SIZE ANALYSIS				
SIEVING (BNQ 2501-025)				
Diameter (mm)	Passing (%)	Requirements		N. Conf.
		Min	Max	
112				
80	100			
56	100			
40	100			
28	100			
20	100			
14	100			
10	100			
5	100			
2.5	100			
1.25	100			
0.630	100			
0.315	100			
0.160	100			
0.080	99			



DESCRIPTION			
Cobbles: 0.0 %	D ₁₀ :	Unified soil classification system :	
Gravel: 0.0 %	D ₃₀ :	Description :	
Sand: 0.6 %	D ₆₀ : 0.002	Silty clay, trace sand	
Silt: 35.0 %	C _c :		
Clay: 64.4 %	C _u :		

HYDROMETER (BNQ 2501-025)	
Diameter (mm)	Passing (%)
0.0368	97.4
0.0262	96.4
0.0167	94.5
0.0099	90.6
0.0066	86.7
0.0051	83.8
0.0034	76.0
0.0026	71.1
0.0012	55.5

ESSAIS DIVERS			
TESTS		RESULTS	REQUIREMENTS
Moisture content		BNQ2501-170	

PROCTOR TEST	
Method :	
Maximal density :	
Optimal moisture content :	

OBSERVATIONS :

Tested by: N Sandoval	Reviewed by: N Krebs
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ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-6

Project/Site: Notre Dame de la Salette

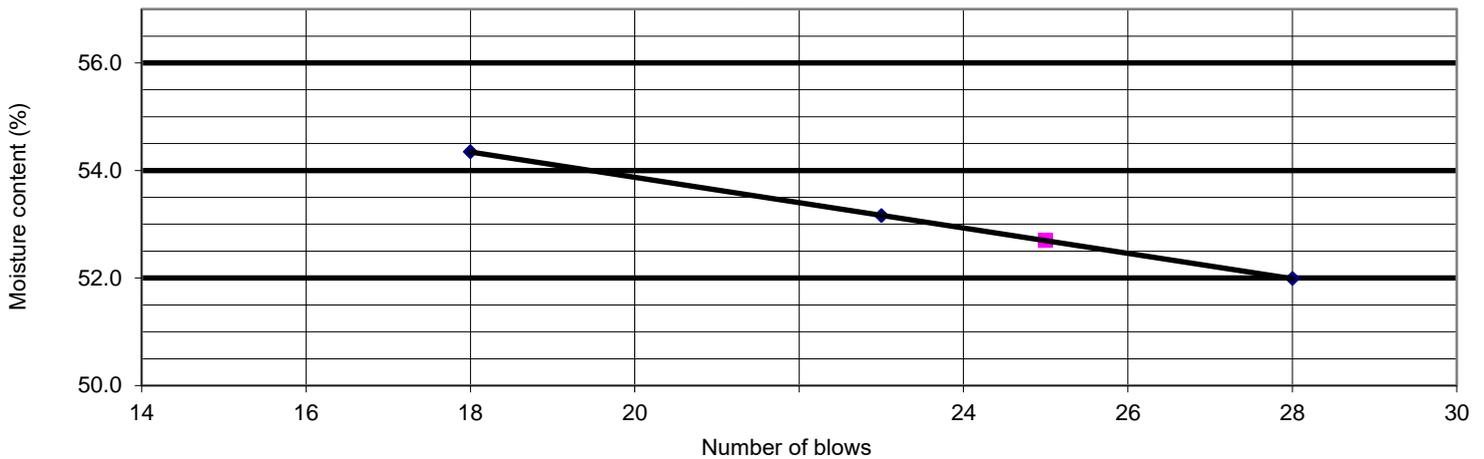
No. Projet: 191-12784-03

Borehole No.: B03

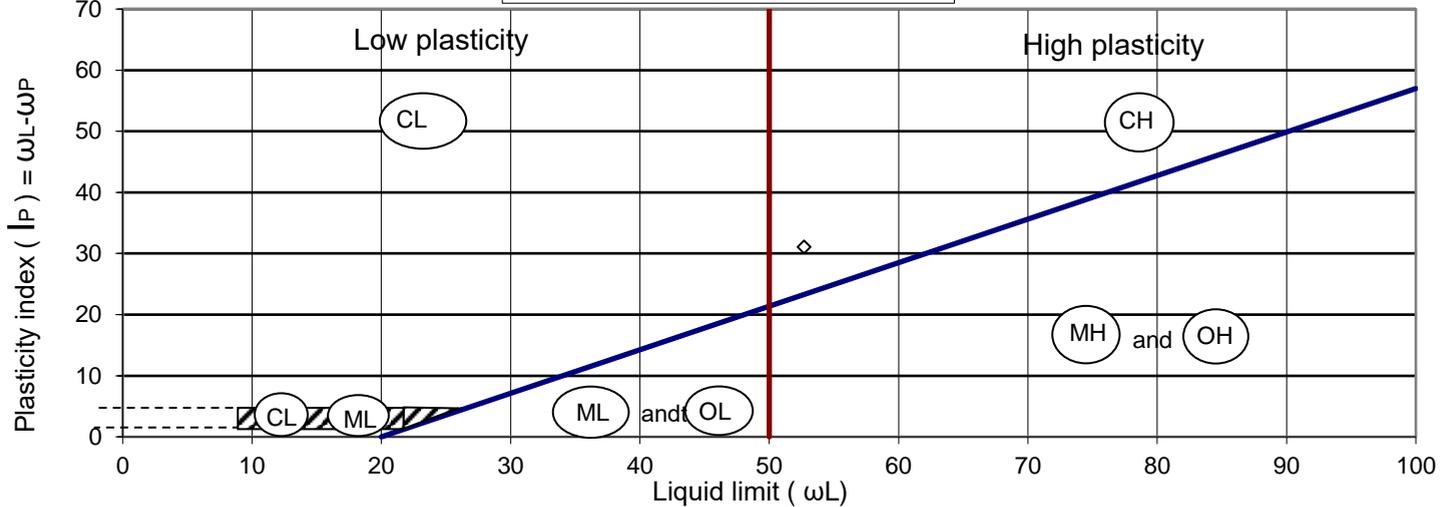
Sample No.: SS7

Sample depth: 3.66 - 4.27 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
52.70	21.61	31.09	0.65	41.67

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 1st 2021

Reviewed by: N Krebs

Date: March, 9th 2021

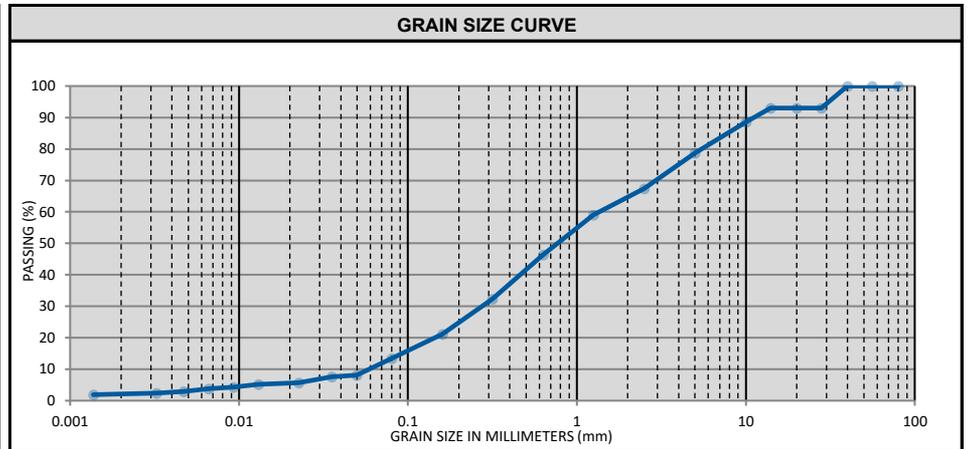


Grain size analysis

CLIENT : PSPC	Project No.: 191-12784-03
SITE : Notre Dame de laSalette	Lab sample No.: OL811-7
	SENT DATE : 3/9/2021

MATÉRIEL			
Material: Soil	From: Borehole		
Caliber :	ID: B12		
Use : Geotechnical study	SS1A		
Sampled by: E.S.	Date : 1/20/2021	Received: 2/23/2021	

GRAIN SIZE ANALYSIS				
SIEVING (BNQ 2501-025)				
Diameter (mm)	Passing (%)	Requirements		N. Conf.
		Min	Max	
112				
80	100			
56	100			
40	100			
28	93			
20	93			
14	93			
10	89			
5	79			
2.5	67			
1.25	59			
0.630	46			
0.315	32			
0.160	21			
0.080	13			



ESSAIS DIVERS		
TESTS	RESULTS	REQUIREMENTS
Moisture content	BNQ2501-170	

HYDROMETER (BNQ 2501-025)	
Diameter (mm)	Passing (%)
0.0497	8.1
0.0353	7.6
0.0226	5.7
0.0130	5.2
0.0093	4.3
0.0066	3.8
0.0047	2.9
0.0032	2.4
0.0014	1.9

PROCTOR TEST	
Method :	
Maximal density :	
Optimal moisture content :	
OBSERVATIONS :	

Tested by: N Sandoval	Reviewed by: N Krebs
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ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-8

Project/Site: Notre Dame de la Salette

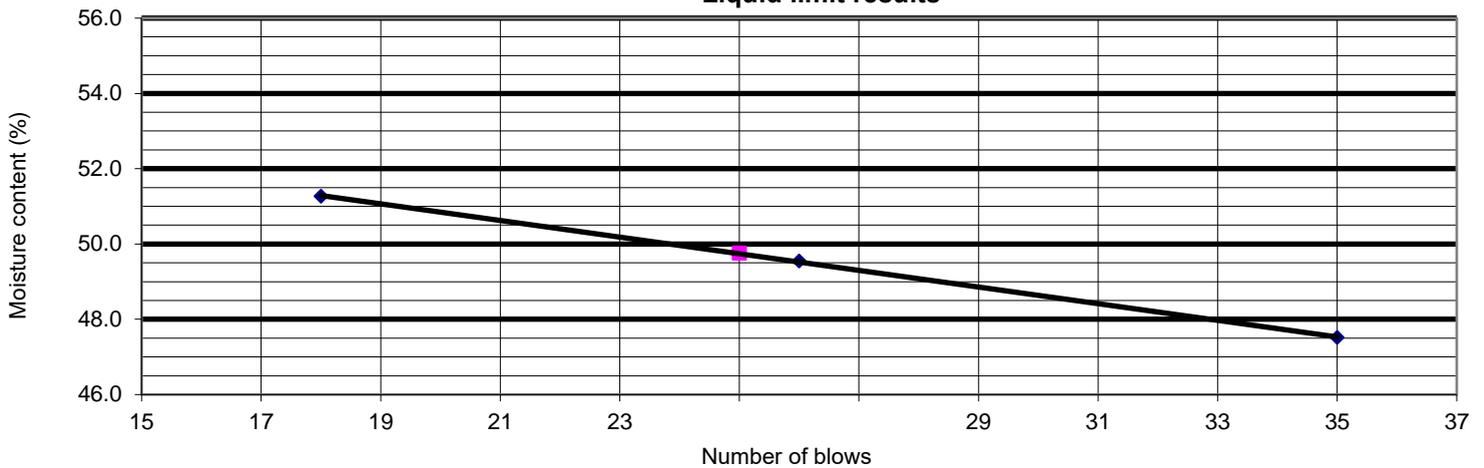
No. Projet: 191-12784-03

Borehole No.: B12

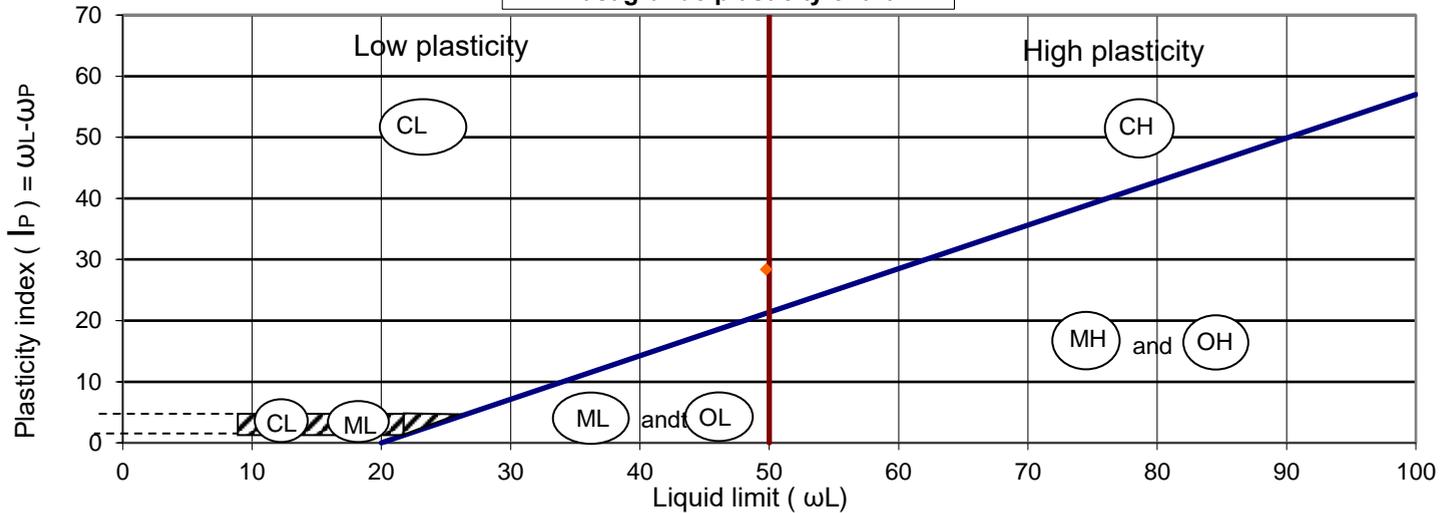
Sample No.: SS2

Sample depth: 0.61 - 1.22 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
52.90	20.52	32.38	0.53	37.69

Sample description: Low plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 3rd 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-9

Project/Site: Notre Dame de la Salette

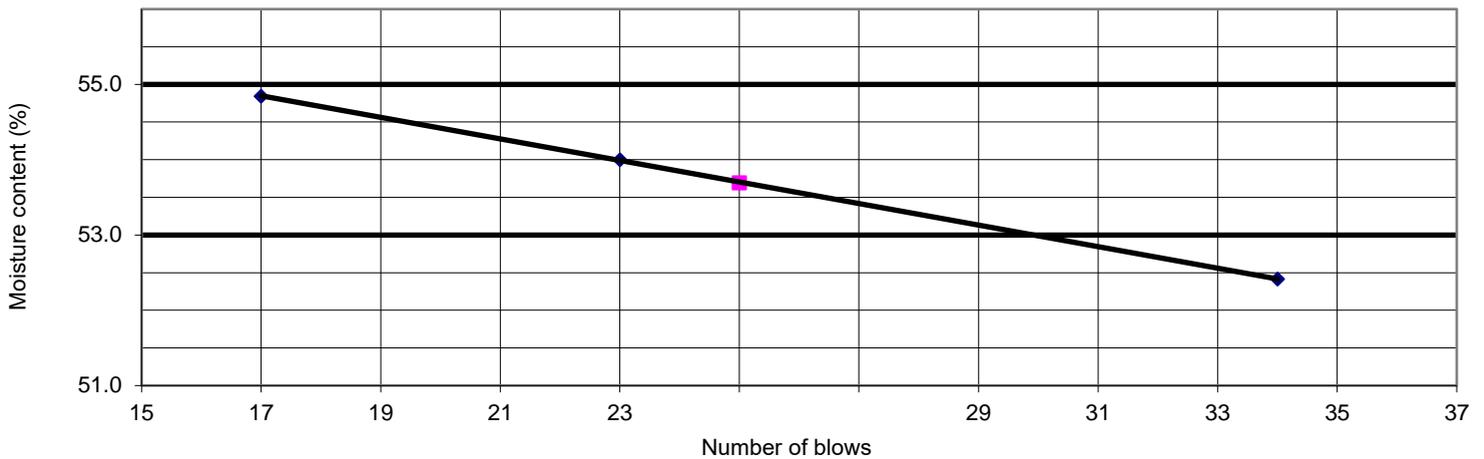
No. Projet: 191-12784-03

Borehole No.: B12

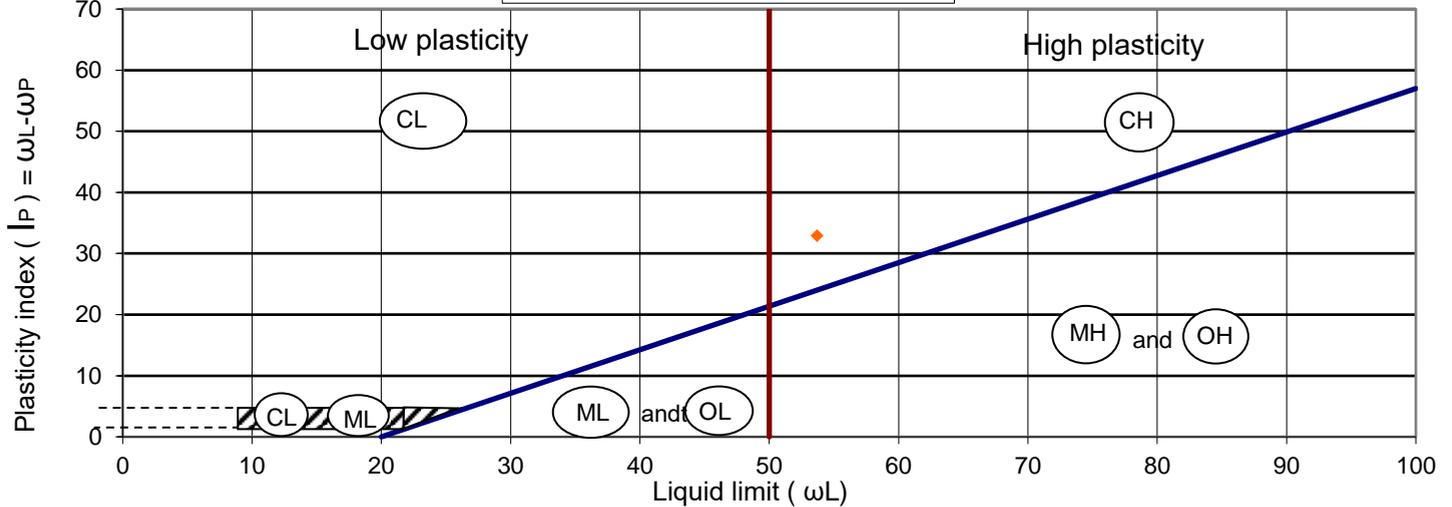
Sample No.: SS5

Sample depth: 2.44 - 3.05 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _P)	Plasticity index (I _p)	Liquidity index (I _L)	T Natural moisture content ω _n (%)
53.69	20.76	32.93	0.65	42.30

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 4th 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-10

Project/Site: Notre Dame de la Salette

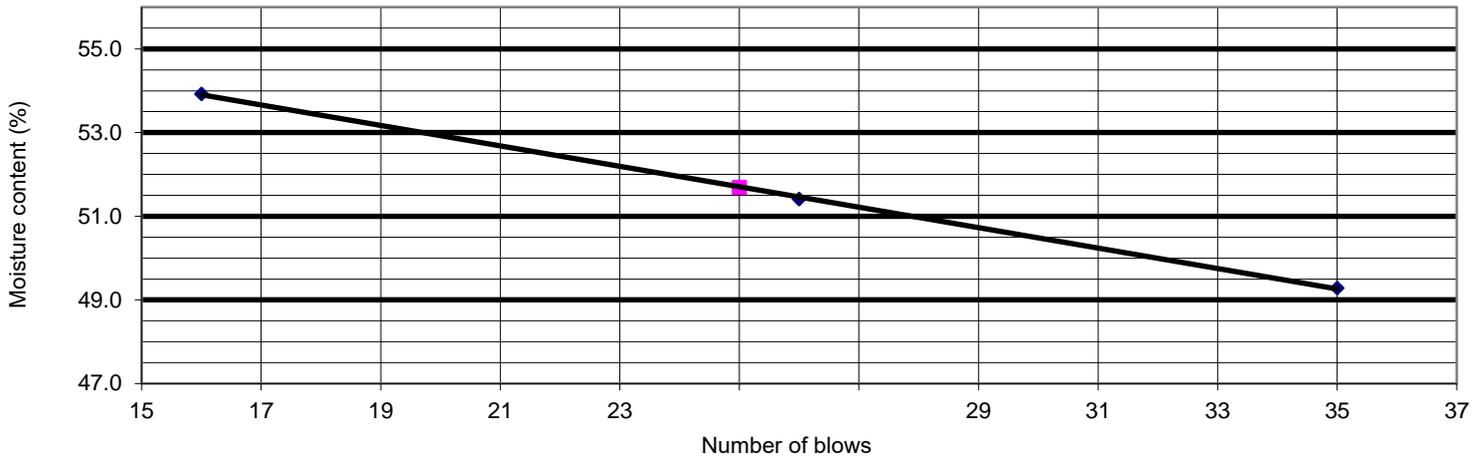
No. Projet: 191-12784-03

Borehole No.: B12

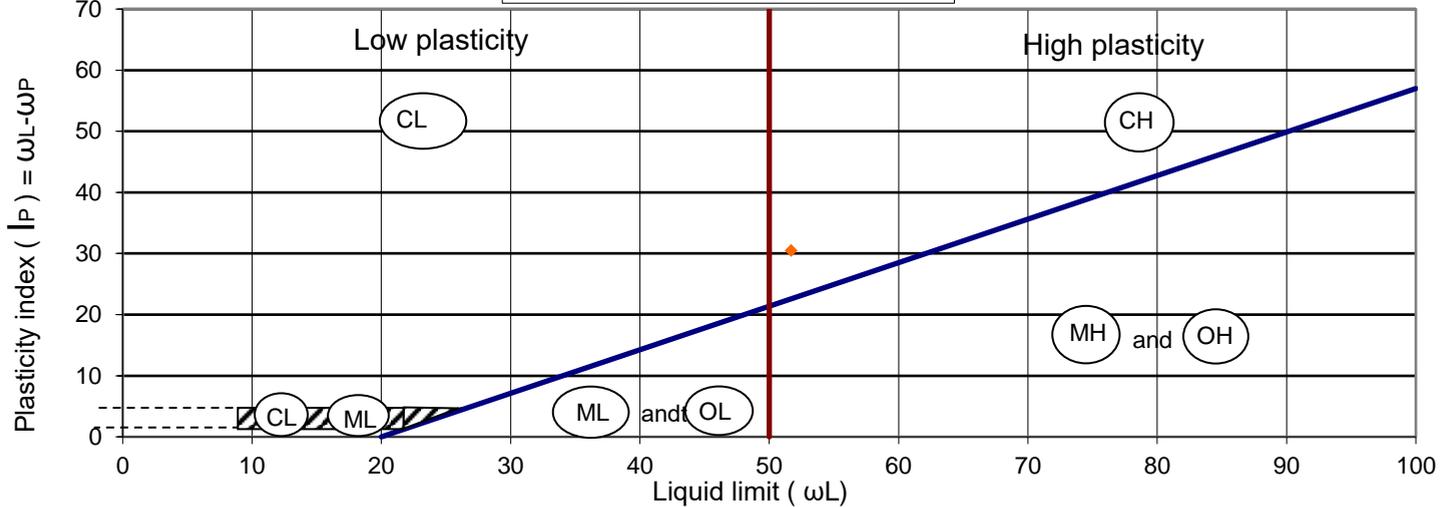
Sample No.: SS8

Sample depth: 4.27 - 4.88 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _P)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
51.69	21.20	30.49	0.56	38.38

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 1st 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-11

Project/Site: Notre Dame de la Salette

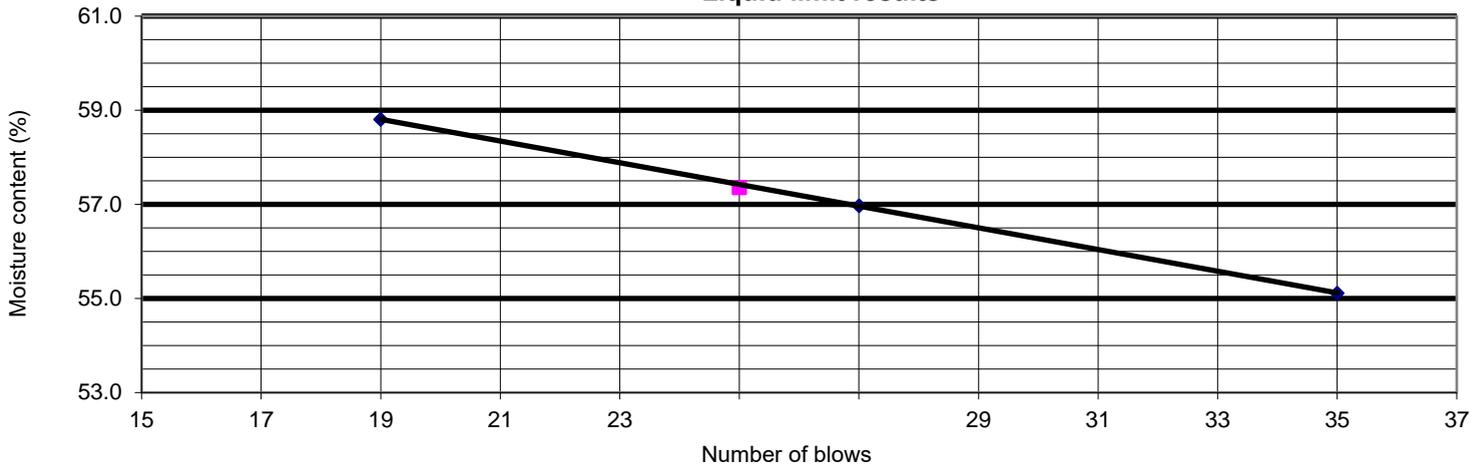
No. Projet: 191-12784-03

Borehole No.: B13

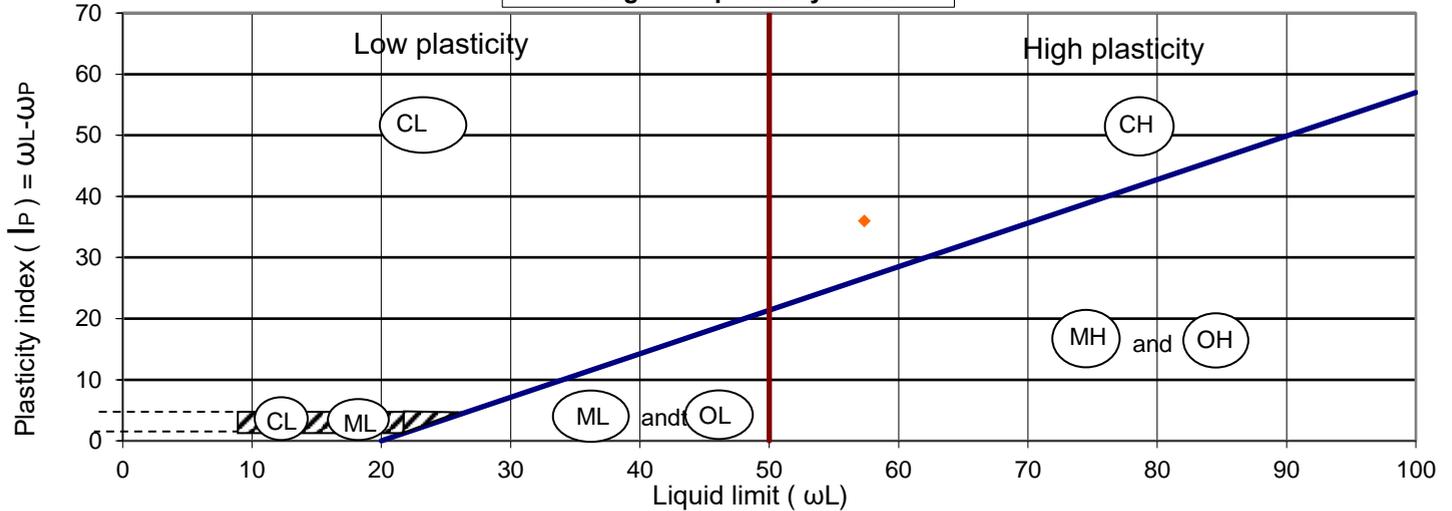
Sample No.: SS3

Sample depth: 1.22 - 1.83 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω_L)	Plasticity limit (ω_p)	Plasticity index (I_p)	Liquidity index (I_L)	TNatural moisture content ω_n (%)
57.35	21.34	36.01	0.57	41.93

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 4th 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-12

Project/Site: Notre Dame de la Salette

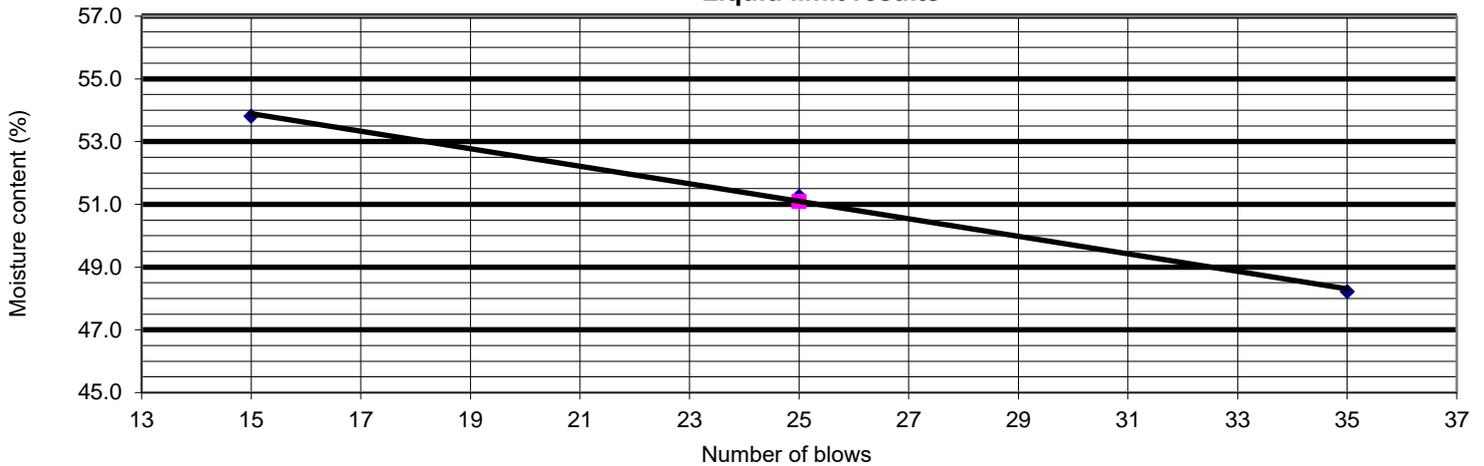
No. Projet: 191-12784-03

Borehole No.: B13

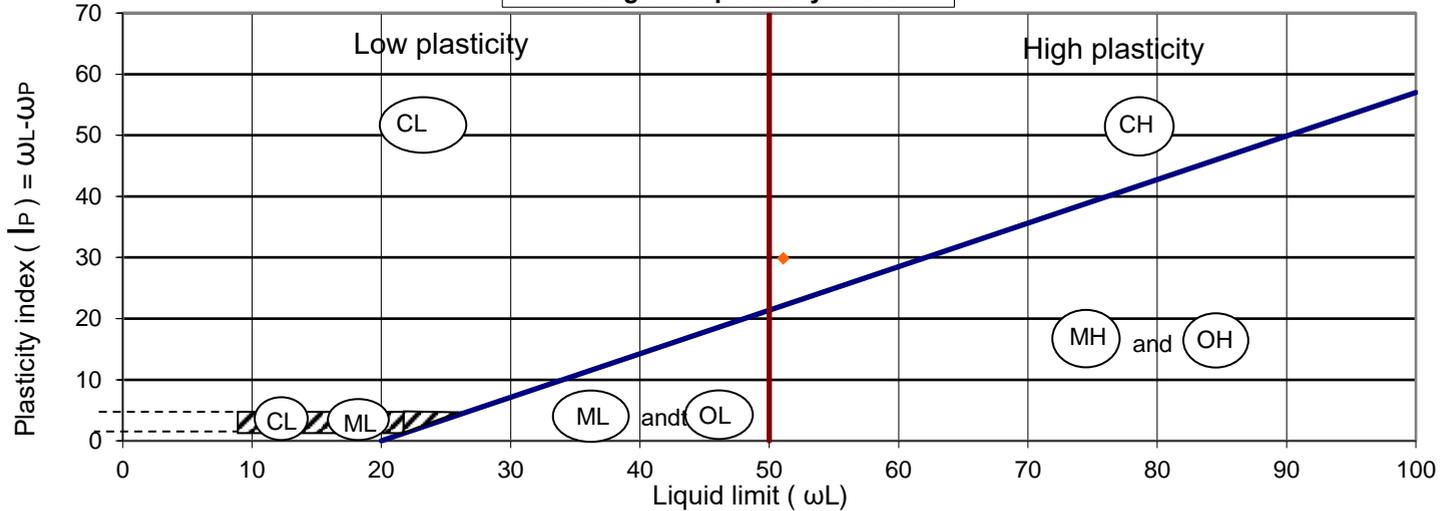
Sample No.: SS8

Sample depth: 4.27 - 4.88 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _P)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
51.09	21.21	29.88	0.74	43.23

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 5th 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-13

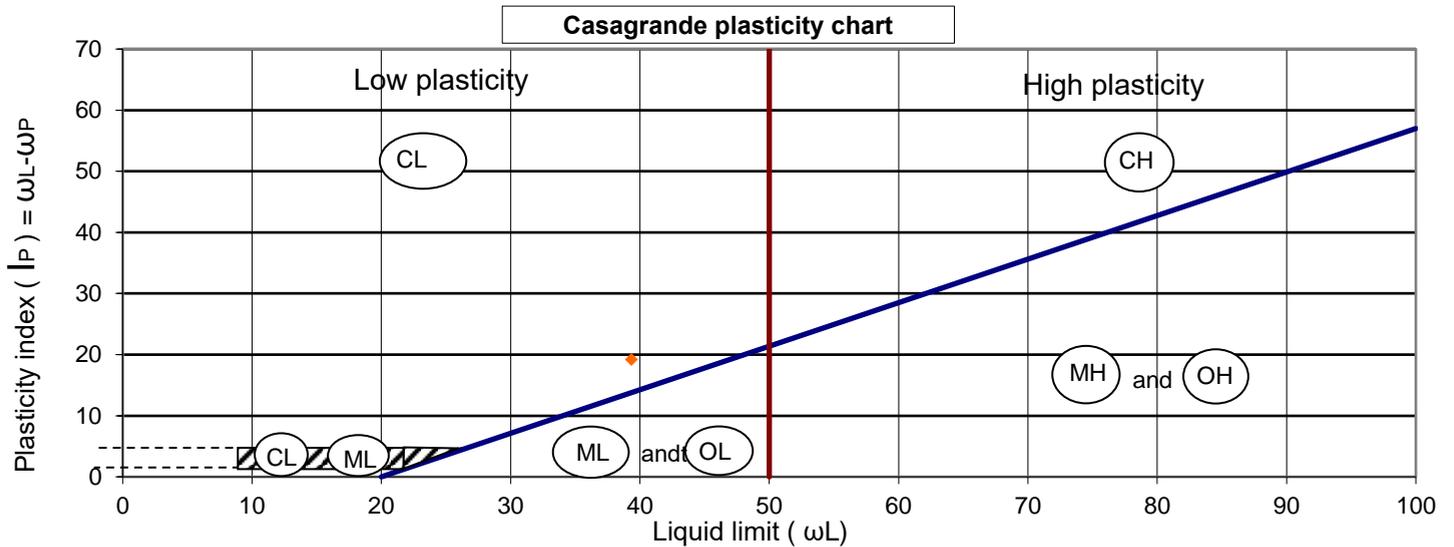
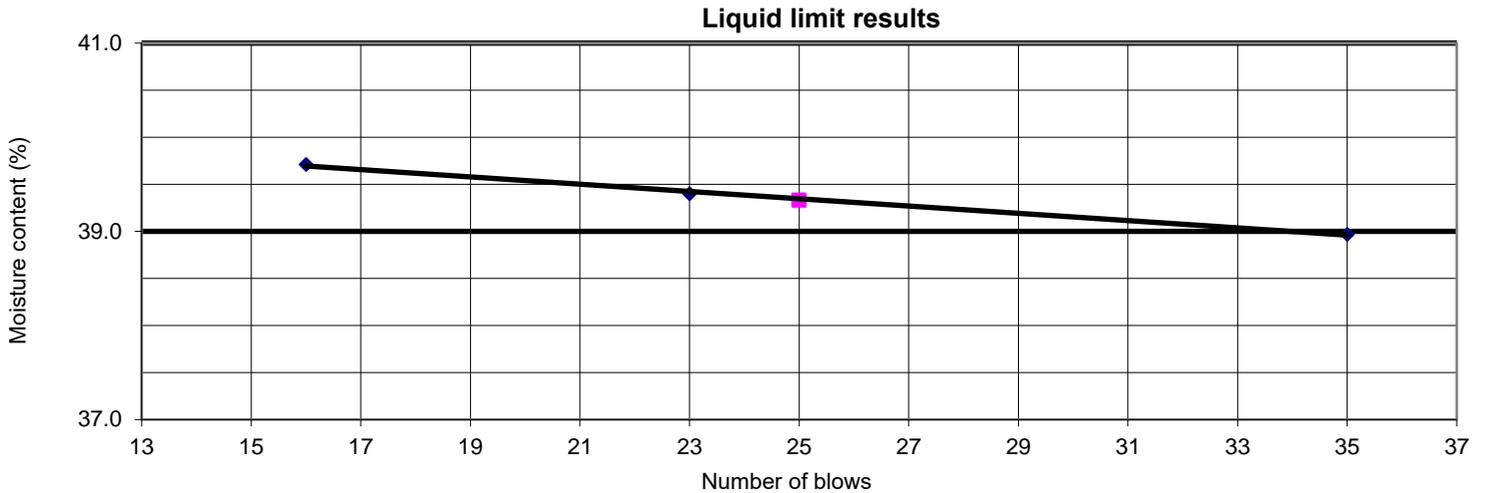
Project/Site: Notre Dame de la Salette

No. Projet: 191-12784-03

Borehole No.: B13

Sample No.: SS12

Sample depth: 6.71 - 7.32 m



Liquid limit (ω _L)	Plasticity limit (ω _P)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
39.33	20.12	19.21	1.18	42.84

Sample description: Low plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 5th 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-14

Project/Site: Notre Dame de la Salette

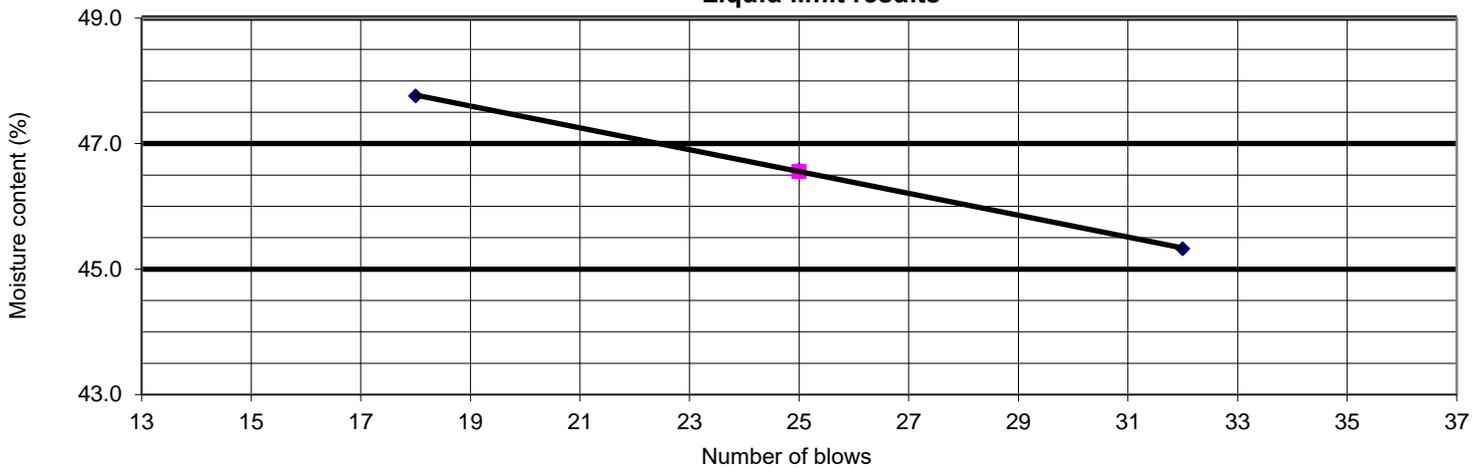
No. Projet: 191-12784-03

Borehole No.: B14

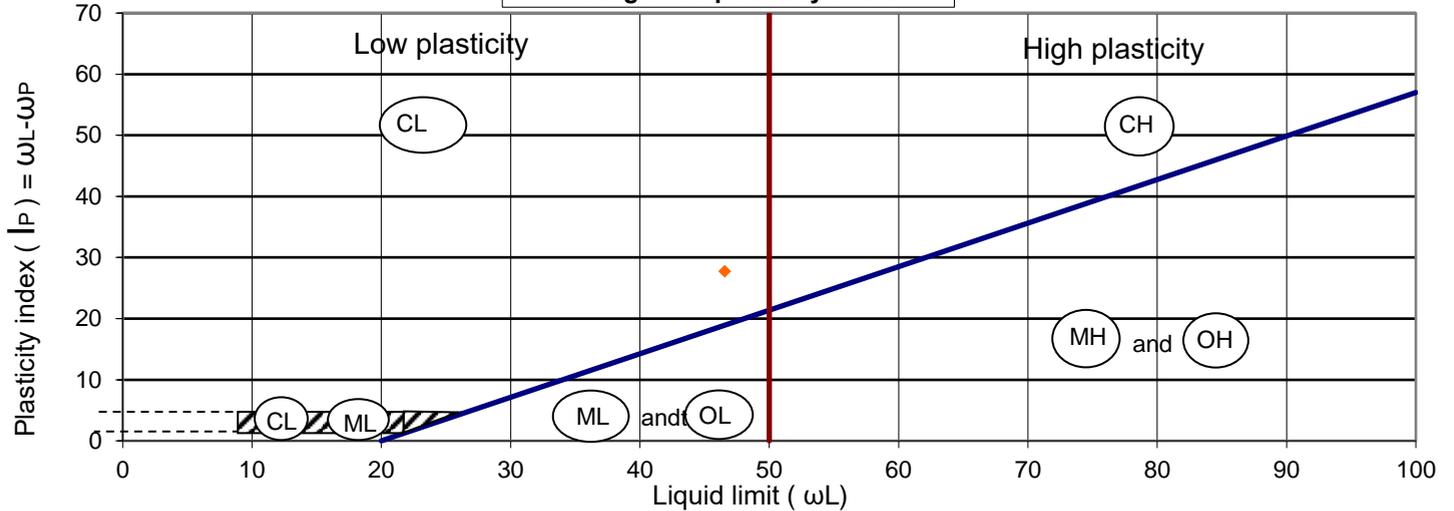
Sample No.: SS2

Sample depth: 0.61 - 1.22 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
46.55	18.81	27.74	0.17	23.65

Sample description: Low plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 3rd 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-15

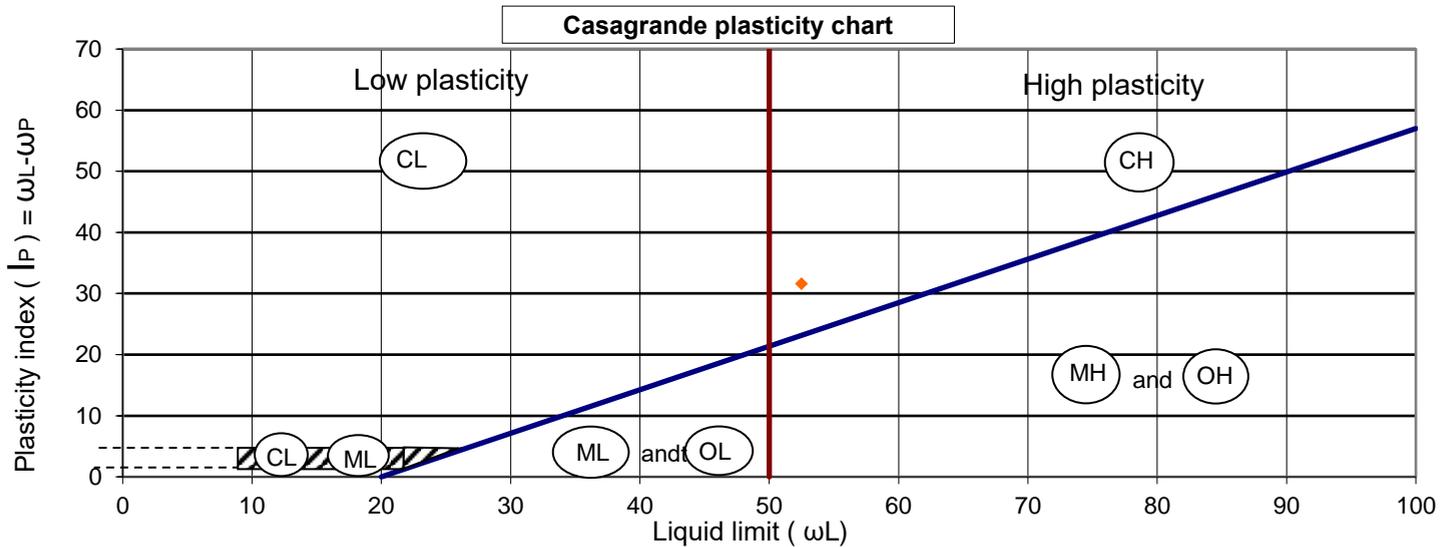
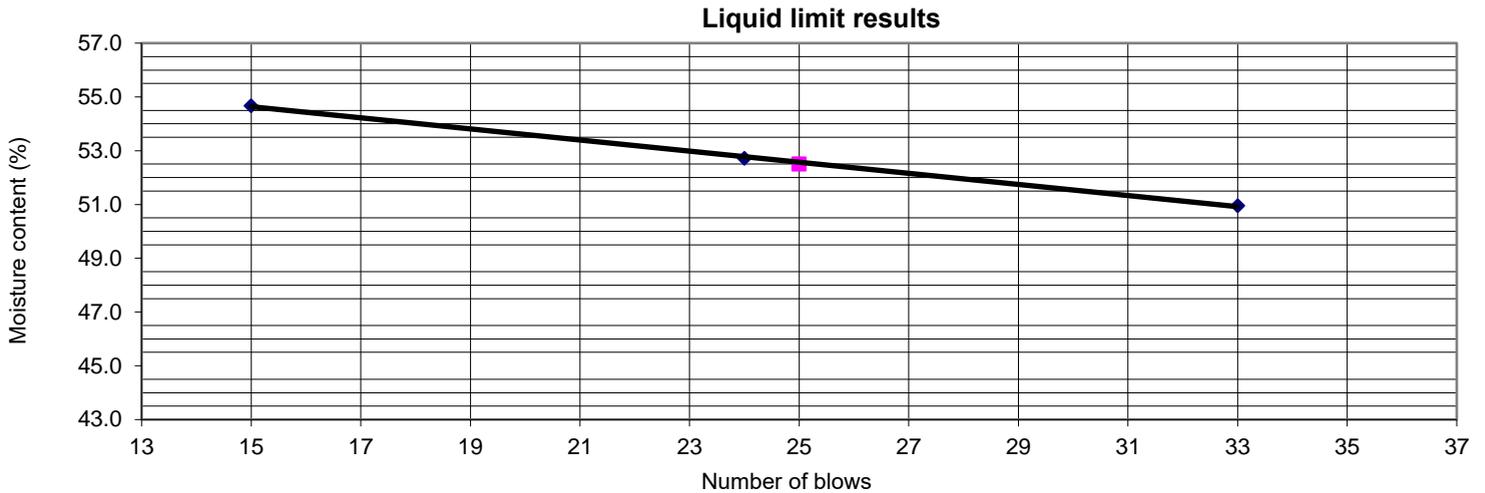
Project/Site: Notre Dame de la Salette

No. Projet: 191-12784-03

Borehole No.: B14

Sample No.: SS6

Sample depth: 3.05 - 3.66 m



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
52.50	20.88	31.62	0.80	46.08

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 2nd 2021

Reviewed by: N Krebs

Date: March, 9th 2021

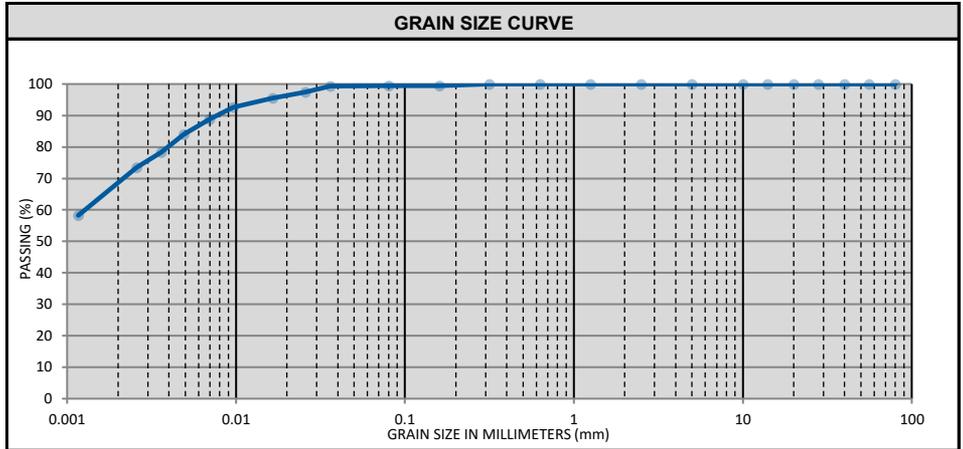


Grain size analysis

CLIENT : PSPC	Project No.: 191-12784-03
SITE : Notre Dame de laSalette	Lab sample No.: OL811-15
	SENT DATE : 3/9/2021

MATÉRIEL			
Material: Soil	From: Borehole		
Caliber :	ID: B14		
Use : Geotechnical study	SS6		
Sampled by: E.S.	Date : 1/20/2021	Received: 2/23/2021	

GRAIN SIZE ANALYSIS				
SIEVING (BNQ 2501-025)				
Diameter (mm)	Passing (%)	Requirements		N. Conf.
		Min	Max	
112				
80	100			
56	100			
40	100			
28	100			
20	100			
14	100			
10	100			
5	100			
2.5	100			
1.25	100			
0.630	100			
0.315	100			
0.160	99			
0.080	99			



DESCRIPTION			
Cobbles: 0.0 %	D ₁₀ :	Unified soil classification system :	
Gravel: 0.0 %	D ₃₀ :	Description :	
Sand: 0.6 %	D ₆₀ : 0.001	Silty clay, trace sand	
Silt: 32.2 %	C _c :		
Clay: 67.2 %	C _u :		

HYDROMETER (BNQ 2501-025)	
Diameter (mm)	Passing (%)
0.0362	99.3
0.0257	97.4
0.0165	95.5
0.0096	92.6
0.0070	88.8
0.0049	84.0
0.0036	78.3
0.0026	73.5
0.0012	58.2

ESSAIS DIVERS			
TESTS		RESULTS	REQUIREMENTS
Moisture content		BNQ2501-170	

PROCTOR TEST	
Method :	
Maximal density :	
Optimal moisture content :	

OBSERVATIONS :

Tested by: N Sandoval	Reviewed by: N Krebs
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ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-16

Project/Site: Notre Dame de la Salette

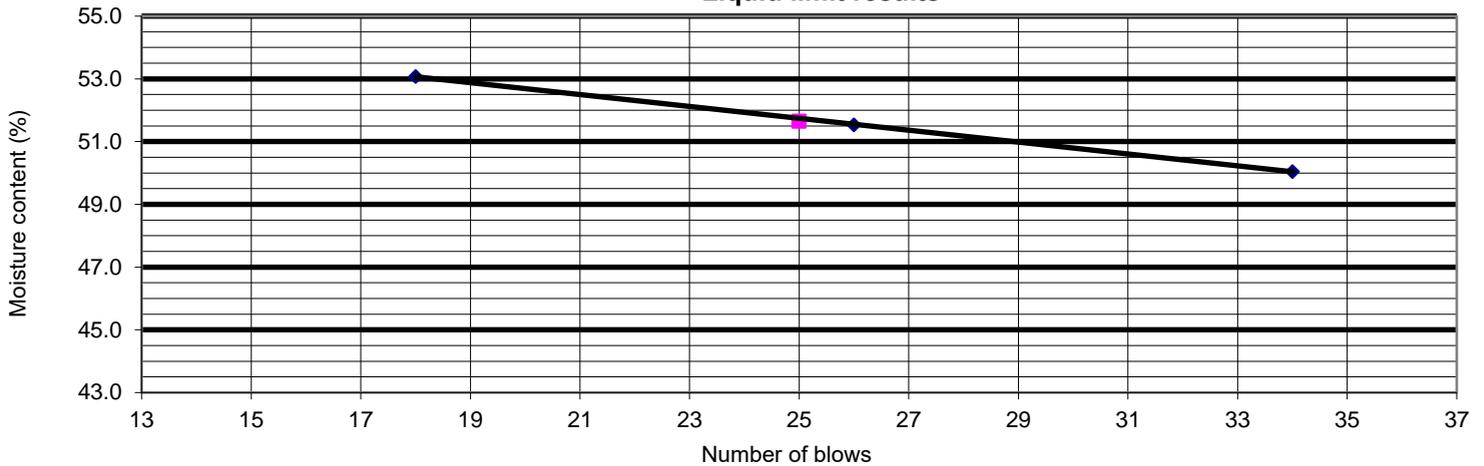
No. Projet: 191-12784-03

Borehole No.: B14

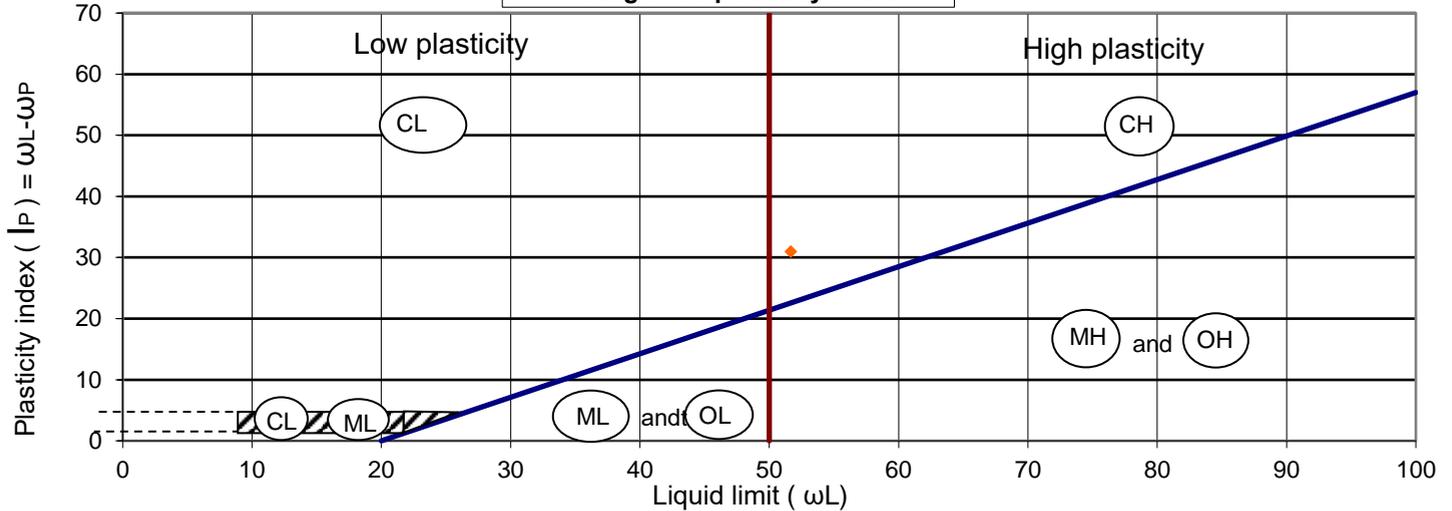
Sample No.: SS8

Sample depth: 4.27 - 4.88 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω_L)	Plasticity limit (ω_p)	Plasticity index (I_p)	Liquidity index (I_L)	TNatural moisture content ω_n (%)
51.65	20.70	30.95	0.63	40.27

Sample description: High plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 2nd 2021

Reviewed by: N Krebs

Date: March, 9th 2021



ATTERBERG LIMITS

(ASTM D4318)

Client: PSPC

No. Lab: OL811-17

Project/Site: Notre Dame de la Salette

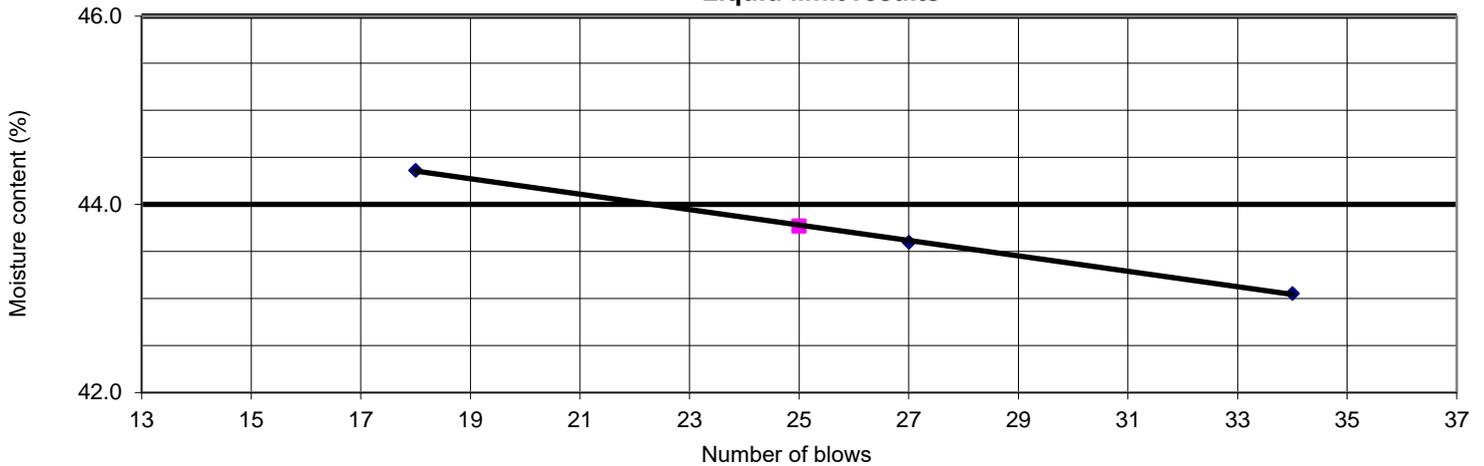
No. Projet: 191-12784-03

Borehole No.: B14

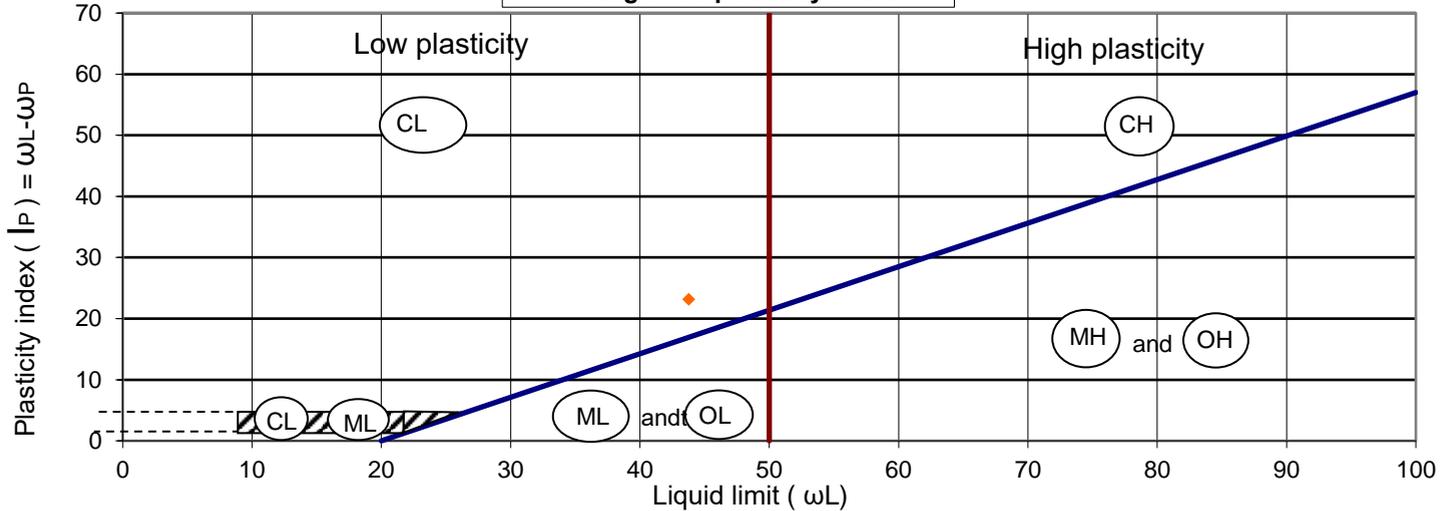
Sample No.: SS10

Sample depth: 5.49 - 6.10 m

Liquid limit results



Casagrande plasticity chart



Liquid limit (ω _L)	Plasticity limit (ω _p)	Plasticity index (I _p)	Liquidity index (I _L)	TNatural moisture content ω _n (%)
43.77	20.60	23.17	0.90	41.55

Sample description: Low plasticity, inorganic clay.

Tested by: N Sandoval

Date: March, 5th 2021

Reviewed by: N Krebs

Date: March, 9th 2021



Moisture contents

Project # :	191-12784-03			Lab # :	OL811
Project name :	Notre Dame de la Salette			Date:	February 24, 2021
Client :	PSPC			Tech:	NS
TIN NO.					
BOREHOLE NO.	B01	B01	B01	B03	B03
SAMPLE & DEPTH	SS5/2.44-3.05 m	SS7/3.66-4.27 m	SS11/ 6.10-6.71 m	SS3B/2.44-3.05 m	SS4/1.8-2.4 m
WT of TIN & WET SOIL (g)	769.0	588.1	620.7	189.3	280.8
WT of TIN & DRY SOIL (g)	602.5	463.3	477.6	184.9	231.4
WT of WATER (g)	166.5	124.8	143.1	4.4	49.4
TARE WT (g)	160.7	164.7	153.1	167.3	86.2
WT of DRY SOIL (g)	441.8	298.6	324.5	17.6	145.2
MOISTURE CONTENT	37.7%	41.8%	44.1%	25.0%	34.0%
TIN NO.					
BOREHOLE NO.	B03	B03	B12	B12	B12
SAMPLE & DEPTH	SS5/2.44-3.05 m	SS7/3.66-4.27 m	SS2/0.61-1.22 m	SS5/2.44-3.05 m	SS8/4.27-4.88 m
WT of TIN & WET SOIL (g)	580.5	675.4	588.5	475.6	471.1
WT of TIN & DRY SOIL (g)	452.5	522.3	494.0	360.5	363.3
WT of WATER (g)	128.0	153.1	94.5	115.1	107.8
TARE WT (g)	153.1	154.9	167.0	88.4	82.4
WT of DRY SOIL (g)	299.4	367.4	327.0	272.1	280.9
MOISTURE CONTENT	42.8%	41.7%	28.9%	42.3%	38.4%
TIN NO.					
BOREHOLE NO.	B13	B13	B13	B14	B14
SAMPLE & DEPTH	SS3/1.22-1.83 m	SS8/4.27-4.88 m	SS12/6.71-7.32 m	SS2/0.61-1.22 m	SS6/3.05-3.66 m
WT of TIN & WET SOIL (g)	522.4	632.3	584.2	353.7	607.3
WT of TIN & DRY SOIL (g)	399.2	469.9	435.3	306.4	447.4
WT of WATER (g)	123.2	162.4	148.9	47.3	159.9
TARE WT (g)	105.4	94.2	87.7	106.4	100.4
WT of DRY SOIL (g)	293.8	375.7	347.6	200.0	347.0
MOISTURE CONTENT	41.9%	43.2%	42.8%	23.7%	46.1%
TIN NO.					
BOREHOLE NO.	B14	B14			
SAMPLE & DEPTH	SS8/4.27-4.88 m	SS10/5.49-6.10 m			
WT of TIN & WET SOIL (g)	690.3	599.7			
WT of TIN & DRY SOIL (g)	521.8	451.4			
WT of WATER (g)	168.5	148.3			
TARE WT (g)	103.4	94.5			
WT of DRY SOIL (g)	418.4	356.9			
MOISTURE CONTENT	40.3%	41.6%			
TIN NO.					
BOREHOLE NO.					
SAMPLE & DEPTH					
WT of TIN & WET SOIL (g)					
WT of TIN & DRY SOIL (g)					
WT of WATER (g)					
TARE WT (g)					
WT of DRY SOIL (g)					
MOISTURE CONTENT					

ANNEXES

D PHOTOGRAPHIC REPORT



Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 1

Borehole:
B-01

Description:

SS-01

N-count:

30 / 42 / 18 / 7

Depth (m):

0.00 – 0.61



Photo 2

Borehole:
B-01

Description:

SS-02

N-count:

3-3-4-5

Depth (m):

0.61 – 1.22





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 3

Borehole:
B-01

Description:

SS-03

N-count:

1-1-3-3

Depth (m):

1.22 – 1.83



Photo 4

Borehole:
B-01

Description:

SS-04

N-count:

1-2-3-3

Depth (m):

1.83 – 2.44



	<h1>Photolog</h1>	<p>Date: March 18th, 2021</p>
<p>Project: Geotechnical study – Notre-Dame De La Salette</p>	<p>Project site:: 1735 Route 309, Notre-Dame De La Salette, QC</p>	<p>Project N.: 191-12784-03</p>

<p>Photo 5</p>	
<p>Borehole: B-01</p>	
<p>Description:</p> <p>SS-06</p> <p>N-count:</p> <p>0-1-1-1</p> <p>Depth (m):</p> <p>3.05 – 3.66</p>	



Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 6

Borehole:
B-01

Description:

SS-07

N-count:

0-0-0-2

Depth (m):

3.66 – 4.27



Photo 7

Borehole:
B-01

Description:

SS-08

N-count:

0-0-0-0

Depth (m):

4.27 – 4.88





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 8

Borehole:
B-01

Description:

SS-09

N-count:

0-0-0-0

Depth (m):

4.88 – 5.49



Photo 9

Borehole:
B-01

Description:

SS-10

N-count:

0-0-0-0

Depth (m):

5.49 – 6.10





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 10	
Borehole: B-01	
Description: SS-11 N-count: 0-0-0-0 Depth (m): 6.10 – 6.71	
Photo 11	
Borehole: B-01	
Description: SS-13 N-count: 0-0-0-0 Depth (m): 7.32 – 7.92	



Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 12

Borehole:
B-01

Description:

SS-14

N-count:

0-0-0-0

Depth (m):

7.92 – 8.53



Photo 13

Borehole:
B-03

Description:

SS-01

N-count:

7-3-4-5

Depth (m):

0.00 – 0.61





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 14

Borehole:
B-03

Description:

SS-2A – 2B

N-count:

3-3-2-5

Depth (m):

0.61 – 1.01

1.01 – 1.22





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 15

Borehole:
B-03

Description:

SS-3A – 3B

N-count:

4-3-2-2

Depth (m):

1.22 – 1.34

1.34 – 1.83



Photo 16

Borehole:
B-03

Description:

SS-04

N-count:

0-0-0-1

Depth (m):

1.83 – 2.44





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 17

Borehole:
B-03

Description:

SS-05

N-count:

0-1-1-2

Depth
(m):

2.44 – 3.05



Photo 18

Borehole:
B-03

Description:

SS-06

N-count:

0-0-0-1

Depth
(m):

3.05 – 3.66





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 19

Borehole:
B-03

Description:

SS-07

N-count:

0-0-0-1

Depth (m):

3.66 – 4.27



Photo 20

Borehole:
B-03

Description:

SS-08

N-count:

0-0-1-1

Depth (m):

4.27 – 4.88





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 21

Borehole:
B-03

Description:

SS-09

N-count:

0-0-0-1

Depth (m):

4.88 – 5.49



Photo 22

Borehole:
B-03

Description:

SS-10

N-count:

0-0-0-0

Depth (m):

5.49 – 6.10





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 23

Borehole:
B-03

Description:

SS-11

N-count:

0-0-0-0

Depth (m):

6.10 – 6.71



Photo 24

Borehole:
B-03

Description:

SS-12

N-count:

0-0-0-0

Depth (m):

6.71 – 7.32





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 25

Borehole:
B-03

Description:

SS-13

N-count:

0-0-0-0

Depth (m):

7.32 – 7.92



Photo 26

Borehole:
B-03

Description:

SS-14

N-count:

0-0-0-0

Depth (m):

7.92 – 8.53





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 27

Borehole:
B-12

Description:

SS-1A – 1B

N-count:

60-50-23-7

Depth (m):

0.00 – 0.61



Photo 28

Borehole:
B-12

Description:

SS-02

N-count:

3-3-3-5

Depth (m):

0.61 – 1.22





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 29

Borehole:
B-12

Description:

SS-03

N-count:

1-1-2-3

Depth (m):

1.22 – 1.83



Photo 30

Borehole:
B-12

Description:

SS-04

N-count:

0-1-1-2

Depth (m):

1.83 – 2.44





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 31

Borehole:
B-12

Description:

SS-05

N-count:

0-0-0-0

Depth
(m):

2.44 – 3.05



Photo 32

Borehole:
B-12

Description:

SS-06

N-count:

0-0-0-1

Depth
(m):

3.05 – 3.66





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 33

Borehole:
B-12

Description:

SS-07

N-count:

0-0-0-0

Depth (m):

3.66 – 4.27



Photo 34

Borehole:
B-12

Description:

SS-08

N-count:

0-0-0-0

Depth (m):

4.27 – 4.88





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 35

Borehole:
B-12

Description:

SS-09

N-count:

0-0-1-2

Depth (m):

4.88 – 5.49



Photo 36

Borehole:
B-12

Description:

SS-10

N-count:

0-0-0-0

Depth (m):

5.49 – 6.10





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 37

Borehole:
B-12

Description:

SS-11

N-count:

0-0-0-0

Depth (m):

6.10 – 6.71



Photo 38

Borehole:
B-12

Description:

SS-12

N-count:

0-0-0-0

Depth (m):

6.71 – 7.32





Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 39

Borehole:
B-12

Description:

SS-13

N-count:

0-0-0-0

Depth (m):

7.32 – 7.92



Photo 40

Borehole:
B-12

Description:

SS-14

N-count:

0-0-0-0

Depth (m):

7.92 – 8.53



	<h1>Photolog</h1>	<p>Date: March 18th, 2021</p>
<p>Project: Geotechnical study – Notre-Dame De La Salette</p>	<p>Project site:: 1735 Route 309, Notre-Dame De La Salette, QC</p>	<p>Project N.: 191-12784-03</p>

<p>Photo 41</p>	
<p>Borehole: B-13</p>	
<p>Description: SS-02 N-count: 3-3-3-5</p>	
<p>Depth (m): 0.61 – 1.22</p>	



Photolog

Date:
March
18th, 2021

Project:
Geotechnical study – Notre-Dame De La
Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

Project N.:
191-12784-03

Photo 42

Borehole:
B-13

Description:

SS-03

N-count:

1-1-1-3

Depth (m):

1.22 – 1.83

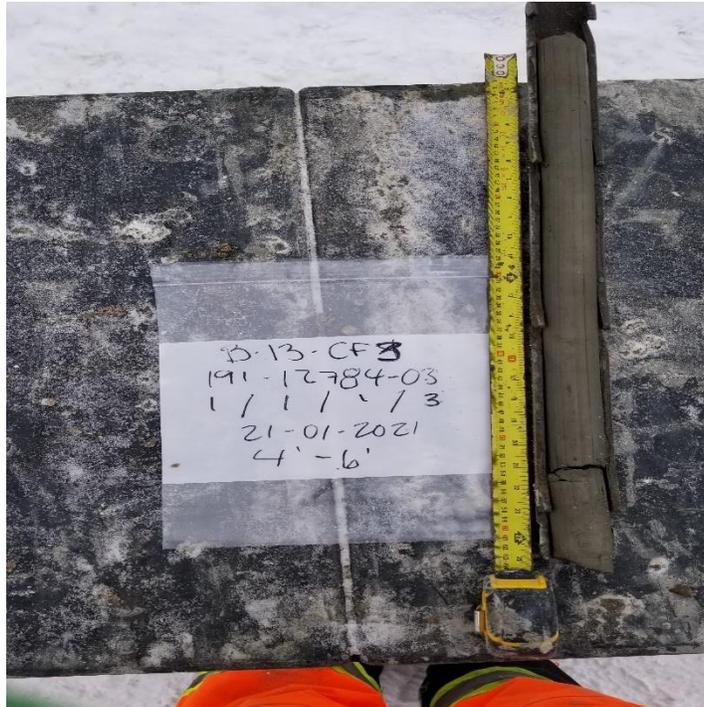


Photo 43

Borehole:
B-13

Description:

SS-04

N-count:

1-1-2-3

Depth (m):

1.83 – 2.44





Photolog

Date:
March
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Project:
Geotechnical study – Notre-Dame De La Salette

Project site::
1735 Route 309, Notre-Dame De La Salette, QC

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Photo 44

Borehole:
B-13

Description:

SS-05

N-count:

0-0-2-1

Depth
(m):

2.44 – 3.05



Photo 45

Borehole:
B-13

Description:

SS-06

N-count:

0-0-0-2

Depth
(m):

3.05 – 3.66





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Salette

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Photo 46	
Borehole: B-13	
Description: SS-07 N-count: 0-0-0-2 Depth (m): 3.66 – 4.27	
Photo 47	
Borehole: B-13	
Description: SS-08 N-count: 0-0-0-1 Depth (m): 4.27 – 4.88	



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Photo 48	
Borehole: B-13	
Description: SS-10 N-count: 0-0-0-1 Depth (m): 5.49 – 6.10	



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Photo 49	
Borehole: B-13	
Description: SS-12 N-count: 0-0-0-0 Depth (m): 6.71 – 7.32	
Photo 50	
Borehole: B-13	
Description: SS-13 N-count: 0-0-0-0 Depth (m): 7.32 – 7.92	



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191-12784-03

Photo 51

Borehole:
B-13

Description:

SS-14

N-count:

0-0-0-0

Depth (m):

7.92 – 8.53



Photo 52

Borehole:
B-14

Description:

SS-01

N-count:

9-6-5-3

Depth (m):

0.00 – 0.61





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Photo 53

Borehole:
B-14

Description:

SS-02

N-count:

2-2-2-3

Depth (m):

0.61 – 1.22





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191-12784-03

Photo 54

Borehole:
B-14

Description:

SS-03

N-count:

1-0-0-0

Depth (m):

1.22 – 1.83



Photo 55

Borehole:
B-14

Description:

SS-4A – 4B

N-count:

0-0-0-0

Depth (m):

1.83 – 2.17

2.17 – 2.44





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Photo 56

Borehole:
B-14

Description:

SS-05

N-count:

0-0-0-0

Depth
(m):

2.44 – 3.05



Photo 57

Borehole:
B-14

Description:

SS-06

N-count:

0-0-0-0

Depth
(m):

3.05 – 3.66





Photolog

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Photo 58

Borehole:
B-14

Description:

SS-07

N-count:

0-0-0-2

Depth (m):

3.66 – 4.27



Photo 59

Borehole:
B-14

Description:

SS-08

N-count:

0-0-0-2

Depth (m):

4.27 – 4.88





Photolog

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Project N.:
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Photo 60

Borehole:
B-14

Description:

SS-09

N-count:

0-0-0-2

Depth (m):

4.88 – 5.49



Photo 61

Borehole:
B-14

Description:

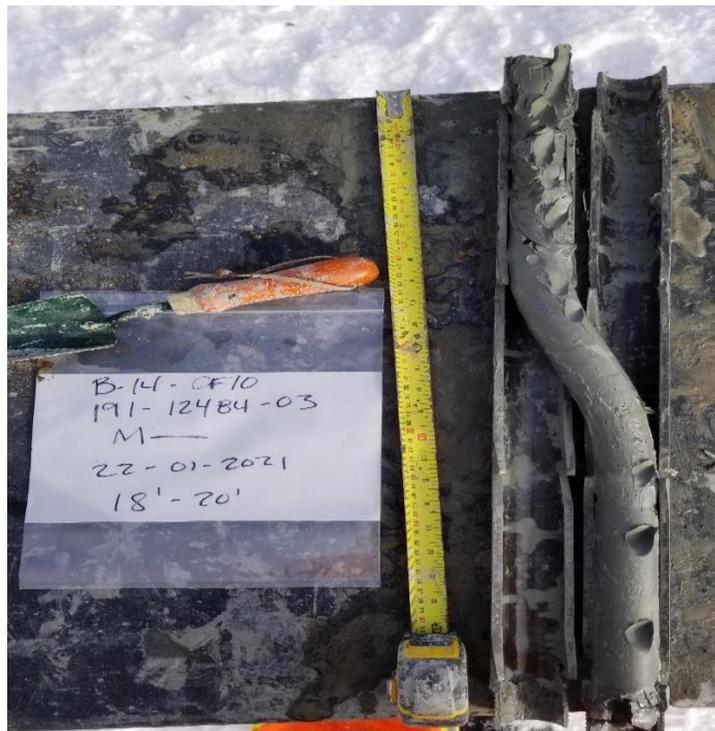
SS-10

N-count:

0-0-0-0

Depth (m):

5.49 – 6.10





Photolog

Date:
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Project:
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Photo 62

Borehole:
B-14

Description:

SS-11

N-count:

0-0-0-0

Depth (m):

6.10 – 6.71



Photo 63

Borehole:
B-14

Description:

SS-12

N-count:

0-0-0-0

Depth (m):

6.71 – 7.32





Photolog

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Project:
Geotechnical study – Notre-Dame De La
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Project site::
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Project N.:
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Photo 64

Borehole:
B-14

Description:

SS-14

N-count:

0-0-0-0

Depth (m):

7.92 – 8.53

